

LIFE CYCLE ASSESSMENT OF READY MIXED CONCRETE

Project Proponent:

National Ready Mixed Concrete Association (NRMCA)



Products Included:

Industry-wide ready mixed concrete product ranges

Study Completed:

Version 4 - October 9, 2026



EXECUTIVE SUMMARY

NRMCA Industry Wide Life Cycle Assessment Project Report Version 4

Purpose and context. The National Ready Mixed Concrete Association Industry Wide Life Cycle Assessment Project Report Version 4 updates and supersedes Version 3.2 issued in December 2021. It provides the technical basis for NRMCA's industry average environmental product declaration and updated national and regional benchmarks. The study reflects new governing requirements, a larger and more current primary dataset, an expanded product schedule, and more detailed geographic and statistical reporting.

Major Changes Since Version 3.2

- **Updated governing requirements.** Version 4 is structured to conform to ISO 14025:2026, ISO 14040, ISO 14044, ISO 21930:2017, and NSF 1112-26 Concrete Product Category Rule Version 3. The prior study used ISO 14025:2006 and Concrete PCR Version 2.1. PCR Version 3 clarifies product and EPD classifications, covers permanent and mobile batching operations including volumetric mixing, strengthens documentation, and updates rules for electricity, transportation, material loss, and optional Module A4 reporting.
- **Broader product representation.** The modeled schedule increases from 72 to 120 industry average mix designs. It includes air entrained and non-air entrained normal weight concrete from 2,500 to 5,000 psi, high strength concrete through 12,000 psi, and lightweight concrete at 3,000, 4,000, and 5,000 psi. Eight cementitious material configurations are represented at each applicable strength level.
- **Larger and more current primary dataset.** The analytical population expands from 489 facilities in Version 3.2 to 1,238 facilities in Version 4. Primary foreground data cover 12 month reporting periods during 2023 and 2024 and include production, plant technology, energy, water, ancillary materials, wastes, emissions, and inbound material transportation. Facility level information remains confidential.
- **Expanded geographic detail.** Version 4 reports national results and benchmarks for 18 geographic study groups: the eight original NRMCA regions, California, Florida, Ohio, Texas, Illinois, DC Metro, and the Greater Los Angeles, Bay Area, and San Diego subregions. Regional calculations apply location relevant material shares, inbound transportation, manufacturing inventories, and electricity profiles within a consistent framework.
- **More transparent modeling and uncertainty information.** The study updates upstream datasets and applies the PCR Version 3 transportation methodology, including imported material and ocean shipping data. It uses surveyed manufacturing loss and regionalizes U.S. electricity at the balancing authority level. No environmental attribute certificates or renewable electricity instruments are applied.
- **Expanded statistical analysis.** Version 4 introduces product level statistical analysis for key LCIA indicators, including measures of variability, precision, and confidence intervals. This added analysis improves transparency regarding the range and uncertainty underlying the reported industry average results and helps users interpret how individual product results relate to the reported averages.

Scope and Appropriate Use

The assessment remains cradle to gate and reports Modules A1 through A3 for one cubic meter of fresh concrete, with results convertible to one U.S. cubic yard using the PCR factor. Module A4, the use stage, and end of life are not included in the baseline model. Results support industry average reporting and region and strength specific benchmarking, but do not represent a specific plant or product, full life cycle performance, or environmental superiority. Comparisons require equivalent functions, declared units, system boundaries, data sources, and PCR based methods.

Overall significance. Version 4 provides a more current, comprehensive, and transparent picture of U.S. ready mixed concrete production. Expanded facility coverage, product representation, geographic resolution, updated background data, and explicit treatment of variability give users a stronger technical foundation for interpreting industry averages and applying regional benchmarks.

GLOSSARY

Table 1. Glossary

Term	Definition
Allocation	Partitioning input or output flows of a process or product system between the product system under study and one or more other product systems.
Declared unit	Quantity of a construction product used as a reference unit for expressing environmental information in information modules. For this study, one cubic meter of fresh concrete.
Environmental Product Declaration (EPD)	A Type III environmental declaration that provides quantified environmental data using predetermined parameters based on LCA.
Life cycle assessment (LCA)	Compilation and evaluation of inputs, outputs, and potential environmental impacts of a product system throughout its life cycle.
Life cycle inventory (LCI)	Compilation and quantification of inputs and outputs for a product system.
Life cycle impact assessment (LCIA)	Evaluation of the magnitude and significance of potential environmental impacts for a product system.
Product Category Rule (PCR)	Specific rules, requirements, and guidelines for developing Type III environmental declarations for one or more product categories.
Ready-mixed concrete (RMC)	Concrete manufactured in a batching plant and delivered to a construction site in a ready-to-use form.
Supplementary cementitious material (SCM)	A material used with cement to contribute to the properties of fresh or hardened concrete, including fly ash, slag cement, silica fume, and other qualifying materials.
System boundary	Set of criteria specifying which unit processes are included in the product system.

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ACRONYMS AND ABBREVIATIONS

Table 2. Acronyms and abbreviations

Acronym	Meaning
ACI	American Concrete Institute
A1	Raw material supply
A2	Transportation to the concrete plant
A3	Manufacturing
ACA	American Cement Association
AE	Air-Entrained
EPD	Environmental Product Declaration
FA	Fly ash
GWP	Global warming potential
IW	Industry-wide
LCA	Life cycle assessment
LCI	Life cycle inventory
LCIA	Life cycle impact assessment
NAE	Non-Air-Entrained
NRMCA	National Ready Mixed Concrete Association
PCR	Product Category Rule
PLC	Portland-limestone cement
RMC	Ready-mixed concrete
SCM	Supplementary cementitious material
SL	Slag cement
USLCI	U.S. Life Cycle Inventory Database

1 GENERAL STUDY ASPECTS

1.1 DOCUMENT SUMMARY

The following table identifies the principal details of the Version 4 industry-wide life cycle assessment (LCA).

Table 3. Document summary

PROJECT PROPONENT	National Ready Mixed Concrete Association (NRMCA)
PRODUCTS	120 Version 4 industry-average ready-mixed concrete mix designs: 96 normal- and high-strength mixes and 24 lightweight mixes
DECLARED UNIT	One cubic meter of fresh concrete. Results may additionally be presented per U.S. cubic yard using the NSF PCR conversion factor of 0.7645549.
REFERENCE SERVICE LIFE	Not applicable; the study covers production stage Modules A1-A3.
REFERENCE STANDARDS	ISO 14025:2026; ISO 14040:2006/Amd 1:2020; ISO 14044:2006/Amd 1:2017/Amd 2:2020; ISO 21930:2017
REFERENCE PCR	NSF 1112-26, Product Category Rule for Environmental Product Declarations – Concrete, Version 3, valid through April 30, 2031
LCA SCOPE	Cradle-to-gate, Modules A1-A3. Module A4 is optional under the PCR and is not included in the baseline V4 model unless separately reported.
LCA STUDY DETAILS	Version 4, October 9, 2026. LCA practitioner: WAP Sustainability, LLC.
YEAR OF PRIMARY DATA	Primary foreground data were collected for full calendar-year reporting periods from January 1 through December 31, 2023 and January 1 through December 31, 2024. Each participating facility contributed one complete 12-month calendar-year dataset from one of those two years.
LCA SOFTWARE / DATABASE	The current background data schedule includes Federal LCA Commons/USLCI, ecoinvent 3.10, and current industry EPDs.
LCIA METHODOLOGY	Result tables are structured for NSF 1112-26 and the V4 indicator set.
APPLICABLE REGIONS	United States national average; Eastern, Great Lakes/Midwest, Southeast, South Central, North Central, Pacific Northwest, Pacific Southwest, Rocky Mountains; California, Greater Los Angeles, Bay Area, San Diego, Florida, Ohio, Texas, Illinois; and DC Metro.

Important note: LCA results are relative expressions of potential impacts and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

1.2 LCA COMMISSIONER AND PRACTITIONERS

The National Ready Mixed Concrete Association (NRMCA) commissioned this industry-wide LCA on behalf of participating member companies and facilities. NRMCA represents ready-mixed concrete producers and companies that provide materials, equipment, and services to the industry. WAP Sustainability, LLC prepared the Version 4 LCA model and this project report using the WAP reporting template.

Participating companies and facilities are represented in the aggregated industry-wide and regional datasets included in this report. Confidential facility-level data are not disclosed.

1.3 REPORTING DATE AND VERSION

This report is Version 4, October 9, 2026. It updates and supersedes the content of A Cradle-to-Gate Life Cycle Assessment of Ready-Mixed Concrete Manufactured by NRMCA Members – Version 3.2 (December 2021) for purposes of the V4 industry-wide LCA and subsequent industry-average EPD.

1.4 STANDARDS AND PCR COMPLIANCE

The study is structured to conform to ISO 14025:2026, ISO 14040:2006/Amd 1:2020, ISO 14044:2006/Amd 1:2017/Amd 2:2020, ISO 21930:2017, and NSF 1112-26, Product Category Rule for Environmental Product Declarations – Concrete, Version 3.

NSF 1112-26 applies to concrete manufactured in permanent or mobile batching plants, including volumetric mixing, and delivered in ready-to-use form. It covers UN CPC Group 375, CSI MasterFormat 03 30 00, ASTM C94, ASTM C476, CSA A23.1/A23.2, and UNSPSC 30111500. It is not applicable to precast concrete or concrete masonry products.

1.5 VERSION 4 STUDY SUMMARY

This Version 4 industry-wide LCA is a sector-driven initiative of NRMCA and participating ready-mixed concrete producers. It updates the NRMCA Version 3.2 project report while retaining its goal of supporting an industry-average Environmental Product Declaration and regional benchmarking. The NRMCA industry-wide life cycle assessment (IW LCA) provides the basis for the NRMCA industry-average EPD.

The assessment covers the production of ready-mixed concrete from raw material supply through transportation and concrete manufacturing (Modules A1, A2, and A3). The declared unit is one cubic meter of fresh concrete. Results may also be presented per U.S. cubic yard. The use stage and end-of-life stages are outside the scope of the governing concrete PCR.

The V4 product schedule contains 120 mix designs. It expands the earlier product schedule to include air-entrained and non-air-entrained normal-weight mixes from 2,500 to 5,000 psi, high-strength mixes through 12,000 psi, and lightweight mixes at 3,000, 4,000, and 5,000 psi. Eight cementitious-material configurations are represented at each applicable strength level.

Primary manufacturing LCI is reported for the national average, the eight original NRMCA regions, California, Florida, Ohio, Texas, Illinois, DC Metro, and three California subregions: Greater Los Angeles, Bay Area, and San Diego. Material transportation and manufacturing inventory data are presented in the applicable appendices.

National and regional mix-design appendices present the Version 4 benchmark mixes and associated results.

Study design and modeling framework. The Version 4 LCA combines primary foreground facility-survey data with national and regional benchmark mix designs, material-specific inbound transportation parameters, and controlled secondary background LCI datasets. A1 applies the applicable upstream datasets to benchmark constituent quantities; A2 applies geography- and material-specific production weighted mean transport distances by mode; and A3 applies production-volume-weighted manufacturing inventories. Primary LCI tables retain the U.S. cubic yard basis where identified, while environmental performance results are reported per 1 m³ of fresh concrete.

Interpretation of the study is therefore based on the consistency of the A1-A3 model, the representativeness and quality of the primary and secondary data, the magnitude of module and material contributions, and the observed

geographic and site variation. The study is intended to characterize sector-average products and benchmarks rather than a specific facility or commercial mix; the data-quality assessment, completeness and consistency review, contribution analysis, and stated limitations are used together to evaluate the robustness and appropriate use of the results.

1.5.1 Key V4 Modeling Updates

- Governing PCR updated to NSF 1112-26, Concrete, Version 3.
- Regional A2 and A3 LCI updated for all 18 study groups, including Illinois, DC Metro, and three California subregions.
- V4 mix schedule updated to 120 national mix designs, including air-entrained and non-air-entrained normal-weight, high-strength, and lightweight concrete.
- Upstream default data schedule updated to current cement, slag cement, aggregate, admixture, water, fuel, electricity, and transport sources.

2 STUDY GOAL

2.1 INTENDED APPLICATIONS

This is a sector-driven initiative by NRMCA and its members to support an industry-wide Environmental Product Declaration (EPD) for ready-mixed concrete in accordance with ISO 14025 and the governing concrete PCR. The goal of this study is to provide the life cycle information required for the NRMCA industry-average EPD and the national and regional benchmark results reported herein.

The regional benchmark results also allow users of this report to conduct benchmarking against region- and strength-specific industry averages, subject to the comparability requirements of the governing PCR and ISO 21930.

2.2 INTENDED AUDIENCE

The intended audience includes NRMCA and participating producers, suppliers, EPD verifiers and program operators, architects, engineers, specifiers, LCA practitioners and tool developers, academia, governmental organizations, policy makers, and other value-chain parties that require reliable environmental information for ready-mixed concrete.

2.3 COMPARATIVE ASSERTIONS

This project report does not make comparative assertions of environmental superiority or equivalence. Comparisons are limited unless products have equivalent functions, declared units, system boundaries, data quality, background datasets, allocation procedures, and LCIA methods. Comparisons involving only Modules A1-A3 do not address the full life cycle performance of concrete in a building or civil infrastructure application.

3 STUDY SCOPE

3.1 PRODUCT STANDARD AND PRODUCT DESCRIPTION

The products are industry-average ready-mixed concrete mixtures for residential, commercial, institutional, and public-works applications in the United States. Applicable mixtures include conventional normal-weight concrete, air-entrained concrete, high-performance and high-strength concrete, and structural lightweight concrete.

The V4 schedule includes 120 mix designs. Mixes are classified by 28-day specified compressive strength, water-to-cementitious-material ratio, cementitious-material configuration, air entrainment, admixture type, aggregate type, and concrete density class. Appendix C provides the complete V4 national mix schedule. Appendix D provides the regional benchmark mixture compositions.

3.1.1 Product Performance Characteristics

The mix designs represent commonly specified 28-day compressive strengths and cementitious-material ranges. Normal-weight V4 mixes cover 2,500, 3,000, 4,000, and 5,000 ps, both air-entrained and non-air-entrained. High-strength mixes cover 6,000, 8,000, 10,000, and 12,000 psi. Lightweight mixes cover 3,000, 4,000, and 5,000 psi.

Eight cementitious-material configurations are modeled: 100% portland cement; 20%, 30%, and 40% fly ash; 30%, 40%, and 50% slag cement; and a ternary 20% fly ash/30% slag cement configuration. Mixture proportions and admixture quantities are listed in Appendix C.

3.2 SYSTEM BOUNDARY

The system boundary for this study is limited to a cradle-to-gate focus. The following three life cycle stages, as defined by the governing PCR, are included in the study scope: A1 - raw material supply, A2 - transportation, and A3 - manufacturing. Other life cycle stages are outside the scope of this study.

Table 4. Life cycle stages included in the study

Module	Stage	Included processes
A1	Raw material supply	Extraction, handling, and processing of raw materials and intermediate component products, as well as fuels used in the production of concrete.
A2	Transportation	Transportation of all input materials and fuels from the supplier to the gate of the concrete plant.
A3	Manufacturing	Energy used to store, move, batch, and mix the concrete and operate the concrete plant, including transportation and processing of wastes from the core processes.

3.2.1 Module A1 – Raw Material Supply

A1 - Raw material supply (upstream processes): extraction, handling, and processing of the raw materials and intermediate component products, as well as fuels used in the production of concrete.

3.2.2 Module A2 – Transportation

A2 - Transportation: transportation of all input materials and fuels from the supplier to the gate of the concrete plant. The V4 transportation model applies the truck backhaul treatment required by NSF 1112-26.

3.2.3 Module A3 – Manufacturing

A3 - Manufacturing (core process): the energy used to store, move, batch, and mix the concrete and operate the concrete plant, as well as the transportation and processing of wastes from these core processes. The V4 model applies the transit-mix/mobile-mixer energy allocation requirements of NSF 1112-26.

3.2.4 Excluded Processes

The following processes are excluded from the product system:

- Manufacture and construction of capital goods and infrastructure.
- Manufacture of production equipment, delivery vehicles, earthmoving equipment, and laboratory equipment.
- Personnel-related activities, including commuting, travel, furniture, and office supplies.
- Company management and sales energy and water use not associated with concrete production.
- Concrete placement and curing water at the construction site.

3.3 DECLARED UNIT

The declared unit is one cubic meter of fresh concrete. Results may be derived per U.S. cubic yard. In accordance with NSF 1112-26, results calculated per cubic meter are multiplied by 0.7645549 to convert to one cubic yard. No functional unit or reference service life is assigned because the study excludes the use stage. The density, compressive strength, exposure characteristics, cementitious-material types and proportions, air entrainment, lightweight aggregate use, and other technical information required by the PCR are reported.

3.4 CUT-OFF CRITERIA

In accordance with ISO 21930:2017 §7.1.8 and the governing NSF Concrete PCR, a 1% cut-off applies to renewable and non-renewable primary energy consumption and to the total mass of inputs within a unit process. The sum of all neglected flows shall not exceed 5% of total energy consumption or mass inputs. All flows known to have significant environmental relevance or contribute materially to uncertainty are included regardless of magnitude, and hazardous or toxic material flows are not subject to cut-off. All available collected core-process data were included in the study. Compliance with the applicable cut-off requirements is therefore confirmed.

3.5 WASTE TREATMENT

Hazardous and non-hazardous solid wastes generated during concrete manufacturing are included in Module A3 based on the reported quantities of waste generated by participating facilities. Hazardous solid waste is modeled using a hazardous-waste treatment/incineration process, while non-hazardous solid waste is modeled using an inert-waste sanitary landfill treatment process. The environmental burdens associated with these treatment processes are included in the A3 results using the applicable background LCI datasets.

4 LIFE CYCLE INVENTORY ANALYSIS

4.1 PRIMARY DATA SOURCES

Primary foreground data were collected from participating ready-mixed concrete facilities through structured NRMCA survey instruments requesting one complete 12-month calendar-year dataset for either CY2023 or CY2024, together with supporting facility records. Data include concrete production, plant type, electricity and fuels, water, wash-water reuse, ancillary materials, solid waste, selected air and water emissions, and mixing-fleet energy. Supporting records include utility bills, fuel invoices, sales and production records, and similar documentation retained for verification.

Appendix D reports the regional A2 and A3 statistics for all 18 study groups.

4.1.1 Regionalization and Industry Averaging

Industry-average and regional inventories are based on participating facilities and products. Facility-level values are normalized to concrete production and aggregated to protect confidentiality and improve representativeness. State, metro, and California-subregional datasets are reported alongside the regional datasets included in the study.

Table 5. National, regional, state, metro, and subregional facility counts

Region / state / metro / subregion	Code	Facilities (N)
NRMCA - National	NRMCA	1238
Eastern	E	227
Great Lakes/Midwest	GL	199
North Central	NC	68
Pacific Northwest	PNW	77
Pacific Southwest	PSW	136
Rocky Mountains	RM	64
South Central	SC	192
Southeast	SE	275
Ohio	OH	51
Texas	TX	123
California	CA	85
Greater Los Angeles Metro	GLAM	30
Bay Area Metro	BAM	15
San Diego Metro	SDM	9
Florida	FL	88
Illinois	ILL	47
DC Metro	DCM	13

Primary foreground data were collected for full calendar-year reporting periods from January 1 through December 31, 2023 and January 1 through December 31, 2024. Each participating facility contributed one complete 12-month calendar-year dataset from one of those two years. Primary LCI tables are reported on the U.S. cubic-yard basis where identified; environmental performance results are normalized to the declared unit of 1 m³ of fresh ready mixed concrete. Aggregation differs by module. For A1, benchmark constituent quantities are calculated using the production weighted mean of eligible reported observations within the applicable national or regional dataset, with the corresponding upstream LCI/EPD impacts applied to those quantities. For A2, material transport distances are calculated as production weighted means across eligible reporting facilities for each material and transportation mode; these mean distances are then applied to the benchmark material quantities and applicable transportation factors. For A3, facility energy, water, waste, and other manufacturing flows are first normalized per unit of concrete production and then aggregated using production-volume weighting, i.e., $\sum(V_i \times I_i) / \sum V_i$, where V_i is the reported concrete production volume for facility i and I_i is its normalized A3 inventory.

Manufacturing loss is based on the surveyed facility data and is applied consistently across Modules A1, A2, and A3. The surveyed loss rate is incorporated into the modeled material quantities so that the associated upstream material production burdens (A1), transportation burdens (A2), and manufacturing and waste-treatment burdens (A3) reflect the material required and impacts associated with production losses. For batch waste, source values reported as 0% or 5% were corrected to the governing PCR default of 2%; the recalculated production-weighted national mean is 1.724%.

The modeled production-loss rate is not equivalent to the NHWD indicator. NHWD reports only non-hazardous waste that is disposed to landfill in the modeled system. A portion of batch waste may remain onsite, be reclaimed, or be recycled into other products or processes and therefore is not necessarily represented as landfill-disposed non-hazardous waste.

Empirical distribution: The median values reported in Appendices A and D represent the empirical facility medians and therefore reflect the observed data, including reported zero values. Statistical results were derived from the observed empirical distribution of the reported data rather than by fitting a specific parametric distribution to the dataset. Percentile statistics were calculated directly from the available observations and therefore do not require an assumption of normality. Means, medians, standard deviations, and confidence intervals are provided as complementary measures of central tendency and variability. This approach was selected because operational and transportation data can be asymmetric and may contain legitimate variation between facilities; use of the empirical distribution avoids imposing a distributional form that may not adequately represent the underlying data.

Confidence-interval basis and limitation: except where a table note specifies the unequal-weight ratio-estimator method for production-weighted A3 flows, 95% confidence intervals for product/site means are calculated using a two-sided Student t approximation, $\text{mean} \pm t_{0.975, n-1} \times \text{SD} / \sqrt{n}$. These intervals describe sampling precision under an independent-facility approximation; they do not include systematic uncertainty in background datasets or model structure, and the product/site intervals do not propagate A2 distance-sampling variability because geography-level mean A2 distances are applied uniformly.

4.1.2 A2 Material Transportation

Module A2 represents transportation of input materials and fuels from the supplier to the concrete plant. The one-way transportation distances are reported in Appendix B by material group and transport mode. Truck transportation impacts are adjusted for backhauls in accordance with NSF 1112-26 by multiplying impacts from the dataset by the factor 2/1.35. The distances reported in this report are not adjusted.

For each geography, A2 distance parameters are calculated separately by material category and transport mode from the eligible primary responses. Missing transportation records are excluded from the applicable mean; reported zero rail, ocean, or barge distances are retained as structural zeros when the mode was not used. The resulting geography-level production weighted mean distances are then applied to the benchmark material quantities for all modeled products in that geography. Facility-specific A2 transportation distances are not imputed for nonresponding facilities. Product calculations use the applicable geography-, material-, and mode-specific A2 mean distances. Sampling uncertainty associated with those A2 means is propagated into the product-level statistical uncertainty and combined with A3 sampling uncertainty by root-sum-of-squares. A1 is fixed for each declared product.

4.1.3 A3 Manufacturing Inventory

All ocean-transport distances used in the A2 model are primary distances reported by study participants. PCR default ocean distances were not applied. Where imported cement is represented, its A1 burden uses the American Cement Association industry-average cement EPD dataset identified in Appendix F.

Module A3 represents the core ready-mixed concrete manufacturing process. Primary data include plant electricity and fuels, material handling and mixing energy, water, ancillary materials, wastes, and reported facility emissions. Regional A3 inventory statistics are reported in Appendix D.

U.S. facility electricity was regionalized in accordance with the Concrete PCR v3 (NSF 1112-26). Each participating facility was mapped using its reported ZIP code and the U.S. Energy Atlas ZIP-code-to-balancing-authority (BA) mapping. Where a ZIP code was associated with a single balancing authority, the corresponding BA-level electricity profile was applied. Where multiple balancing authorities were mapped to the same ZIP code, the electricity impacts were calculated as the production weighted mean of the applicable impact results for all balancing authorities associated with that ZIP code. This ZIP-code-level electricity profile was then applied to the facility's reported electricity consumption for calculation of A3 impacts. This approach follows the PCR requirement for U.S. electricity to be regionalized at the balancing-authority level.

No environmental attribute certificates (EACs/RECs), Green-e claims, book-and-claim instruments, or other market-based electricity claims are applied in this LCA study. The declared electricity results are location-based using the regional background datasets documented in the V4 LCA. No separate "Purchased Electricity from Green Grid" or site-generated renewable-electricity claim is used in the reported A1-A3 results. Land-use-related impacts (for example, biodiversity/soil fertility) and toxicological aspects are not declared as separate indicators in this LCA study.

4.2 SECONDARY DATA SOURCES

All upstream material, resource, and energy-carrier inputs are sourced from industry-average datasets and literature appropriate to the V4 study. The secondary LCI data sources used for Module A1 are summarized in Appendix F.

Module A1 includes the raw materials used in the concrete mix designs, including hydraulic cements, fly ash, slag cement, aggregates, admixtures, batch water, and lightweight aggregate where applicable. Fly ash is modeled as a recovered material entering the system without incoming production or preparation burden; its transportation to the concrete plant is modeled in Module A2.

4.3 CALCULATION METHOD

LCI datasets are applied to the raw material quantities and transportation requirements specified by each RMC product mix design for Modules A1 and A2. Manufacturing inventory for Module A3 is normalized to the declared unit and combined with A1 and A2 to calculate the cradle-to-gate results. Modules A1, A2, and A3 are also reported separately.

Calculations use unrounded input values; rounding is applied only for report presentation.

4.3.1 V4 Mix Design Framework

The national benchmark mix designs are based on accepted ACI mixture-proportioning practices. ACI 211.1 provides the conventional mixture-proportioning basis for normal-weight mixes through 5,000 psi, ACI 211.2 provides the basis for structural lightweight mixtures, and ACI 211.4 provides the high-strength mixture-proportioning basis for the 8,000, 10,000, and 12,000 psi mixes.

For the 6,000 psi strength class, ACI 211.1 and ACI 211.4 were both reviewed. The two methods produced conflicting estimates at this transition strength. Empirical industry mix-design data for 6,000 psi concrete were therefore reviewed and utilized to establish the representative 6,000 psi benchmark mixture.

The water-to-cementitious-materials ratio (w/cm) is selected as a function of specified compressive strength using the applicable ACI strength-to-w/cm relationship, with lower w/cm generally corresponding to higher specified strength.

For cement-equivalent strength calculations, fly ash is treated at 75% reactivity relative to portland cement, while slag cement is treated at 100% reactivity. This reactivity treatment is used when establishing the cementitious-material requirement for mixes containing SCMs.

Mixture proportions are adjusted to maintain the target concrete volume as paste and cementitious content change. Aggregate quantities are correspondingly adjusted so that the final mixture represents one cubic yard of fresh concrete.

The ACI compressive-strength-to-water-to-cementitious-materials ratio (w/cm) relationship is used as the basis for translating regional plant-survey averages into benchmark mixtures at the specified strength classes.

The regional SCM-to-total-cementitious-materials ratio is maintained across compressive strengths. For normal-weight concrete, the regional fine-to-coarse aggregate relationship is also maintained across compressive strengths. For lightweight concrete, the fine-to-coarse aggregate relationship is adjusted as needed to maintain the target unit weight.

Water demand is adjusted as strength and paste content change. Higher-strength mixtures may require increased paste content and smaller coarse aggregate, together with water-reducing or high-range water-reducing admixtures. Aggregate quantities are adjusted upward or downward as necessary to maintain the target concrete volume.

Mix proportions were developed to represent product ranges across compressive strength, air entrainment, SCM use, aggregate type, and admixture use. For all structural lightweight mixes, the full coarse-aggregate quantity is modeled as manufactured lightweight aggregate (MLA); normal-weight coarse aggregate is zero. Batch water is reported and modeled in U.S. gallons per cubic yard; source water masses are converted using 8.345 lb per U.S. gallon. State, metro, and California subregional benchmark mixes use the applicable parent NRMCA regional mix framework and are customized for their specific Portland cement/Portland-limestone cement and SCM breakdowns. Benchmark composition tables report the full modeled mix range, including 10,000 and 12,000 psi high-strength mixes and manufactured lightweight aggregate for lightweight mixes.

Liquid admixture dosages reported in fl oz/yd³ are converted to mass in the model using 1 fl oz = 0.02957 L and an assumed admixture density of 1.10 kg/L. This is equivalent to 0.03253 kg per fl oz, or 0.04255 kg/m³ for each 1 fl oz/yd³ of reported dosage after applying the cubic-yard-to-cubic-meter conversion.

Regional benchmark compositions in Appendix D cover all 18 study groups: the national average, eight original production regions, California, Florida, Ohio, Texas, Illinois, DC Metro, Greater Los Angeles, Bay Area, and San Diego.

4.4 ALLOCATION

Allocation conforms with ISO 14044, ISO 21930, and the governing concrete PCR. No allocation is applied where facility flows can be directly assigned to concrete production. Recovered materials, co-products, and secondary flows are modeled in accordance with the applicable PCR and background-data rules.

Fly ash is treated as a recovered material entering the system without incoming production or preparation burden. Module A2 transportation from the supplier to the concrete plant is included. The required share of transit-mix or mobile-mixer fleet energy is allocated to A3. The “Transit Mix Only - Diesel - Used in Fleet” LCI value reported in Appendix A is the pre-allocation inventory value. The model applies the required allocation to Module A3; the balance is reserved for Module A4 when A4 is reported, preventing double counting.

4.5 DATA QUALITY

4.5.1 Geographic Coverage

Foreground manufacturing data represent participating U.S. concrete facilities and are aggregated at national, regional, state, metro, and California-subregional levels. Coverage comprises the national average, eight original NRMCA regions, California, Florida, Ohio, Texas, Illinois, DC Metro, Greater Los Angeles, Bay Area, and San Diego. Background data are selected for North American or U.S. geography wherever available.

4.5.2 Temporal Coverage

Primary foreground data were collected for full calendar-year reporting periods from January 1 through December 31, 2023 and January 1 through December 31, 2024. Each participating facility contributed one complete 12-month calendar-year dataset from one of those two years. These data represent the applicable V4 study reference period and satisfy the temporal requirements of NSF 1112-26. Background-data years are listed in Appendix F.

4.5.3 Technological Coverage

Primary data encompass central-mix and truck-mix plants and the fuels, electricity, water, ancillary materials, wastes, and emissions associated with current ready-mixed concrete manufacturing technology. The mix schedule reflects common North American mixture-proportioning practices and current national and regional material use.

4.5.4 Treatment of Missing Data

Primary A3 manufacturing data use the final analytical population of 1,238 facilities, with reported zero values retained where they represent confirmed non-use. Missing-data limitations are concentrated in A2 material transportation records. For A2, missing records are treated as nonresponse and excluded from the applicable material-and-mode mean rather than imputed as zero; confirmed non-use of a transport mode is retained as a structural zero. The resulting material- and geography-specific A2 means are applied to the benchmark products, so nonresponding facilities do not receive imputed facility-specific A2 distances. National average A2 sample sizes vary by material and mode: SCM N = 889; cement N = 954–955; admixture N = 955; aggregate N = 954; and manufactured lightweight aggregate N = 423–507. The applicable material-mode N values are reported in Appendix B.

Production-weighted A2 means are calculated from the applicable facility observations. Reported N is the observed facility count. Standard errors, margins of error, and confidence intervals for production-weighted A2 means use the Kish effective sample size to account for unequal production-volume weights. Effective N may therefore be lower than the observed N.

Secondary-data gaps and proxy use are assessed separately in Appendix F. Where complete upstream inventory information is unavailable, the affected indicators are identified as unavailable or incomplete rather than assigned

a value of zero, and any proxy datasets are documented with their geographic, temporal, and technological representativeness. These identified gaps correspond directly to the limitations disclosed in the EPD, while the data-quality assessment evaluates completeness, consistency, precision, reliability, and geographic, temporal, and technological representativeness of the underlying data.

4.5.5 Data Quality Assessment

Data quality is judged on the basis of representativeness (technological, temporal, and geographical), completeness, consistency, precision, and reliability. Appendix F summarizes the secondary data sources used in the V4 model.

DQA rating convention: Excellent = directly current and representative; Very good = closely representative with no material known limitation; Good = fit for purpose with disclosed age or genericity; Moderate = known proxy or representativeness limitation. The assessment below applies the same source-by-source ratings used in the EPD and considers temporal, geographic and technological representativeness together with completeness, precision/uncertainty and reliability.

Dataset / source	Temporal	Geographic	Technological	Completeness / precision / reliability
ACA portland cement / PLC industry-average EPDs (2023)	Very good	Very good - U.S./North America	Very good	Very good. Current verified industry EPD source; dominant A1 input for many mixes.
Slag Cement Association industry-average EPD (2021)	Good	Very good - North America	Very good	Very good. Verified industry EPD; age is disclosed.
Fly ash recovered-material treatment + A2 transport	N/A for incoming burden	Very good - U.S. transport	Very good	Good. PCR treatment assigns no incoming production/preparation burden; transport is modeled.
NSSGA construction aggregate LCA data (2025)	Excellent	Very good - U.S.	Very good	Very good. Current U.S. industry LCA data mapped by aggregate type.
Manufactured lightweight aggregate - ecoinvent 3.10 expanded clay	Good	Moderate - proxy	Good	Moderate/Good. Conservative generic data.
Concrete admixtures - EFCA EPDs (2021)	Good	Moderate - European proxy	Good	Moderate/Good. Industry EPD proxy used where North American product-specific data are unavailable.
Batch/process water - ecoinvent 3.10	Good	Good	Good	Good. Generic water background.
U.S. electricity - DOE/NETL balancing-authority data (2022)	Very good	Excellent - regional U.S.	Very good	Very good. Government LCI; balancing-authority regionalization used.
USLCI freight: truck 2010; rail 2012; ocean 2023; barge 2007	Moderate	Very good - U.S./applicable route	Good	Good. Mode-specific public LCI; older vintages are transparent and retained in the controlled source schedule.
USLCI fuels: natural gas/residual fuel/diesel/gasoline/LPG	Good	Very good - U.S.	Good	Good. Public LCI with process-specific vintages and recent updates documented in the source schedule.

5 LIFE CYCLE IMPACT ASSESSMENT

5.1 LIFE CYCLE IMPACT ASSESSMENT RESULTS

5.1.1 Selection of Impact Parameters

Life cycle impact assessment converts the life cycle inventory flows into the impact indicators and inventory metrics required by NSF 1112-26 and ISO 21930. The parameters reported in this study are listed below. Net freshwater (FW) represents total net freshwater consumption across the modeled upstream supply chain and concrete manufacturing; it is not equivalent to plant batch-water use alone. Product-specific SM includes recovered-material contribution associated with fly ash and raw slag; the processing burdens for slag cement remain included through the Slag Cement Association EPD dataset.

Table 6. Abbreviation / Parameter / Unit

Abbreviation	Parameter	Unit
Climate Change Indicators (IPCC AR5)		
GWPT	Global warming potential — total	kg CO ₂ eq
GWPF	Global warming potential — fossil	kg CO ₂ eq
GWPB	Global warming potential — biogenic	kg CO ₂ eq
GWPL	Global warming potential — land use and land-use change	kg CO ₂ eq
TRACI 2.2 Impact Indicators		
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 eq
AP	Acidification potential of soil and water	kg SO ₂ eq
EPM	Eutrophication potential — marine	kg N eq
EPF	Eutrophication potential — freshwater	kg P eq
SFP	Smog formation potential	kg O ₃ eq
Supplemental TRACI 2.1 Indicator		
EPT	Eutrophication potential - total (supplemental TRACI 2.1)	kg N eq
Additional Environmental Impact Indicators (CML 3.1)		
ADP _f	Abiotic depletion potential for fossil resources	MJ
ADP _e	Abiotic depletion potential for elements and other non-fossil resources	kg Sb eq
Resource-Use Parameters		
RPRE	Use of renewable primary energy as an energy carrier	MJ, net calorific value
NRPRE	Use of non-renewable primary energy as an energy carrier	MJ, net calorific value
NRSF	Use of non-renewable secondary fuels	MJ, net calorific value
FW	Net use of fresh water	m ³
Waste Parameters and Output Flows		
HWD	Hazardous waste disposed	kg
NHWD	Non-hazardous waste disposed	kg
HLRW	High-level radioactive waste disposed	m ³
ILLRW	Intermediate- and low-level radioactive waste disposed	m ³
Additional Carbon-Emission Parameter		
CCE	Calcination carbon emissions	kg CO ₂ eq

This LCA does not apply a "net GWP" adjustment. Fossil carbon emissions associated with combustion of recycled or recovered materials and fuels are retained in the applicable fossil GWP contribution and therefore in total GWP; they are not subtracted from GWPT on the basis of recycled or recovered status.

Resource-use/output-flow values below apply to all 120 declared products and are reported once here rather than repeated in each product result table. Zero indicates a flow confirmed absent in the current V4 model output generated in Theta Concrete Version 1.2; N/A indicates a transparency flow that is not applicable to the declared A1-A3 system. NRSF values from the applicable source EPDs are reported in the product result tables. GWPL is zero or nearly zero for modeled flows where the applicable source provides the indicator; a dash ("-") is used as the upstream source does not support a separate GWPL value. HLRW and ILLRW are reported as "-" because consistent radioactive-waste inventory coverage is not available across the applicable background LCI sources.

Components for reuse (CRU) and materials for recycling (MFR) are reported as "-" in accordance with NSF 1112-26 §9.5 where the applicable upstream LCA datasets do not provide these inventory flows. The declared system covers Modules A1–A3; recovery or recycling of concrete following its use is outside the declared system boundary. Such downstream recycling processes and any associated benefits are therefore not included in the declared results.

Table 7. Indicators not reported in product results tables

Indicator / flow	A1	A2	A3
RPRM	0	0	0
NRPRM	0	0	0
RSF	0	0	0
RE	-	-	-
CRU	-	-	-
MFR	-	-	-
MER	0	0	0
EE	0	0	0
Biogenic carbon in product	N/A	N/A	N/A
Biogenic carbon in packaging	N/A	N/A	N/A
CO ₂ from renewable waste fuels	-	-	-
CO ₂ from non-renewable waste fuels	N/A	N/A	N/A
Carbonation removals	N/A	N/A	N/A

5.1.2 National Product Results

The 120 national-average product results are reported per cubic meter. Separate A1, A2, and A3 module results are provided in Appendix G.

Table 8. NRMCA national average - Normal-Weight 2,500 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	2500-00-FA/SL-AE	2500-20-FA-AE	2500-30-FA-AE	2500-30-SL-AE	2500-40-FA-AE	2500-40-SL-AE	2500-50-FA/SL-AE	2500-50-SL-AE
GWPT	kg CO2e	272.59	238.90	220.69	218.58	201.46	200.58	182.05	182.58
GWPF	kg CO2e	272.45	238.79	220.59	218.49	201.38	200.51	181.99	182.52
GWPB	kg CO2e	0.15	0.12	0.11	0.10	0.09	0.08	0.07	0.07
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	5.74E-06	4.88E-06	4.42E-06	5.98E-06	3.93E-06	6.06E-06	5.13E-06	6.14E-06
AP	kg SO2e	0.86	0.82	0.80	0.92	0.78	0.94	0.89	0.96
EPT	kg Ne	0.34	0.31	0.29	0.30	0.27	0.28	0.26	0.26
EPM	kg N-eq	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
EPF	kg P-eq	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
SFP	kg O3e	18.75	18.30	18.06	20.30	17.80	20.81	19.93	21.33
ADP _f	MJ	1816.68	1671.15	1592.49	1535.76	1509.45	1442.13	1375.45	1348.49
ADP _e	kg Sbe	1.09E-04	1.07E-04	1.05E-04	1.03E-04	1.04E-04	1.01E-04	9.99E-05	9.88E-05
RPRE	MJ	63.89	59.88	57.72	57.98	55.43	56.01	53.66	54.04
NRPRE	MJ	1771.41	1623.45	1543.48	1643.50	1459.05	1600.86	1488.81	1558.23
NRSF	MJ	126.76	106.75	95.93	88.73	84.51	76.06	66.72	63.38
SM	kg	0.00	54.51	83.97	77.68	115.08	103.57	136.27	129.46
FW	m3	3.03	2.95	2.90	2.96	2.86	2.93	2.87	2.91
CCE	kg CO2e	116.32	97.95	88.03	81.42	77.55	69.79	61.22	58.16
HWD	kg	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	8.39	8.24	8.15	8.02	8.07	7.89	7.84	7.77
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 9. NRMCA national average - Normal-Weight 3,000 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	3000-00-FA/SL-AE	3000-20-FA-AE	3000-30-FA-AE	3000-30-SL-AE	3000-40-FA-AE	3000-40-SL-AE	3000-50-FA/SL-AE	3000-50-SL-AE
GWPT	kg CO2e	304.33	266.15	245.51	243.13	223.73	222.73	201.73	202.33
GWPF	kg CO2e	304.17	266.03	245.41	243.03	223.64	222.65	201.66	202.27
GWPB	kg CO2e	0.17	0.14	0.12	0.11	0.10	0.09	0.08	0.07
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	6.46E-06	5.49E-06	4.96E-06	6.73E-06	4.41E-06	6.82E-06	5.77E-06	6.91E-06
AP	kg SO2e	0.94	0.89	0.87	1.01	0.84	1.03	0.97	1.05
EPT	kg Ne	0.38	0.34	0.32	0.33	0.30	0.31	0.29	0.29
EPM	kg N-eq	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13
EPF	kg P-eq	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.03
SFP	kg O3e	20.28	19.77	19.50	22.04	19.21	22.62	21.62	23.21
ADP _f	MJ	1993.35	1828.45	1739.31	1675.03	1645.22	1568.93	1493.38	1462.82
ADP _e	kg Sbe	1.24E-04	1.21E-04	1.19E-04	1.17E-04	1.17E-04	1.14E-04	1.13E-04	1.12E-04
RPRE	MJ	71.77	67.24	64.78	65.08	62.20	62.85	60.19	60.62
NRPRE	MJ	1941.36	1773.70	1683.07	1796.42	1587.41	1748.10	1621.13	1699.79
NRSF	MJ	143.64	120.96	108.70	100.55	95.76	86.18	75.60	71.82
SM	kg	0.00	61.77	95.16	88.02	130.40	117.36	154.42	146.70
FW	m3	3.05	2.96	2.91	2.97	2.85	2.94	2.87	2.91
CCE	kg CO2e	131.81	111.00	99.75	92.27	87.87	79.08	69.37	65.90
HWD	kg	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15
NHWD	kg	8.67	8.50	8.40	8.25	8.30	8.11	8.05	7.97
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 10. NRMCA national average - Normal-Weight 4,000 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	4000-00-FA/SL-AE	4000-20-FA-AE	4000-30-FA-AE	4000-30-SL-AE	4000-40-FA-AE	4000-40-SL-AE	4000-50-FA/SL-AE	4000-50-SL-AE
GWPT	kg CO2e	376.21	327.87	301.74	298.72	274.16	272.89	246.30	247.06
GWPF	kg CO2e	376.01	327.71	301.61	298.60	274.05	272.79	246.22	246.99
GWPB	kg CO2e	0.22	0.18	0.15	0.14	0.13	0.12	0.10	0.09
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	8.09E-06	6.86E-06	6.19E-06	8.43E-06	5.49E-06	8.55E-06	7.22E-06	8.66E-06
AP	kg SO2e	1.11	1.05	1.02	1.20	0.99	1.23	1.15	1.26
EPT	kg Ne	0.48	0.42	0.40	0.41	0.37	0.38	0.35	0.36
EPM	kg N-eq	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15
EPF	kg P-eq	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.03
SFP	kg O3e	23.75	23.11	22.76	25.97	22.39	26.71	25.45	27.46
ADP _f	MJ	2393.50	2184.70	2071.84	1990.46	1952.71	1856.12	1760.46	1721.77
ADP _e	kg Sbe	1.56E-04	1.52E-04	1.50E-04	1.47E-04	1.48E-04	1.44E-04	1.43E-04	1.41E-04
RPRE	MJ	89.64	83.89	80.79	81.16	77.51	78.34	74.97	75.51
NRPRE	MJ	2326.27	2113.99	1999.25	2142.76	1878.13	2081.59	1920.82	2020.41
NRSF	MJ	181.87	153.15	137.63	127.31	121.25	109.12	95.72	90.93
SM	kg	0.00	78.21	120.48	111.44	165.10	148.59	195.52	185.74
FW	m3	3.09	2.98	2.91	2.99	2.85	2.96	2.87	2.92
CCE	kg CO2e	166.89	140.54	126.29	116.82	111.26	100.13	87.84	83.44
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	9.31	9.09	8.96	8.77	8.84	8.59	8.52	8.41
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 11. NRMCA national average - Normal-Weight 5,000 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	5000-00-FA/SL-AE	5000-20-FA-AE	5000-30-FA-AE	5000-30-SL-AE	5000-40-FA-AE	5000-40-SL-AE	5000-50-FA/SL-AE	5000-50-SL-AE
GWPT	kg CO2e	464.16	404.04	371.54	367.51	337.24	335.29	302.30	303.07
GWPF	kg CO2e	463.92	403.85	371.38	367.36	337.11	335.17	302.21	302.99
GWPB	kg CO2e	0.26	0.21	0.18	0.17	0.15	0.14	0.11	0.11
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.00E-05	8.47E-06	7.64E-06	1.04E-05	6.77E-06	1.06E-05	8.93E-06	1.07E-05
AP	kg SO2e	1.32	1.25	1.21	1.43	1.18	1.47	1.37	1.51
EPT	kg Ne	0.61	0.55	0.51	0.52	0.48	0.49	0.46	0.47
EPM	kg N-eq	0.17	0.17	0.18	0.17	0.18	0.18	0.18	0.18
EPF	kg P-eq	0.06	0.05	0.04	0.05	0.04	0.04	0.04	0.04
SFP	kg O3e	27.87	27.07	26.64	30.65	26.18	31.57	29.99	32.49
ADPf	MJ	2937.80	2681.19	2542.47	2435.10	2396.06	2267.53	2152.02	2099.96
ADPe	kg Sbe	2.27E-04	2.23E-04	2.21E-04	2.15E-04	2.20E-04	2.11E-04	2.11E-04	2.07E-04
RPRE	MJ	122.67	116.14	112.61	112.10	108.88	108.58	105.01	105.05
NRPRE	MJ	2828.39	2566.15	2424.40	2599.50	2274.77	2523.20	2325.20	2446.90
NRSF	MJ	226.84	191.03	171.67	158.79	151.23	136.11	119.39	113.42
SM	kg	0.00	97.55	150.28	139.00	205.93	185.34	243.87	231.67
FW	m3	3.17	3.03	2.95	3.04	2.87	3.00	2.89	2.96
CCE	kg CO2e	208.16	175.29	157.53	145.71	138.77	124.90	109.56	104.08
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	10.45	10.20	10.06	9.78	9.91	9.56	9.49	9.34
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 12. NRMCA national average - Normal-Weight 2,500 psi - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	2500-00-FA/SL	2500-20-FA	2500-30-FA	2500-30-SL	2500-40-FA	2500-40-SL	2500-50-FA/SL	2500-50-SL
GWPT	kg CO2e	253.19	221.37	204.17	202.62	186.01	185.77	168.14	168.91
GWPF	kg CO2e	253.03	221.23	204.05	202.51	185.91	185.67	168.06	168.83
GWPB	kg CO2e	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	5.40E-06	4.59E-06	4.16E-06	5.62E-06	3.70E-06	5.70E-06	4.83E-06	5.77E-06
AP	kg SO2e	0.82	0.78	0.76	0.88	0.74	0.90	0.84	0.92
EPT	kg Ne	0.29	0.25	0.23	0.24	0.21	0.23	0.21	0.21
EPM	kg N-eq	0.11	0.11	0.11	0.11	0.12	0.11	0.12	0.12
EPF	kg P-eq	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02
SFP	kg O3e	18.26	17.84	17.61	19.71	17.37	20.19	19.36	20.68
ADP _f	MJ	1631.71	1489.38	1412.45	1368.70	1331.24	1281.03	1212.53	1193.36
ADP _e	kg Sbe	5.21E-05	4.68E-05	4.40E-05	4.61E-05	4.10E-05	4.41E-05	4.05E-05	4.21E-05
RPRE	MJ	41.04	36.29	33.72	35.51	31.01	33.67	30.47	31.82
NRPRE	MJ	1628.09	1485.50	1408.43	1508.33	1327.07	1468.41	1359.44	1428.49
NRSF	MJ	118.68	99.94	89.81	83.08	79.12	71.21	62.47	59.34
SM	kg	0.00	51.04	78.62	72.73	107.74	96.97	127.59	121.21
FW	m3	3.08	3.01	2.97	3.02	2.92	2.99	2.94	2.97
CCE	kg CO2e	108.91	91.71	82.42	76.24	72.61	65.34	57.32	54.45
HWD	kg	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	7.63	7.45	7.35	7.28	7.25	7.16	7.08	7.04
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 13. NRMCA national average - Normal-Weight 3,000 psi - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	3000-00-FA/SL	3000-20-FA	3000-30-FA	3000-30-SL	3000-40-FA	3000-40-SL	3000-50-FA/SL	3000-50-SL
GWPT	kg CO2e	276.34	241.13	222.10	220.40	202.02	201.75	182.25	183.10
GWPF	kg CO2e	276.16	240.99	221.97	220.28	201.90	201.65	182.16	183.02
GWPB	kg CO2e	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	5.93E-06	5.05E-06	4.57E-06	6.18E-06	4.06E-06	6.27E-06	5.31E-06	6.35E-06
AP	kg SO2e	0.88	0.83	0.81	0.94	0.79	0.96	0.90	0.98
EPT	kg Ne	0.32	0.28	0.25	0.27	0.23	0.25	0.22	0.23
EPM	kg N-eq	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
EPF	kg P-eq	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02
SFP	kg O3e	19.40	18.93	18.68	21.00	18.41	21.54	20.62	22.07
ADP _f	MJ	1751.41	1593.96	1508.86	1460.46	1419.02	1363.48	1287.70	1266.49
ADP _e	kg Sbe	5.74E-05	5.16E-05	4.85E-05	5.08E-05	4.52E-05	4.86E-05	4.46E-05	4.63E-05
RPRE	MJ	44.91	39.65	36.81	38.79	33.81	36.75	33.21	34.71
NRPRE	MJ	1746.83	1589.10	1503.84	1614.35	1413.84	1570.19	1449.65	1526.03
NRSF	MJ	131.29	110.56	99.35	91.90	87.53	78.77	69.10	65.65
SM	kg	0.00	56.46	86.97	80.45	119.19	107.27	141.14	134.09
FW	m3	3.10	3.01	2.96	3.02	2.91	3.00	2.93	2.97
CCE	kg CO2e	120.48	101.45	91.17	84.33	80.32	72.29	63.41	60.24
HWD	kg	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	7.77	7.57	7.47	7.38	7.35	7.25	7.16	7.12
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 14. NRMCA national average - Normal-Weight 4,000 psi - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	4000-00-FA/SL	4000-20-FA	4000-30-FA	4000-30-SL	4000-40-FA	4000-40-SL	4000-50-FA/SL	4000-50-SL
GWPT	kg CO2e	330.17	287.11	263.83	261.74	239.26	238.93	215.07	216.12
GWPF	kg CO2e	329.96	286.93	263.67	261.59	239.12	238.80	214.96	216.01
GWPB	kg CO2e	0.22	0.19	0.17	0.16	0.15	0.13	0.12	0.11
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	7.18E-06	6.10E-06	5.51E-06	7.49E-06	4.89E-06	7.59E-06	6.42E-06	7.69E-06
AP	kg SO2e	1.00	0.95	0.93	1.08	0.90	1.11	1.04	1.14
EPT	kg Ne	0.38	0.33	0.30	0.32	0.27	0.30	0.26	0.28
EPM	kg N-eq	0.13	0.13	0.14	0.13	0.14	0.14	0.14	0.14
EPF	kg P-eq	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
SFP	kg O3e	22.05	21.48	21.17	24.01	20.84	24.67	23.54	25.32
ADP _f	MJ	2029.81	1837.20	1733.09	1673.88	1623.19	1555.24	1462.54	1436.60
ADP _e	kg Sbe	6.98E-05	6.27E-05	5.88E-05	6.17E-05	5.48E-05	5.90E-05	5.41E-05	5.62E-05
RPRE	MJ	53.89	47.46	43.99	46.41	40.32	43.92	39.58	41.42
NRPRE	MJ	2023.02	1830.06	1725.76	1860.95	1615.66	1806.93	1659.46	1752.90
NRSF	MJ	160.61	135.25	121.54	112.43	107.07	96.37	84.53	80.31
SM	kg	0.00	69.07	106.40	98.42	145.81	131.23	172.66	164.03
FW	m3	3.12	3.02	2.96	3.03	2.90	3.00	2.92	2.97
CCE	kg CO2e	147.38	124.11	111.53	103.17	98.25	88.43	77.57	73.69
HWD	kg	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15
NHWD	kg	8.10	7.86	7.73	7.63	7.59	7.47	7.36	7.31
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 15. NRMCA national average - Normal-Weight 5,000 psi - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	5000-00-FA/SL	5000-20-FA	5000-30-FA	5000-30-SL	5000-40-FA	5000-40-SL	5000-50-FA/SL	5000-50-SL
GWPT	kg CO2e	410.67	356.37	327.02	324.14	296.04	295.29	265.29	266.45
GWPF	kg CO2e	410.41	356.16	326.83	323.96	295.87	295.15	265.16	266.33
GWPB	kg CO2e	0.28	0.23	0.21	0.19	0.18	0.16	0.14	0.14
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	8.99E-06	7.62E-06	6.88E-06	9.38E-06	6.10E-06	9.51E-06	8.03E-06	9.64E-06
AP	kg SO2e	1.19	1.13	1.10	1.29	1.06	1.33	1.24	1.36
EPT	kg Ne	0.49	0.43	0.39	0.41	0.36	0.38	0.35	0.36
EPM	kg N-eq	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16
EPF	kg P-eq	0.05	0.04	0.04	0.04	0.03	0.04	0.03	0.04
SFP	kg O3e	25.78	25.05	24.66	28.26	24.25	29.08	27.67	29.91
ADP _f	MJ	2491.56	2251.43	2121.63	2041.50	1984.61	1891.49	1777.68	1741.47
ADP _e	kg Sbe	1.17E-04	1.09E-04	1.05E-04	1.06E-04	1.01E-04	1.03E-04	9.82E-05	9.94E-05
RPRE	MJ	77.67	70.11	66.02	68.21	61.70	65.06	60.15	61.90
NRPRE	MJ	2459.79	2218.06	2087.40	2254.86	1949.48	2186.55	2002.35	2118.24
NRSF	MJ	203.09	171.02	153.69	142.16	135.39	121.85	106.89	101.54
SM	kg	0.00	87.33	134.54	124.45	184.37	165.93	218.33	207.41
FW	m3	3.15	3.01	2.94	3.03	2.87	2.99	2.89	2.95
CCE	kg CO2e	186.36	156.93	141.03	130.45	124.24	111.82	98.08	93.18
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	8.94	8.65	8.50	8.34	8.33	8.14	8.02	7.94
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 16. NRMCA national average - High-Strength 6,000 psi - A1-A3 total results per cubic meter

Indicator	Unit	6000-00-FA/SL	6000-20-FA	6000-30-FA	6000-30-SL	6000-40-FA	6000-40-SL	6000-50-FA/SL	6000-50-SL
GWPT	kg CO2e	449.66	391.26	359.69	355.87	326.36	324.61	292.53	293.35
GWPF	kg CO2e	449.40	391.05	359.51	355.71	326.21	324.48	292.42	293.24
GWPB	kg CO2e	0.28	0.24	0.21	0.19	0.18	0.16	0.14	0.13
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.72E-06	8.23E-06	7.43E-06	1.01E-05	6.58E-06	1.03E-05	8.67E-06	1.04E-05
AP	kg SO2e	1.29	1.22	1.19	1.40	1.15	1.43	1.34	1.47
EPT	kg Ne	0.58	0.51	0.48	0.49	0.45	0.47	0.43	0.44
EPM	kg N-eq	0.16	0.17	0.17	0.17	0.18	0.17	0.18	0.17
EPF	kg P-eq	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04
SFP	kg O3e	27.40	26.63	26.22	30.09	25.78	30.99	29.47	31.88
ADP _f	MJ	2822.05	2571.19	2435.59	2334.27	2292.46	2171.67	2057.74	2009.08
ADP _e	kg Sbe	1.99E-04	1.95E-04	1.93E-04	1.88E-04	1.90E-04	1.84E-04	1.83E-04	1.81E-04
RPRE	MJ	111.07	104.31	100.65	100.82	96.79	97.40	93.51	93.98
NRPRE	MJ	2732.05	2476.57	2338.47	2509.95	2192.71	2435.91	2242.78	2361.88
NRSF	MJ	220.12	185.36	166.58	154.08	146.75	132.07	115.85	110.06
SM	kg	0.00	94.65	145.82	134.88	199.83	179.84	236.64	224.81
FW	m3	3.22	3.08	3.01	3.09	2.93	3.05	2.95	3.01
CCE	kg CO2e	201.99	170.09	152.85	141.39	134.66	121.19	106.31	100.99
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	10.07	9.81	9.66	9.42	9.51	9.20	9.12	8.98
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 17. NRMCA national average - High-Strength 8,000 psi - A1-A3 total results per cubic meter

Indicator	Unit	8000-00-FA/SL	8000-20-FA	8000-30-FA	8000-30-SL	8000-40-FA	8000-40-SL	8000-50-FA/SL	8000-50-SL
GWPT	kg CO2e	518.34	450.67	414.10	409.57	375.49	373.32	336.18	337.06
GWPF	kg CO2e	518.05	450.44	413.90	409.39	375.33	373.17	336.07	336.95
GWPB	kg CO2e	0.33	0.27	0.24	0.22	0.20	0.18	0.16	0.15
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.12E-05	9.49E-06	8.56E-06	1.17E-05	7.58E-06	1.19E-05	1.00E-05	1.20E-05
AP	kg SO2e	1.46	1.38	1.34	1.58	1.29	1.62	1.51	1.66
EPT	kg Ne	0.68	0.61	0.57	0.58	0.53	0.55	0.51	0.52
EPM	kg N-eq	0.18	0.19	0.19	0.19	0.20	0.19	0.20	0.19
EPF	kg P-eq	0.06	0.05	0.05	0.05	0.04	0.05	0.04	0.04
SFP	kg O3e	30.61	29.71	29.22	33.73	28.71	34.77	32.99	35.81
ADP _f	MJ	3246.42	2957.41	2801.19	2680.72	2636.29	2492.16	2361.94	2303.59
ADP _e	kg Sbe	2.54E-04	2.51E-04	2.49E-04	2.42E-04	2.47E-04	2.37E-04	2.37E-04	2.33E-04
RPRE	MJ	136.98	129.61	125.62	125.09	121.41	121.12	117.09	117.16
NRPRE	MJ	3123.17	2827.85	2668.22	2865.58	2499.72	2779.72	2556.71	2693.86
NRSF	MJ	255.27	214.96	193.18	178.69	170.18	153.16	134.35	127.63
SM	kg	0.00	109.77	169.11	156.42	231.74	208.56	274.43	260.71
FW	m3	3.27	3.11	3.02	3.13	2.93	3.08	2.96	3.03
CCE	kg CO2e	234.24	197.26	177.27	163.97	156.16	140.55	123.29	117.12
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	10.97	10.68	10.52	10.21	10.36	9.96	9.89	9.71
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 18. NRMCA national average - High-Strength 10,000 psi - A1-A3 total results per cubic meter

Indicator	Unit	10000-00-FA/SL	10000-20-FA	10000-30-FA	10000-30-SL	10000-40-FA	10000-40-SL	10000-50-FA/SL	10000-50-SL
GWPT	kg CO2e	656.33	569.36	522.35	516.53	472.72	469.93	422.20	423.32
GWPF	kg CO2e	655.96	569.07	522.09	516.29	472.51	469.74	422.04	423.18
GWPB	kg CO2e	0.42	0.34	0.30	0.28	0.26	0.24	0.20	0.19
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.43E-05	1.21E-05	1.09E-05	1.49E-05	9.64E-06	1.52E-05	1.28E-05	1.54E-05
AP	kg SO2e	1.79	1.69	1.63	1.95	1.58	2.00	1.86	2.05
EPT	kg Ne	0.86	0.77	0.72	0.74	0.67	0.70	0.64	0.66
EPM	kg N-eq	0.22	0.23	0.23	0.23	0.24	0.23	0.24	0.23
EPF	kg P-eq	0.08	0.07	0.06	0.06	0.05	0.06	0.05	0.05
SFP	kg O3e	37.23	36.07	35.45	41.24	34.78	42.58	40.29	43.91
ADP _f	MJ	4030.92	3659.44	3458.64	3303.79	3246.68	3061.41	2894.03	2819.03
ADP _e	kg Sbe	3.27E-04	3.22E-04	3.19E-04	3.10E-04	3.17E-04	3.04E-04	3.04E-04	2.99E-04
RPRE	MJ	174.75	165.26	160.14	159.46	154.73	154.36	149.17	149.26
NRPRE	MJ	3870.98	3491.38	3286.20	3539.89	3069.61	3429.52	3142.87	3319.16
NRSF	MJ	328.12	276.31	248.31	229.68	218.75	196.87	172.69	164.06
SM	kg	0.00	141.10	217.37	201.06	297.87	268.09	352.74	335.11
FW	m3	3.37	3.16	3.04	3.18	2.92	3.12	2.96	3.05
CCE	kg CO2e	301.09	253.55	227.85	210.76	200.73	180.66	158.47	150.55
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	12.30	11.93	11.73	11.33	11.52	11.01	10.91	10.69
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 19. NRMCA national average - High-Strength 12,000 psi - A1-A3 total results per cubic meter

Indicator	Unit	12000-00-FA/SL	12000-20-FA	12000-30-FA	12000-30-SL	12000-40-FA	12000-40-SL	12000-50-FA/SL	12000-50-SL
GWPT	kg CO2e	745.16	645.75	592.02	585.37	535.31	532.11	477.56	478.85
GWPF	kg CO2e	744.74	645.42	591.73	585.11	535.07	531.90	477.39	478.69
GWPB	kg CO2e	0.48	0.39	0.35	0.32	0.30	0.27	0.23	0.22
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.63E-05	1.38E-05	1.24E-05	1.70E-05	1.10E-05	1.73E-05	1.45E-05	1.75E-05
AP	kg SO2e	2.00	1.89	1.82	2.18	1.76	2.24	2.08	2.31
EPT	kg Ne	0.98	0.87	0.82	0.84	0.76	0.79	0.73	0.74
EPM	kg N-eq	0.24	0.25	0.26	0.25	0.26	0.26	0.26	0.26
EPF	kg P-eq	0.09	0.08	0.07	0.07	0.06	0.07	0.06	0.06
SFP	kg O3e	41.50	40.17	39.45	46.08	38.70	47.60	44.99	49.13
ADP _f	MJ	4535.90	4111.33	3881.83	3704.85	3639.58	3427.83	3236.53	3150.81
ADP _e	kg Sbe	3.73E-04	3.67E-04	3.65E-04	3.54E-04	3.61E-04	3.48E-04	3.47E-04	3.41E-04
RPRE	MJ	199.05	188.22	182.36	181.58	176.17	175.75	169.82	169.93
NRPRE	MJ	4352.34	3918.49	3683.98	3973.93	3436.44	3847.79	3520.17	3721.65
NRSF	MJ	375.01	315.80	283.79	262.51	250.01	225.01	197.37	187.51
SM	kg	0.00	161.26	248.43	229.80	340.44	306.40	403.16	383.00
FW	m3	3.42	3.19	3.06	3.21	2.92	3.14	2.96	3.07
CCE	kg CO2e	344.12	289.79	260.42	240.89	229.41	206.47	181.12	172.06
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	13.16	12.74	12.51	12.06	12.27	11.69	11.57	11.32
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 20. NRMCA national average - Lightweight 3,000 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-3000-00-FA/SL-AE	LW-3000-20-FA-AE	LW-3000-30-FA-AE	LW-3000-30-SL-AE	LW-3000-40-FA-AE	LW-3000-40-SL-AE	LW-3000-50-FA/SL-AE	LW-3000-50-SL-AE
GWPT	kg CO2e	519.89	450.84	413.57	441.88	379.06	419.26	375.33	396.63
GWPF	kg CO2e	519.69	450.67	413.42	441.75	378.94	419.14	375.24	396.54
GWPB	kg CO2e	0.20	0.17	0.15	0.14	0.13	0.12	0.10	0.09
GWPL	kg CO2e	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ODP	kg CFC11e	7.71E-06	6.56E-06	5.93E-06	7.99E-06	5.29E-06	8.09E-06	6.86E-06	8.19E-06
AP	kg SO2e	2.37	2.13	2.00	2.38	1.90	2.40	2.18	2.43
EPT	kg Ne	1.05	0.91	0.83	0.95	0.77	0.93	0.83	0.91
EPM	kg N-eq	0.18	0.18	0.18	0.19	0.18	0.19	0.18	0.19
EPF	kg P-eq	0.12	0.10	0.10	0.11	0.09	0.11	0.10	0.10
SFP	kg O3e	34.18	31.90	30.66	35.47	29.68	36.12	33.68	36.77
ADP _f	MJ	3731.76	3306.13	3076.54	3288.48	2877.31	3170.79	2898.39	3053.10
ADP _e	kg Sbe	4.27E-04	3.71E-04	3.41E-04	4.00E-04	3.18E-04	3.98E-04	3.55E-04	3.95E-04
RPRE	MJ	314.04	272.07	249.45	292.92	232.12	290.45	258.77	287.97
NRPRE	MJ	3891.44	3442.62	3200.55	3631.67	2992.33	3578.08	3233.78	3524.49
NRSF	MJ	159.31	134.16	120.56	111.52	106.21	95.59	83.85	79.65
SM	kg	0.00	68.51	105.54	97.62	144.62	130.16	171.27	162.70
FW	m3	2.16	2.17	2.18	2.12	2.16	2.09	2.10	2.06
CCE	kg CO2e	146.19	123.10	110.63	102.33	97.46	87.71	76.94	73.09
HWD	kg	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15
NHWD	kg	8.09	7.85	7.72	7.62	7.59	7.46	7.36	7.31
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 21. NRMCA national average - Lightweight 4,000 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-4000-00-FA/SL-AE	LW-4000-20-FA-AE	LW-4000-30-FA-AE	LW-4000-30-SL-AE	LW-4000-40-FA-AE	LW-4000-40-SL-AE	LW-4000-50-FA/SL-AE	LW-4000-50-SL-AE
GWPT	kg CO2e	601.81	523.41	477.97	511.81	434.95	483.16	428.89	450.46
GWPF	kg CO2e	601.55	523.20	477.78	511.64	434.79	483.02	428.76	450.34
GWPB	kg CO2e	0.26	0.21	0.19	0.17	0.16	0.14	0.12	0.12
GWPL	kg CO2e	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ODP	kg CFC11e	9.53E-06	8.10E-06	7.31E-06	9.90E-06	6.50E-06	1.00E-05	8.49E-06	1.01E-05
AP	kg SO2e	2.59	2.35	2.20	2.66	2.07	2.69	2.42	2.69
EPT	kg Ne	1.15	1.00	0.91	1.06	0.84	1.03	0.91	0.99
EPM	kg N-eq	0.20	0.20	0.20	0.21	0.20	0.21	0.21	0.21
EPF	kg P-eq	0.13	0.12	0.10	0.12	0.10	0.12	0.10	0.11
SFP	kg O3e	38.28	35.97	34.53	40.48	33.32	41.30	38.30	41.86
ADP _f	MJ	4170.95	3712.51	3437.40	3687.84	3191.11	3538.83	3205.87	3353.73
ADP _e	kg Sbe	4.53E-04	3.98E-04	3.64E-04	4.35E-04	3.36E-04	4.31E-04	3.80E-04	4.21E-04
RPRE	MJ	332.60	291.67	265.40	317.72	244.37	314.59	276.30	305.98
NRPRE	MJ	4330.87	3850.90	3561.49	4087.70	3304.40	4019.85	3597.02	3912.40
NRSF	MJ	201.71	169.86	152.64	141.20	134.47	121.02	106.16	100.85
SM	kg	0.00	86.74	133.62	123.60	183.11	164.80	216.85	206.00
FW	m3	2.19	2.16	2.16	2.09	2.14	2.05	2.06	2.03
CCE	kg CO2e	185.09	155.87	140.07	129.57	123.40	111.06	97.42	92.55
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	8.57	8.27	8.10	7.97	7.93	7.77	7.64	7.58
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 22. NRMCA national average - Lightweight 5,000 psi - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-5000-00-FA/SL-AE	LW-5000-20-FA-AE	LW-5000-30-FA-AE	LW-5000-30-SL-AE	LW-5000-40-FA-AE	LW-5000-40-SL-AE	LW-5000-50-FA/SL-AE	LW-5000-50-SL-AE
GWPT	kg CO2e	674.76	582.71	529.12	566.36	479.75	533.61	471.17	494.77
GWPF	kg CO2e	674.48	582.48	528.92	566.18	479.58	533.45	471.04	494.65
GWPB	kg CO2e	0.29	0.23	0.21	0.19	0.18	0.16	0.13	0.13
GWPL	kg CO2e	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
ODP	kg CFC11e	1.08E-05	9.17E-06	8.26E-06	1.12E-05	7.33E-06	1.14E-05	9.60E-06	1.15E-05
AP	kg SO2e	2.84	2.55	2.37	2.88	2.22	2.92	2.61	2.91
EPT	kg Ne	1.29	1.12	1.01	1.17	0.92	1.14	1.00	1.09
EPM	kg N-eq	0.23	0.22	0.22	0.23	0.22	0.23	0.23	0.23
EPF	kg P-eq	0.15	0.13	0.11	0.13	0.10	0.13	0.11	0.12
SFP	kg O3e	42.06	39.26	37.49	44.22	36.10	45.16	41.70	45.70
ADP _f	MJ	4667.83	4124.45	3796.59	4066.49	3514.68	3896.12	3514.26	3671.62
ADP _e	kg Sbe	5.28E-04	4.63E-04	4.20E-04	4.97E-04	3.89E-04	4.93E-04	4.35E-04	4.78E-04
RPRE	MJ	375.64	325.98	293.95	351.20	269.89	347.61	303.71	335.81
NRPRE	MJ	4814.88	4243.35	3896.95	4483.14	3601.70	4405.56	3919.15	4268.58
NRSF	MJ	230.62	194.21	174.53	161.44	153.75	138.37	121.38	115.31
SM	kg	0.00	99.17	152.78	141.32	209.37	188.43	247.93	235.54
FW	m3	2.17	2.16	2.16	2.09	2.14	2.04	2.05	2.03
CCE	kg CO2e	211.63	178.21	160.15	148.14	141.09	126.98	111.38	105.81
HWD	kg	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NHWD	kg	9.30	8.98	8.80	8.62	8.62	8.39	8.26	8.17
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

6 INTERPRETATION

6.1 STUDY LIMITATIONS

This study reports an industry-wide cradle-to-gate LCA of ready-mixed concrete in order to benchmark the manufacture of ready-mixed concrete. It does not represent the full life cycle of concrete in a building or civil works application.

A number of manufacturers reported inventory flows, such as particulate emissions, that are not reflected in all impact indicators or inventory metrics. Assessment of local effects on human health, land use, or local ecology requires additional site-specific analysis. Industry-average and regional results may not represent a specific plant or product.

No environmental claim regarding the superiority or equivalence of ready-mixed concrete relative to a competing product is implied. LCIA results are relative expressions of potential impacts and do not predict actual impacts, threshold exceedances, safety margins, or risks.

Contribution analysis summary

Across the 120 national declared products, the cradle-to-gate GWPT contribution ranges shown below summarize the relative importance of A1, A2, and A3 without listing every individual product. A1 is the dominant contributor throughout the product range; A2 is secondary; and A3 is the smallest share for the modeled national-average products.

Module	GWPT range (kg CO ₂ e/m ³)	Contribution range
Total A1-A3	168.14–745.16	100%
A1	131.12–696.64	78.0%–93.5%
A2	22.47–49.20	5.0%–15.5%
A3	10.91	1.5%–6.5%

Selected GWPT contribution breakdown by material and input

The following input-level analysis supplements the module summary above. A1 and A2 values are ranges across the 120 national products; A3 uses the national manufacturing inventory and therefore is a common per-m³ contribution for the national products. Percentages for A1 and A2 are shares of the applicable module; A3 percentages are shares of national A3 GWPT.

A1 material/input	GWPT contribution range (kg CO ₂ e/m ³)	Share of A1 range
Portland cement (PC + PLC)	105.35–665.74	37.8%–96.8%
Slag cement	0.00–56.32	0.0%–13.7%
Fly ash	0.00	0.0%
Aggregates (normal/crushed)	3.01–7.76	0.6%–5.8%
Manufactured lightweight aggregate	0.00–220.08	0.0%–55.9%
Batch water	0.11–0.12	0.0%–0.1%
Admixtures	1.39–27.71	0.4%–6.3%
A2 transported input	GWPT contribution range (kg CO ₂ e/m ³)	Share of A2 range
SCM transport	0.00–24.83	0.0%–50.6%
Cement transport	4.15–26.22	13.5%–69.6%
Admixture transport	0.04–0.73	0.1%–1.8%
Aggregate transport	4.80–14.19	10.8%–63.0%
Manufactured lightweight aggregate transport	0.00–22.09	0.0%–53.5%
A3 manufacturing input	GWPT contribution (kg CO ₂ e/m ³)	Share of A3
Transit-mix diesel - fleet	4.00	36.8%
Purchased electricity	2.34	21.6%
Diesel - plant	1.69	15.5%
Natural gas - plant	1.54	14.2%
Hazardous solid waste	0.40	3.7%
Fuel oil - plant	0.27	2.5%
LPG - plant	0.22	2.0%
Net process water	0.15	1.4%
Road dust chemicals	0.08	0.8%
Non-hazardous solid waste	0.07	0.6%
Other A3 inputs	0.11	1.0%
A3 total	10.87	100%

For the national A3 inventory, the largest GWPT contributors are transit-mix fleet diesel, purchased electricity, plant diesel, and plant natural gas. In A1, Portland cement is the dominant contributor for normal-weight products, while manufactured lightweight aggregate can become a major A1 contributor for lightweight products. A2 contributions vary with both material mass and the applicable transport-mode distances.

6.2 COMPLETENESS AND CONSISTENCY REVIEW

The completeness and consistency review confirmed that the study includes all required cradle-to-gate modules, A1 through A3, the complete 120-product national mix schedule, and all 18 reported geographic benchmark groups. The same declared unit, conversion factors, source hierarchy, material-loss treatment, transport methodology, and core calculation framework were applied throughout the national model. Regional benchmark calculations use the same modeling structure while substituting the applicable regional A2 transportation data, A3 manufacturing data, electricity profiles, and material-share assumptions. Remaining data gaps are identified explicitly

rather than being treated as zero values. The supporting model records provide traceability between the reported results and the underlying calculations, including the A2 Truck-N/deduplication/outlier audit, A2/A3 regional calculation workbook, national EPD calculation model, product-statistics workbook and addendum, and geographic and electricity-grid mapping records.

Sensitivity and uncertainty were evaluated with consideration of the principal parameters affecting each life-cycle module. A1 results are particularly sensitive to total cementitious-material content and the relative use of cement, fly ash, slag cement, and other cementitious materials. A2 uncertainty is driven primarily by variability in reported transportation distances, transportation modes, and the smaller number of observations available for some materials relative to the A3 manufacturing dataset. A3 variability is associated principally with plant fuel consumption, purchased electricity, water use, and other facility-level manufacturing inputs. Product-level variability and uncertainty for key LCIA indicators, including GWPT, ODP, AP, EPM, EPF, SFP, ADPf, and ADPe, are documented separately in Appendix H. These analyses demonstrate that variability in individual inputs is retained and characterized rather than assuming that a single national or regional average fully represents the underlying facility population.

Allocation assumptions were also reviewed to determine whether a reasonable alternative allocation approach could materially change the study conclusions or trigger the PCR sensitivity-analysis requirement. In particular, the A3 mixer-fleet allocation was tested using bounding cases in which between 0% and 100% of the reported transit-mix diesel consumption was assigned to A3, compared with the study's required 30% allocation. The resulting change in representative A1-A3 GWP remained well below the PCR's 20% sensitivity threshold; therefore, no additional PCR sensitivity analysis was triggered for this allocation choice. Material limitations nevertheless remain, including lower A2 reporting coverage for some materials, incomplete availability of certain resource and output indicators, and differing levels of specificity among background datasets. Future updates should therefore prioritize increased A2 reporting coverage, retention of exact background-process identifiers during data import and model development, and expansion of currently incomplete inventory indicators as improved source data become available.

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APPENDIX A — NRMCA NATIONAL WEIGHTED-AVERAGE MANUFACTURING LCI

Table 23. A3 Flow / yd3

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile	Zero %
Total Concrete Production	yd3	74,272	60,912	64,884	77,886	70,658	25,267	46,598	72,129	111,659	0.00%
Batch Waste	%	1.724	2.0000	1.013	1.791	1.657	1.00E+00	2.00000	2.000	2.000	0.00%
Purchased Electricity - Used at Plant	kWh	3.911	3.582	5.348	4.104	3.718	2.046	3.143	4.226	5.983	2.58%
Natural Gas - Used at Plant	ft3	17.31	0	166.9	26.05	8.564	0	0	6.374E-05	21.16	59.61%
Diesel - Used at Plant	gal	0.1074	0.01481	0.3600	0.1273	0.08747	0	0	0.06478	0.1308	47.98%
Fuel Oil - Used at Plant	gal	0.01468	0	0.1667	0.02716	0.002209	0	0	0	0	93.86%
Gasoline - Used at Plant	gal	0.001856	0	0.06074	0.003449	2.629E-04	0	0	0	0	93.94%
LPG (Liquified Propane Gas) - Used at	gal	0.02123	0	0.5851	0.03133	0.01112	0	0	0	0	81.83%
Natural Gas - Used in Fleet	ft3	0.2209	0	7.578	0.5593	0	0	0	0	0	98.79%
Transit Mix Only - Diesel - Used in Fleet	gal	0.8480	0.9890	1.394	0.9141	0.7820	0.05017	0.5533	1.169	1.628	15.67%
Purchased Electricity From Green Grid	kWh	0.04752	0	0.4391	0.06731	0.02773	0	0	0	0	94.43%
Site Generated Renewable Electricity	kWh	0.01415	0	0.2036	0.02986	0	0	0	0	0	99.52%
Road Dust Control Chemicals (e.g.	lb	0.07167	0	2.635	0.1767	0	0	0	0	0	98.30%
Oil and Lubricants	lb	0.06232	0.01878	0.2099	0.06892	0.05572	0	0.005709	0.03842	0.1338	27.63%
Grease	lb	0.09293	2.374E-08	2.170	0.2649	0	0	0	9.765E-04	0.006369	50.00%
Total Water Use	gal	45.42	40.46	58.88	49.74	41.10	14.32	31.82	51.88	71.64	5.57%
Percentage of Batch Water That Is	%	7.266	0	19.08	8.778	5.754	0	0	0	0	83.76%
Hazardous Solid Waste	lb	0.2525	0	5.511	0.5081	0	0	0	0	0	91.03%
Non-Hazardous Solid Waste	lb	10.42	0.1158	90.50	14.75	6.093	0	0.02708	0.4988	2.674	32.31%
Particulates, PM-2.5	lb	9.277E-04	0	0.007358	0.001310	5.457E-04	0	0	0	0	89.58%
Particulates, PM-10	lb	0.006520	0	0.04528	0.008569	0.004472	0	0	0	0	87.16%
Particulates, total	lb	0.007193	0	0.08631	0.009913	0.004473	0	0	0	0	89.66%
Lead	lb	3.185E-05	0	3.325E-04	5.781E-05	5.890E-06	0	0	0	0	94.75%
Hg	lb	1.371E-06	0	3.019E-05	2.281E-06	4.622E-07	0	0	0	0	97.90%

Notes: n = 1238. Flow means are production weighted; annual production is averaged arithmetically. Median, sample SD and P20/P40/P60/P80 describe the empirical facility distribution, including numeric zeros. Approximate 95% confidence limits use the unequal-weight ratio standard error (annual production: $SD/\sqrt{n}$); lower limits are bounded at zero. No parametric distribution is fitted to individual flow observations. Missing flows are excluded without imputation; all retained flow observations in this group are numeric.

APPENDIX B — NRMCA NATIONAL MATERIAL TRANSPORTATION DISTANCES

Table 24. A2 Transportation Distances

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile	Observed N	Effective N (Kish)	Zero %
Cement													
Truck Distance	mi	70.48	51.00	71.26	76.61	64.34	15.00	36.20	67.10	115.00	955	518.52	3.10%
Rail Distance	mi	72.30	0.00	173.20	87.21	57.39	0.00	0.00	0.00	0.00	955	518.52	80.24%
Ocean Distance	mi	548.39	0.00	1,986.64	719.39	377.39	0.00	0.00	0.00	0.00	955	518.52	89.41%
Barge Distance	mi	56.51	0.00	231.50	76.45	36.58	0.00	0.00	0.00	0.00	954	518.16	88.79%
SCM													
Truck Distance	mi	112.08	75.80	189.40	129.02	95.13	26.00	56.50	99.00	167.00	889	479.99	1.56%
Rail Distance	mi	64.34	0.00	239.40	85.76	42.93	0.00	0.00	0.00	0.00	889	479.99	87.36%
Ocean Distance	mi	1165.07	0.00	4,066.83	1528.89	801.24	0.00	0.00	0.00	0.00	889	479.99	89.79%
Barge Distance	mi	95.68	0.00	377.13	129.42	61.94	0.00	0.00	0.00	0.00	889	479.99	92.39%
Aggregate													
Truck Distance	mi	35.36	26.00	42.89	39.06	31.67	4.80	18.20	33.00	56.50	954	517.51	9.73%
Rail Distance	mi	10.65	0.00	61.49	15.95	5.35	0.00	0.00	0.00	0.00	954	517.51	95.95%
Ocean Distance	mi	8.82	0.00	123.36	19.45	0.00	0.00	0.00	0.00	0.00	954	517.51	99.41%
Barge Distance	mi	6.11	0.00	36.14	9.22	3.00	0.00	0.00	0.00	0.00	954	517.51	95.12%
Admixture													
Truck Distance	mi	395.41	184.00	585.38	445.77	345.05	49.90	127.00	233.00	509.00	955	519.05	0.61%
Rail Distance	mi	2.46	0.00	57.03	7.37	0.00E+00	0.00	0.00	0.00	0.00	955	519.05	99.37%
Ocean Distance	mi	24.29	0.00	236.44	44.63	3.95	0.00	0.00	0.00	0.00	955	519.05	98.93%
Barge Distance	mi	7.77E-02	0.00	3.00	3.36E-01	0.00	0.00	0.00	0.00	0.00	955	519.05	99.93%
Manufactured Lightweight Aggregate													
Truck Distance	mi	178.31	147.00	173.92	199.36	157.27	34.80	99.00	187.00	274.00	423	262.30	2.31%
Rail Distance	mi	91.96	0.00	256.97	123.05	60.86	0.00	0.00	0.00	0.00	423	262.30	84.18%
Ocean Distance	mi	11.05	0.00	231.59	31.25	0.00	0.00	0.00	0.00	0.00	507	507.00*	99.61%
Barge Distance	mi	13.24	0.00	103.19	25.73	0.75	0.00	0.00	0.00	0.00	423	262.30	97.82%

Observed N is the applicable facility count. Effective N is the Kish effective sample size based on production-volume weights and is used to calculate SE, MOE, and 95% confidence intervals for production-weighted A2 means. MLA- Ocean uses the documented local source fallback because the matched weighted population contains no positive ocean-distance observations; the applied source population is unweighted, so effective N equals observed N (507).

APPENDIX C — NRMCA NATIONAL MIX DESIGNS

Table 25. Mix ID / Density (lb/yd³) / Density (kg/m³)

Mix ID	Density (lb/yd³)	Density (kg/m³)
NW-2500-PC-AE	3,775	2,239
NW-3000-PC-AE	3,785	2,245
NW-4000-PC-AE	3,807	2,259
NW-5000-PC-AE	3,842	2,279
NW-2500-FA20-AE	3,726	2,210
NW-3000-FA20-AE	3,729	2,213
NW-4000-FA20-AE	3,737	2,217
NW-5000-FA20-AE	3,754	2,227
NW-2500-FA30-AE	3,700	2,195
NW-3000-FA30-AE	3,700	2,195
NW-4000-FA30-AE	3,699	2,195
NW-5000-FA30-AE	3,707	2,199
NW-2500-FA40-AE	3,672	2,178
NW-3000-FA40-AE	3,668	2,176
NW-4000-FA40-AE	3,660	2,171
NW-5000-FA40-AE	3,658	2,170
NW-2500-SL30-AE	3,765	2,234
NW-3000-SL30-AE	3,774	2,239
NW-4000-SL30-AE	3,794	2,251
NW-5000-SL30-AE	3,825	2,269
NW-2500-SL40-AE	3,762	2,232
NW-3000-SL40-AE	3,771	2,237
NW-4000-SL40-AE	3,790	2,248
NW-5000-SL40-AE	3,820	2,266
NW-2500-SL50-AE	3,759	2,230
NW-3000-SL50-AE	3,767	2,235
NW-4000-SL50-AE	3,785	2,246
NW-5000-SL50-AE	3,814	2,263
NW-2500-FA20SL30-AE	3,716	2,205
NW-3000-FA20SL30-AE	3,718	2,206
NW-4000-FA20SL30-AE	3,723	2,209
NW-5000-FA20SL30-AE	3,737	2,217
NW-2500-PC-NAE	3,937	2,335
NW-3000-PC-NAE	3,944	2,340
NW-4000-PC-NAE	3,961	2,350
NW-5000-PC-NAE	3,923	2,327
NW-2500-FA20-NAE	3,891	2,308
NW-3000-FA20-NAE	3,894	2,310
NW-4000-FA20-NAE	3,900	2,314
NW-5000-FA20-NAE	3,845	2,281

Table 25 (continued)

Mix ID	Density (lb/yd³)	Density (kg/m³)
NW-2500-FA30-NAE	3,866	2,294
NW-3000-FA30-NAE	3,866	2,294
NW-4000-FA30-NAE	3,866	2,294
NW-5000-FA30-NAE	3,803	2,256
NW-2500-FA40-NAE	3,840	2,278
NW-3000-FA40-NAE	3,837	2,277
NW-4000-FA40-NAE	3,831	2,273
NW-5000-FA40-NAE	3,758	2,230
NW-2500-SL30-NAE	3,928	2,330
NW-3000-SL30-NAE	3,934	2,334
NW-4000-SL30-NAE	3,950	2,343
NW-5000-SL30-NAE	3,908	2,319
NW-2500-SL40-NAE	3,925	2,329
NW-3000-SL40-NAE	3,931	2,332
NW-4000-SL40-NAE	3,946	2,341
NW-5000-SL40-NAE	3,903	2,316
NW-2500-SL50-NAE	3,922	2,327
NW-3000-SL50-NAE	3,928	2,330
NW-4000-SL50-NAE	3,942	2,339
NW-5000-SL50-NAE	3,899	2,313
NW-2500-FA20SL30-NAE	3,882	2,303
NW-3000-FA20SL30-NAE	3,884	2,304
NW-4000-FA20SL30-NAE	3,887	2,306
NW-5000-FA20SL30-NAE	3,829	2,272
HS-6000-PC-NAE	3,951	2,344
HS-8000-PC-NAE	3,972	2,356
HS-10000-PC-NAE	4,015	2,382
HS-12000-PC-NAE	4,042	2,398
HS-6000-FA20-NAE	3,873	2,298
HS-8000-FA20-NAE	3,874	2,298
HS-10000-FA20-NAE	3,889	2,307
HS-12000-FA20-NAE	3,898	2,313
HS-6000-FA30-NAE	3,832	2,273
HS-8000-FA30-NAE	3,821	2,267
HS-10000-FA30-NAE	3,821	2,267
HS-12000-FA30-NAE	3,820	2,267
HS-6000-FA40-NAE	3,787	2,247
HS-8000-FA40-NAE	3,765	2,233
HS-10000-FA40-NAE	3,749	2,224
HS-12000-FA40-NAE	3,738	2,218

Table 25 (continued)

Mix ID	Density (lb/yd³)	Density (kg/m³)
HS-6000-SL30-NAE	3,935	2,335
HS-8000-SL30-NAE	3,953	2,345
HS-10000-SL30-NAE	3,991	2,368
HS-12000-SL30-NAE	4,015	2,382
HS-6000-SL40-NAE	3,930	2,331
HS-8000-SL40-NAE	3,947	2,342
HS-10000-SL40-NAE	3,983	2,363
HS-12000-SL40-NAE	4,006	2,377
HS-6000-SL50-NAE	3,924	2,328
HS-8000-SL50-NAE	3,941	2,338
HS-10000-SL50-NAE	3,975	2,358
HS-12000-SL50-NAE	3,997	2,372
HS-6000-FA20SL30-NAE	3,857	2,288
HS-8000-FA20SL30-NAE	3,854	2,287
HS-10000-FA20SL30-NAE	3,864	2,292
HS-12000-FA20SL30-NAE	3,870	2,296
LW-3000-PC-AE	3,171	1,881
LW-4000-PC-AE	3,184	1,889
LW-5000-PC-AE	3,177	1,885
LW-3000-FA20-AE	3,189	1,892
LW-4000-FA20-AE	3,179	1,886
LW-5000-FA20-AE	3,179	1,886
LW-3000-FA30-AE	3,198	1,897
LW-4000-FA30-AE	3,186	1,890
LW-5000-FA30-AE	3,192	1,894
LW-3000-FA40-AE	3,194	1,895
LW-4000-FA40-AE	3,178	1,886
LW-5000-FA40-AE	3,184	1,889
LW-3000-SL30-AE	3,190	1,893
LW-4000-SL30-AE	3,182	1,888
LW-5000-SL30-AE	3,191	1,893
LW-3000-SL40-AE	3,186	1,890
LW-4000-SL40-AE	3,177	1,885
LW-5000-SL40-AE	3,185	1,890
LW-3000-SL50-AE	3,182	1,888
LW-4000-SL50-AE	3,184	1,889
LW-5000-SL50-AE	3,198	1,897
LW-3000-FA20SL30-AE	3,189	1,892
LW-4000-FA20SL30-AE	3,176	1,884
LW-5000-FA20SL30-AE	3,186	1,890

C.1 NORMAL-WEIGHT 2,500–5,000 PSI, AIR-ENTRAINED

Table 26. Mix ID / psi / Class

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
NW-2500-PC-AE	2500	NW	No-SCM cementitious scenario	0.609	0	0	Y	WR
NW-3000-PC-AE	3000	NW	No-SCM cementitious scenario	0.537	0	0	Y	WR
NW-4000-PC-AE	4000	NW	No-SCM cementitious scenario	0.424	0	0	Y	WR
NW-5000-PC-AE	5000	NW	No-SCM cementitious scenario	0.352	0	0	Y	HRWR
NW-2500-FA20-AE	2500	NW	20% Fly Ash	0.578	20	0	Y	WR
NW-3000-FA20-AE	3000	NW	20% Fly Ash	0.511	20	0	Y	WR
NW-4000-FA20-AE	4000	NW	20% Fly Ash	0.403	20	0	Y	WR
NW-5000-FA20-AE	5000	NW	20% Fly Ash	0.334	20	0	Y	HRWR
NW-2500-FA30-AE	2500	NW	30% Fly Ash	0.563	30	0	Y	WR
NW-3000-FA30-AE	3000	NW	30% Fly Ash	0.497	30	0	Y	WR
NW-4000-FA30-AE	4000	NW	30% Fly Ash	0.393	30	0	Y	WR
NW-5000-FA30-AE	5000	NW	30% Fly Ash	0.325	30	0	Y	HRWR
NW-2500-FA40-AE	2500	NW	40% Fly Ash	0.548	40	0	Y	WR
NW-3000-FA40-AE	3000	NW	40% Fly Ash	0.484	40	0	Y	WR
NW-4000-FA40-AE	4000	NW	40% Fly Ash	0.382	40	0	Y	WR
NW-5000-FA40-AE	5000	NW	40% Fly Ash	0.317	40	0	Y	HRWR
NW-2500-SL30-AE	2500	NW	30% Slag	0.609	0	30	Y	WR
NW-3000-SL30-AE	3000	NW	30% Slag	0.537	0	30	Y	WR
NW-4000-SL30-AE	4000	NW	30% Slag	0.424	0	30	Y	WR
NW-5000-SL30-AE	5000	NW	30% Slag	0.352	0	30	Y	HRWR
NW-2500-SL40-AE	2500	NW	40% Slag	0.609	0	40	Y	WR

Table 26 (continued)

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
NW-3000-SL40-AE	3000	NW	40% Slag	0.537	0	40	Y	WR
NW-4000-SL40-AE	4000	NW	40% Slag	0.424	0	40	Y	WR
NW-5000-SL40-AE	5000	NW	40% Slag	0.352	0	40	Y	HRWR
NW-2500-SL50-AE	2500	NW	50% Slag	0.609	0	50	Y	WR
NW-3000-SL50-AE	3000	NW	50% Slag	0.537	0	50	Y	WR
NW-4000-SL50-AE	4000	NW	50% Slag	0.424	0	50	Y	WR
NW-5000-SL50-AE	5000	NW	50% Slag	0.352	0	50	Y	HRWR
NW-2500-FA20SL30-AE	2500	NW	20% Fly Ash and 30% Slag	0.578	20	30	Y	WR
NW-3000-FA20SL30-AE	3000	NW	20% Fly Ash and 30% Slag	0.511	20	30	Y	WR
NW-4000-FA20SL30-AE	4000	NW	20% Fly Ash and 30% Slag	0.403	20	30	Y	WR
NW-5000-FA20SL30-AE	5000	NW	20% Fly Ash and 30% Slag	0.334	20	30	Y	HRWR

Mix proportions

Table 27. Mix proportions

Mix ID	Cement (lb/yd³)	Fly ash (lb/yd³)	Slag (lb/yd³)	Water (US gal/yd³)	Coarse aggregate (lb/yd³)	Fine aggregate (lb/yd³)	AE (fl oz/yd³)	WR (fl oz/yd³)	HRWR (fl oz/yd³)	Accelerator (fl oz/yd³)
NW-2500-PC-AE	429.0	0	0	31.31	1,676.7	1,407.6	4.29	12.87	0	42.90
NW-3000-PC-AE	486.2	0	0	31.31	1,676.7	1,360.4	4.86	14.58	0	48.62
NW-4000-PC-AE	615.5	0	0	31.31	1,676.7	1,253.6	6.16	18.47	0	61.55
NW-5000-PC-AE	767.8	0	0	32.35	1,539.0	1,264.8	7.68	23.03	30.71	76.78
NW-2500-FA20-AE	361.3	90.32	0	31.31	1,676.7	1,336.3	4.52	13.55	0	45.16
NW-3000-FA20-AE	409.4	102.3	0	31.31	1,676.7	1,279.6	5.12	15.35	0	51.17
NW-4000-FA20-AE	518.4	129.6	0	31.31	1,676.7	1,151.4	6.48	19.44	0	64.79
NW-5000-FA20-AE	646.5	161.6	0	32.35	1,539.0	1,137.3	8.08	24.25	32.33	80.82
NW-2500-FA30-AE	324.7	139.1	0	31.31	1,676.7	1,297.8	4.64	13.91	0	46.38
NW-3000-FA30-AE	367.9	157.7	0	31.31	1,676.7	1,236.0	5.26	15.77	0	52.56
NW-4000-FA30-AE	465.8	199.6	0	31.31	1,676.7	1,096.1	6.65	19.96	0	66.55
NW-5000-FA30-AE	581.0	249.0	0	32.35	1,539.0	1,068.3	8.30	24.90	33.20	83.00
NW-2500-FA40-AE	286.0	190.7	0	31.31	1,676.7	1,257.1	4.77	14.30	0	47.67
NW-3000-FA40-AE	324.1	216.1	0	31.31	1,676.7	1,189.9	5.40	16.21	0	54.02
NW-4000-FA40-AE	410.4	273.6	0	31.31	1,676.7	1,037.7	6.84	20.52	0	68.39
NW-5000-FA40-AE	511.8	341.2	0	32.35	1,539.0	995.5	8.53	25.59	34.12	85.31
NW-2500-SL30-AE	300.3	0	128.7	31.31	1,676.7	1,398.4	4.29	12.87	0	42.90
NW-3000-SL30-AE	340.3	0	145.8	31.31	1,676.7	1,350.1	4.86	14.58	0	48.62
NW-4000-SL30-AE	430.9	0	184.7	31.31	1,676.7	1,240.5	6.16	18.47	0	61.55
NW-5000-SL30-AE	537.4	0	230.3	32.35	1,539.0	1,248.5	7.68	23.03	30.71	76.78
NW-2500-SL40-AE	257.4	0	171.6	31.31	1,676.7	1,395.4	4.29	12.87	0	42.90
NW-3000-SL40-AE	291.7	0	194.5	31.31	1,676.7	1,346.6	4.86	14.58	0	48.62
NW-4000-SL40-AE	369.3	0	246.2	31.31	1,676.7	1,236.1	6.16	18.47	0	61.55
NW-5000-SL40-AE	460.7	0	307.1	32.35	1,539.0	1,243.0	7.68	23.03	30.71	76.78
NW-2500-SL50-AE	214.5	0	214.5	31.31	1,676.7	1,392.3	4.29	12.87	0	42.90
NW-3000-SL50-AE	243.1	0	243.1	31.31	1,676.7	1,343.1	4.86	14.58	0	48.62
NW-4000-SL50-AE	307.8	0	307.8	31.31	1,676.7	1,231.7	6.16	18.47	0	61.55
NW-5000-SL50-AE	383.9	0	383.9	32.35	1,539.0	1,237.5	7.68	23.03	30.71	76.78
NW-2500-FA20SL30-AE	225.8	90.32	135.5	31.31	1,676.7	1,326.7	4.52	13.55	0	45.16
NW-3000-FA20SL30-AE	255.9	102.3	153.5	31.31	1,676.7	1,268.7	5.12	15.35	0	51.17
NW-4000-FA20SL30-AE	324.0	129.6	194.4	31.31	1,676.7	1,137.5	6.48	19.44	0	64.79
NW-5000-FA20SL30-AE	404.1	161.6	242.5	32.35	1,539.0	1,120.0	8.08	24.25	32.33	80.82

C.2 NORMAL-WEIGHT 2,500–5,000 PSI, NON-AIR-ENTRAINED

Table 28. Mix ID / psi / Class

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
NW-2500-PC-NAE	2500	NW	No-SCM cementitious scenario	0.698	0	0	N	WR
NW-3000-PC-NAE	3000	NW	No-SCM cementitious scenario	0.631	0	0	N	WR
NW-4000-PC-NAE	4000	NW	No-SCM cementitious scenario	0.516	0	0	N	WR
NW-5000-PC-NAE	5000	NW	No-SCM cementitious scenario	0.426	0	0	N	HRWR
NW-2500-FA20-NAE	2500	NW	20% Fly Ash	0.663	20	0	N	WR
NW-3000-FA20-NAE	3000	NW	20% Fly Ash	0.599	20	0	N	WR
NW-4000-FA20-NAE	4000	NW	20% Fly Ash	0.490	20	0	N	WR
NW-5000-FA20-NAE	5000	NW	20% Fly Ash	0.404	20	0	N	HRWR
NW-2500-FA30-NAE	2500	NW	30% Fly Ash	0.645	30	0	N	WR
NW-3000-FA30-NAE	3000	NW	30% Fly Ash	0.583	30	0	N	WR
NW-4000-FA30-NAE	4000	NW	30% Fly Ash	0.477	30	0	N	WR
NW-5000-FA30-NAE	5000	NW	30% Fly Ash	0.394	30	0	N	HRWR
NW-2500-FA40-NAE	2500	NW	40% Fly Ash	0.628	40	0	N	WR
NW-3000-FA40-NAE	3000	NW	40% Fly Ash	0.568	40	0	N	WR
NW-4000-FA40-NAE	4000	NW	40% Fly Ash	0.464	40	0	N	WR
NW-5000-FA40-NAE	5000	NW	40% Fly Ash	0.383	40	0	N	HRWR
NW-2500-SL30-NAE	2500	NW	30% Slag	0.698	0	30	N	WR
NW-3000-SL30-NAE	3000	NW	30% Slag	0.631	0	30	N	WR
NW-4000-SL30-NAE	4000	NW	30% Slag	0.516	0	30	N	WR
NW-5000-SL30-NAE	5000	NW	30% Slag	0.426	0	30	N	HRWR
NW-2500-SL40-NAE	2500	NW	40% Slag	0.698	0	40	N	WR
NW-3000-SL40-NAE	3000	NW	40% Slag	0.631	0	40	N	WR
NW-4000-SL40-NAE	4000	NW	40% Slag	0.516	0	40	N	WR

Table 28 (continued)

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
NW-5000-SL40-NAE	5000	NW	40% Slag	0.426	0	40	N	HRWR
NW-2500-SL50-NAE	2500	NW	50% Slag	0.698	0	50	N	WR
NW-3000-SL50-NAE	3000	NW	50% Slag	0.631	0	50	N	WR
NW-4000-SL50-NAE	4000	NW	50% Slag	0.516	0	50	N	WR
NW-5000-SL50-NAE	5000	NW	50% Slag	0.426	0	50	N	HRWR
NW-2500-FA20SL30-NAE	2500	NW	20% Fly Ash and 30% Slag	0.663	20	30	N	WR
NW-3000-FA20SL30-NAE	3000	NW	20% Fly Ash and 30% Slag	0.599	20	30	N	WR
NW-4000-FA20SL30-NAE	4000	NW	20% Fly Ash and 30% Slag	0.490	20	30	N	WR
NW-5000-FA20SL30-NAE	5000	NW	20% Fly Ash and 30% Slag	0.404	20	30	N	HRWR

Mix proportions

Table 29. Mix proportions

Mix ID	Cement (lb/yd³)	Fly ash (lb/yd³)	Slag (lb/yd³)	Water (US gal/yd³)	Coarse aggregate (lb/yd³)	Fine aggregate (lb/yd³)	AE (fl oz/yd³)	WR (fl oz/yd³)	HRWR (fl oz/yd³)	Accelerator (fl oz/yd³)
NW-2500-PC-NAE	401.7	0	0	33.58	1,676.7	1,577.9	0	12.05	0	0
NW-3000-PC-NAE	444.4	0	0	33.58	1,676.7	1,542.7	0	13.33	0	0
NW-4000-PC-NAE	543.6	0	0	33.58	1,676.7	1,460.7	0	16.31	0	0
NW-5000-PC-NAE	687.4	0	0	35.05	1,539.0	1,404.1	0	20.62	27.49	0
NW-2500-FA20-NAE	338.3	84.57	0	33.58	1,676.7	1,511.1	0	12.68	0	0
NW-3000-FA20-NAE	374.2	93.55	0	33.58	1,676.7	1,468.8	0	14.03	0	0
NW-4000-FA20-NAE	457.8	114.4	0	33.58	1,676.7	1,370.4	0	17.17	0	0
NW-5000-FA20-NAE	578.8	144.7	0	35.05	1,539.0	1,289.9	0	21.71	28.94	0
NW-2500-FA30-NAE	304.0	130.3	0	33.58	1,676.7	1,475.0	0	13.03	0	0
NW-3000-FA30-NAE	336.3	144.1	0	33.58	1,676.7	1,428.9	0	14.41	0	0
NW-4000-FA30-NAE	411.4	176.3	0	33.58	1,676.7	1,321.6	0	17.63	0	0
NW-5000-FA30-NAE	520.2	222.9	0	35.05	1,539.0	1,228.2	0	22.29	29.72	0
NW-2500-FA40-NAE	267.8	178.5	0	33.58	1,676.7	1,437.0	0	13.39	0	0
NW-3000-FA40-NAE	296.2	197.5	0	33.58	1,676.7	1,386.8	0	14.81	0	0
NW-4000-FA40-NAE	362.4	241.6	0	33.58	1,676.7	1,270.0	0	18.12	0	0
NW-5000-FA40-NAE	458.2	305.5	0	35.05	1,539.0	1,163.0	0	22.91	30.55	0
NW-2500-SL30-NAE	281.2	0	120.5	33.58	1,676.7	1,569.3	0	12.05	0	0
NW-3000-SL30-NAE	311.1	0	133.3	33.58	1,676.7	1,533.2	0	13.33	0	0
NW-4000-SL30-NAE	380.5	0	163.1	33.58	1,676.7	1,449.1	0	16.31	0	0
NW-5000-SL30-NAE	481.2	0	206.2	35.05	1,539.0	1,389.4	0	20.62	27.49	0
NW-2500-SL40-NAE	241.0	0	160.7	33.58	1,676.7	1,566.4	0	12.05	0	0
NW-3000-SL40-NAE	266.6	0	177.7	33.58	1,676.7	1,530.0	0	13.33	0	0
NW-4000-SL40-NAE	326.2	0	217.4	33.58	1,676.7	1,445.3	0	16.31	0	0
NW-5000-SL40-NAE	412.4	0	274.9	35.05	1,539.0	1,384.6	0	20.62	27.49	0
NW-2500-SL50-NAE	200.8	0	200.8	33.58	1,676.7	1,563.6	0	12.05	0	0
NW-3000-SL50-NAE	222.2	0	222.2	33.58	1,676.7	1,526.8	0	13.33	0	0
NW-4000-SL50-NAE	271.8	0	271.8	33.58	1,676.7	1,441.4	0	16.31	0	0
NW-5000-SL50-NAE	343.7	0	343.7	35.05	1,539.0	1,379.7	0	20.62	27.49	0
NW-2500-FA20SL30-NAE	211.4	84.57	126.8	33.58	1,676.7	1,502.1	0	12.68	0	0
NW-3000-FA20SL30-NAE	233.9	93.55	140.3	33.58	1,676.7	1,458.8	0	14.03	0	0
NW-4000-FA20SL30-NAE	286.1	114.4	171.7	33.58	1,676.7	1,358.2	0	17.17	0	0
NW-5000-FA20SL30-NAE	361.8	144.7	217.1	35.05	1,539.0	1,274.5	0	21.71	28.94	0

C.3 HIGH-STRENGTH 6,000–12,000 PSI

Table 30. Mix ID / psi / Class

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
HS-6000-PC-NAE	6000	HS	No-SCM cementitious scenario	0.396	0	0	N	HRWR
HS-8000-PC-NAE	8000	HS	No-SCM cementitious scenario	0.341	0	0	N	HRWR
HS-10000-PC-NAE	10000	HS	No-SCM cementitious scenario	0.266	0	0	N	HRWR
HS-12000-PC-NAE	12000	HS	No-SCM cementitious scenario	0.232	0	0	N	HRWR
HS-6000-FA20-NAE	6000	HS	20% Fly Ash	0.376	20	0	N	HRWR
HS-8000-FA20-NAE	8000	HS	20% Fly Ash	0.324	20	0	N	HRWR
HS-10000-FA20-NAE	10000	HS	20% Fly Ash	0.252	20	0	N	HRWR
HS-12000-FA20-NAE	12000	HS	20% Fly Ash	0.221	20	0	N	HRWR
HS-6000-FA30-NAE	6000	HS	30% Fly Ash	0.366	30	0	N	HRWR
HS-8000-FA30-NAE	8000	HS	30% Fly Ash	0.316	30	0	N	HRWR
HS-10000-FA30-NAE	10000	HS	30% Fly Ash	0.246	30	0	N	HRWR
HS-12000-FA30-NAE	12000	HS	30% Fly Ash	0.215	30	0	N	HRWR
HS-6000-FA40-NAE	6000	HS	40% Fly Ash	0.356	40	0	N	HRWR
HS-8000-FA40-NAE	8000	HS	40% Fly Ash	0.307	40	0	N	HRWR
HS-10000-FA40-NAE	10000	HS	40% Fly Ash	0.239	40	0	N	HRWR
HS-12000-FA40-NAE	12000	HS	40% Fly Ash	0.209	40	0	N	HRWR
HS-6000-SL30-NAE	6000	HS	30% Slag	0.396	0	30	N	HRWR
HS-8000-SL30-NAE	8000	HS	30% Slag	0.341	0	30	N	HRWR
HS-10000-SL30-NAE	10000	HS	30% Slag	0.266	0	30	N	HRWR
HS-12000-SL30-NAE	12000	HS	30% Slag	0.232	0	30	N	HRWR
HS-6000-SL40-NAE	6000	HS	40% Slag	0.396	0	40	N	HRWR
HS-8000-SL40-NAE	8000	HS	40% Slag	0.341	0	40	N	HRWR

Table 30 (continued)

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
HS-10000-SL40-NAE	10000	HS	40% Slag	0.266	0	40	N	HRWR
HS-12000-SL40-NAE	12000	HS	40% Slag	0.232	0	40	N	HRWR
HS-6000-SL50-NAE	6000	HS	50% Slag	0.396	0	50	N	HRWR
HS-8000-SL50-NAE	8000	HS	50% Slag	0.341	0	50	N	HRWR
HS-10000-SL50-NAE	10000	HS	50% Slag	0.266	0	50	N	HRWR
HS-12000-SL50-NAE	12000	HS	50% Slag	0.232	0	50	N	HRWR
HS-6000-FA20SL30-NAE	6000	HS	20% Fly Ash and 30% Slag	0.376	20	30	N	HRWR
HS-8000-FA20SL30-NAE	8000	HS	20% Fly Ash and 30% Slag	0.324	20	30	N	HRWR
HS-10000-FA20SL30-NAE	10000	HS	20% Fly Ash and 30% Slag	0.252	20	30	N	HRWR
HS-12000-FA20SL30-NAE	12000	HS	20% Fly Ash and 30% Slag	0.221	20	30	N	HRWR

Mix proportions

Table 31. Mix proportions

Mix ID	Cement (lb/yd ³)	Fly ash (lb/yd ³)	Slag (lb/yd ³)	Water (US gal/yd ³)	Coarse aggregate (lb/yd ³)	Fine aggregate (lb/yd ³)	AE (fl oz/yd ³)	WR (fl oz/yd ³)	HRWR (fl oz/yd ³)	Accelerator (fl oz/yd ³)
HS-6000-PC-NAE	745.0	0	0	35.35	1,783.7	1,127.3	0	19.25	25.66	64.15
HS-8000-PC-NAE	864.0	0	0	35.35	1,836.0	976.7	0	25.92	34.56	86.40
HS-10000-PC-NAE	1,110.5	0	0	35.35	1,836.0	773.2	0	33.32	44.42	111.1
HS-12000-PC-NAE	1,269.2	0	0	35.35	1,836.0	642.2	0	38.08	50.77	126.9
HS-6000-FA20-NAE	627.4	156.8	0	35.35	1,775.3	1,018.9	0	20.26	27.01	67.53
HS-8000-FA20-NAE	727.6	181.9	0	35.35	1,836.0	833.2	0	27.28	36.38	90.94
HS-10000-FA20-NAE	935.2	233.8	0	35.35	1,836.0	588.7	0	35.07	46.76	116.9
HS-12000-FA20-NAE	1,068.8	267.2	0	35.35	1,836.0	431.3	0	40.08	53.44	133.6
HS-6000-FA30-NAE	563.8	241.6	0	35.35	1,770.5	960.6	0	20.81	27.74	69.35
HS-8000-FA30-NAE	653.8	280.2	0	35.35	1,836.0	755.6	0	28.02	37.36	93.40
HS-10000-FA30-NAE	840.4	360.2	0	35.35	1,836.0	489.0	0	36.02	48.02	120.1
HS-12000-FA30-NAE	960.5	411.6	0	35.35	1,836.0	317.3	0	41.16	54.89	137.2
HS-6000-FA40-NAE	496.7	331.1	0	35.35	1,765.3	899.3	0	21.38	28.51	71.28
HS-8000-FA40-NAE	576.0	384.0	0	35.35	1,836.0	673.7	0	28.80	38.40	96.00
HS-10000-FA40-NAE	740.4	493.6	0	35.35	1,836.0	383.7	0	37.02	49.36	123.4
HS-12000-FA40-NAE	846.2	564.1	0	35.35	1,836.0	197.0	0	42.31	56.41	141.0
HS-6000-SL30-NAE	521.5	0	223.5	35.35	1,782.1	1,113.0	0	19.25	25.66	64.15
HS-8000-SL30-NAE	604.8	0	259.2	35.35	1,836.0	958.3	0	25.92	34.56	86.40
HS-10000-SL30-NAE	777.4	0	333.2	35.35	1,836.0	749.5	0	33.32	44.42	111.1
HS-12000-SL30-NAE	888.5	0	380.8	35.35	1,836.0	615.1	0	38.08	50.77	126.9
HS-6000-SL40-NAE	447.0	0	298.0	35.35	1,781.5	1,108.2	0	19.25	25.66	64.15
HS-8000-SL40-NAE	518.4	0	345.6	35.35	1,836.0	952.2	0	25.92	34.56	86.40
HS-10000-SL40-NAE	666.3	0	444.2	35.35	1,836.0	741.6	0	33.32	44.42	111.1
HS-12000-SL40-NAE	761.5	0	507.7	35.35	1,836.0	606.1	0	38.08	50.77	126.9
HS-6000-SL50-NAE	372.5	0	372.5	35.35	1,781.0	1,103.5	0	19.25	25.66	64.15
HS-8000-SL50-NAE	432.0	0	432.0	35.35	1,836.0	946.0	0	25.92	34.56	86.40
HS-10000-SL50-NAE	555.3	0	555.3	35.35	1,836.0	733.7	0	33.32	44.42	111.1
HS-12000-SL50-NAE	634.6	0	634.6	35.35	1,836.0	597.1	0	38.08	50.77	126.9
HS-6000-FA20SL30-NAE	392.1	156.8	235.3	35.35	1,773.5	1,004.0	0	20.26	27.01	67.53
HS-8000-FA20SL30-NAE	454.7	181.9	272.8	35.35	1,836.0	813.8	0	27.28	36.38	90.94
HS-10000-FA20SL30-NAE	584.5	233.8	350.7	35.35	1,836.0	563.8	0	35.07	46.76	116.9
HS-12000-FA20SL30-NAE	668.0	267.2	400.8	35.35	1,836.0	402.8	0	40.08	53.44	133.6

C.4 LIGHTWEIGHT 3,000–5,000 PSI

Table 32. Mix ID / psi / Class

Mix ID	psi	Class	SCM configuration	w/cm	FA %	SL %	AE	Adm.
LW-3000-PC-AE	3000	LW	No-SCM cementitious scenario	0.537	0	0	Y	WR
LW-4000-PC-AE	4000	LW	No-SCM cementitious scenario	0.424	0	0	Y	WR
LW-5000-PC-AE	5000	LW	No-SCM cementitious scenario	0.352	0	0	Y	HRWR
LW-3000-FA20-AE	3000	LW	20% Fly Ash	0.511	20	0	Y	WR
LW-4000-FA20-AE	4000	LW	20% Fly Ash	0.403	20	0	Y	WR
LW-5000-FA20-AE	5000	LW	20% Fly Ash	0.334	20	0	Y	HRWR
LW-3000-FA30-AE	3000	LW	30% Fly Ash	0.497	30	0	Y	WR
LW-4000-FA30-AE	4000	LW	30% Fly Ash	0.393	30	0	Y	WR
LW-5000-FA30-AE	5000	LW	30% Fly Ash	0.325	30	0	Y	HRWR
LW-3000-FA40-AE	3000	LW	40% Fly Ash	0.484	40	0	Y	WR
LW-4000-FA40-AE	4000	LW	40% Fly Ash	0.382	40	0	Y	WR
LW-5000-FA40-AE	5000	LW	40% Fly Ash	0.317	40	0	Y	HRWR
LW-3000-SL30-AE	3000	LW	30% Slag	0.537	0	30	Y	WR
LW-4000-SL30-AE	4000	LW	30% Slag	0.424	0	30	Y	WR
LW-5000-SL30-AE	5000	LW	30% Slag	0.352	0	30	Y	HRWR
LW-3000-SL40-AE	3000	LW	40% Slag	0.537	0	40	Y	WR
LW-4000-SL40-AE	4000	LW	40% Slag	0.424	0	40	Y	WR
LW-5000-SL40-AE	5000	LW	40% Slag	0.352	0	40	Y	HRWR
LW-3000-SL50-AE	3000	LW	50% Slag	0.537	0	50	Y	WR
LW-4000-SL50-AE	4000	LW	50% Slag	0.424	0	50	Y	WR
LW-5000-SL50-AE	5000	LW	50% Slag	0.352	0	50	Y	HRWR
LW-3000-FA20SL30-AE	3000	LW	20% Fly Ash and 30% Slag	0.511	20	30	Y	WR
LW-4000-FA20SL30-AE	4000	LW	20% Fly Ash and 30% Slag	0.403	20	30	Y	WR
LW-5000-FA20SL30-AE	5000	LW	20% Fly Ash and 30% Slag	0.334	20	30	Y	HRWR

Mix proportions

Table 33. Mix proportions

Mix ID	Cement (lb/yd³)	Fly ash (lb/yd³)	Slag (lb/yd³)	Water (US gal/yd³)	LW aggregate (lb/yd³)	Fine aggregate (lb/yd³)	AE (fl oz/yd³)	WR (fl oz/yd³)	HRWR (fl oz/yd³)	Accelerator (fl oz/yd³)
LW-3000-PC-AE	539.2	0	0	34.72	923.4	1,418.7	5.39	16.18	0	0
LW-4000-PC-AE	682.7	0	0	34.72	942.8	1,268.7	6.83	20.48	0	0
LW-5000-PC-AE	780.6	0	0	32.89	1,020.6	1,101.2	7.81	23.42	31.22	0
LW-3000-FA20-AE	454.1	113.5	0	34.72	797.0	1,534.5	5.68	17.03	0	0
LW-4000-FA20-AE	574.9	143.7	0	34.72	826.2	1,344.8	7.19	21.56	0	0
LW-5000-FA20-AE	657.3	164.3	0	32.89	874.8	1,208.4	8.22	24.65	32.87	0
LW-3000-FA30-AE	408.0	174.9	0	34.72	729	1,596.6	5.83	17.49	0	0
LW-4000-FA30-AE	516.6	221.4	0	34.72	748.4	1,409.8	7.38	22.14	0	0
LW-5000-FA30-AE	590.7	253.2	0	32.89	777.6	1,296.3	8.44	25.32	33.75	0
LW-3000-FA40-AE	359.5	239.6	0	34.72	680.4	1,624.5	5.99	17.97	0	0
LW-4000-FA40-AE	455.1	303.4	0	34.72	690.1	1,439.9	7.59	22.76	0	0
LW-5000-FA40-AE	520.4	346.9	0	32.89	709.6	1,332.8	8.67	26.02	34.69	0
LW-3000-SL30-AE	377.4	0	161.8	34.72	874.8	1,486.2	5.39	16.18	0	0
LW-4000-SL30-AE	477.9	0	204.8	34.72	923.4	1,285.7	6.83	20.48	0	0
LW-5000-SL30-AE	546.4	0	234.2	32.89	972	1,163.5	7.81	23.42	31.22	0
LW-3000-SL40-AE	323.5	0	215.7	34.72	874.8	1,482.4	5.39	16.18	0	0
LW-4000-SL40-AE	409.6	0	273.1	34.72	923.4	1,280.9	6.83	20.48	0	0
LW-5000-SL40-AE	468.3	0	312.2	32.89	972	1,158.0	7.81	23.42	31.22	0
LW-3000-SL50-AE	269.6	0	269.6	34.72	874.8	1,478.5	5.39	16.18	0	0
LW-4000-SL50-AE	341.3	0	341.3	34.72	904.0	1,307.6	6.83	20.48	0	0
LW-5000-SL50-AE	390.3	0	390.3	32.89	942.8	1,199.8	7.81	23.42	31.22	0
LW-3000-FA20SL30-AE	283.8	113.5	170.3	34.72	777.6	1,553.9	5.68	17.03	0	0
LW-4000-FA20SL30-AE	359.3	143.7	215.6	34.72	806.8	1,361.0	7.19	21.56	0	0
LW-5000-FA20SL30-AE	410.8	164.3	246.5	32.89	835.9	1,254.1	8.22	24.65	32.87	0

National and regional benchmarks

18 study groups • Editable regional graphics

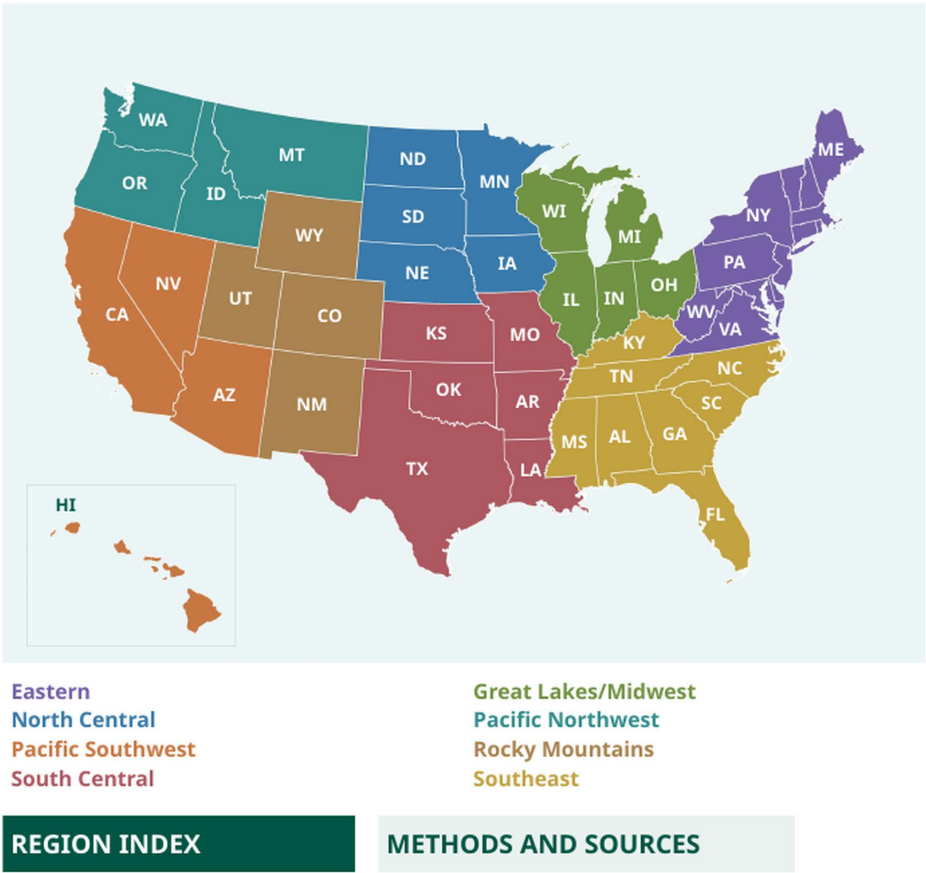
D.1 National	D.7 Rocky Mountains	D.13 Greater Los Angeles Metro
D.2 Eastern	D.8 South Central	D.14 Bay Area Metro
D.3 Great Lakes/Midwest	D.9 Southeast	D.15 San Diego Metro
D.4 North Central	D.10 Ohio	D.16 Florida
D.5 Pacific Northwest	D.11 Texas	D.17 Illinois
D.6 Pacific Southwest	D.12 California	D.18 DC Metro

Charts reproduce the V4 LCA benchmark results. Metro maps show matched 2020 Census ZCTAs; exact ZIP lists are in the Metro ZIP Code Directory.

ZIP directory	Methods and sources
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NATIONAL

Appendix D.1 / National concrete benchmark overview



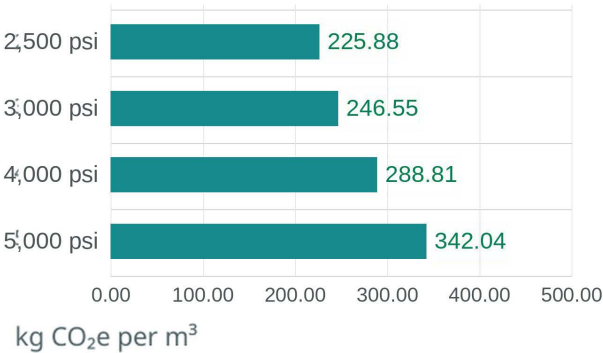
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 34. NRMCA National A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	70.48	51.00	71.26	76.61	64.34	15.00	36.20	67.10	115.00
Rail Distance	mi	72.30	0.00	173.20	87.21	57.39	0.00	0.00	0.00	0.00
Ocean Distance	mi	548.39	0.00	1,986.64	719.39	377.39	0.00	0.00	0.00	0.00
Barge Distance	mi	56.51	0.00	231.50	76.45	36.58	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	112.08	75.80	189.40	129.02	95.13	26.00	56.50	99.00	167.00
Rail Distance	mi	64.34	0.00	239.40	85.76	42.93	0.00	0.00	0.00	0.00
Ocean Distance	mi	1165.07	0.00	4,066.83	1528.89	801.24	0.00	0.00	0.00	0.00
Barge Distance	mi	95.68	0.00	377.13	129.42	61.94	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	35.36	26.00	42.89	39.06	31.67	4.80	18.20	33.00	56.50
Rail Distance	mi	10.65	0.00	61.49	15.95	5.35	0.00	0.00	0.00	0.00
Ocean Distance	mi	8.82	0.00	123.36	19.45	-1.81	0.00	0.00	0.00	0.00
Barge Distance	mi	6.11	0.00	36.14	9.22	3.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	395.41	184.00	585.38	445.77	345.05	49.90	127.00	233.00	509.00
Rail Distance	mi	2.46	0.00	57.03	7.37	-2.44E+00	0.00	0.00	0.00	0.00
Ocean Distance	mi	24.29	0.00	236.44	44.63	3.95	0.00	0.00	0.00	0.00
Barge Distance	mi	7.77E-02	0.00	3.00	3.36E-01	-0.18	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	178.31	147.00	173.92	199.36	157.27	34.80	99.00	187.00	274.00
Rail Distance	mi	91.96	0.00	256.97	123.05	60.86	0.00	0.00	0.00	0.00
Ocean Distance	mi	11.05	0.00	231.59	31.25	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	13.24	0.00	103.19	25.73	0.75	0.00	0.00	0.00	0.00

Table 35. NRMCA National A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	74,272	60,912	64,884	77,886	70,658	25,267	46,598	72,129	111,659
Batch Waste	%	1.724	2.0000	1.013	1.791	1.657	1.00E+00	2.00000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.911	3.582	5.348	4.104	3.718	2.046	3.143	4.226	5.983
Natural Gas - Used at Plant	ft3	17.31	0	166.9	26.05	8.564	0	0	6.374E-05	21.16
Diesel - Used at Plant	gal	0.1074	0.01481	0.3600	0.1273	0.08747	0	0	0.06478	0.1308
Fuel Oil - Used at Plant	gal	0.01468	0	0.1667	0.02716	0.002209	0	0	0	0
Gasoline - Used at Plant	gal	0.001856	0	0.06074	0.003449	2.629E-04	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.02123	0	0.5851	0.03133	0.01112	0	0	0	0
Natural Gas - Used in Fleet	ft3	0.2209	0	7.578	0.5593	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.8480	0.9890	1.394	0.9141	0.7820	0.05017	0.5533	1.169	1.628
Purchased Electricity From Green Grid	kWh	0.04752	0	0.4391	0.06731	0.02773	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0.01415	0	0.2036	0.02986	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0.07167	0	2.635	0.1767	0	0	0	0	0
Oil and Lubricants	lb	0.06232	0.01878	0.2099	0.06892	0.05572	0	0.005709	0.03842	0.1338
Grease	lb	0.09293	2.374E-08	2.170	0.2649	0	0	0	9.765E-04	0.006369
Total Water Use	gal	45.42	40.46	58.88	49.74	41.10	14.32	31.82	51.88	71.64
Percentage of Batch Water That Is Recycled Wash Water	%	7.266	0	19.08	8.778	5.754	0	0	0	0
Hazardous Solid Waste	lb	0.2525	0	5.511	0.5081	0	0	0	0	0
Non-Hazardous Solid Waste	lb	10.42	0.1158	90.50	14.75	6.093	0	0.02708	0.4988	2.674
Particulates, PM-2.5	lb	9.277E-04	0	0.007358	0.001310	5.457E-04	0	0	0	0
Particulates, PM-10	lb	0.006520	0	0.04528	0.008569	0.004472	0	0	0	0
Particulates, total	lb	0.007193	0	0.08631	0.009913	0.004473	0	0	0	0
Lead	lb	3.185E-05	0	3.325E-04	5.781E-05	5.890E-06	0	0	0	0
Hg	lb	1.371E-06	0	3.019E-05	2.281E-06	4.622E-07	0	0	0	0

Table 36. NRMCA National benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	110.5	123.0	148.3	179.9	103.5	112.4	131.0	161.1	197.2	228.7	294.0	336.0	123.0	148.3	173.6
PLC	Portland limestone cement	lb	222.9	248.1	299.1	362.9	208.7	226.8	264.1	324.9	397.7	461.2	592.9	677.6	248.1	299.1	350.1
SC	Slag cement	lb	56.34	62.72	75.61	91.74	52.75	57.33	66.77	82.13	100.54	116.6	149.9	171.3	62.72	75.61	88.50
FA	Fly ash	lb	37.01	41.20	49.67	60.26	34.66	37.66	43.86	53.95	66.05	76.60	98.46	112.53	41.20	49.67	58.14
CCA	Crushed coarse aggregate	lb	1,128.1	1,117.3	1,085.8	1,032.4	1,129.1	1,121.5	1,098.3	1,053.4	1,056.8	1,017.4	1,214.6	1,214.6	0	0	0
NCA	Natural coarse aggregate	lb	554.0	548.1	532.4	506.7	554.5	550.2	538.5	517.0	518.9	498.7	595.4	595.4	0	0	0
CFA	Crushed fine aggregate	lb	169.3	167.3	162.4	154.5	190.0	190.4	191.4	175.1	158.4	151.9	99.36	82.53	161.4	149.4	136.4
NFA	Natural fine aggregate	lb	1,284.4	1,272.7	1,236.2	1,174.9	1,441.2	1,447.9	1,457.0	1,331.6	1,203.2	1,158.3	757.6	629.3	1,227.7	1,133.0	1,038.3
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	982.1	992.7	1,003.2
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	36.49	36.49	36.49	37.73	39.14	39.14	39.14	40.87	35.35	35.35	35.35	35.35	36.93	36.93	36.93

Table 37. National benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	467.69	512.72	557.96
GWPF	kg CO2e	467.55	512.55	557.75
GWPB	kg CO2e	0.15	0.18	0.21
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.54E-06	7.70E-06	8.85E-06
AP	kg SO2e	2.59	2.73	2.87
EPT	kg Ne	1.02	1.07	1.13
EPM	kg N-eq	0.24	0.25	0.27
EPF	kg P-eq	0.12	0.12	0.13
SFP	kg O3e	39.13	41.99	44.84
ADP _f	MJ	3681.64	3917.41	4157.35
ADP _e	kg Sbe	4.42E-04	4.52E-04	4.63E-04
RPRE	MJ	321.06	329.68	339.04
NRPRE	MJ	3925.61	4180.38	4437.78
NRSF	MJ	109.65	132.19	154.72
SM	kg	62.72	75.61	88.49
FW	m3	2.10	2.10	2.09
CCE	kg CO2e	100.62	121.30	141.97
HWD	kg	0.16	0.16	0.16
NHWD	kg	7.66	7.86	8.08
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

Table 38. National benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	225.88	246.55	288.81	342.04
GWPF	kg CO2e	225.76	246.41	288.64	341.83
GWPB	kg CO2e	0.13	0.15	0.18	0.22
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.35E-06	5.92E-06	7.07E-06	8.50E-06
AP	kg SO2e	0.85	0.91	1.04	1.19
EPT	kg Ne	0.28	0.30	0.34	0.40
EPM	kg N-eq	0.12	0.12	0.13	0.15
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	19.05	20.39	23.04	26.29
ADP _f	MJ	1531.49	1626.94	1831.64	2097.23
ADP _e	kg Sbe	7.01E-05	6.77E-05	6.91E-05	7.66E-05
RPRE	MJ	45.77	46.61	50.70	57.98
NRPRE	MJ	1578.33	1686.20	1911.11	2197.64
NRSF	MJ	98.50	109.65	132.19	160.38
SM	kg	56.34	62.72	75.61	91.73
FW	m3	3.01	3.02	3.02	3.02
CCE	kg CO2e	90.39	100.62	121.30	147.17
HWD	kg	0.15	0.16	0.16	0.16
NHWD	kg	7.70	7.74	7.88	8.14
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 39. National benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

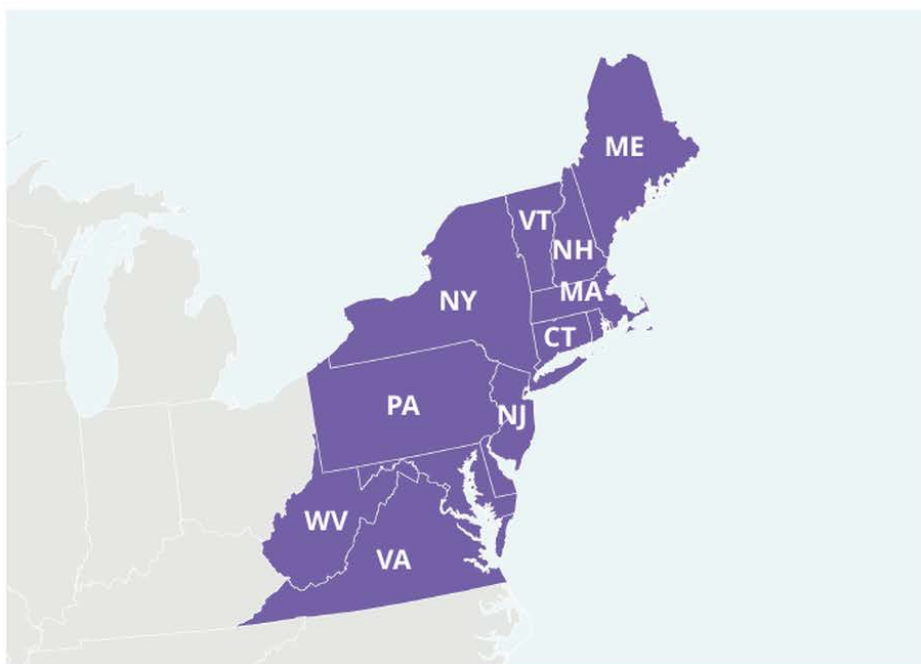
Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	212.76	228.30	260.34	314.19
GWPF	kg CO2e	212.63	228.17	260.19	314.01
GWPB	kg CO2e	0.13	0.14	0.16	0.19
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.04E-06	5.44E-06	6.29E-06	7.65E-06
AP	kg SO2e	0.82	0.87	0.96	1.12
EPT	kg Ne	0.25	0.27	0.31	0.39
EPM	kg N-eq	0.11	0.12	0.13	0.14
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	18.60	19.60	21.63	24.63
ADP _f	MJ	1436.58	1519.89	1691.30	2016.83
ADP _e	kg Sbe	4.61E-05	5.02E-05	5.89E-05	1.01E-04
RPRE	MJ	35.74	38.52	44.41	64.52
NRPRE	MJ	1495.85	1583.66	1764.08	2082.86
NRSF	MJ	92.23	100.23	116.74	143.58
SM	kg	52.75	57.33	66.77	82.13
FW	m3	3.10	3.12	3.15	3.13
CCE	kg CO2e	84.63	91.97	107.12	131.76
HWD	kg	0.15	0.15	0.16	0.16
NHWD	kg	7.37	7.46	7.67	8.35
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 40. National benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	373.70	426.51	557.34	631.87
GWPF	kg CO2e	373.47	426.24	557.07	631.55
GWPB	kg CO2e	0.24	0.28	0.33	0.37
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	9.28E-06	1.07E-05	1.37E-05	1.56E-05
AP	kg SO2e	1.29	1.44	1.83	2.04
EPT	kg Ne	0.44	0.50	0.77	0.87
EPM	kg N-eq	0.16	0.18	0.23	0.25
EPF	kg P-eq	0.05	0.05	0.07	0.08
SFP	kg O3e	28.37	31.68	38.84	43.28
ADP _f	MJ	2291.45	2549.94	3551.31	3985.45
ADP _e	kg Sbe	9.65E-05	9.97E-05	3.12E-04	3.56E-04
RPRE	MJ	67.79	73.46	162.05	184.54
NRPRE	MJ	2391.48	2674.00	3569.91	4005.93
NRSF	MJ	175.77	203.85	262.02	299.46
SM	kg	100.54	116.60	149.87	171.29
FW	m3	3.09	3.10	3.27	3.31
CCE	kg CO2e	161.30	187.06	240.44	274.80
HWD	kg	0.16	0.16	0.16	0.16
NHWD	kg	8.47	8.67	11.65	12.42
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

EASTERN

Appendix D.2 / Regional concrete benchmark overview



Coverage: ME, NH, VT, MA, RI, CT, NY, PA, NJ, DE, MD, DC, VA, WV
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

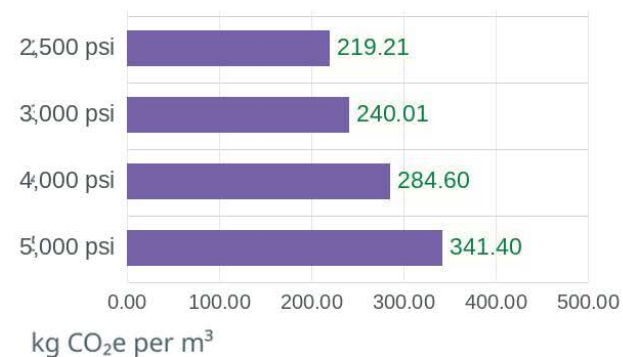
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 41. Eastern A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	71.06	60.00	64.90	82.81	59.31	10.00	42.00	77.00	104.00
Rail Distance	mi	51.34	0.00	133.01	75.43	27.25	0.00	0.00	0.00	0.00
Ocean Distance	mi	346.71	0.00	1292.95	580.84	112.58	0.00	0.00	0.00	0.00
Barge Distance	mi	36.93	0.00	325.89	95.94	-22.09	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	183.59	99.00	397.80	260.89	106.29	51.60	83.00	119.00	180.00
Rail Distance	mi	39.25	0.00	183.34	74.87	3.62	0.00	0.00	0.00	0.00
Ocean Distance	mi	1.10	0.00	10.75	3.19	-0.99	0.00	0.00	0.00	0.00
Barge Distance	mi	11.65	0.00	41.08	19.63	3.66	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	44.87	32.60	65.41	56.71	33.02	7.60	23.00	47.00	64.00
Rail Distance	mi	2.90	0.00	13.89	5.42	0.39	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	5.91	0.00	41.54	13.43	-1.61	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	339.03	206.00	470.90	424.30	253.75	102.00	183.00	240.00	392.00
Rail Distance	mi	31.57	0.00	181.73	56.78	6.36E+00	0.00	0.00	0.00	0.00
Ocean Distance	mi	71.29	0.00	582.04	152.04	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	165.13	153.00	127.78	193.38	136.88	33.80	115.00	179.00	275.00
Rail Distance	mi	60.92	0.00	174.50	99.50	22.34	0.00	0.00	0.00	0.00
Ocean Distance	mi	40.58	0.00	443.71	115.27	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	21.89	0.00	112.49	46.76	-2.98	0.00	0.00	0.00	0.00

Table 42. Eastern A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	66,611	53,546	50,537	73,185	60,036	26,124	44,593	66,034	98,071
Batch Waste	%	1.635	2.0000	0.911	1.810	1.4588	1.00E+00	2	2.0000	2.000
Purchased Electricity - Used at Plant	kWh	4.561	4.146	4.194	5.161	3.961	2.204	3.394	4.708	7.414
Natural Gas - Used at Plant	ft3	10.56	0	28.16	14.07	7.040	0	0	0.10365	16.37
Diesel - Used at Plant	gal	0.1453	0.04691	0.3464	0.1876	0.1030	0	0	0.09480	0.1979
Fuel Oil - Used at Plant	gal	0.01890	0	0.1204	0.02731	0.01050	0	0	0	0
Gasoline - Used at Plant	gal	2.508E-04	0	0.002293	4.227E-04	7.882E-05	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.03304	0	0.4569	0.05037	0.01571	0	0	0	0.001417
Natural Gas - Used in Fleet	ft3	1.172	0	17.57	3.213	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.8677	1.046	0.9988	1.023	0.7124	0	0.5481	1.289	1.717
Purchased Electricity From Green Grid	kWh	0.03546	0	0.3171	0.08866	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0.01643	0	0.1613	0.04055	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	1.656E-04	0	0.002689	3.601E-04	0	0	0	0	0
Oil and Lubricants	lb	0.05937	0.01794	0.1518	0.07229	0.04645	0	0.005487	0.03673	0.1356
Grease	lb	0.006163	1.946E-04	0.02576	0.009105	0.003222	0	0	0.001401	0.007675
Total Water Use	gal	44.19	45.78	50.33	51.58	36.80	8.341	34.01	59.65	80.33
Percentage of Batch Water That Is Recycled Wash Water	%	10.52	0	19.78	14.71	6.333	0	0	0	10.00
Hazardous Solid Waste	lb	0.01126	0	0.09479	0.02485	0	0	0	0	0
Non-Hazardous Solid Waste	lb	21.91	0.2831	186.6	44.50	0	0	0.03382	0.7587	3.477
Particulates, PM-2.5	lb	2.423E-04	0	0.001587	5.536E-04	0	0	0	0	0
Particulates, PM-10	lb	7.396E-04	0	0.002760	0.001360	1.193E-04	0	0	0	0
Particulates, total	lb	0.001786	0	0.01399	0.003604	0	0	0	0	0
Lead	lb	1.914E-04	0	7.673E-04	3.469E-04	3.584E-05	0	0	0	0
Hg	lb	2.569E-07	0	1.070E-06	4.559E-07	5.788E-08	0	0	0	0

Table 43. Eastern benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	61.22	68.61	84.08	103.7	57.32	62.71	74.25	92.81	113.58	134.6	173.0	197.8	68.68	84.08	99.94
PLC	Portland limestone cement	lb	259.7	291.0	356.7	439.8	243.2	266.0	315.0	393.7	481.8	571.1	734.0	838.9	291.3	356.7	424.0
SC	Slag cement	lb	90.29	101.2	124.0	152.9	84.54	92.48	109.5	136.9	167.5	198.5	255.2	291.7	101.3	124.0	147.4
FA	Fly ash	lb	26.71	29.93	36.68	45.23	25.01	27.36	32.39	40.49	49.55	58.73	75.49	86.28	29.96	36.68	43.60
CCA	Crushed coarse aggregate	lb	1,390.2	1,363.1	1,322.7	1,256.6	1,390.5	1,365.5	1,332.3	1,271.5	1,286.1	1,223.5	1,418.4	1,407.9	0	0	0
NCA	Natural coarse aggregate	lb	324.8	318.8	309.7	293.7	324.9	319.4	311.9	297.2	301.2	286.0	331.6	329.1	0	0	0
CFA	Crushed fine aggregate	lb	185.9	181.9	176.8	167.8	208.3	206.7	207.5	188.4	171.4	163.9	104.1	85.80	181.9	163.9	148.9
NFA	Natural fine aggregate	lb	1,226.3	1,202.2	1,166.8	1,108.8	1,374.4	1,366.0	1,369.5	1,245.0	1,134.5	1,078.5	685.0	564.8	1,200.3	1,085.4	981.2
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	989.4	1,009.4	1,019.1
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	34.61	34.61	34.61	35.79	37.13	37.13	37.13	38.77	33.62	33.62	33.62	33.62	35.04	35.04	35.04

Table 44. Eastern benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	219.21	240.01	284.60	341.40
GWPF	kg CO2e	219.08	239.86	284.41	341.17
GWPB	kg CO2e	0.14	0.16	0.20	0.24
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.66E-06	6.31E-06	7.66E-06	9.38E-06
AP	kg SO2e	0.83	0.89	1.01	1.17
EPT	kg Ne	0.27	0.29	0.34	0.40
EPM	kg N-eq	0.10	0.11	0.12	0.13
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	17.95	19.14	21.72	24.93
ADP _f	MJ	1493.86	1584.93	1795.30	2071.10
ADP _e	kg Sbe	7.02E-05	6.80E-05	7.03E-05	7.90E-05
RPRE	MJ	45.98	47.01	51.73	59.90
NRPRE	MJ	1581.26	1690.03	1932.33	2244.13
NRSF	MJ	93.38	104.64	128.24	158.12
SM	kg	70.55	79.05	96.88	119.46
FW	m3	2.89	2.88	2.89	2.89
CCE	kg CO2e	85.68	96.01	117.67	145.09
HWD	kg	0.01	0.01	0.01	0.01
NHWD	kg	14.57	14.61	14.76	15.04
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 45. Eastern benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	206.69	222.51	256.82	313.66
GWPF	kg CO2e	206.56	222.37	256.65	313.46
GWPB	kg CO2e	0.14	0.15	0.18	0.21
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.33E-06	5.80E-06	6.81E-06	8.43E-06
AP	kg SO2e	0.80	0.84	0.94	1.10
EPT	kg Ne	0.24	0.26	0.30	0.39
EPM	kg N-eq	0.10	0.11	0.11	0.13
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	17.59	18.47	20.47	23.38
ADP _f	MJ	1404.34	1484.57	1662.46	1994.37
ADP _e	kg Sbe	4.62E-05	5.05E-05	6.00E-05	1.03E-04
RPRE	MJ	35.97	38.93	45.36	66.27
NRPRE	MJ	1501.62	1590.29	1786.15	2125.49
NRSF	MJ	87.43	95.64	113.25	141.56
SM	kg	66.05	72.26	85.56	106.95
FW	m3	2.97	2.97	3.00	2.98
CCE	kg CO2e	80.22	87.76	103.92	129.90
HWD	kg	0.01	0.01	0.01	0.01
NHWD	kg	14.24	14.34	14.55	15.25
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 46. Eastern benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	372.76	433.48	565.36	640.78
GWPF	kg CO2e	372.51	433.17	565.03	640.41
GWPB	kg CO2e	0.27	0.32	0.37	0.42
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	1.02E-05	1.21E-05	1.55E-05	1.76E-05
AP	kg SO2e	1.27	1.44	1.82	2.03
EPT	kg Ne	0.45	0.51	0.78	0.89
EPM	kg N-eq	0.14	0.16	0.20	0.22
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	26.85	30.32	36.92	41.06
ADP _f	MJ	2260.10	2549.13	3535.54	3963.41
ADP _e	kg Sbe	9.91E-05	1.04E-04	3.18E-04	3.63E-04
RPRE	MJ	69.83	77.09	166.53	189.61
NRPRE	MJ	2439.64	2770.37	3678.98	4126.49
NRSF	MJ	173.24	205.32	263.91	301.63
SM	kg	130.88	155.12	199.39	227.88
FW	m3	2.96	2.96	3.11	3.14
CCE	kg CO2e	158.96	188.40	242.16	276.77
HWD	kg	0.01	0.01	0.01	0.01
NHWD	kg	15.37	15.61	18.59	19.36
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 47. Eastern benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	460.92	510.08	558.50
GWPF	kg CO2e	460.77	509.89	558.27
GWPB	kg CO2e	0.16	0.20	0.24
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.94E-06	8.31E-06	9.70E-06
AP	kg SO2e	2.55	2.71	2.86
EPT	kg Ne	1.02	1.08	1.14
EPM	kg N-eq	0.22	0.23	0.24
EPF	kg P-eq	0.12	0.12	0.13
SFP	kg O3e	37.56	40.48	43.28
ADP _f	MJ	3626.77	3885.03	4132.99
ADP _e	kg Sbe	4.45E-04	4.59E-04	4.71E-04
RPRE	MJ	323.31	335.18	345.11
NRPRE	MJ	3917.50	4208.05	4485.72
NRSF	MJ	104.74	128.24	152.43
SM	kg	79.14	96.88	115.17
FW	m3	1.97	1.96	1.95
CCE	kg CO2e	96.11	117.67	139.87
HWD	kg	0.01	0.01	0.01
NHWD	kg	14.53	14.74	14.98
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

GREAT LAKES/MIDWEST

Appendix D.3 / Regional concrete benchmark overview



Coverage: WI, MI, IL, IN, OH
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 48. Great Lakes/Midwest A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	56.14	42.00	52.20	65.23	47.04	16.00	35.00	54.70	82.60
Rail Distance	mi	51.11	0.00	153.59	77.87	24.36	0.00	0.00	0.00	0.00
Ocean Distance	mi	834.67	0.00	3,049.83	1365.96	303.37	0.00	0.00	0.00	0.00
Barge Distance	mi	198.64	0.00	369.78	263.17	134.11	0.00	0.00	0.00	359.00
SCM										
Truck Distance	mi	108.34	71.00	112.18	128.16	88.51	34.10	60.00	92.30	151.00
Rail Distance	mi	7.37	0.00	48.52	15.95	-1.20	0.00	0.00	0.00	0.00
Ocean Distance	mi	4546.28	0.00	7,572.74	5,884.62	3207.95	0.00	0.00	0.00	15377.00
Barge Distance	mi	429.77	0.00	675.07	549.08	310.47	0.00	0.00	0.00	1500.00
Aggregate										
Truck Distance	mi	29.76	18.00	43.52	37.36	22.17	2.00	15.00	24.90	38.00
Rail Distance	mi	2.95	0.00	17.13	5.94	-4.19E-02	0.00	0.00	0.00	0.00
Ocean Distance	mi	5.63E-01	0.00	8.33	2.02	-0.89	0.00	0.00	0.00	0.00
Barge Distance	mi	15.06	0.00	56.14	24.85	5.26	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	193.89	88.70	291.16	244.61	143.17	28.90	60.40	110.00	217.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	208.88	219.00	76.07	227.00	190.76	156.00	202.00	223.00	286.00
Rail Distance	mi	25.47	0.00	99.99	49.28	1.65	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	3.42	0.00	22.40	8.76	-1.91	0.00	0.00	0.00	0.00

Table 49. Great Lakes/Midwest A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	69,185	61,216	51,478	76,337	62,032	26,432	46,661	72,546	102,404
Batch Waste	%	1.6946	2	0.897	1.8269	1.5624	1.00E+00	2	2.0000	2.000
Purchased Electricity - Used at Plant	kWh	4.185	3.637	4.533	4.646	3.724	2.361	3.172	4.142	5.514
Natural Gas - Used at Plant	ft3	78.62	36.11	407.3	135.9	21.34	0.3988	23.99	49.94	86.54
Diesel - Used at Plant	gal	0.1246	0.01784	0.5593	0.1829	0.06641	0	0	0.05795	0.1311
Fuel Oil - Used at Plant	gal	0.001595	0	0.01880	0.004208	0	0	0	0	0
Gasoline - Used at Plant	gal	0.001681	0	0.01260	0.003898	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.004788	0	0.02607	0.007778	0.001797	0	0	0	0
Natural Gas - Used in Fleet	ft3	0.1463	0	1.523	0.4319	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	1.152	1.173	1.933	1.344	0.9593	0.4389	1.002	1.335	1.780
Purchased Electricity From Green Grid	kWh	0.009355	0	0.1966	0.02408	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0.4760	0	6.562	1.176	0	0	0	0	0
Oil and Lubricants	lb	0.06678	0.001393	0.2310	0.08904	0.04452	0	3.829E-07	0.008275	0.1270
Grease	lb	0.5951	5.409E-05	5.411	1.742	0	0	0	5.745E-04	0.005818
Total Water Use	gal	42.30	32.70	65.86	47.79	36.81	22.46	30.42	41.23	65.09
Percentage of Batch Water That Is Recycled Wash Water	%	1.472	0	5.700	2.550	0.3941	0	0	0	0
Hazardous Solid Waste	lb	1.001	0	9.765	2.415	0	0	0	0	0
Non-Hazardous Solid Waste	lb	10.42	0.1922	48.63	14.45	6.386	0	0.004079	0.8788	9.090
Particulates, PM-2.5	lb	8.438E-04	0	0.004192	0.001305	3.826E-04	0	0	0	2.537E-08
Particulates, PM-10	lb	0.002795	0	0.01214	0.003965	0.001626	0	0	0	3.349E-07
Particulates, total	lb	0.01979	0	0.1894	0.03201	0.007559	0	0	0	3.148E-05
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 50. Great Lakes/Midwest benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	55.58	62.31	76.33	94.06	52.04	56.95	67.41	84.21	103.27	121.8	156.6	179.0	62.45	76.33	90.78
PLC	Portland limestone cement	lb	247.0	276.9	339.3	418.1	231.3	253.1	299.6	374.3	459.0	541.5	696.0	795.5	277.6	339.3	403.5
SC	Slag cement	lb	68.72	77.04	94.39	116.3	64.34	70.42	83.35	104.1	127.69	150.6	193.6	221.3	77.22	94.39	112.3
FA	Fly ash	lb	30.58	34.29	42.01	51.76	28.64	31.34	37.10	46.34	56.83	67.05	86.18	98.49	34.37	42.01	49.96
CCA	Crushed coarse aggregate	lb	1,515.8	1,487.7	1,443.4	1,385.2	1,530.8	1,505.5	1,472.2	1,424.6	1,419.0	1,364.2	1,639.6	1,639.8	0	0	0
NCA	Natural coarse aggregate	lb	244.8	239.8	232.7	223.7	247.2	242.7	237.4	230.1	229.1	219.6	263.9	263.9	0	0	0
CFA	Crushed fine aggregate	lb	13.99	13.99	13.98	12.98	15.84	16.05	16.62	14.82	13.9	12.92	8.50	7.06	13.99	11.99	10.98
NFA	Natural fine aggregate	lb	1,458.8	1,430.8	1,388.5	1,333.3	1,651.5	1,642.1	1,649.7	1,521.7	1,364.5	1,312.6	863.7	717.5	1,369.8	1,246.6	1,136.4
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	1,049.1	1,068.8	1,078.5
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	32.00	32.00	32.00	33.08	34.32	34.32	34.32	35.84	31.08	31.08	31.08	31.08	32.44	32.44	32.44

Table 51. Great Lakes/Midwest benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	224.64	245.66	290.35	347.39
GWPF	kg CO2e	224.52	245.52	290.17	347.17
GWPB	kg CO2e	0.13	0.15	0.19	0.23
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.23E-06	5.81E-06	7.03E-06	8.57E-06
AP	kg SO2e	1.03	1.11	1.28	1.51
EPT	kg Ne	0.27	0.29	0.33	0.40
EPM	kg N-eq	0.15	0.16	0.18	0.21
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	22.90	24.83	28.90	34.05
ADP _f	MJ	1654.97	1759.40	1995.15	2305.72
ADP _e	kg Sbe	6.79E-05	6.54E-05	6.70E-05	7.49E-05
RPRE	MJ	44.67	45.45	49.62	57.08
NRPRE	MJ	1717.62	1836.90	2098.45	2437.23
NRSF	MJ	88.03	98.69	120.91	148.98
SM	kg	59.91	67.17	82.29	101.40
FW	m3	3.22	3.22	3.22	3.23
CCE	kg CO2e	80.77	90.56	110.94	136.71
HWD	kg	0.61	0.61	0.61	0.61
NHWD	kg	7.59	7.62	7.77	8.02
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 52. Great Lakes/Midwest benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	212.18	228.17	262.54	319.74
GWPF	kg CO2e	212.06	228.03	262.39	319.55
GWPB	kg CO2e	0.13	0.14	0.17	0.21
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.93E-06	5.35E-06	6.26E-06	7.72E-06
AP	kg SO2e	0.99	1.05	1.19	1.40
EPT	kg Ne	0.24	0.26	0.30	0.39
EPM	kg N-eq	0.14	0.15	0.17	0.20
EPF	kg P-eq	0.02	0.03	0.03	0.04
SFP	kg O3e	22.19	23.60	26.72	31.49
ADP _f	MJ	1560.20	1650.27	1847.17	2213.78
ADP _e	kg Sbe	4.40E-05	4.81E-05	5.71E-05	9.98E-05
RPRE	MJ	34.78	37.57	43.59	63.84
NRPRE	MJ	1634.27	1730.71	1940.99	2307.66
NRSF	MJ	82.42	90.21	106.78	133.38
SM	kg	56.10	61.39	72.67	90.78
FW	m3	3.33	3.33	3.36	3.36
CCE	kg CO2e	75.63	82.77	97.98	122.39
HWD	kg	0.61	0.61	0.61	0.61
NHWD	kg	7.26	7.36	7.56	8.24
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 53. Great Lakes/Midwest benchmark - High-Strength - A1-A3 total results per cubic meter

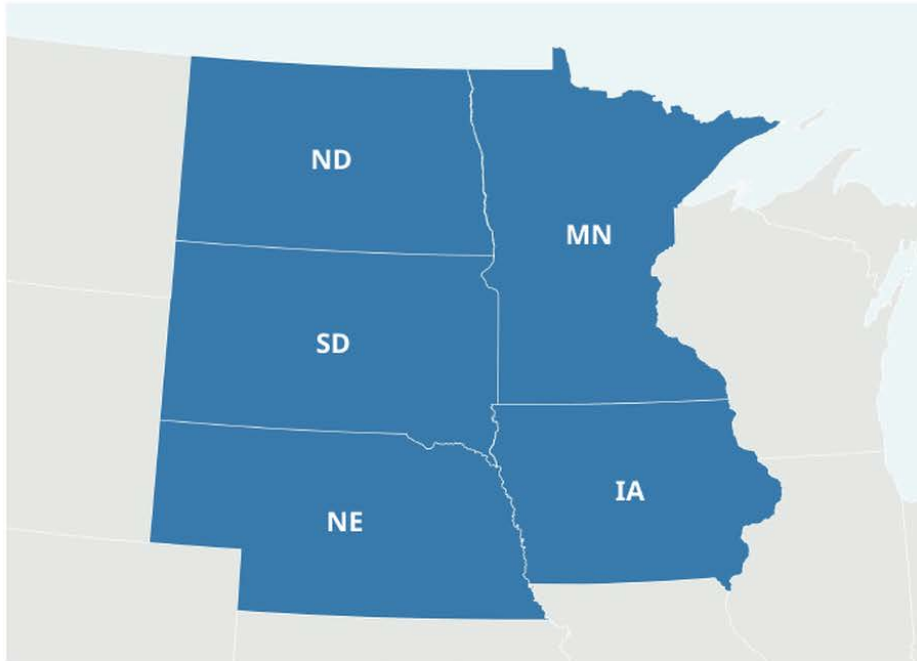
Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	379.41	438.80	570.98	646.45
GWPF	kg CO2e	379.17	438.51	570.68	646.11
GWPB	kg CO2e	0.25	0.30	0.35	0.40
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	9.36E-06	1.10E-05	1.40E-05	1.59E-05
AP	kg SO2e	1.63	1.87	2.36	2.65
EPT	kg Ne	0.44	0.51	0.77	0.88
EPM	kg N-eq	0.23	0.26	0.34	0.38
EPF	kg P-eq	0.04	0.05	0.07	0.07
SFP	kg O3e	36.95	42.36	52.71	59.23
ADP _f	MJ	2513.23	2830.29	3882.11	4350.08
ADP _e	kg Sbe	9.47E-05	9.88E-05	3.11E-04	3.55E-04
RPRE	MJ	66.77	73.04	161.14	183.32
NRPRE	MJ	2647.61	2997.30	3955.94	4433.67
NRSF	MJ	163.57	192.97	248.04	283.48
SM	kg	111.33	131.34	168.81	192.94
FW	m3	3.31	3.32	3.51	3.55
CCE	kg CO2e	150.09	177.07	227.60	260.12
HWD	kg	0.61	0.61	0.61	0.61
NHWD	kg	8.35	8.56	11.51	12.25
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 54. Great Lakes/Midwest benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	485.38	534.51	583.36
GWPF	kg CO2e	485.24	534.33	583.14
GWPB	kg CO2e	0.15	0.19	0.23
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.49E-06	7.71E-06	8.97E-06
AP	kg SO2e	2.93	3.13	3.33
EPT	kg Ne	1.06	1.13	1.19
EPM	kg N-eq	0.29	0.32	0.34
EPF	kg P-eq	0.12	0.13	0.13
SFP	kg O3e	45.44	49.86	54.24
ADPf	MJ	4005.18	4289.32	4566.23
ADPe	kg Sbe	4.66E-04	4.79E-04	4.91E-04
RPRE	MJ	338.74	349.98	359.37
NRPRE	MJ	4280.35	4590.55	4890.99
NRSF	MJ	98.91	120.91	143.79
SM	kg	67.32	82.29	97.87
FW	m3	2.26	2.25	2.25
CCE	kg CO2e	90.76	110.94	131.94
HWD	kg	0.61	0.61	0.61
NHWD	kg	7.55	7.74	7.97
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

NORTH CENTRAL

Appendix D.4 / Regional concrete benchmark overview



Coverage: ND, SD, NE, MN, IA
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

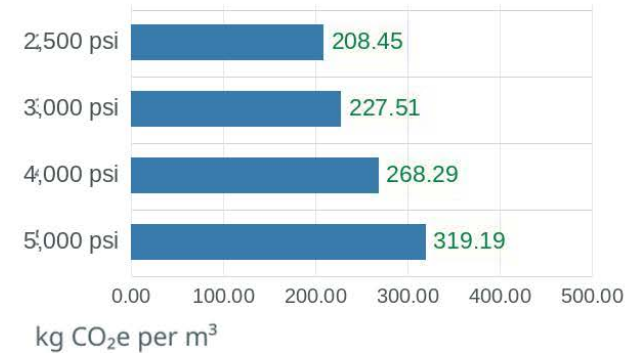
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 55. North Central A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	68.77	24.00	127.52	112.20	25.33	9.50	15.00	26.00	68.00
Rail Distance	mi	355.93	432.00	311.38	461.99	249.87	0.00	360.00	455.00	630.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	30.88	0.00	89.62	61.41	0.36	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	65.60	50.00	77.06	92.42	38.79	6.00	19.00	75.00	92.80
Rail Distance	mi	89.56	0.00	166.25	147.41	31.72	0.00	0.00	0.00	240.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	24.98	14.00	36.81	37.52	12.45	5.00	10.90	18.60	34.60
Rail Distance	mi	7.69	0.00	34.79	19.54	-4.16	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	507.40	501.00	408.48	646.53	368.26	50.00	400.00	529.00	1069.00
Rail Distance	mi	16.56	0.00	55.56	35.48	-2.37	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	183.25	187.00	91.26	244.39	122.10	169.00	187.00	193.00	195.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 56. North Central A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	69,988	42,964	72,372	87,190	52,787	15,820	29,201	55,290	127,457
Batch Waste	%	1.7348	2	0.640	2.024	1.4453	2	2	2.0000	2.000
Purchased Electricity - Used at Plant	kWh	2.753	2.153	5.285	3.319	2.188	1.644	1.945	3.251	4.696
Natural Gas - Used at Plant	ft3	12.33	0.02879	19.18	15.65	9.017	0	0	0.2752	18.43
Diesel - Used at Plant	gal	0.09975	0.07126	0.1825	0.1677	0.03182	0.004444	0.06508	0.07139	0.1295
Fuel Oil - Used at Plant	gal	0.001284	0	0.01753	0.003076	0	0	0	0	0
Gasoline - Used at Plant	gal	0.002793	0	0.01752	0.007117	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.009447	0	1.310	0.02034	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	1.359	1.196	2.828	1.837	0.8800	0.9889	1.165	1.354	1.426
Purchased Electricity From Green Grid	kWh	0.2172	0	0.3299	0.3401	0.09439	0	0	0	0.5150
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0.02750	0	0.2379	0.08186	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.07622	0.07362	0.4354	0.1152	0.03728	0.007967	4.88E-02	0.09674	0.2190
Grease	lb	0.002767	0.005647	0.04345	0.003677	0.001857	2.230E-04	0.004026	0.007477	0.01370
Total Water Use	gal	97.02	65.40	124.3	161.7	32.32	48.82	65.40	65.40	69.50
Percentage of Batch Water That Is Recycled Wash Water	%	0.005946	0	0.009080	0.01189	0	0	0	0	0
Hazardous Solid Waste	lb	0.004732	0	0.02147	0.009041	4.222E-04	0	0	0	0.009146
Non-Hazardous Solid Waste	lb	1.195	0.08725	6.158	2.759	0	0.01622	0.06784	0.09466	0.1654
Particulates, PM-2.5	lb	0.004724	0	0.007388	0.008222	0.001225	0	0	0	0.00E+00
Particulates, PM-10	lb	0.01625	0	0.02351	0.02839	0.004105	0	0	0	0.00E+00
Particulates, total	lb	0.03978	0	0.05798	0.06944	0.01012	0	0	0	0.00E+00
Lead	lb	5.620E-07	0	7.092E-07	9.739E-07	1.502E-07	0	0	0	0
Hg	lb	1.223E-07	0	2.910E-07	2.442E-07	4.344E-10	0	0	0	0

Table 57. North Central benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	30.72	34.22	41.52	50.58	28.77	31.27	36.67	45.28	55.55	64.72	83.18	95.07	34.29	41.52	48.75
PLC	Portland limestone cement	lb	296.8	330.5	401.1	488.6	277.9	302.1	354.2	437.4	536.6	625.2	803.6	918.4	331.3	401.1	471.0
SC	Slag cement	lb	21.67	24.13	29.28	35.67	20.29	22.06	25.86	31.93	39.18	45.64	58.67	67.05	24.19	29.28	34.38
FA	Fly ash	lb	74.07	82.49	100.1	121.9	69.35	75.40	88.40	109.2	133.9	156.0	200.5	229.2	82.67	100.1	117.5
CCA	Crushed coarse aggregate	lb	781.7	766.5	743.8	705.1	789.6	776.9	760.8	730.5	729.4	700.7	852.0	853.2	0	0	0
NCA	Natural coarse aggregate	lb	929.2	911.0	884.2	838.4	938.6	923.4	904.5	868.6	867.5	833.1	1,013.0	1,014.5	0	0	0
CFA	Crushed fine aggregate	lb	221.3	217.3	211.1	199.9	250.7	249.7	251.6	229.8	207.3	198.6	132.3	110.0	218.2	202.1	182.0
NFA	Natural fine aggregate	lb	1,207.4	1,184.1	1,149.1	1,090.0	1,367.7	1,360.9	1,369.5	1,253.2	1,127.1	1,083.2	721.2	599.9	1,190.9	1,100.2	994.7
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	976.6	985.7	1,004.6
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	34.86	34.86	34.86	36.05	37.40	37.40	37.40	39.05	33.86	33.86	33.86	33.86	35.29	35.29	35.29

Table 58. North Central benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	208.45	227.51	268.29	319.19
GWPF	kg CO2e	208.31	227.35	268.09	318.94
GWPB	kg CO2e	0.15	0.17	0.21	0.26
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.00E-06	5.51E-06	6.57E-06	7.89E-06
AP	kg SO2e	0.66	0.70	0.80	0.92
EPT	kg Ne	0.26	0.28	0.32	0.37
EPM	kg N-eq	0.08	0.08	0.09	0.10
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	14.26	15.20	17.22	19.66
ADP _f	MJ	1409.03	1493.45	1688.37	1939.51
ADP _e	kg Sbe	6.95E-05	6.68E-05	6.80E-05	7.52E-05
RPRE	MJ	45.74	46.35	50.19	57.08
NRPRE	MJ	1415.04	1507.18	1713.09	1973.56
NRSF	MJ	94.43	105.16	127.62	155.44
SM	kg	57.79	64.35	78.10	95.12
FW	m3	3.65	3.64	3.64	3.63
CCE	kg CO2e	86.65	96.50	117.10	142.63
HWD	kg	5.15E-03	5.41E-03	5.96E-03	6.64E-03
NHWD	kg	2.09	2.12	2.27	2.52
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 59. North Central benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	196.07	210.41	241.55	293.31
GWPF	kg CO2e	195.93	210.25	241.37	293.09
GWPB	kg CO2e	0.15	0.16	0.19	0.23
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.73E-06	5.09E-06	5.88E-06	7.13E-06
AP	kg SO2e	0.64	0.67	0.75	0.87
EPT	kg Ne	0.23	0.25	0.29	0.36
EPM	kg N-eq	0.08	0.08	0.09	0.10
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	13.97	14.66	16.22	18.50
ADP _f	MJ	1317.62	1392.10	1556.85	1870.97
ADP _e	kg Sbe	4.56E-05	4.95E-05	5.81E-05	1.00E-04
RPRE	MJ	35.84	38.46	44.20	63.93
NRPRE	MJ	1338.66	1414.27	1581.31	1877.62
NRSF	MJ	88.42	96.12	112.70	139.16
SM	kg	54.10	58.82	68.97	85.16
FW	m3	3.75	3.75	3.78	3.76
CCE	kg CO2e	81.13	88.20	103.41	127.69
HWD	kg	4.99E-03	5.18E-03	5.59E-03	6.23E-03
NHWD	kg	1.76	1.85	2.06	2.73
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 60. North Central benchmark - High-Strength - A1-A3 total results per cubic meter

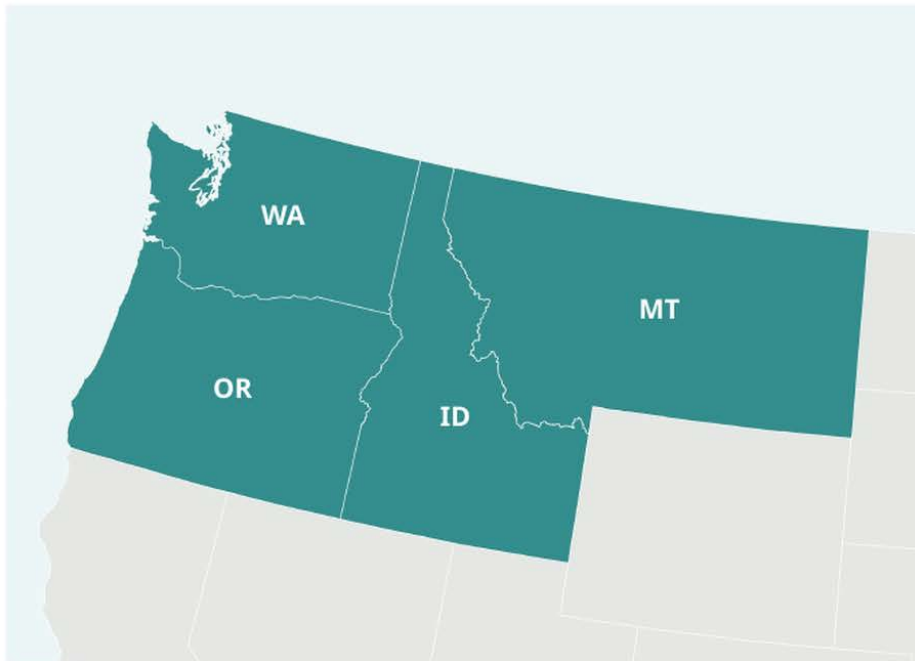
Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	349.74	401.05	526.28	596.97
GWPF	kg CO2e	349.46	400.73	525.94	596.58
GWPB	kg CO2e	0.28	0.33	0.39	0.45
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.61E-06	9.95E-06	1.26E-05	1.44E-05
AP	kg SO2e	1.00	1.13	1.44	1.61
EPT	kg Ne	0.42	0.47	0.73	0.83
EPM	kg N-eq	0.11	0.12	0.16	0.18
EPF	kg P-eq	0.04	0.05	0.07	0.07
SFP	kg O3e	21.29	23.82	29.34	32.68
ADP _f	MJ	2126.50	2374.44	3346.07	3757.63
ADP _e	kg Sbe	9.49E-05	9.80E-05	3.09E-04	3.53E-04
RPRE	MJ	66.70	72.12	159.73	181.60
NRPRE	MJ	2153.84	2414.37	3256.42	3654.33
NRSF	MJ	170.74	198.91	255.66	292.20
SM	kg	104.48	121.72	156.45	178.81
FW	m3	3.72	3.72	3.92	3.95
CCE	kg CO2e	156.67	182.51	234.59	268.12
HWD	kg	7.00E-03	7.69E-03	9.08E-03	9.97E-03
NHWD	kg	2.85	3.05	6.01	6.77
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 61. North Central benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	448.35	491.16	536.38
GWPF	kg CO2e	448.18	490.95	536.14
GWPB	kg CO2e	0.17	0.21	0.25
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.14E-06	7.20E-06	8.26E-06
AP	kg SO2e	2.37	2.48	2.61
EPT	kg Ne	0.99	1.04	1.10
EPM	kg N-eq	0.20	0.21	0.22
EPF	kg P-eq	0.11	0.12	0.13
SFP	kg O3e	33.56	35.73	38.08
ADPf	MJ	3547.65	3768.60	4014.36
ADPe	kg Sbe	4.39E-04	4.48E-04	4.63E-04
RPRE	MJ	319.34	327.24	338.64
NRPRE	MJ	3745.38	3975.75	4231.23
NRSF	MJ	105.40	127.62	149.84
SM	kg	64.50	78.10	91.69
FW	m3	2.74	2.74	2.72
CCE	kg CO2e	96.71	117.10	137.49
HWD	kg	5.41E-03	5.96E-03	6.49E-03
NHWD	kg	2.04	2.24	2.46
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

PACIFIC NORTHWEST

Appendix D.5 / Regional concrete benchmark overview



Coverage: WA, OR, ID, MT
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

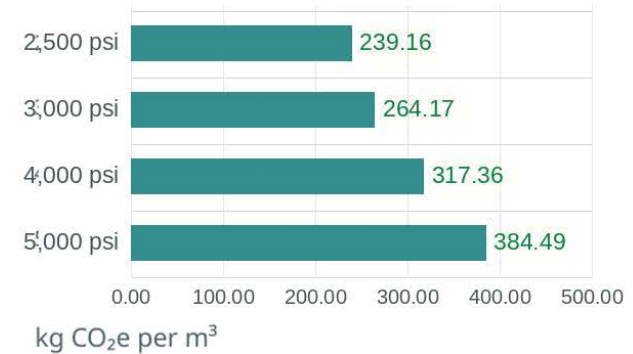
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 62. Pacific Northwest A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	63.72	35.00	78.42	87.02	40.41	14.50	26.00	52.00	93.00
Rail Distance	mi	88.02	0.00	189.44	144.34	31.71	0.00	0.00	0.00	170.00
Ocean Distance	mi	2063.14	366.00	2,462.87	2795.22	1331.05	0.00	0.00	366.00	5241.00
Barge Distance	mi	2.96	0.00	31.68	12.38	-6.46	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	56.24	19.90	94.49	88.12	24.37	9.20	17.50	27.00	70.00
Rail Distance	mi	259.74	0.00	487.48	424.20	95.28	0.00	0.00	44.00	260.00
Ocean Distance	mi	304.42	0.00	1,151.13	692.78	-83.94	0.00	0.00	0.00	99.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	20.49	12.00	36.05	31.20	9.78	0.00E+00	2.40	16.00	34.00
Rail Distance	mi	2.97E-01	0.00	3.77	1.42	-0.82	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	7.04	0.00	19.17	12.74	1.34E+00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	1465.01	1,970.00	968.64	1752.94	1177.08	261.00	1,120.00	2,259.00	2,371.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	7.73	0.00	97.98	36.86	-21.39	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	450.04	375.00	344.41	588.48	311.59	30.00	359.00	780.00	802.00
Rail Distance	mi	346.57	0.00	597.88	586.91	106.24	0.00	0.00	0.00	1378.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 63. Pacific Northwest A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	63,078	48,999	54,432	75,236	50,920	22,529	39,584	57,524	96,272
Batch Waste	%	1.782	2.0000	1.755	2.158	1.406	1.00E+00	2.0000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	6.010	5.347	4.655	6.768	5.253	3.433	4.835	6.125	10.25
Natural Gas - Used at Plant	ft3	9.932	3.956E-04	15.56	14.38	5.483	0	4.749E-05	0.01033	22.45
Diesel - Used at Plant	gal	0.1483	0.1039	0.3378	0.2155	0.08098	5.579E-05	0.06181	0.1295	0.1611
Fuel Oil - Used at Plant	gal	0.002496	0	0.01519	0.005958	0	0	0	0	0
Gasoline - Used at Plant	gal	3.716E-05	0	2.351E-04	9.374E-05	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.03821	0	0.3103	0.05824	0.01818	0	0	2.789E-04	0.09658
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.7562	0.9995	0.8460	0.9976	0.5148	0	0.1907	1.253	1.518
Purchased Electricity From Green Grid	kWh	0	0	0	0	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0.1357	0	0.6580	0.4002	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.03501	0.01278	0.1541	0.04852	0.02150	9.655E-04	0.007063	0.02448	0.07248
Grease	lb	0.005435	0.003119	0.01337	0.007429	0.003441	0	0.002228	0.004405	0.009835
Total Water Use	gal	48.27	64.84	63.78	55.22	41.32	27.62	50.30	65.40	65.40
Percentage of Batch Water That Is Recycled Wash Water	%	18.31	0	22.78	25.43	11.20	0	0	0	31.60
Hazardous Solid Waste	lb	0.002698	0	0.01486	0.003881	0.001515	0	0	0	0.007195
Non-Hazardous Solid Waste	lb	62.19	0.08459	136.3	93.18	31.20	0.01800	0.04504	0.2242	30.58
Particulates, PM-2.5	lb	1.846E-04	0	0.006250	5.515E-04	0	0	0	0	1.953E-07
Particulates, PM-10	lb	2.661E-07	0	1.118E-06	3.764E-07	1.558E-07	0	0	0	4.848E-07
Particulates, total	lb	1.642E-07	0	6.683E-07	2.322E-07	9.613E-08	0	0	0	2.934E-07
Lead	lb	4.897E-09	0	2.058E-08	6.927E-09	2.867E-09	0	0	0	8.922E-09
Hg	lb	2.501E-05	0	1.171E-04	4.139E-05	8.638E-06	0	0	0	0

Table 64. Pacific Northwest benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	49.81	55.99	68.93	85.19	46.63	51.18	60.88	76.27	93.41	111.0	142.7	163.1	56.11	68.93	82.29
PLC	Portland limestone cement	lb	306.6	344.6	424.3	524.3	287.0	315.0	374.7	469.4	574.9	683.2	878.1	1,003.6	345.3	424.3	506.5
SC	Slag cement	lb	84.52	95.02	117.0	144.6	79.14	86.85	103.3	129.4	158.5	188.4	242.1	276.7	95.21	117.0	139.6
FA	Fly ash	lb	2.48	2.79	3.44	4.25	2.33	2.55	3.04	3.80	4.66	5.54	7.12	8.14	2.80	3.44	4.11
CCA	Crushed coarse aggregate	lb	136.4	134.5	130.9	123.3	134.6	132.6	129.1	121.3	126.5	119.4	132.6	131.2	0	0	0
NCA	Natural coarse aggregate	lb	1,712.1	1,682.3	1,637.7	1,547.2	1,689.5	1,657.8	1,615.3	1,521.8	1,584.8	1,498.6	1,664.8	1,646.9	0	0	0
CFA	Crushed fine aggregate	lb	79.80	78.91	76.10	72.36	88.28	88.16	87.44	79.02	73.9	70.39	42.80	35.17	71.88	64.00	57.10
NFA	Natural fine aggregate	lb	1,353.5	1,330.3	1,295.8	1,223.1	1,497.4	1,486.2	1,488.8	1,335.5	1,252.9	1,185.4	720.8	592.2	1,214.8	1,089.0	974.9
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	1,073.1	1,086.9	1,091.1
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	36.22	36.22	36.22	37.45	38.85	38.85	38.85	40.57	35.18	35.18	35.18	35.18	36.64	36.64	36.64

Table 65. Pacific Northwest benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	239.16	264.17	317.36	384.49
GWPF	kg CO2e	239.01	263.99	317.14	384.22
GWPB	kg CO2e	0.16	0.18	0.23	0.28
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	6.11E-06	6.82E-06	8.31E-06	1.02E-05
AP	kg SO2e	1.00	1.09	1.29	1.54
EPT	kg Ne	0.31	0.33	0.39	0.47
EPM	kg N-eq	0.14	0.15	0.18	0.21
EPF	kg P-eq	0.03	0.03	0.04	0.05
SFP	kg O3e	23.15	25.33	29.94	35.68
ADP _f	MJ	1603.98	1726.81	2001.95	2356.34
ADP _e	kg Sbe	7.37E-05	7.20E-05	7.53E-05	8.52E-05
RPRE	MJ	48.21	49.64	55.20	64.36
NRPRE	MJ	1684.68	1824.94	2131.37	2520.69
NRSF	MJ	103.29	116.12	142.95	176.66
SM	kg	52.54	59.07	72.71	89.86
FW	m3	2.78	2.78	2.80	2.80
CCE	kg CO2e	94.78	106.55	131.17	162.10
HWD	kg	4.27E-03	4.60E-03	5.28E-03	6.14E-03
NHWD	kg	39.02	39.07	39.25	39.56
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 66. Pacific Northwest benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	224.11	243.11	283.93	350.87
GWPF	kg CO2e	223.96	242.95	283.73	350.64
GWPB	kg CO2e	0.16	0.17	0.20	0.25
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.75E-06	6.27E-06	7.39E-06	9.16E-06
AP	kg SO2e	0.95	1.02	1.17	1.41
EPT	kg Ne	0.28	0.30	0.35	0.45
EPM	kg N-eq	0.13	0.14	0.16	0.20
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	22.09	23.71	27.22	32.62
ADP _f	MJ	1489.43	1593.31	1819.29	2230.55
ADP _e	kg Sbe	4.94E-05	5.41E-05	6.44E-05	1.09E-04
RPRE	MJ	38.03	41.31	48.40	70.26
NRPRE	MJ	1580.28	1692.47	1936.00	2353.69
NRSF	MJ	96.71	106.14	126.24	158.16
SM	kg	49.19	53.99	64.21	80.45
FW	m3	2.84	2.84	2.87	2.84
CCE	kg CO2e	88.74	97.39	115.84	145.12
HWD	kg	4.10E-03	4.34E-03	4.85E-03	5.67E-03
NHWD	kg	38.68	38.79	39.03	39.76
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 67. Pacific Northwest benchmark - High-Strength - A1-A3 total results per cubic meter

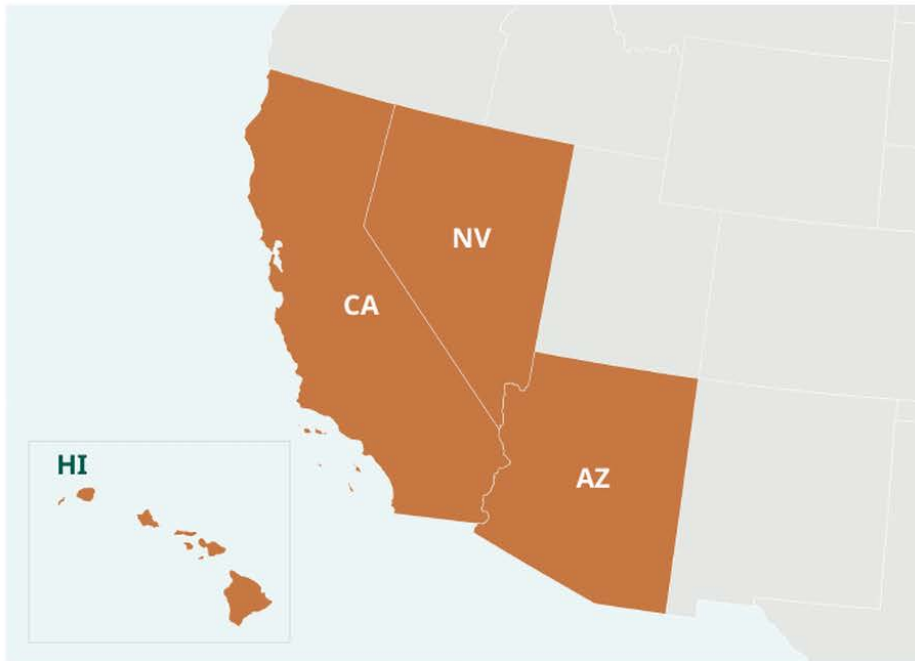
Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	420.92	493.25	645.64	733.89
GWPF	kg CO2e	420.62	492.89	645.25	733.44
GWPB	kg CO2e	0.31	0.37	0.44	0.50
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	1.11E-05	1.32E-05	1.68E-05	1.92E-05
AP	kg SO2e	1.68	1.95	2.51	2.84
EPT	kg Ne	0.52	0.59	0.89	1.01
EPM	kg N-eq	0.23	0.26	0.35	0.39
EPF	kg P-eq	0.05	0.06	0.08	0.09
SFP	kg O3e	38.82	45.04	56.80	64.16
ADP _f	MJ	2583.26	2959.06	4111.71	4640.73
ADP _e	kg Sbe	1.06E-04	1.13E-04	3.29E-04	3.76E-04
RPRE	MJ	74.80	83.21	174.58	198.84
NRPRE	MJ	2753.50	3170.12	4242.41	4789.46
NRSF	MJ	193.71	230.19	295.87	338.15
SM	kg	98.53	117.09	150.50	172.01
FW	m3	2.88	2.88	3.00	3.04
CCE	kg CO2e	177.74	211.21	271.48	310.28
HWD	kg	6.57E-03	7.50E-03	9.18E-03	1.03E-02
NHWD	kg	39.92	40.20	43.25	44.07
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 68. Pacific Northwest benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	545.12	601.81	658.38
GWPF	kg CO2e	544.95	601.59	658.11
GWPB	kg CO2e	0.18	0.23	0.27
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	7.51E-06	9.00E-06	1.05E-05
AP	kg SO2e	3.42	3.65	3.87
EPT	kg Ne	1.14	1.21	1.28
EPM	kg N-eq	0.41	0.44	0.47
EPF	kg P-eq	0.13	0.13	0.14
SFP	kg O3e	59.32	64.32	69.20
ADP _f	MJ	4520.14	4836.95	5144.60
ADP _e	kg Sbe	4.82E-04	4.95E-04	5.06E-04
RPRE	MJ	349.98	360.93	370.22
NRPRE	MJ	4826.19	5173.51	5509.41
NRSF	MJ	116.35	142.95	170.65
SM	kg	59.19	72.71	86.80
FW	m3	1.83	1.83	1.84
CCE	kg CO2e	106.76	131.17	156.59
HWD	kg	4.61E-03	5.28E-03	5.99E-03
NHWD	kg	38.99	39.23	39.50
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

PACIFIC SOUTHWEST

Appendix D.6 / Regional concrete benchmark overview



Coverage: CA, NV, AZ, HI
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

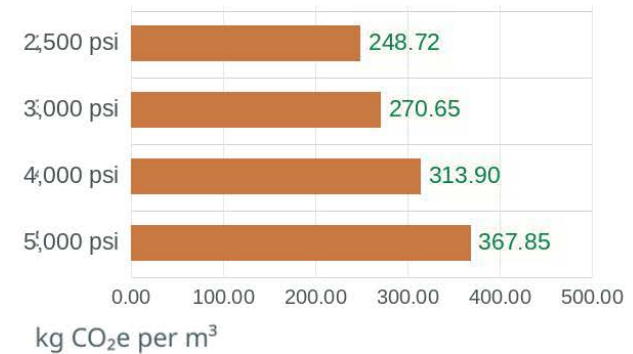
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 69. Pacific Southwest A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	86.30	70.00	66.46	105.96	66.65	31.00	50.00	101.00	133.00
Rail Distance	mi	9.19	0.00	63.19	27.88	-9.50	0.00	0.00	0.00	0.00
Ocean Distance	mi	679.01	0.00	1,946.73	1254.76	103.26	0.00	0.00	0.00	0.00
Barge Distance	mi	0.82	0.00	9.74	3.70	-2.06	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	70.12	39.00	68.81	91.93	48.31	18.60	32.30	48.30	124.00
Rail Distance	mi	164.69	0.00	514.23	327.68	1.70	0.00	0.00	0.00	0.00
Ocean Distance	mi	220.35	0.00	1023.59	544.78	-104.08	0.00	0.00	0.00	0.00
Barge Distance	mi	38.43	0.00	435.34	176.41	-99.55	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	23.82	19.60	26.39	31.54	16.09	0.10	7.00	27.00	44.00
Rail Distance	mi	51.53	0.00	339.11	107.99	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	23.40	0.00	160.64	50.15	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	41.95	0.00	220.12	78.60	5.30	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	369.62	46.50	752.91	590.07	149.18	11.00	41.00	87.50	256.00
Rail Distance	mi	13.45	0.00	175.88	64.95	-38.04	0.00	0.00	0.00	0.00
Ocean Distance	mi	244.42	0.00	717.46	454.48	34.36	0.00	0.00	0.00	0.00
Barge Distance	mi	7.99E-01	0.00	9.60	3.61	-2.01	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	157.45	111.00	138.64	212.65	102.24	67.00	99.00	120.00	205.00
Rail Distance	mi	258.10	0.00	403.23	341.60	174.59	0.00	0.00	0.00	847.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 70. Pacific Southwest A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	90,681	72,055	69,203	102,312	79,050	34,581	63,570	86,702	134,927
Batch Waste	%	1.850	2.000	0.674	2.003	1.697	2	2.000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.699	3.355	6.096	4.111	3.287	2.076	3.048	3.822	4.861
Natural Gas - Used at Plant	ft3	0.8692	0.00E+00	6.129	1.566	0.1720	0	0.00E+00	0	0
Diesel - Used at Plant	gal	0.04254	0	0.1889	0.09120	0	0.00E+00	0	0	0
Fuel Oil - Used at Plant	gal	3.759E-04	0	0.007888	9.839E-04	0	0	0	0	0
Gasoline - Used at Plant	gal	0.003763	0	0.01673	0.009226	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.01809	0	0.05049	0.02689	0.009286	0	0	0.00E+00	0.001500
Natural Gas - Used in Fleet	ft3	0.008002	0	0.1120	0.02374	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.6174	0.1136	0.9681	0.7807	0.4542	0.02960	0.07534	0.6244	1.292
Purchased Electricity From Green Grid	kWh	0.05289	0	0.3764	0.1312	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0.01930	0	0.2430	0.05724	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.06794	0.04227	0.1345	0.08398	0.05191	0.00E+00	0.02599	0.06943	0.1255
Grease	lb	0.002767	0	0.01437	0.004059	0.001475	0	0	0	0.003103
Total Water Use	gal	40.93	34.99	46.03	49.20	32.67	5.964	26.22	46.29	61.87
Percentage of Batch Water That Is Recycled Wash Water	%	3.612	0	11.56	6.581	0.6434	0	0	0	0
Hazardous Solid Waste	lb	0.007813	0	0.02982	0.01715	0	0	0	0	0
Non-Hazardous Solid Waste	lb	0.8380	0.007030	4.093	1.700	0	0	1.753E-04	0.1596	0.7343
Particulates, PM-2.5	lb	0.001088	0	0.004000	0.001811	3.648E-04	0	0	0	0.00E+00
Particulates, PM-10	lb	0.001429	0	0.007531	0.002367	4.904E-04	0	0	0	0.00E+00
Particulates, total	lb	7.586E-04	0	1.74E-02	0.002243	0.00E+00	0	0	0	0.00E+00
Lead	lb	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00
Hg	lb	1.061E-08	0	4.822E-08	3.120E-08	0.00E+00	0	0	0	0

Table 71. Pacific Southwest benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	313.1	346.3	411.1	491.2	293.2	316.5	363.1	439.8	540.3	615.5	791.2	904.2	346.3	411.9	473.9
PLC	Portland limestone cement	lb	60.80	67.24	79.83	95.38	56.93	61.46	70.50	85.39	104.91	119.5	153.6	175.6	67.24	79.97	92.02
SC	Slag cement	lb	16.38	18.12	21.51	25.70	15.34	16.56	18.99	23.01	28.26	32.20	41.39	47.30	18.12	21.55	24.79
FA	Fly ash	lb	39.90	44.13	52.39	62.60	37.36	40.33	46.27	56.04	68.85	78.44	100.82	115.2	44.13	52.48	60.39
CCA	Crushed coarse aggregate	lb	781.3	773.5	751.8	721.1	781.8	776.4	762.3	741.1	738.8	711.3	863.6	866.6	0	0	0
NCA	Natural coarse aggregate	lb	743.2	736.4	714.7	686.0	743.7	739.2	724.7	705.0	702.9	676.3	821.2	824.0	0	0	0
CFA	Crushed fine aggregate	lb	186.3	184.3	178.4	171.5	208.9	209.8	210.9	195.5	176.2	168.8	112.3	93.60	179.3	167.4	153.4
NFA	Natural fine aggregate	lb	1,320.2	1,307.5	1,270.0	1,219.6	1,480.5	1,488.1	1,500.9	1,390.5	1,248.5	1,201.8	799.5	666.3	1,271.5	1,185.9	1,087.1
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	901.7	912.2	932.7
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	39.35	39.35	39.35	40.69	42.21	42.21	42.21	44.08	38.23	38.23	38.23	38.23	39.83	39.83	39.83

Table 72. Pacific Southwest benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	248.72	270.65	313.90	367.85
GWPF	kg CO2e	248.64	270.55	313.78	367.71
GWPB	kg CO2e	0.09	0.10	0.12	0.15
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.15E-06	5.66E-06	6.67E-06	7.92E-06
AP	kg SO2e	0.87	0.92	1.03	1.16
EPT	kg Ne	0.30	0.32	0.37	0.43
EPM	kg N-eq	0.12	0.13	0.14	0.15
EPF	kg P-eq	0.03	0.03	0.04	0.05
SFP	kg O3e	20.15	21.32	23.55	26.29
ADP _f	MJ	1596.87	1696.11	1900.41	2164.64
ADP _e	kg Sbe	7.22E-05	6.98E-05	7.09E-05	7.80E-05
RPRE	MJ	47.47	48.44	52.57	59.80
NRPRE	MJ	1594.98	1701.06	1914.17	2184.99
NRSF	MJ	116.34	128.66	152.74	182.50
SM	kg	34.01	37.61	44.65	53.35
FW	m3	2.64	2.65	2.66	2.67
CCE	kg CO2e	106.77	118.07	140.18	167.49
HWD	kg	7.62E-03	7.93E-03	8.53E-03	9.28E-03
NHWD	kg	2.10	2.15	2.31	2.58
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 73. Pacific Southwest benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	234.22	250.40	282.62	337.49
GWPF	kg CO2e	234.14	250.31	282.52	337.37
GWPB	kg CO2e	0.09	0.10	0.11	0.13
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.84E-06	5.21E-06	5.93E-06	7.13E-06
AP	kg SO2e	0.84	0.88	0.97	1.10
EPT	kg Ne	0.28	0.29	0.33	0.41
EPM	kg N-eq	0.12	0.13	0.14	0.15
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	19.85	20.74	22.47	24.99
ADP _f	MJ	1497.70	1582.68	1751.87	2078.26
ADP _e	kg Sbe	4.80E-05	5.20E-05	6.05E-05	1.03E-04
RPRE	MJ	37.22	40.06	45.88	66.01
NRPRE	MJ	1511.34	1596.78	1766.57	2072.55
NRSF	MJ	108.92	117.60	134.89	163.39
SM	kg	31.84	34.38	39.43	47.76
FW	m3	2.73	2.75	2.79	2.80
CCE	kg CO2e	99.97	107.92	123.79	149.95
HWD	kg	7.43E-03	7.65E-03	8.08E-03	8.79E-03
NHWD	kg	1.75	1.86	2.07	2.77
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 74. Pacific Southwest benchmark - High-Strength - A1-A3 total results per cubic meter

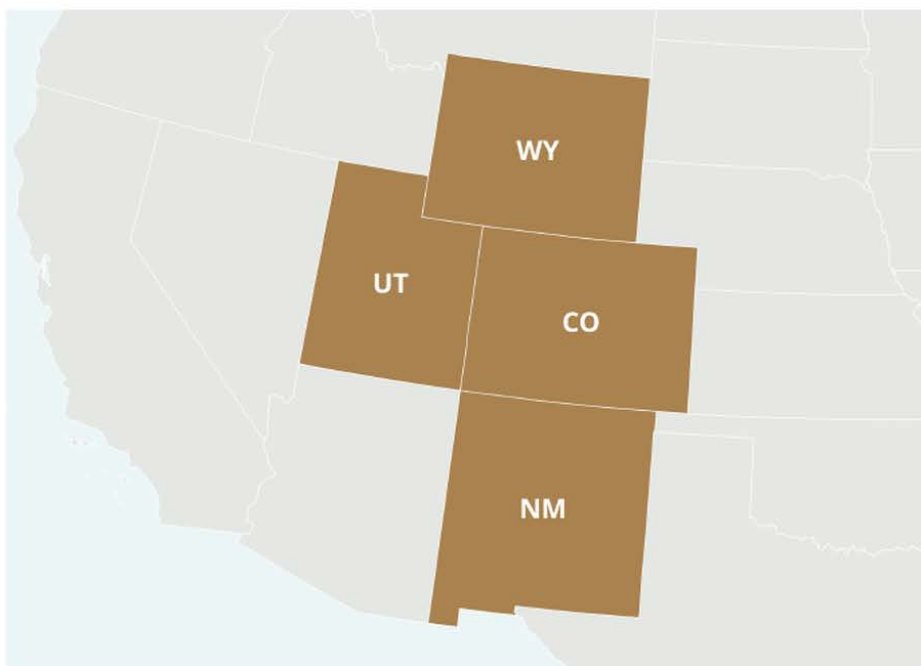
Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	403.60	453.84	593.04	672.86
GWPF	kg CO2e	403.44	453.66	592.89	672.68
GWPB	kg CO2e	0.16	0.18	0.20	0.23
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.69E-06	9.86E-06	1.26E-05	1.44E-05
AP	kg SO2e	1.26	1.38	1.73	1.93
EPT	kg Ne	0.48	0.53	0.80	0.91
EPM	kg N-eq	0.16	0.18	0.22	0.24
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	28.34	30.91	37.35	41.29
ADP _f	MJ	2376.87	2615.44	3646.70	4098.83
ADP _e	kg Sbe	9.83E-05	1.01E-04	3.14E-04	3.58E-04
RPRE	MJ	70.13	75.30	164.92	188.04
NRPRE	MJ	2389.34	2637.36	3534.04	3969.39
NRSF	MJ	200.73	228.68	293.93	335.94
SM	kg	58.68	66.85	85.93	98.21
FW	m3	2.75	2.75	2.94	2.97
CCE	kg CO2e	184.22	209.87	269.76	308.31
HWD	kg	9.73E-03	1.04E-02	0.01	0.01
NHWD	kg	2.94	3.14	6.20	7.01
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 75. Pacific Southwest benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	472.84	519.43	566.03
GWPF	kg CO2e	472.74	519.31	565.89
GWPB	kg CO2e	0.10	0.12	0.14
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.24E-06	7.26E-06	8.24E-06
AP	kg SO2e	2.45	2.58	2.72
EPT	kg Ne	0.99	1.04	1.10
EPM	kg N-eq	0.24	0.25	0.26
EPF	kg P-eq	0.11	0.12	0.13
SFP	kg O3e	38.65	41.13	43.68
ADP _f	MJ	3569.95	3808.70	4060.21
ADP _e	kg Sbe	4.13E-04	4.23E-04	4.38E-04
RPRE	MJ	300.54	309.27	321.20
NRPRE	MJ	3745.00	3991.37	4250.56
NRSF	MJ	128.66	153.02	176.06
SM	kg	37.61	44.73	51.47
FW	m3	1.82	1.82	1.81
CCE	kg CO2e	118.07	140.43	161.58
HWD	kg	7.93E-03	8.54E-03	9.11E-03
NHWD	kg	2.07	2.28	2.51
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

ROCKY MOUNTAINS

Appendix D.7 / Regional concrete benchmark overview



Coverage: WY, UT, CO, NM
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

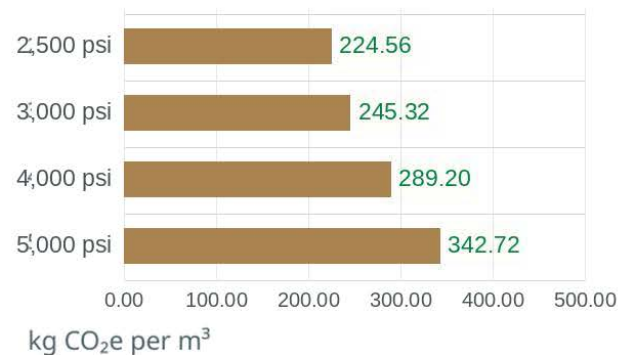
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 76. Rocky Mountains A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	73.50	55.20	51.14	92.13	54.87	41.70	51.60	67.10	106.00
Rail Distance	mi	25.22	0.00	65.72	49.16	1.28	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	171.37	185.00	76.96	200.56	142.17	122.00	184.00	197.00	208.00
Rail Distance	mi	19.47	0.00	57.02	41.10	-2.17	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	22.93	24.90	23.57	31.52	14.35	0.10	13.00	27.50	35.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	657.40	103.00	804.25	950.39	364.42	65.00	85.60	182.00	1818.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	53.24	49.80	20.57	63.37	43.11	42.10	49.50	56.80	61.20
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 77. Rocky Mountains A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	90,280	71,347	72,349	108,006	72,554	23,020	66,371	88,401	144,572
Batch Waste	%	1.6389	2	1.958	1.971	1.3063	1.00E+00	2	2.0000	2.000
Purchased Electricity - Used at Plant	kWh	3.835	3.744	1.970	4.291	3.379	2.302	3.416	4.331	5.375
Natural Gas - Used at Plant	ft3	19.08	0.14436	29.47	26.07	12.09	0	0	0.9329	37.60
Diesel - Used at Plant	gal	0.04746	0	0.2018	0.07087	0.02405	0	0	0.000000	0.1125
Fuel Oil - Used at Plant	gal	0.001526	0	0.006537	0.004491	0	0	0	0	0
Gasoline - Used at Plant	gal	2.264E-06	0	5.126E-05	6.768E-06	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.1151	0	1.962	0.2691	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0.08365	0	2.010	0.2055	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.6472	0.4126	1.398	0.8430	0.4515	0	0.0967	0.9014	1.542
Purchased Electricity From Green Grid	kWh	0.01643	0	0.6940	0.03772	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.03761	7.917E-05	0.4172	0.06925	0.005972	0	0	0.003218	0.04242
Grease	lb	0.001272	0	0.02793	0.003103	0	0	0	0	0.001883
Total Water Use	gal	45.10	50.10	22.94	53.68	36.52	33.96	45.78	54.41	64.87
Percentage of Batch Water That Is Recycled Wash Water	%	2.818	0	13.81	5.430	0.2067	0	0	0	0
Hazardous Solid Waste	lb	1.068	0	16.40	3.186	0	0	0	0	0
Non-Hazardous Solid Waste	lb	5.013	0.04517	21.26	10.62	0	0	0.01338	0.05200	0.2731
Particulates, PM-2.5	lb	7.923E-04	0	0.02001	0.001771	0.00E+00	0	0	0	0
Particulates, PM-10	lb	0.003486	0	0.07791	0.007620	0.00E+00	0	0	0	0
Particulates, total	lb	0.007334	0	0.1489	0.01818	0	0	0	0	0
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0.00E+00	0	0.00E+00	0.00E+00	0	0	0	0	0

Table 78. Rocky Mountains benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	156.7	174.1	210.4	254.4	146.7	159.1	185.8	227.8	279.7	324.5	417.1	476.8	174.5	210.4	246.0
PLC	Portland limestone cement	lb	201.7	224.1	270.9	327.5	188.8	204.8	239.2	293.2	360.1	417.8	537.0	613.7	224.6	270.9	316.7
SC	Slag cement	lb	7.09E-01	7.88E-01	9.53E-01	1.15	6.64E-01	7.20E-01	8.41E-01	1.03	1.27	1.47	1.89	2.16	7.90E-01	9.53E-01	1.11
FA	Fly ash	lb	72.95	81.06	98.0	118.5	68.30	74.09	86.53	106.1	130.3	151.1	194.2	222.0	81.24	98.0	114.6
CCA	Crushed coarse aggregate	lb	927.6	918.5	891.2	846.8	932.8	926.5	907.4	872.2	866.0	833.2	1,004.7	1,005.4	0	0	0
NCA	Natural coarse aggregate	lb	824.8	816.7	792.4	752.0	829.4	823.8	806.8	774.6	770.0	740.9	893.5	894.1	0	0	0
CFA	Crushed fine aggregate	lb	18.97	18.97	18.96	17.95	21.39	21.69	22.48	20.52	17.8	16.86	11.15	9.27	18.97	17.96	15.96
NFA	Natural fine aggregate	lb	1,367.0	1,353.9	1,313.4	1,246.8	1,540.9	1,548.0	1,557.2	1,425.3	1,276.8	1,227.0	811.2	674.2	1,357.7	1,251.4	1,144.2
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	988.3	997.9	1,007.5
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	36.35	36.35	36.35	37.59	38.99	38.99	38.99	40.72	35.31	35.31	35.31	35.31	36.77	36.77	36.77

Table 79. Rocky Mountains benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	224.56	245.32	289.20	342.72
GWPF	kg CO2e	224.44	245.18	289.03	342.51
GWPB	kg CO2e	0.13	0.14	0.18	0.21
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.85E-06	5.35E-06	6.40E-06	7.66E-06
AP	kg SO2e	0.61	0.66	0.75	0.86
EPT	kg Ne	0.28	0.29	0.34	0.40
EPM	kg N-eq	0.07	0.07	0.08	0.09
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	12.67	13.53	15.29	17.39
ADP _f	MJ	1424.59	1516.95	1723.12	1982.43
ADP _e	kg Sbe	7.04E-05	6.78E-05	6.93E-05	7.66E-05
RPRE	MJ	45.01	45.84	50.11	57.34
NRPRE	MJ	1404.42	1501.64	1712.78	1973.94
NRSF	MJ	106.93	118.81	143.62	173.66
SM	kg	44.42	49.35	59.66	72.14
FW	m3	2.64	2.65	2.66	2.65
CCE	kg CO2e	98.12	109.03	131.80	159.36
HWD	kg	0.65	0.65	0.65	0.65
NHWD	kg	4.52	4.56	4.73	5.00
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 80. Rocky Mountains benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	210.88	226.39	259.67	314.09
GWPF	kg CO2e	210.76	226.26	259.52	313.91
GWPB	kg CO2e	0.13	0.14	0.16	0.19
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.57E-06	4.93E-06	5.70E-06	6.90E-06
AP	kg SO2e	0.59	0.62	0.69	0.81
EPT	kg Ne	0.25	0.27	0.30	0.38
EPM	kg N-eq	0.06	0.07	0.07	0.08
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	12.37	13.02	14.38	16.35
ADP _f	MJ	1326.28	1406.72	1578.95	1902.08
ADP _e	kg Sbe	4.63E-05	5.03E-05	5.91E-05	1.01E-04
RPRE	MJ	34.96	37.73	43.75	63.82
NRPRE	MJ	1322.73	1402.24	1572.32	1870.57
NRSF	MJ	100.11	108.60	126.84	155.48
SM	kg	41.59	45.11	52.69	64.59
FW	m3	2.73	2.75	2.78	2.77
CCE	kg CO2e	91.87	99.66	116.39	142.68
HWD	kg	0.65	0.65	0.65	0.65
NHWD	kg	4.18	4.28	4.50	5.20
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 81. Rocky Mountains benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	375.84	430.09	564.13	640.49
GWPF	kg CO2e	375.61	429.82	563.85	640.17
GWPB	kg CO2e	0.24	0.28	0.32	0.37
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.39E-06	9.68E-06	1.23E-05	1.41E-05
AP	kg SO2e	0.93	1.04	1.34	1.50
EPT	kg Ne	0.44	0.50	0.76	0.87
EPM	kg N-eq	0.09	0.10	0.14	0.15
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	18.80	20.98	25.92	28.88
ADP _f	MJ	2177.66	2435.16	3440.39	3873.78
ADP _e	kg Sbe	9.66E-05	9.99E-05	3.12E-04	3.56E-04
RPRE	MJ	67.35	73.15	161.91	184.54
NRPRE	MJ	2158.37	2420.89	3281.49	3691.46
NRSF	MJ	190.93	221.51	284.71	325.40
SM	kg	79.31	92.01	118.27	135.17
FW	m3	2.72	2.73	2.94	2.98
CCE	kg CO2e	175.20	203.27	261.27	298.61
HWD	kg	0.65	0.65	0.65	0.65
NHWD	kg	5.36	5.58	8.61	9.40
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 82. Rocky Mountains benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	455.47	501.34	546.92
GWPF	kg CO2e	455.33	501.17	546.72
GWPB	kg CO2e	0.15	0.18	0.21
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	5.99E-06	7.03E-06	8.05E-06
AP	kg SO2e	2.18	2.29	2.40
EPT	kg Ne	1.01	1.06	1.12
EPM	kg N-eq	0.15	0.15	0.16
EPF	kg P-eq	0.12	0.12	0.13
SFP	kg O3e	28.26	30.16	32.03
ADPf	MJ	3405.21	3636.56	3869.56
ADPe	kg Sbe	4.44E-04	4.54E-04	4.65E-04
RPRE	MJ	321.87	330.34	339.46
NRPRE	MJ	3573.65	3808.55	4043.57
NRSF	MJ	119.07	143.62	167.91
SM	kg	49.46	59.66	69.75
FW	m3	1.69	1.69	1.69
CCE	kg CO2e	109.27	131.80	154.09
HWD	kg	0.65	0.65	0.65
NHWD	kg	4.48	4.70	4.94
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

SOUTH CENTRAL

Appendix D.8 / Regional concrete benchmark overview



Coverage: KS, MO, OK, AR, TX, LA
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 83. South Central A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	64.64	51.00	60.28	80.76	48.53	16.00	38.90	67.00	108.00
Rail Distance	mi	64.74	0.00	150.62	105.00	24.47	0.00	0.00	0.00	0.00
Ocean Distance	mi	531.81	0.00	1903.47	1040.64	22.97	0.00	0.00	0.00	0.00
Barge Distance	mi	17.57	0.00	102.04	44.84	-9.71	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	88.37	90.00	69.39	107.05	69.70	22.80	67.00	110.00	130.00
Rail Distance	mi	90.78	0.00	175.92	138.11	43.44	0.00	0.00	0.00	282.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	39.17	35.60	26.04	46.13	32.21	17.10	31.00	37.30	60.50
Rail Distance	mi	0.27	0.00	3.21	1.13	-0.58	0.00	0.00	0.00	0.00
Ocean Distance	mi	13.27	0.00	119.31	33.07	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	2.03	0.00	17.03	4.85	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	280.21	216.00	242.05	344.92	215.51	113.00	207.00	254.00	362.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	104.35	113.00	71.64	145.90	62.79	28.00	82.00	135.20	151.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	48.68	0.00	246.41	191.61	-94.25	0.00	0.00	0.00	0.00

Table 84. South Central A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	83,963	59,040	96,936	97,674	70,251	20,275	44,440	72,714	122,796
Batch Waste	%	1.612	2.0000	0.745	1.780	1.444	9.20E-01	2.00000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.176	3.232	6.045	3.689	2.663	1.491	2.627	3.895	5.723
Natural Gas - Used at Plant	ft3	5.849	0	19.67	8.015	3.683	0	0	0	13.50
Diesel - Used at Plant	gal	0.1163	0.03950	0.2853	0.1777	0.05487	0	0	0.07470	0.1306
Fuel Oil - Used at Plant	gal	0.06123	0	0.4002	0.1296	0	0	0	0	0
Gasoline - Used at Plant	gal	0.001398	0	0.008315	0.003822	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.002708	0	0.04294	0.004583	8.337E-04	0	0	0	0
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.7941	1.052	1.231	0.9513	0.6370	0.1177	0.8729	1.134	1.543
Purchased Electricity From Green Grid	kWh	0.1192	0	0.8566	0.1899	0.04848	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0.001513	0	0.03842	0.004496	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0.002073	0	0.01359	0.005873	0	0	0	0	0
Oil and Lubricants	lb	0.04920	0.01635	0.09764	0.06211	0.03629	0	0.004202	0.02961	0.1073
Grease	lb	0.003608	0	0.01621	0.005626	0.001589	0	0	4.466E-04	0.004112
Total Water Use	gal	49.04	53.49	59.52	57.03	41.06	9.766	39.00	64.06	103.2
Percentage of Batch Water That Is Recycled Wash Water	%	12.54	0	27.42	17.85	7.232	0	0	0	2.000
Hazardous Solid Waste	lb	0.01669	0	0.1806	0.03347	0	0	0	0	0
Non-Hazardous Solid Waste	lb	1.817	0.02878	18.36	3.363	0.2711	0	0	0.1709	1.506
Particulates, PM-2.5	lb	0.001777	0	0.01203	0.003447	1.064E-04	0	0	0	0
Particulates, PM-10	lb	0.01446	0	0.06278	0.02223	0.006703	0	0	0	0.004352
Particulates, total	lb	0.007499	0	0.03286	0.01140	0.003595	0	0	0	0
Lead	lb	1.984E-06	0	9.060E-06	5.773E-06	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 85. South Central benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	139.6	155.0	186.5	224.8	130.7	141.7	164.7	201.2	247.0	285.4	366.9	419.3	155.4	186.1	217.0
PLC	Portland limestone cement	lb	168.3	186.9	224.8	271.0	157.6	170.8	198.5	242.6	297.7	344.1	442.2	505.4	187.3	224.4	261.5
SC	Slag cement	lb	12.98	14.40	17.33	20.89	12.15	13.17	15.30	18.70	22.95	26.52	34.09	38.96	14.44	17.30	20.16
FA	Fly ash	lb	71.74	79.64	95.81	115.5	67.17	72.79	84.61	103.4	126.87	146.6	188.5	215.4	79.83	95.62	111.5
CCA	Crushed coarse aggregate	lb	1,272.7	1,260.4	1,222.7	1,184.9	1,295.1	1,287.6	1,263.8	1,245.1	1,213.3	1,165.4	1,466.0	1,478.9	0	0	0
NCA	Natural coarse aggregate	lb	426.9	422.8	410.6	397.3	434.4	431.9	424.3	417.5	407.4	391.1	492.0	496.3	0	0	0
CFA	Crushed fine aggregate	lb	20.95	20.94	19.93	19.91	23.88	24.25	24.02	23.22	19.8	18.81	12.97	10.86	20.94	19.93	17.92
NFA	Natural fine aggregate	lb	1,419.3	1,405.0	1,362.2	1,320.3	1,618.0	1,627.0	1,641.8	1,539.8	1,351.7	1,299.1	895.4	750.2	1,436.8	1,343.3	1,233.7
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	977.1	986.5	1,005.6
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	33.48	33.48	33.48	34.62	35.91	35.91	35.91	37.50	32.52	32.52	32.52	32.52	33.92	33.92	33.92

Table 86. South Central benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	205.68	223.62	260.84	306.81
GWPF	kg CO2e	205.58	223.51	260.70	306.64
GWPB	kg CO2e	0.11	0.12	0.15	0.18
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.36E-06	4.80E-06	5.71E-06	6.83E-06
AP	kg SO2e	0.71	0.75	0.84	0.95
EPT	kg Ne	0.25	0.27	0.30	0.35
EPM	kg N-eq	0.10	0.10	0.11	0.12
EPF	kg P-eq	0.02	0.03	0.03	0.04
SFP	kg O3e	15.82	16.76	18.63	20.96
ADP _f	MJ	1408.22	1487.82	1662.57	1889.55
ADP _e	kg Sbe	6.58E-05	6.28E-05	6.31E-05	6.91E-05
RPRE	MJ	42.41	42.81	46.08	52.14
NRPRE	MJ	1403.61	1489.68	1672.69	1905.56
NRSF	MJ	92.02	102.15	122.90	148.14
SM	kg	51.07	56.69	68.21	82.21
FW	m3	3.05	3.05	3.05	3.06
CCE	kg CO2e	84.45	93.74	112.78	135.94
HWD	kg	0.01	0.01	0.01	0.01
NHWD	kg	2.44	2.47	2.59	2.82
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 87. South Central benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	194.20	207.72	236.08	283.27
GWPF	kg CO2e	194.10	207.61	235.95	283.12
GWPB	kg CO2e	0.11	0.12	0.14	0.16
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.11E-06	4.42E-06	5.09E-06	6.15E-06
AP	kg SO2e	0.69	0.73	0.80	0.91
EPT	kg Ne	0.23	0.24	0.28	0.35
EPM	kg N-eq	0.10	0.10	0.11	0.12
EPF	kg P-eq	0.02	0.03	0.03	0.03
SFP	kg O3e	15.68	16.40	17.88	20.04
ADP _f	MJ	1326.76	1398.60	1548.91	1840.16
ADP _e	kg Sbe	4.20E-05	4.57E-05	5.36E-05	9.46E-05
RPRE	MJ	32.59	35.04	40.31	59.27
NRPRE	MJ	1337.91	1409.99	1560.56	1830.78
NRSF	MJ	86.16	93.37	108.54	132.62
SM	kg	47.82	51.82	60.23	73.60
FW	m3	3.17	3.19	3.22	3.23
CCE	kg CO2e	79.07	85.68	99.60	121.70
HWD	kg	0.01	0.01	0.01	0.01
NHWD	kg	2.11	2.20	2.39	3.04
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 88. South Central benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	335.88	381.47	500.38	566.76
GWPF	kg CO2e	335.69	381.24	500.16	566.51
GWPB	kg CO2e	0.20	0.23	0.26	0.30
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	7.47E-06	8.58E-06	1.09E-05	1.25E-05
AP	kg SO2e	1.03	1.14	1.45	1.61
EPT	kg Ne	0.40	0.44	0.69	0.79
EPM	kg N-eq	0.13	0.14	0.18	0.20
EPF	kg P-eq	0.04	0.05	0.06	0.07
SFP	kg O3e	22.56	24.84	30.27	33.46
ADP _f	MJ	2068.01	2284.26	3221.60	3608.08
ADP _e	kg Sbe	8.83E-05	9.01E-05	3.00E-04	3.42E-04
RPRE	MJ	61.51	66.03	152.46	173.60
NRPRE	MJ	2075.58	2300.88	3102.19	3470.74
NRSF	MJ	162.75	188.10	241.77	276.32
SM	kg	90.32	104.39	134.17	153.35
FW	m3	3.13	3.13	3.37	3.40
CCE	kg CO2e	149.35	172.61	221.86	253.57
HWD	kg	0.01	0.01	0.02	0.02
NHWD	kg	3.15	3.32	6.25	6.99
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 89. South Central benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	435.44	474.28	507.27
GWPF	kg CO2e	435.33	474.14	507.10
GWPB	kg CO2e	0.12	0.15	0.18
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	5.43E-06	6.33E-06	7.24E-06
AP	kg SO2e	2.30	2.41	2.43
EPT	kg Ne	0.98	1.03	1.07
EPM	kg N-eq	0.19	0.20	0.18
EPF	kg P-eq	0.11	0.12	0.12
SFP	kg O3e	32.35	34.35	34.16
ADP _f	MJ	3412.69	3611.54	3717.74
ADP _e	kg Sbe	4.35E-04	4.43E-04	4.57E-04
RPRE	MJ	315.61	322.96	333.80
NRPRE	MJ	3596.82	3802.40	3914.31
NRSF	MJ	102.40	122.66	142.98
SM	kg	56.83	68.07	79.35
FW	m3	2.15	2.15	2.11
CCE	kg CO2e	93.97	112.56	131.21
HWD	kg	0.01	0.01	0.01
NHWD	kg	2.39	2.57	2.77
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

SOUTHEAST

Appendix D.9 / Regional concrete benchmark overview



Coverage: KY, TN, NC, SC, MS, AL, GA, FL
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

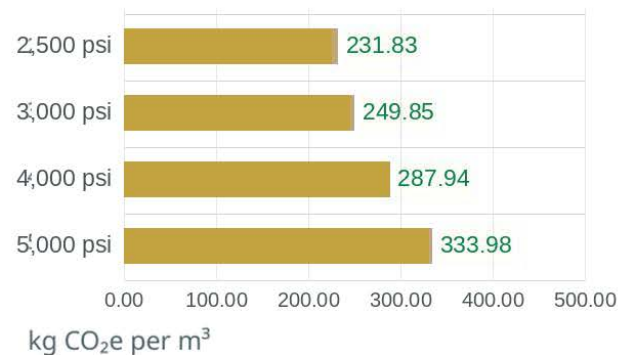
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 90. Southeast A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	85.98	70.00	75.60	99.60	72.37	16.00	36.00	100.00	160.00
Rail Distance	mi	55.08	0.00	116.19	76.00	34.15	0.00	0.00	0.00	140.00
Ocean Distance	mi	171.21	0.00	1,020.78	355.06	-12.63	0.00	0.00	0.00	0.00
Barge Distance	mi	32.19	0.00	103.54	50.83	13.54	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	116.64	73.00	177.95	148.97	84.32	28.00	58.30	95.00	160.00
Rail Distance	mi	15.98	0.00	86.53	31.70	0.26	0.00	0.00	0.00	0.00
Ocean Distance	mi	1051.70	0.00	2798.51	1560.07	543.33	0.00	0.00	0.00	0.00
Barge Distance	mi	9.20	0.00	84.68	24.58	-6.19	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	51.32	42.00	39.84	58.54	44.10	15.00	32.30	53.30	89.00
Rail Distance	mi	53.24	0.00	138.28	78.30	28.18	0.00	0.00	0.00	0.00
Ocean Distance	mi	51.52	0.00	296.25	105.21	-2.17E+00	0.00	0.00	0.00	0.00
Barge Distance	mi	9.93	0.00	45.15	18.11	1.74	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	229.12	193.00	178.82	261.37	196.88	59.00	139.00	249.00	394.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	39.65	0.00	460.64	94.74	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	121.64	43.00	135.47	156.37	86.92	25.00	34.00	93.00	257.00
Rail Distance	mi	223.48	0.00	262.13	290.67	156.30	0.00	0.00	246.00	561.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	15.29	0.00	91.84	38.83	-8.25	0.00	0.00	0.00	0.00

Table 91. Southeast A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	69,865	64,141	48,812	75,634	64,096	28,537	50,632	72,982	104,820
Batch Waste	%	1.836	2.000	0.919	1.974	1.699	1.00E+00	2.0000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.735	3.489	6.343	4.040	3.429	2.080	2.938	3.838	5.700
Natural Gas - Used at Plant	ft3	1.417	0	5.386	2.187	0.6459	0	0	0	0
Diesel - Used at Plant	gal	0.1090	0	0.3598	0.1531	0.06484	0	0	0.05859	0.1170
Fuel Oil - Used at Plant	gal	0.001227	0	0.01386	0.002796	0	0	0	0	0
Gasoline - Used at Plant	gal	0.003190	0	0.1274	0.009363	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.01166	0	0.07136	0.01649	0.006818	0	0	0	5.661E-05
Natural Gas - Used in Fleet	ft3	2.798E-05	0	6.071E-04	8.292E-05	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.7654	0.4769	0.9322	0.8766	0.6541	0.04888	0.1889	1.024	1.670
Purchased Electricity From Green Grid	kWh	9.190E-05	0	0.004231	2.726E-04	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	3.593E-05	0	6.431E-04	9.759E-05	0	0	0	0	0
Oil and Lubricants	lb	0.07975	0.03301	0.1713	0.09363	0.06586	0	0.01700	0.06946	0.1711
Grease	lb	0.006194	0	0.02428	0.008394	0.003994	0	0	5.810E-04	0.006265
Total Water Use	gal	35.05	29.31	37.82	39.27	30.84	14.01	25.98	36.41	55.12
Percentage of Batch Water That Is Recycled Wash Water	%	7.117	0	21.14	10.51	3.722	0	0	0	0
Hazardous Solid Waste	lb	0.1402	0	2.240	0.4072	0	0	0	0	0
Non-Hazardous Solid Waste	lb	5.575	0.8488	14.52	8.189	2.961	0	0.2599	1.317	3.163
Particulates, PM-2.5	lb	3.063E-09	0	6.341E-08	7.931E-09	0.00E+00	0	0	0	0
Particulates, PM-10	lb	0.01049	0	0.06819	0.01688	0.004105	0	0	0	0
Particulates, total	lb	1.324E-06	0	1.295E-05	2.663E-06	0	0	0	0	0
Lead	lb	1.232E-08	0	1.054E-07	2.627E-08	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 92. Southeast benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	69.72	76.85	91.52	109.2	65.28	70.25	80.82	97.8	120.17	136.9	176.0	201.2	76.81	91.04	105.0
PLC	Portland limestone cement	lb	266.2	293.5	349.4	416.9	249.2	268.2	308.6	373.3	458.8	522.9	672.1	768.1	293.3	347.6	400.8
SC	Slag cement	lb	58.12	64.07	76.30	91.03	54.42	58.56	67.38	81.50	100.18	114.2	146.7	167.7	64.04	75.90	87.50
FA	Fly ash	lb	60.93	67.16	79.98	95.43	57.05	61.39	70.63	85.43	105.01	119.7	153.8	175.8	67.13	79.56	91.72
CCA	Crushed coarse aggregate	lb	1,332.2	1,306.3	1,268.8	1,205.4	1,325.7	1,304.9	1,279.0	1,229.8	1,233.6	1,186.9	1,418.5	1,418.4	0	0	0
NCA	Natural coarse aggregate	lb	290.5	284.5	276.6	262.7	289.1	284.2	278.8	268.1	268.6	258.6	309.0	309.0	0	0	0
CFA	Crushed fine aggregate	lb	419.7	411.7	399.9	379.1	468.2	466.1	469.5	429.3	388.0	373.4	244.3	202.9	395.8	364.9	340.0
NFA	Natural fine aggregate	lb	1,047.7	1,027.8	998.2	948.7	1,168.8	1,163.5	1,172.1	1,074.5	971.0	934.4	611.5	507.8	990.0	913.2	850.4
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	921.8	932.2	932.6
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	41.58	41.58	41.58	43.00	44.61	44.61	44.61	46.58	40.39	40.39	40.39	40.39	42.03	42.03	42.03

Table 93. Southeast benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	231.83	249.85	287.94	333.98
GWPF	kg CO2e	231.70	249.70	287.75	333.75
GWPB	kg CO2e	0.14	0.16	0.19	0.23
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.37E-06	5.90E-06	6.97E-06	8.26E-06
AP	kg SO2e	0.96	1.01	1.11	1.23
EPT	kg Ne	0.28	0.30	0.33	0.39
EPM	kg N-eq	0.15	0.15	0.16	0.17
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	22.45	23.39	25.45	27.78
ADP _f	MJ	1618.67	1696.02	1874.93	2096.86
ADP _e	kg Sbe	7.01E-05	6.73E-05	6.82E-05	7.47E-05
RPRE	MJ	45.44	45.97	49.55	55.91
NRPRE	MJ	1668.37	1757.56	1955.86	2196.96
NRSF	MJ	98.11	108.15	128.78	153.66
SM	kg	71.93	79.29	94.42	112.65
FW	m3	2.98	2.97	2.97	2.96
CCE	kg CO2e	90.02	99.23	118.17	141.00
HWD	kg	0.09	0.09	0.09	0.09
NHWD	kg	4.78	4.80	4.93	5.15
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 94. Southeast benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	219.28	232.50	261.19	308.32
GWPF	kg CO2e	219.14	232.35	261.03	308.13
GWPB	kg CO2e	0.14	0.15	0.17	0.20
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.06E-06	5.42E-06	6.19E-06	7.43E-06
AP	kg SO2e	0.94	0.98	1.06	1.17
EPT	kg Ne	0.25	0.27	0.30	0.38
EPM	kg N-eq	0.15	0.15	0.16	0.17
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	22.28	22.97	24.62	26.68
ADP _f	MJ	1530.76	1598.68	1751.13	2034.50
ADP _e	kg Sbe	4.60E-05	4.98E-05	5.80E-05	9.96E-05
RPRE	MJ	35.40	37.91	43.35	62.65
NRPRE	MJ	1592.84	1664.70	1825.40	2100.39
NRSF	MJ	91.86	98.85	113.73	137.57
SM	kg	67.34	72.47	83.38	100.86
FW	m3	3.06	3.06	3.09	3.07
CCE	kg CO2e	84.29	90.70	104.36	126.23
HWD	kg	0.09	0.09	0.09	0.09
NHWD	kg	4.44	4.53	4.71	5.37
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 95. Southeast benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	365.72	409.29	532.54	602.18
GWPF	kg CO2e	365.47	409.01	532.25	601.85
GWPB	kg CO2e	0.26	0.29	0.34	0.39
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	9.06E-06	1.03E-05	1.31E-05	1.50E-05
AP	kg SO2e	1.32	1.44	1.77	1.96
EPT	kg Ne	0.43	0.48	0.73	0.83
EPM	kg N-eq	0.18	0.19	0.23	0.25
EPF	kg P-eq	0.04	0.05	0.06	0.07
SFP	kg O3e	29.79	32.12	37.94	41.51
ADP _f	MJ	2291.73	2497.19	3447.72	3849.19
ADP _e	kg Sbe	9.46E-05	9.65E-05	3.08E-04	3.52E-04
RPRE	MJ	65.75	70.18	158.01	179.97
NRPRE	MJ	2391.88	2618.82	3462.76	3865.47
NRSF	MJ	169.09	192.70	247.68	283.08
SM	kg	123.97	141.28	181.59	207.54
FW	m3	3.03	3.02	3.18	3.21
CCE	kg CO2e	155.16	176.82	227.27	259.75
HWD	kg	0.09	0.09	0.09	0.09
NHWD	kg	5.48	5.64	8.59	9.33
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 96. Southeast benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	448.62	488.15	524.89
GWPF	kg CO2e	448.47	487.97	524.67
GWPB	kg CO2e	0.16	0.19	0.23
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.48E-06	7.52E-06	8.54E-06
AP	kg SO2e	2.47	2.58	2.68
EPT	kg Ne	0.97	1.02	1.06
EPM	kg N-eq	0.23	0.24	0.25
EPF	kg P-eq	0.11	0.12	0.12
SFP	kg O3e	38.20	40.35	42.29
ADPf	MJ	3499.78	3701.58	3883.92
ADPe	kg Sbe	4.19E-04	4.27E-04	4.34E-04
RPRE	MJ	303.70	311.59	317.27
NRPRE	MJ	3733.71	3953.17	4149.51
NRSF	MJ	108.09	128.11	147.69
SM	kg	79.25	93.93	108.28
FW	m3	2.06	2.05	2.05
CCE	kg CO2e	99.18	117.56	135.52
HWD	kg	0.09	0.09	0.09
NHWD	kg	4.72	4.89	5.09
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

OHIO

Appendix D.10 / Regional concrete benchmark overview



Coverage: OH
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

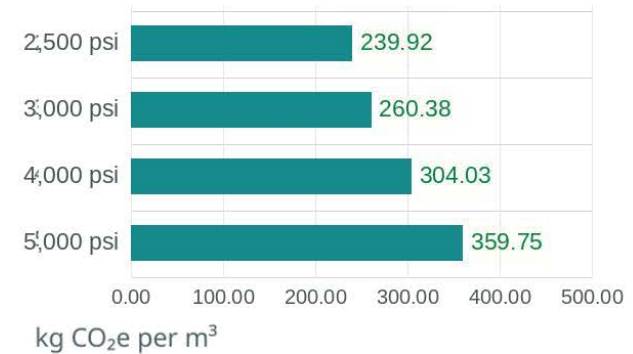
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 97. Ohio A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	75.73	51.00	78.67	102.24	49.23	18.00	33.00	62.00	135.00
Rail Distance	mi	107.21	0.00	237.14	187.10	27.31	0.00	0.00	0.00	308.00
Ocean Distance	mi	2257.18	0.00	4,804.54	3875.81	638.54	0.00	0.00	0.00	417.00
Barge Distance	mi	370.93	0.00	533.83	552.06	189.80	0.00	0.00	240.00	764.00
SCM										
Truck Distance	mi	129.16	138.00	78.01	156.55	101.77	52.00	122.00	139.00	179.00
Rail Distance	mi	33.32	0.00	98.86	68.04	-1.40	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	24.78	0.00	131.88	71.09	-21.54	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	51.33	13.70	78.02	77.62	25.05	1.50	10.00	15.60	67.60
Rail Distance	mi	8.17	0.00	27.51	17.44	-1.10	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	31.57	0.00	92.63	62.78	3.68E-01	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	398.63	195.00	404.78	535.00	262.26	21.00	99.00	394.00	962.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	165.89	216.00	105.96	225.83	105.95	58.00	125.00	220.00	245.00
Rail Distance	mi	171.39	0.00	205.63	287.71	55.07	0.00	0.00	360.00	395.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	23.04	0.00	54.08	53.63	-7.56	0.00	0.00	0.00	0.00

Table 98. Ohio A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	62,799	58,051	45,151	75,191	50,407	19,000	47,893	62,530	100,396
Batch Waste	%	1.2324	1.0000	1.366	1.667	0.7979	0.20000	0.3000	1.0000	2.000
Purchased Electricity - Used at Plant	kWh	3.524	3.369	4.972	4.262	2.787	2.197	3.112	3.659	4.298
Natural Gas - Used at Plant	ft3	184.6	21.48	780.4	427.9	0	0	1.715	27.23	51.22
Diesel - Used at Plant	gal	0.2347	0.1078	0.9068	0.3667	0.1026	0	0.09513	0.1381	0.2653
Fuel Oil - Used at Plant	gal	0.001052	0	0.006146	0.002549	0	0	0	0	0
Gasoline - Used at Plant	gal	0.002507	0	0.01430	0.006599	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.007636	0	0.03218	0.01371	0.001558	0	0	0	0.00E+00
Natural Gas - Used in Fleet	ft3	0.6266	0	3.008	1.85E+00	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	1.161	0.9837	0.8868	1.508	0.8135	0.4178	0.9431	1.209	1.781
Purchased Electricity From Green Grid	kWh	0.00E+00	0	0	0.00E+00	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0.00E+00	0	0.00E+00	0.00E+00	0	0	0	0	0
Oil and Lubricants	lb	0.1599	0.1186	0.3812	0.2329	0.08694	0.005980	0.06786	0.1625	0.4305
Grease	lb	2.551	0.005848	10.68	7.443	0	3.908E-05	0.005787	0.006022	0.05277
Total Water Use	gal	63.52	53.82	57.69	75.61	51.43	32.50	47.86	62.70	95.19
Percentage of Batch Water That Is Recycled Wash Water	%	0.01634	0	0.07503	0.03782	0	0	0	0	0
Hazardous Solid Waste	lb	0.009587	0	0.1260	0.02257	0	0	0	0	0
Non-Hazardous Solid Waste	lb	6.327	0.8857	12.84	10.83	1.823	0.01984	0.5539	0.9039	2.243
Particulates, PM-2.5	lb	0.00E+00	0	0.00E+00	0.00E+00	0	0	0	0	0
Particulates, PM-10	lb	0	0	0	0	0	0	0	0	0
Particulates, total	lb	0.05298	0	0.3644	1.04E-01	0.002274	0	0	0	0
Lead	lb	0.00E+00	0	0.00E+00	0.00E+00	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 99. Ohio benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	25.74	28.86	35.35	43.56	24.10	26.38	31.22	39.00	47.83	56.43	72.53	82.89	28.92	35.35	42.05
PLC	Portland limestone cement	lb	274.1	307.3	376.4	463.9	256.6	280.9	332.4	415.3	509.3	600.8	772.3	882.6	308.0	376.4	447.7
SC	Slag cement	lb	61.93	69.43	85.06	104.8	57.98	63.46	75.12	93.84	115.08	135.8	174.5	199.4	69.59	85.06	101.2
FA	Fly ash	lb	43.34	48.59	59.53	73.35	40.58	44.41	52.57	65.67	80.53	95.01	122.1	139.6	48.70	59.53	70.79
CCA	Crushed coarse aggregate	lb	1,513.1	1,484.7	1,439.7	1,380.6	1,530.6	1,505.2	1,472.0	1,424.4	1,414.0	1,358.3	1,637.7	1,637.6	0	0	0
NCA	Natural coarse aggregate	lb	244.4	239.3	232.1	223.0	247.2	242.6	237.4	230.0	228.2	218.6	263.6	263.6	0	0	0
CFA	Crushed fine aggregate	lb	13.96	13.96	13.95	12.94	15.83	16.05	16.61	14.82	13.8	12.86	8.49	7.05	13.96	11.95	10.95
NFA	Natural fine aggregate	lb	1,456.2	1,427.8	1,384.9	1,328.8	1,651.2	1,641.8	1,649.5	1,521.5	1,359.6	1,306.8	862.8	716.5	1,366.9	1,243.3	1,132.7
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	1,046.8	1,066.0	1,075.0
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	32.00	32.00	32.00	33.08	34.32	34.32	34.32	35.84	31.08	31.08	31.08	31.08	32.44	32.44	32.44

Table 100. Ohio benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	239.92	260.38	304.03	359.75
GWPF	kg CO2e	239.79	260.24	303.84	359.51
GWPB	kg CO2e	0.15	0.16	0.20	0.25
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.01E-06	5.58E-06	6.76E-06	8.25E-06
AP	kg SO2e	1.22	1.30	1.47	1.68
EPT	kg Ne	0.27	0.29	0.33	0.39
EPM	kg N-eq	0.18	0.19	0.21	0.24
EPF	kg P-eq	0.02	0.03	0.03	0.04
SFP	kg O3e	25.98	27.85	31.83	36.86
ADP _f	MJ	1945.69	2047.53	2279.28	2584.65
ADP _e	kg Sbe	6.73E-05	6.47E-05	6.62E-05	7.38E-05
RPRE	MJ	45.00	45.70	49.69	56.92
NRPRE	MJ	2002.68	2118.33	2373.77	2704.68
NRSF	MJ	85.94	96.35	118.04	145.46
SM	kg	63.22	70.88	86.84	107.00
FW	m3	3.05	3.04	3.04	3.05
CCE	kg CO2e	78.86	88.41	108.31	133.47
HWD	kg	7.94E-03	8.21E-03	8.76E-03	9.45E-03
NHWD	kg	5.08	5.11	5.25	5.50
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 101. Ohio benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	228.29	243.90	277.63	333.43
GWPF	kg CO2e	228.16	243.76	277.47	333.23
GWPB	kg CO2e	0.14	0.16	0.18	0.22
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.72E-06	5.13E-06	6.01E-06	7.43E-06
AP	kg SO2e	1.19	1.25	1.38	1.59
EPT	kg Ne	0.24	0.26	0.30	0.38
EPM	kg N-eq	0.18	0.18	0.20	0.23
EPF	kg P-eq	0.02	0.03	0.03	0.04
SFP	kg O3e	25.46	26.84	29.93	34.55
ADP _f	MJ	1860.04	1948.55	2144.28	2503.76
ADP _e	kg Sbe	4.35E-05	4.76E-05	5.64E-05	9.87E-05
RPRE	MJ	35.20	37.92	43.80	63.76
NRPRE	MJ	1928.99	2023.13	2230.71	2587.83
NRSF	MJ	80.47	88.07	104.25	130.22
SM	kg	59.20	64.79	76.69	95.80
FW	m3	3.15	3.15	3.18	3.18
CCE	kg CO2e	73.83	80.81	95.65	119.49
HWD	kg	7.80E-03	7.99E-03	8.40E-03	9.06E-03
NHWD	kg	4.76	4.85	5.05	5.72
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 102. Ohio benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	391.48	449.51	579.67	653.54
GWPF	kg CO2e	391.23	449.20	579.35	653.17
GWPB	kg CO2e	0.27	0.32	0.38	0.43
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	9.02E-06	1.06E-05	1.35E-05	1.54E-05
AP	kg SO2e	1.81	2.04	2.53	2.82
EPT	kg Ne	0.44	0.50	0.76	0.87
EPM	kg N-eq	0.26	0.29	0.37	0.41
EPF	kg P-eq	0.04	0.05	0.06	0.07
SFP	kg O3e	39.83	45.12	55.44	61.84
ADP _f	MJ	2794.99	3107.06	4156.19	4618.40
ADP _e	kg Sbe	9.34E-05	9.73E-05	3.08E-04	3.52E-04
RPRE	MJ	66.46	72.49	159.79	181.63
NRPRE	MJ	2916.64	3258.53	4210.04	4678.79
NRSF	MJ	159.70	188.40	242.16	276.77
SM	kg	117.48	138.60	178.14	203.60
FW	m3	3.13	3.14	3.33	3.36
CCE	kg CO2e	146.54	172.87	222.20	253.95
HWD	kg	9.80E-03	1.05E-02	0.01	0.01
NHWD	kg	5.82	6.03	8.95	9.68
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 103. Ohio benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	492.41	540.23	587.80
GWPF	kg CO2e	492.26	540.04	587.57
GWPB	kg CO2e	0.17	0.20	0.24
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.25E-06	7.43E-06	8.65E-06
AP	kg SO2e	3.05	3.25	3.44
EPT	kg Ne	1.06	1.12	1.17
EPM	kg N-eq	0.31	0.33	0.36
EPF	kg P-eq	0.12	0.13	0.13
SFP	kg O3e	47.39	51.69	55.97
ADPf	MJ	4186.84	4463.91	4734.45
ADPe	kg Sbe	4.62E-04	4.75E-04	4.86E-04
RPRE	MJ	337.04	347.89	356.88
NRPRE	MJ	4452.88	4753.77	5045.55
NRSF	MJ	96.57	118.04	140.39
SM	kg	71.04	86.84	103.27
FW	m3	2.07	2.06	2.06
CCE	kg CO2e	88.61	108.31	128.82
HWD	kg	8.21E-03	8.76E-03	9.31E-03
NHWD	kg	5.04	5.22	5.44
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

TEXAS

Appendix D.11 / Regional concrete benchmark overview



Coverage: TX
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

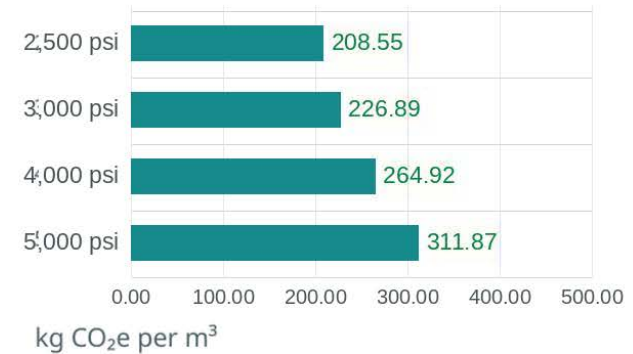
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 104. Texas A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	51.38	47.00	57.90	72.28	30.48	12.00	35.00	51.00	70.90
Rail Distance	mi	75.41	0.00	171.10	137.17	13.65	0.00	0.00	0.00	0.00
Ocean Distance	mi	803.97	0.00	2,293.17	1631.67	-23.73	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	101.47	110.00	72.57	127.74	75.19	34.00	90.00	115.00	142.00
Rail Distance	mi	35.57	0.00	93.63	69.47	1.68	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	37.02	36.00	23.30	45.43	28.61	15.00	31.00	37.00	64.00
Rail Distance	mi	0.41	0.00	3.94	1.83	-1.01	0.00	0.00	0.00	0.00
Ocean Distance	mi	21.42	0.00	151.31	53.48	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	3.27	0.00	21.58	7.85	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	184.51	207.00	112.55	225.13	143.88	77.50	164.00	215.00	282.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	144.24	151.00	53.33	186.04	102.45	88.00	150.00	151.00	167.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 105. Texas A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	96,654	66,748	107,129	115,586	77,721	29,635	53,906	86,732	137,450
Batch Waste	%	1.576	2.0000	0.724	1.787	1.365	0.5000	2.0000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	2.940	2.931	3.521	3.526	2.354	1.564	2.520	3.548	5.571
Natural Gas - Used at Plant	ft3	0.4516	0	9.682	0.9296	0	0	0	0	0
Diesel - Used at Plant	gal	0.1403	0.002831	0.3158	0.2232	0.05751	0	0	0.06975	0.1308
Fuel Oil - Used at Plant	gal	0.08275	0	0.4995	0.1741	0	0	0	0	0
Gasoline - Used at Plant	gal	0.001896	0	0.01038	0.005184	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.001248	0	0.02002	0.002682	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.6848	0.9417	1.062	0.8740	0.4956	0.08956	0.3787	1.067	1.308
Purchased Electricity From Green Grid	kWh	0	0	0	0	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0.002628	0	0.01669	0.007772	0	0	0	0	0
Oil and Lubricants	lb	0.04540	0.01587	0.09694	0.06106	0.02975	0	0	0.03238	0.1073
Grease	lb	0.003916	0	0.01322	0.006637	0.001194	0.00E+00	0	0	0.003998
Total Water Use	gal	45.11	42.94	55.28	54.75	35.47	5.290	26.73	52.52	78.00
Percentage of Batch Water That Is Recycled Wash Water	%	12.47	0	26.95	18.65	6.288	0	0	0	4.000
Hazardous Solid Waste	lb	0.01978	0	0.2140	0.04202	0	0	0	0	0
Non-Hazardous Solid Waste	lb	0.9903	0	22.27	2.095	0	0	0	0.02687	0.2084
Particulates, PM-2.5	lb	4.280E-04	0	0.001909	6.879E-04	1.681E-04	0	0	0	0
Particulates, PM-10	lb	0.009275	0	0.04939	0.01385	0.004697	0	0	0	0.006340
Particulates, total	lb	0.008906	0	0.04001	0.01376	0.004057	0	0	0	0.01377
Lead	lb	4.819E-08	0	2.183E-07	7.897E-08	1.740E-08	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 106. Texas benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	159.7	177.3	213.3	257.0	149.5	162.0	188.3	230.1	282.4	326.4	419.5	479.5	177.7	212.8	248.1
PLC	Portland limestone cement	lb	152.5	169.3	203.7	245.5	142.8	154.8	179.9	219.8	269.8	311.8	400.8	458.0	169.7	203.3	237.0
SC	Slag cement	lb	7.57	8.41	10.11	12.19	7.09	7.68	8.93	10.91	13.39	15.48	19.90	22.74	8.43	10.09	11.77
FA	Fly ash	lb	73.28	81.34	97.87	118.0	68.61	74.35	86.43	105.6	129.59	149.8	192.5	220.0	81.54	97.67	113.9
CCA	Crushed coarse aggregate	lb	1,272.7	1,260.4	1,222.7	1,184.8	1,294.8	1,287.2	1,263.3	1,244.4	1,213.2	1,165.3	1,464.7	1,477.3	0	0	0
NCA	Natural coarse aggregate	lb	426.9	422.8	410.5	397.3	434.3	431.8	424.2	417.3	407.4	391.1	491.5	495.8	0	0	0
CFA	Crushed fine aggregate	lb	20.95	20.94	19.93	19.91	23.87	24.24	24.01	23.21	19.8	18.81	12.95	10.85	20.94	19.93	17.92
NFA	Natural fine aggregate	lb	1,419.3	1,404.9	1,362.2	1,320.2	1,617.6	1,626.5	1,641.2	1,539.0	1,351.6	1,298.9	894.6	749.4	1,436.7	1,343.2	1,233.6
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	977.1	986.5	1,005.6
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	33.48	33.48	33.48	34.62	35.91	35.91	35.91	37.50	32.52	32.52	32.52	32.52	33.92	33.92	33.92

Table 107. Texas benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	208.55	226.89	264.92	311.87
GWPF	kg CO2e	208.46	226.78	264.78	311.70
GWPB	kg CO2e	0.10	0.12	0.14	0.17
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.30E-06	4.74E-06	5.65E-06	6.75E-06
AP	kg SO2e	0.73	0.78	0.87	0.99
EPT	kg Ne	0.25	0.27	0.31	0.36
EPM	kg N-eq	0.10	0.11	0.12	0.13
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	16.67	17.69	19.74	22.27
ADP _f	MJ	1420.80	1503.18	1683.61	1917.43
ADP _e	kg Sbe	6.58E-05	6.28E-05	6.32E-05	6.92E-05
RPRE	MJ	42.51	42.94	46.28	52.42
NRPRE	MJ	1409.94	1498.09	1685.35	1923.31
NRSF	MJ	93.81	104.13	125.28	151.00
SM	kg	48.72	54.09	65.07	78.43
FW	m3	2.80	2.80	2.79	2.81
CCE	kg CO2e	86.08	95.56	114.97	138.57
HWD	kg	0.01	0.01	0.02	0.02
NHWD	kg	1.96	1.99	2.12	2.35
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 108. Texas benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	196.85	210.64	239.59	287.68
GWPF	kg CO2e	196.75	210.54	239.46	287.54
GWPB	kg CO2e	0.10	0.11	0.13	0.15
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.05E-06	4.37E-06	5.03E-06	6.08E-06
AP	kg SO2e	0.71	0.75	0.82	0.94
EPT	kg Ne	0.23	0.25	0.28	0.35
EPM	kg N-eq	0.10	0.11	0.12	0.13
EPF	kg P-eq	0.02	0.03	0.03	0.04
SFP	kg O3e	16.49	17.27	18.87	21.22
ADP _f	MJ	1337.65	1411.39	1565.71	1863.15
ADP _e	kg Sbe	4.21E-05	4.57E-05	5.37E-05	9.47E-05
RPRE	MJ	32.68	35.15	40.47	59.49
NRPRE	MJ	1342.94	1416.43	1569.96	1844.72
NRSF	MJ	87.83	95.18	110.64	135.19
SM	kg	45.62	49.44	57.47	70.22
FW	m3	2.91	2.93	2.96	2.98
CCE	kg CO2e	80.60	87.34	101.53	124.06
HWD	kg	0.01	0.01	0.01	0.02
NHWD	kg	1.63	1.72	1.91	2.57
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 109. Texas benchmark - High-Strength - A1-A3 total results per cubic meter

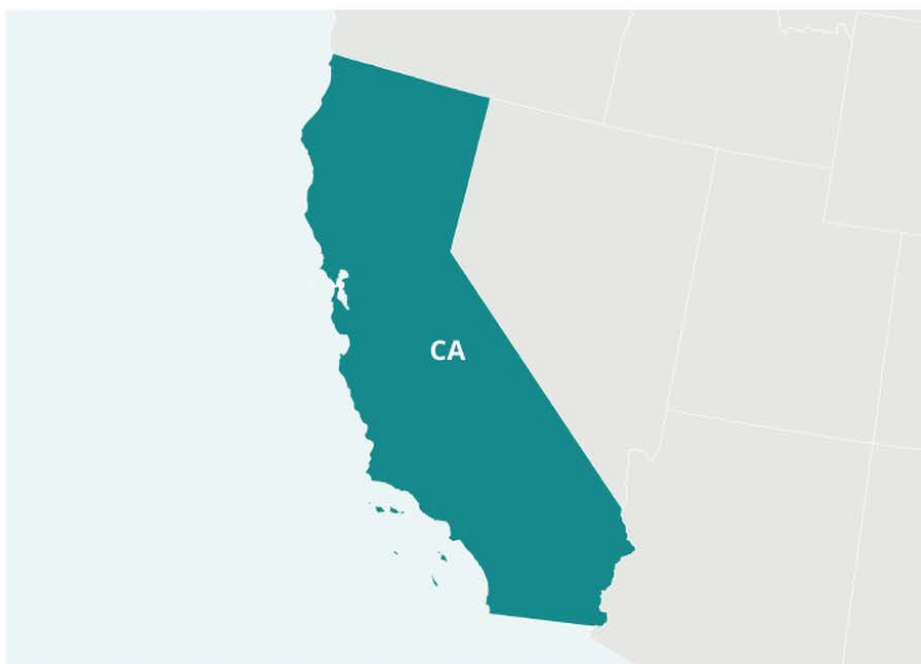
Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	341.48	388.06	508.90	576.60
GWPF	kg CO2e	341.30	387.84	508.70	576.37
GWPB	kg CO2e	0.19	0.22	0.25	0.29
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	7.39E-06	8.49E-06	1.08E-05	1.23E-05
AP	kg SO2e	1.07	1.19	1.51	1.68
EPT	kg Ne	0.40	0.45	0.70	0.80
EPM	kg N-eq	0.14	0.15	0.20	0.22
EPF	kg P-eq	0.04	0.05	0.06	0.07
SFP	kg O3e	23.98	26.47	32.30	35.77
ADP _f	MJ	2099.61	2322.80	3272.52	3668.02
ADP _e	kg Sbe	8.85E-05	9.03E-05	3.00E-04	3.42E-04
RPRE	MJ	61.82	66.42	152.98	174.22
NRPRE	MJ	2096.05	2326.54	3136.55	3511.75
NRSF	MJ	165.90	191.74	246.45	281.68
SM	kg	86.17	99.59	128.01	146.30
FW	m3	2.88	2.88	3.12	3.15
CCE	kg CO2e	152.25	175.96	226.16	258.49
HWD	kg	0.02	0.02	0.02	0.02
NHWD	kg	2.68	2.86	5.80	6.54
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 110. Texas benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	441.35	481.00	523.08
GWPF	kg CO2e	441.24	480.86	522.91
GWPB	kg CO2e	0.12	0.14	0.17
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	5.37E-06	6.26E-06	7.16E-06
AP	kg SO2e	2.36	2.47	2.59
EPT	kg Ne	0.99	1.03	1.09
EPM	kg N-eq	0.20	0.21	0.23
EPF	kg P-eq	0.11	0.12	0.13
SFP	kg O3e	34.02	36.20	38.54
ADPf	MJ	3469.22	3673.93	3902.88
ADPe	kg Sbe	4.35E-04	4.43E-04	4.57E-04
RPRE	MJ	315.64	323.05	333.94
NRPRE	MJ	3646.82	3856.87	4091.41
NRSF	MJ	104.38	125.03	145.75
SM	kg	54.22	64.94	75.70
FW	m3	1.90	1.90	1.89
CCE	kg CO2e	95.79	114.74	133.75
HWD	kg	0.01	0.02	0.02
NHWD	kg	1.91	2.09	2.30
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

CALIFORNIA

Appendix D.12 / Regional concrete benchmark overview



Coverage: CA
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

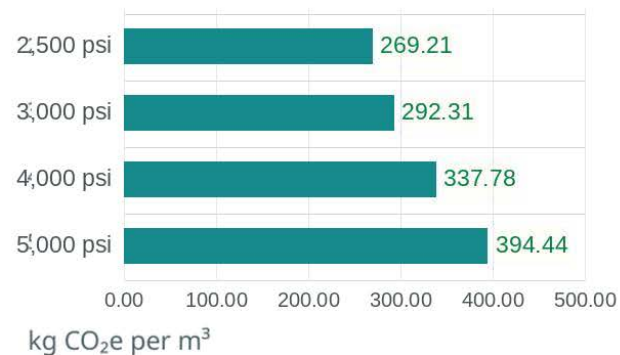
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 111. California A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	96.08	69.50	73.07	123.42	68.74	36.90	50.00	85.00	186.00
Rail Distance	mi	9.09	0.00	49.63	27.66	-9.48	0.00	0.00	0.00	0.00
Ocean Distance	mi	2315.38	0.00	2,834.52	2902.40	1728.37	0.00	0.00	2000.00	6280.00
Barge Distance	mi	68.26	0.00	654.74	203.85	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	89.05	67.90	69.20	114.83	63.27	28.40	48.30	89.50	144.00
Rail Distance	mi	227.38	0.00	654.04	471.08	-16.33	0.00	0.00	0.00	0.00
Ocean Distance	mi	2.45	0.00	118.80	46.72	-41.82	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	37.77	35.00	26.79	47.68	27.86	15.00	27.00	39.00	57.00
Rail Distance	mi	76.48	0.00	411.51	160.31	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	34.74	0.00	195.03	74.47	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	62.26	0.00	266.25	116.50	8.03	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	460.82	75.20	877.93	785.42	136.21	29.20	46.50	129.00	256.00
Rail Distance	mi	25.36	0.00	240.86	114.41	-63.70	0.00	0.00	0.00	0.00
Ocean Distance	mi	207.92	0.00	1194.29	443.69	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	113.11	111.00	40.68	131.71	94.50	82.00	99.00	118.00	136.50
Rail Distance	mi	268.40	0.00	427.48	371.87	164.93	0.00	0.00	0.00	847.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 112. California A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	82,005	71,388	57,853	94,304	69,705	31,134	55,974	81,233	116,336
Batch Waste	%	1.680	2.000	0.746	1.920	1.440	1.8000	2.000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.141	3.151	1.830	3.485	2.797	1.965	2.571	3.348	4.480
Natural Gas - Used at Plant	ft3	0.2905	0	2.589	0.7070	0	0	0	0	0
Diesel - Used at Plant	gal	0.05995	0	0.2157	0.1446	0	0	0	0	0
Fuel Oil - Used at Plant	gal	6.650E-04	0	0.009972	0.001742	0	0	0	0	0
Gasoline - Used at Plant	gal	0.006658	0	0.02107	0.01620	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.004765	0	0.03833	0.009367	1.628E-04	0	0	0	0
Natural Gas - Used in Fleet	ft3	0.01416	0	0.1417	0.04201	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.6651	0.1154	0.9929	0.8893	0.4409	0.02613	0.07732	0.7302	1.149
Purchased Electricity From Green Grid	kWh	0.09358	0	0.4747	0.2316	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.04134	0.02891	0.06391	0.05383	0.02884	0	0.008408	0.04964	0.08734
Grease	lb	0.002885	0	0.01256	0.004820	9.486E-04	0	0	0	0.001346
Total Water Use	gal	30.99	33.30	27.62	38.03	23.95	4.405	18.11	36.08	50.78
Percentage of Batch Water That Is Recycled Wash Water	%	6.391	0	14.40	11.43	1.349	0	0	0	0
Hazardous Solid Waste	lb	0.01014	0	0.03325	0.02608	0	0	0	0	0
Non-Hazardous Solid Waste	lb	1.284	0.004196	4.841	2.786	0	0	6.789E-04	0.1874	0.7432
Particulates, PM-2.5	lb	0.00E+00	0	0	0.00E+00	0.00E+00	0	0	0	0
Particulates, PM-10	lb	0	0	0	0	0	0	0	0	0
Particulates, total	lb	0	0	0	0	0	0	0	0	0
Lead	lb	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 113. California benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	323.0	357.2	424.1	506.7	302.4	326.5	374.5	453.6	557.3	634.9	816.0	932.7	357.2	424.8	488.8
PLC	Portland limestone cement	lb	50.49	55.84	66.29	79.20	47.27	51.03	58.54	70.91	87.11	99.24	127.6	145.8	55.84	66.41	76.41
SC	Slag cement	lb	17.33	19.16	22.75	27.18	16.22	17.51	20.09	24.33	29.89	34.06	43.77	50.03	19.16	22.79	26.22
FA	Fly ash	lb	39.26	43.42	51.55	61.59	36.76	39.69	45.52	55.14	67.74	77.18	99.20	113.4	43.42	51.64	59.42
CCA	Crushed coarse aggregate	lb	781.4	773.6	751.9	721.3	781.8	776.4	762.3	741.0	738.9	711.5	863.5	866.4	0	0	0
NCA	Natural coarse aggregate	lb	743.3	736.5	714.8	686.2	743.7	739.2	724.7	704.9	703.1	676.5	821.0	823.8	0	0	0
CFA	Crushed fine aggregate	lb	186.3	184.4	178.5	171.5	208.9	209.8	210.8	195.5	176.3	168.9	112.3	93.58	179.4	167.4	153.5
NFA	Natural fine aggregate	lb	1,320.4	1,307.6	1,270.2	1,219.8	1,480.4	1,488.0	1,500.8	1,390.3	1,248.8	1,202.1	799.3	666.2	1,271.6	1,186.1	1,087.4
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	901.9	912.4	932.9
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	39.35	39.35	39.35	40.69	42.21	42.21	42.21	44.08	38.23	38.23	38.23	38.23	39.83	39.83	39.83

Table 114. California benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	269.21	292.31	337.78	394.44
GWPF	kg CO2e	269.14	292.22	337.67	394.30
GWPB	kg CO2e	0.09	0.10	0.12	0.14
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.11E-06	5.62E-06	6.63E-06	7.88E-06
AP	kg SO2e	1.22	1.30	1.45	1.64
EPT	kg Ne	0.32	0.34	0.39	0.45
EPM	kg N-eq	0.21	0.22	0.24	0.27
EPF	kg P-eq	0.03	0.03	0.04	0.05
SFP	kg O3e	30.22	32.09	35.65	40.02
ADP _f	MJ	1863.84	1977.95	2210.22	2508.64
ADP _e	kg Sbe	7.18E-05	6.94E-05	7.05E-05	7.76E-05
RPRE	MJ	47.67	48.64	52.78	60.01
NRPRE	MJ	1865.35	1986.54	2228.08	2533.68
NRSF	MJ	116.31	128.62	152.70	182.45
SM	kg	34.14	37.75	44.82	53.55
FW	m3	2.56	2.57	2.58	2.59
CCE	kg CO2e	106.74	118.04	140.14	167.45
HWD	kg	9.01E-03	9.32E-03	9.92E-03	0.01
NHWD	kg	2.37	2.41	2.58	2.85
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 115. California benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	254.47	271.53	305.48	362.80
GWPF	kg CO2e	254.39	271.44	305.38	362.69
GWPB	kg CO2e	0.09	0.09	0.11	0.12
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.80E-06	5.17E-06	5.89E-06	7.09E-06
AP	kg SO2e	1.19	1.25	1.36	1.55
EPT	kg Ne	0.29	0.31	0.35	0.44
EPM	kg N-eq	0.21	0.22	0.23	0.26
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	29.68	31.07	33.81	37.84
ADP _f	MJ	1762.04	1858.24	2049.37	2406.51
ADP _e	kg Sbe	4.76E-05	5.17E-05	6.01E-05	1.02E-04
RPRE	MJ	37.44	40.27	46.09	66.21
NRPRE	MJ	1778.95	1875.81	2067.90	2405.21
NRSF	MJ	108.90	117.57	134.85	163.35
SM	kg	31.96	34.51	39.58	47.94
FW	m3	2.65	2.67	2.71	2.72
CCE	kg CO2e	99.94	107.90	123.76	149.91
HWD	kg	8.82E-03	9.03E-03	9.47E-03	0.01
NHWD	kg	2.02	2.12	2.33	3.03
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 116. California benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	432.25	485.04	630.51	714.22
GWPF	kg CO2e	432.10	484.87	630.37	714.05
GWPB	kg CO2e	0.16	0.18	0.20	0.22
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.65E-06	9.82E-06	1.26E-05	1.43E-05
AP	kg SO2e	1.77	1.95	2.43	2.71
EPT	kg Ne	0.50	0.56	0.84	0.95
EPM	kg N-eq	0.29	0.32	0.39	0.43
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	43.22	47.33	57.47	63.74
ADP _f	MJ	2747.30	3018.03	4128.49	4629.72
ADP _e	kg Sbe	9.78E-05	1.00E-04	3.13E-04	3.57E-04
RPRE	MJ	70.33	75.51	165.02	188.12
NRPRE	MJ	2764.89	3045.61	4023.06	4508.38
NRSF	MJ	200.67	228.62	293.86	335.85
SM	kg	58.90	67.10	86.25	98.58
FW	m3	2.67	2.68	2.87	2.91
CCE	kg CO2e	184.17	209.82	269.69	308.23
HWD	kg	1.11E-02	0.01	0.01	0.01
NHWD	kg	3.21	3.41	6.46	7.27
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 117. California benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	485.66	534.41	582.96
GWPF	kg CO2e	485.57	534.30	582.83
GWPB	kg CO2e	0.10	0.12	0.14
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.19E-06	7.22E-06	8.20E-06
AP	kg SO2e	2.72	2.89	3.07
EPT	kg Ne	1.00	1.06	1.12
EPM	kg N-eq	0.30	0.32	0.35
EPF	kg P-eq	0.11	0.12	0.13
SFP	kg O3e	46.60	50.40	54.16
ADP _f	MJ	3729.56	3995.57	4271.34
ADP _e	kg Sbe	4.12E-04	4.22E-04	4.37E-04
RPRE	MJ	300.36	309.10	321.02
NRPRE	MJ	3906.69	4180.79	4464.68
NRSF	MJ	128.62	152.98	176.02
SM	kg	37.75	44.90	51.66
FW	m3	1.71	1.72	1.71
CCE	kg CO2e	118.04	140.40	161.54
HWD	kg	9.32E-03	9.92E-03	0.01
NHWD	kg	2.33	2.55	2.78
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

GREATER LOS ANGELES METRO

Appendix D.13 / Metropolitan concrete benchmark overview



Coverage: Los Angeles, CA
State assignments follow the V4 source map.

REGION INDEX

Zip Directory

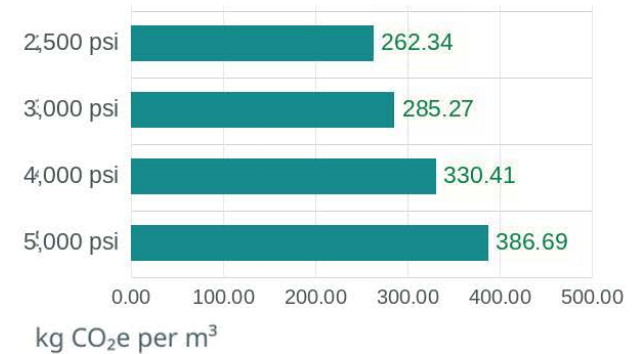
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 118. Greater Los Angeles Metro A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	49.78	48.00	21.11	61.84	37.71	33.00	41.00	51.00	71.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	1689.14	0.00	2,800.69	2651.21	727.07	0.00	0.00	0.00	6280.00
Barge Distance	mi	179.43	0.00	1,061.51	544.07	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	39.43	33.00	19.91	51.02	27.83	21.00	32.30	40.10	63.40
Rail Distance	mi	256.89	0.00	296.11	361.88	151.89	0.00	0.00	416.00	558.25
Ocean Distance	mi	590.91	0.00	1,897.59	1263.77	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	33.75	34.00	24.64	47.84	19.66	0.00	27.00	39.00	57.00
Rail Distance	mi	6.86	0.00	22.72	14.66	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	65.71	0.00	273.26	159.58	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	65.71	0.00	273.26	159.58	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	36.25	41.00	19.43	47.35	25.14	9.00	35.00	42.40	53.40
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	617.65	0.00	2,015.32	1320.82	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	97.73	99.00	20.81	111.24	84.22	67.00	93.00	111.00	117.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 119. Greater Los Angeles Metro A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	93,077	88,346	52,431	111,839	74,315	40,724	73,538	99,944	143,772
Batch Waste	%	1.943	2.000	0.776	2.232	1.653	2.000	2.000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	2.763	2.634	1.190	3.164	2.361	1.878	2.454	3.234	3.948
Natural Gas - Used at Plant	ft3	0	0	0	0	0	0	0	0	0
Diesel - Used at Plant	gal	0.004497	0	0.01879	0.009730	0	0	0	0	0
Fuel Oil - Used at Plant	gal	0	0	0	0	0	0	0	0	0
Gasoline - Used at Plant	gal	0	0	0	0	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.005441	0	0.05498	0.01356	0	0	0	0	1.075E-04
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.6873	0.7038	0.8674	0.9354	0.4392	0.05530	0.1243	0.8586	1.149
Purchased Electricity From Green Grid	kWh	0.06053	0	0.2536	0.1307	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.03061	0	0.05839	0.04955	0.01168	0	0	0.02916	0.08202
Grease	lb	4.691E-04	0	0.007714	0.001414	0	0	0	0	0
Total Water Use	gal	32.26	33.41	20.99	40.23	24.30	1.008	18.11	40.78	48.71
Percentage of Batch Water That Is Recycled Wash Water	%	1.326	0	9.129	3.956	0	0	0	0	0
Hazardous Solid Waste	lb	0	0	0	0	0	0	0	0	0
Non-Hazardous Solid Waste	lb	0.2571	0	1.114	0.4341	0.08006	0	0	0.001208	0.5334
Particulates, PM-2.5	lb	0	0	0	0	0	0	0	0	0
Particulates, PM-10	lb	0	0	0	0	0	0	0	0	0
Particulates, total	lb	0	0	0	0	0	0	0	0	0
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 120. Greater Los Angeles Metro benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	334.3	369.7	438.9	524.4	313.0	337.9	387.6	469.4	576.7	657.0	844.5	965.2	369.7	439.6	505.9
PLC	Portland limestone cement	lb	41.65	46.05	54.68	65.33	38.99	42.10	48.29	58.49	71.85	81.86	105.22	120.3	46.05	54.78	63.02
SC	Slag cement	lb	16.75	18.52	21.99	26.27	15.68	16.93	19.42	23.52	28.90	32.92	42.32	48.36	18.52	22.03	25.35
FA	Fly ash	lb	36.80	40.69	48.31	57.73	34.45	37.20	42.67	51.68	63.49	72.33	92.97	106.26	40.69	48.40	55.69
CCA	Crushed coarse aggregate	lb	781.7	773.9	752.4	721.8	781.8	776.3	762.2	740.9	739.5	712.1	863.3	866.2	0	0	0
NCA	Natural coarse aggregate	lb	743.6	736.8	715.2	686.7	743.7	739.1	724.6	704.8	703.6	677.1	820.9	823.6	0	0	0
CFA	Crushed fine aggregate	lb	186.4	184.5	178.6	171.7	208.9	209.8	210.8	195.5	176.4	169.0	112.3	93.56	179.5	167.5	153.6
NFA	Natural fine aggregate	lb	1,320.9	1,308.3	1,271.0	1,220.7	1,480.4	1,487.9	1,500.7	1,390.0	1,249.8	1,203.2	799.2	666.0	1,272.3	1,186.8	1,088.1
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	902.3	912.9	933.6
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	39.35	39.35	39.35	40.69	42.21	42.21	42.21	44.08	38.23	38.23	38.23	38.23	39.83	39.83	39.83

Table 121. Greater Los Angeles Metro benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	262.34	285.27	330.41	386.69
GWPF	kg CO2e	262.27	285.18	330.30	386.55
GWPB	kg CO2e	0.08	0.09	0.11	0.14
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.14E-06	5.66E-06	6.68E-06	7.93E-06
AP	kg SO2e	1.08	1.15	1.29	1.46
EPT	kg Ne	0.32	0.34	0.38	0.45
EPM	kg N-eq	0.17	0.18	0.20	0.22
EPF	kg P-eq	0.03	0.03	0.04	0.05
SFP	kg O3e	25.94	27.58	30.72	34.57
ADP _f	MJ	1750.29	1859.91	2083.74	2371.74
ADP _e	kg Sbe	7.23E-05	6.98E-05	7.10E-05	7.81E-05
RPRE	MJ	47.44	48.44	52.64	59.96
NRPRE	MJ	1749.87	1866.46	2099.33	2394.21
NRSF	MJ	117.64	130.10	154.45	184.55
SM	kg	32.39	35.81	42.52	50.80
FW	m3	2.57	2.58	2.59	2.61
CCE	kg CO2e	107.97	119.40	141.75	169.37
HWD	kg	3.19E-03	3.50E-03	4.11E-03	4.86E-03
NHWD	kg	1.76	1.81	1.97	2.25
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 122. Greater Los Angeles Metro benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	247.53	264.43	298.08	355.01
GWPF	kg CO2e	247.45	264.35	297.98	354.90
GWPB	kg CO2e	0.08	0.09	0.10	0.12
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.83E-06	5.20E-06	5.93E-06	7.13E-06
AP	kg SO2e	1.05	1.10	1.21	1.37
EPT	kg Ne	0.29	0.31	0.35	0.43
EPM	kg N-eq	0.17	0.18	0.19	0.21
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	25.43	26.65	29.05	32.59
ADP _f	MJ	1648.85	1741.41	1925.45	2272.44
ADP _e	kg Sbe	4.80E-05	5.20E-05	6.05E-05	1.03E-04
RPRE	MJ	37.17	40.03	45.90	66.13
NRPRE	MJ	1663.94	1757.06	1941.87	2268.67
NRSF	MJ	110.15	118.91	136.40	165.22
SM	kg	30.32	32.74	37.55	45.48
FW	m3	2.66	2.68	2.72	2.73
CCE	kg CO2e	101.09	109.13	125.18	151.63
HWD	kg	3.00E-03	3.22E-03	3.65E-03	4.38E-03
NHWD	kg	1.41	1.52	1.73	2.44
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 123. Greater Los Angeles Metro benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	424.06	476.49	620.59	703.66
GWPF	kg CO2e	423.92	476.33	620.45	703.49
GWPB	kg CO2e	0.15	0.17	0.19	0.22
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.70E-06	9.88E-06	1.26E-05	1.44E-05
AP	kg SO2e	1.58	1.74	2.17	2.42
EPT	kg Ne	0.50	0.55	0.83	0.94
EPM	kg N-eq	0.24	0.26	0.32	0.36
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	37.36	40.97	49.80	55.31
ADP _f	MJ	2601.39	2862.43	3942.93	4428.22
ADP _e	kg Sbe	9.85E-05	1.01E-04	3.14E-04	3.59E-04
RPRE	MJ	70.34	75.60	165.47	188.72
NRPRE	MJ	2616.17	2886.93	3833.29	4302.16
NRSF	MJ	202.98	231.25	297.23	339.71
SM	kg	55.88	63.66	81.82	93.52
FW	m3	2.69	2.69	2.88	2.92
CCE	kg CO2e	186.28	212.23	272.79	311.77
HWD	kg	5.32E-03	6.03E-03	7.68E-03	8.74E-03
NHWD	kg	2.62	2.82	5.88	6.70
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 124. Greater Los Angeles Metro benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	474.50	522.89	571.04
GWPF	kg CO2e	474.41	522.78	570.92
GWPB	kg CO2e	0.09	0.11	0.13
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.23E-06	7.27E-06	8.25E-06
AP	kg SO2e	2.50	2.66	2.82
EPT	kg Ne	0.99	1.05	1.11
EPM	kg N-eq	0.24	0.26	0.28
EPF	kg P-eq	0.11	0.12	0.13
SFP	kg O3e	39.65	42.99	46.28
ADP _f	MJ	3555.21	3811.96	4078.38
ADP _e	kg Sbe	4.14E-04	4.23E-04	4.39E-04
RPRE	MJ	300.94	309.78	321.82
NRPRE	MJ	3730.24	3994.84	4269.16
NRSF	MJ	130.10	154.73	178.04
SM	kg	35.81	42.60	49.01
FW	m3	1.71	1.72	1.71
CCE	kg CO2e	119.40	142.01	163.40
HWD	kg	3.50E-03	4.12E-03	4.70E-03
NHWD	kg	1.73	1.95	2.18
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

BAY AREA METRO

Appendix D.14 / Metropolitan concrete benchmark overview



Coverage: Bay Area, CA
State assignments follow the V4 source map.

REGION INDEX

Zip Directory

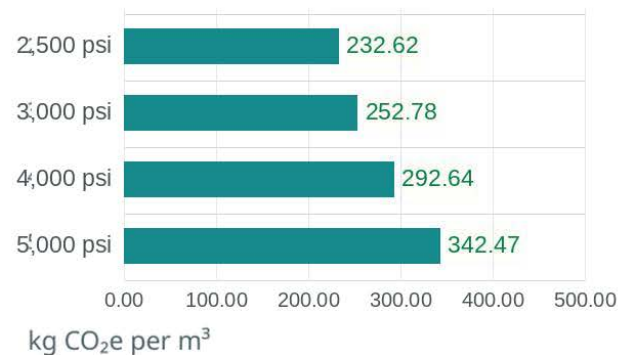
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 125. Bay Area Metro A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	7.40	2.50	9.10	21.80	-7.00	2.50	2.50	2.50	24.30
Rail Distance	mi	61.82	0.00	114.80	243.42	-119.79	0.00	0.00	0.00	275.00
Ocean Distance	mi	5032.00	6280.00	2,336.67	6444.03	3619.97	4388.27	6280.00	6280.00	6280.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	50.38	45.30	9.43	65.31	35.46	45.30	45.30	45.30	67.90
Rail Distance	mi	921.40	982.00	507.59	1228.14	614.67	930.10	982.00	982.00	982.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	53.42	52.70	1.34	55.53	51.31	52.70	52.70	52.70	55.90
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	2297.33	2298.00	1.25	2299.31	2295.34	2295.00	2298.00	2298.00	2298.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	158.95	154.00	9.18	173.47	144.42	154.00	154.00	154.00	176.00
Rail Distance	mi	651.54	847.00	371.43	875.99	427.08	338.80	847.00	847.00	847.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 126. Bay Area Metro A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	62,568	48,035	46,423	86,061	39,075	23,561	36,955	65,894	106,386
Batch Waste	%	1.461	2.000	0.689	2.080	0.8413	1.8000	2.000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	4.203	3.524	3.195	5.495	2.910	2.110	3.103	3.980	6.511
Natural Gas - Used at Plant	ft3	0.4696	0	5.939	1.109	0	0	0	0	0.2970
Diesel - Used at Plant	gal	0.026301	0	0.04261	0.05953	0	0	0	0	0
Fuel Oil - Used at Plant	gal	0	0	0	0	0	0	0	0	0
Gasoline - Used at Plant	gal	4.181E-04	0	0.002098	0.001110	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	4.526E-04	0	0.005821	0.001376	0	0	0	0	0.00E+00
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.4831	0.08115	0.7826	0.8844	0	0.03793	0.07545	0.08939	1.1705
Purchased Electricity From Green Grid	kWh	0.5149	0	1.076	1.480	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.05172	0.05436	0.05251	0.07539	0.02805	0.02153	0.03713	0.06201	0.09724
Grease	lb	0.004187	0	0.01815	0.01023	0	0	0	0	0
Total Water Use	gal	42.93	36.38	33.07	60.63	25.23	16.58	35.91	45.36	66.91
Percentage of Batch Water That Is Recycled Wash Water	%	0.04107	0	0.2582	0.1252	0	0	0	0	0
Hazardous Solid Waste	lb	0.001394	0	0.002913	0.004006	0	0	0	0	0
Non-Hazardous Solid Waste	lb	0.5220	0.5240	1.536	0.902	0.1422	0.0198	0.3191	0.6646	1.567
Particulates, PM-2.5	lb	0	0	0	0	0	0	0	0	0
Particulates, PM-10	lb	0	0	0	0	0	0	0	0	0
Particulates, total	lb	0	0	0	0	0	0	0	0	0
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 127. Bay Area Metro benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	185.5	205.2	243.6	291.1	173.7	187.6	215.1	260.6	320.1	364.7	468.8	535.8	205.2	244.0	280.8
PLC	Portland limestone cement	lb	114.51	126.63	150.34	179.6	107.21	115.75	132.77	160.82	197.57	225.1	289.3	330.7	126.63	150.61	173.30
SC	Slag cement	lb	88.27	97.62	115.89	138.47	82.64	89.22	102.34	123.97	152.30	173.51	223.0	254.9	97.62	116.10	133.58
FA	Fly ash	lb	42.57	47.08	55.89	66.78	39.86	43.03	49.36	59.78	73.45	83.7	107.6	122.9	47.08	55.99	64.42
CCA	Crushed coarse aggregate	lb	779.5	771.4	749.4	718.3	783.1	777.9	764.3	743.8	735.6	707.7	868.8	872.9	0	0	0
NCA	Natural coarse aggregate	lb	741.5	734.5	712.4	683.3	745.0	740.6	726.6	707.6	699.9	672.9	826.1	830.0	0	0	0
CFA	Crushed fine aggregate	lb	185.9	183.9	177.9	170.8	209.3	210.2	211.4	196.3	175.5	168.0	113.0	94.29	178.9	166.9	152.8
NFA	Natural fine aggregate	lb	1,317.1	1,304.1	1,266.0	1,214.8	1,483.0	1,490.9	1,504.8	1,395.6	1,243.2	1,195.7	804.2	671.2	1,268.1	1,182.0	1,082.9
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	899.3	909.2	929.1
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	39.35	39.35	39.35	40.69	42.21	42.21	42.21	44.08	38.23	38.23	38.23	38.23	39.83	39.83	39.83

Table 128. Bay Area Metro benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	232.62	252.78	292.64	342.47
GWPF	kg CO2e	232.54	252.69	292.52	342.32
GWPB	kg CO2e	0.09	0.10	0.12	0.15
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.28E-06	5.81E-06	6.85E-06	8.13E-06
AP	kg SO2e	1.32	1.42	1.63	1.88
EPT	kg Ne	0.29	0.31	0.36	0.41
EPM	kg N-eq	0.23	0.25	0.28	0.33
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	33.21	35.87	41.03	47.41
ADP _f	MJ	1686.95	1793.23	2011.90	2294.72
ADP _e	kg Sbe	6.82E-05	6.53E-05	6.56E-05	7.17E-05
RPRE	MJ	42.59	43.11	46.38	52.53
NRPRE	MJ	1773.20	1895.56	2141.14	2452.96
NRSF	MJ	91.05	100.69	119.54	142.83
SM	kg	78.79	87.13	103.44	123.59
FW	m3	2.58	2.58	2.58	2.59
CCE	kg CO2e	83.56	92.41	109.70	131.08
HWD	kg	3.24E-03	3.49E-03	3.99E-03	4.60E-03
NHWD	kg	1.66	1.67	1.78	1.99
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 129. Bay Area Metro benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	219.07	234.08	263.99	315.35
GWPF	kg CO2e	218.98	233.99	263.89	315.23
GWPB	kg CO2e	0.09	0.10	0.11	0.13
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.97E-06	5.34E-06	6.09E-06	7.31E-06
AP	kg SO2e	1.26	1.34	1.49	1.75
EPT	kg Ne	0.27	0.28	0.32	0.40
EPM	kg N-eq	0.22	0.24	0.26	0.31
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	31.92	33.86	37.71	43.87
ADP _f	MJ	1582.78	1673.88	1855.34	2205.53
ADP _e	kg Sbe	4.43E-05	4.80E-05	5.58E-05	9.69E-05
RPRE	MJ	32.64	35.16	40.35	59.40
NRPRE	MJ	1678.91	1777.02	1972.12	2323.51
NRSF	MJ	85.25	92.04	105.57	127.87
SM	kg	73.77	79.64	91.35	110.65
FW	m3	2.68	2.70	2.73	2.73
CCE	kg CO2e	78.23	84.46	96.88	117.35
HWD	kg	3.08E-03	3.26E-03	3.62E-03	4.20E-03
NHWD	kg	1.32	1.41	1.58	2.22
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 130. Bay Area Metro benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	375.86	422.17	554.76	629.16
GWPF	kg CO2e	375.70	421.99	554.60	628.97
GWPB	kg CO2e	0.16	0.19	0.20	0.23
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.92E-06	1.01E-05	1.29E-05	1.47E-05
AP	kg SO2e	2.05	2.29	2.94	3.31
EPT	kg Ne	0.46	0.51	0.78	0.88
EPM	kg N-eq	0.35	0.39	0.51	0.57
EPF	kg P-eq	0.04	0.05	0.06	0.07
SFP	kg O3e	51.68	57.65	72.75	81.95
ADP _f	MJ	2521.39	2776.71	3883.57	4367.76
ADP _e	kg Sbe	9.13E-05	9.27E-05	3.03E-04	3.46E-04
RPRE	MJ	62.17	66.34	153.33	174.88
NRPRE	MJ	2685.55	2971.35	3993.65	4492.83
NRSF	MJ	157.10	178.98	230.04	262.92
SM	kg	135.94	154.87	199.06	227.51
FW	m3	2.66	2.66	2.85	2.88
CCE	kg CO2e	144.17	164.25	211.11	241.28
HWD	kg	4.97E-03	5.54E-03	6.89E-03	7.75E-03
NHWD	kg	2.32	2.46	5.36	6.08
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 131. Bay Area Metro benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	460.91	504.06	547.47
GWPF	kg CO2e	460.81	503.94	547.34
GWPB	kg CO2e	0.10	0.12	0.14
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.38E-06	7.43E-06	8.44E-06
AP	kg SO2e	3.09	3.32	3.55
EPT	kg Ne	0.98	1.03	1.09
EPM	kg N-eq	0.39	0.43	0.47
EPF	kg P-eq	0.11	0.11	0.12
SFP	kg O3e	58.04	63.54	68.99
ADPf	MJ	3740.56	3994.31	4260.71
ADPe	kg Sbe	4.07E-04	4.15E-04	4.29E-04
RPRE	MJ	293.68	301.35	312.24
NRPRE	MJ	4012.58	4292.18	4583.51
NRSF	MJ	100.69	119.76	137.80
SM	kg	87.13	103.63	119.24
FW	m3	1.77	1.76	1.75
CCE	kg CO2e	92.41	109.90	126.45
HWD	kg	3.49E-03	3.99E-03	4.46E-03
NHWD	kg	1.60	1.76	1.94
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

SAN DIEGO METRO

Appendix D.15 / Metropolitan concrete benchmark overview



Coverage: San Diego, CA
State assignments follow the V4 source map.

REGION INDEX

Zip Directory

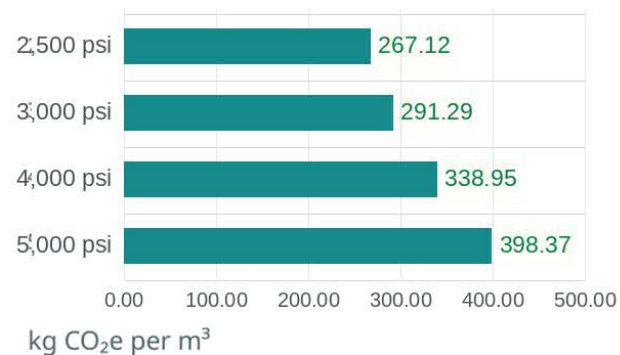
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 132. San Diego Metro A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	210.10	212.00	12.23	223.30	196.91	191.00	212.00	218.00	218.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	2512.00	0.00	3,242.98	4,831.89	192.11	0.00	0.00	2512.00	6280.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	164.41	190.00	43.72	211.59	117.23	124.00	124.00	190.00	212.00
Rail Distance	mi	267.30	0.00	320.31	513.51	21.08	0.00	0.00	396.00	618.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	21.26	25.00	14.30	36.69	5.83	7.00	8.00	25.00	29.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	90.91	0.00	301.51	293.47	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	121.22	129.00	11.87	134.03	108.42	109.00	109.00	129.00	129.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	164.90	205.00	63.14	249.87	79.92	50.00	205.00	205.00	205.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 133. San Diego Metro A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	101,439	80,861	73,178	149,249	53,630	36,181	75,111	106,171	174,625
Batch Waste	%	2.000	2	0.000	2.000	2.000000	2	2	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.817	4.691	1.197	4.723	2.910	2.543	3.459	4.691	4.695
Natural Gas - Used at Plant	ft3	0	0	0	0	0	0	0	0	0
Diesel - Used at Plant	gal	0	0	0	0	0	0	0	0	0
Fuel Oil - Used at Plant	gal	6.447E-04	0	9.457E-04	0.001772	0	0	0	0	0
Gasoline - Used at Plant	gal	0.01315	0.001401	0.02663	0.02735	0	0	2.802E-04	0.007789	0.02743
LPG (Liquified Propane Gas) - Used at Plant	gal	0.00E+00	0	0	0	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	1.278	1.012	1.449	2.378	0.1778	0.02111	0.2769	1.040	3.037
Purchased Electricity From Green Grid	kWh	0	0	0	0	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.02130	0.01087	0.03665	0.03395	0.008655	0.001214	0.003311	0.02112	0.04591
Grease	lb	0.001554	6.372E-04	0.001262	0.002788	3.207E-04	0	1.274E-04	0.001193	0.002015
Total Water Use	gal	6.556	10.02	5.395	10.49	2.625	0.5334	2.621	10.67	10.83
Percentage of Batch Water That Is Recycled Wash Water	%	30.07	50.00	26.35	49.94	10.20	0	10.00	50.00	50.00
Hazardous Solid Waste	lb	0	0	0	0	0	0	0	0	0
Non-Hazardous Solid Waste	lb	6.418E-04	0	0.001085	0.001323	0	0	0	5.857E-04	0.002012
Particulates, PM-2.5	lb	0	0	0	0	0	0	0	0	0
Particulates, PM-10	lb	0	0	0	0	0	0	0	0	0
Particulates, total	lb	0	0	0	0	0	0	0	0	0
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 134. San Diego Metro benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	348.6	385.5	457.7	546.8	326.4	352.3	404.2	489.6	601.4	685.2	880.7	1,006.6	385.5	458.5	527.5
PLC	Portland limestone cement	lb	30.07	33.26	39.49	47.18	28.16	30.40	34.87	42.24	51.89	59.12	75.99	86.85	33.26	39.56	45.51
SC	Slag cement	lb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FA	Fly ash	lb	55.46	61.34	72.82	87.01	51.93	56.06	64.31	77.89	95.69	109.02	140.1	160.2	61.34	72.95	83.94
CCA	Crushed coarse aggregate	lb	779.8	771.8	749.9	718.8	781.8	776.4	762.5	741.4	736.3	708.4	863.7	866.7	0	0	0
NCA	Natural coarse aggregate	lb	741.8	734.9	712.9	683.8	743.7	739.2	724.9	705.3	700.5	673.6	821.2	824.1	0	0	0
CFA	Crushed fine aggregate	lb	186.0	184.0	178.0	171.0	208.9	209.8	210.9	195.6	175.6	168.1	112.3	93.62	179.0	167.0	153.0
NFA	Natural fine aggregate	lb	1,317.7	1,304.7	1,266.8	1,215.7	1,480.5	1,488.1	1,501.2	1,391.0	1,244.3	1,196.9	799.5	666.4	1,268.7	1,182.8	1,083.8
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	899.8	909.8	929.8
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	39.35	39.35	39.35	40.69	42.21	42.21	42.21	44.08	38.23	38.23	38.23	38.23	39.83	39.83	39.83

Table 135. San Diego Metro benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	267.12	291.29	338.95	398.37
GWPF	kg CO2e	267.05	291.21	338.85	398.24
GWPB	kg CO2e	0.08	0.09	0.11	0.13
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.93E-06	5.42E-06	6.40E-06	7.60E-06
AP	kg SO2e	1.14	1.23	1.40	1.61
EPT	kg Ne	0.32	0.34	0.39	0.45
EPM	kg N-eq	0.19	0.21	0.23	0.27
EPF	kg P-eq	0.03	0.03	0.04	0.05
SFP	kg O3e	27.97	30.10	34.19	39.24
ADP _f	MJ	1819.43	1945.93	2204.01	2534.74
ADP _e	kg Sbe	7.18E-05	6.93E-05	7.04E-05	7.74E-05
RPRE	MJ	49.39	50.36	54.52	61.77
NRPRE	MJ	1799.62	1931.16	2194.50	2527.44
NRSF	MJ	118.93	131.52	156.14	186.57
SM	kg	33.56	37.12	44.07	52.65
FW	m3	2.53	2.54	2.55	2.57
CCE	kg CO2e	109.15	120.71	143.30	171.22
HWD	kg	2.95E-03	3.27E-03	3.88E-03	4.63E-03
NHWD	kg	1.62	1.67	1.84	2.11
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 136. San Diego Metro benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	251.09	268.82	304.13	364.26
GWPF	kg CO2e	251.02	268.73	304.04	364.16
GWPB	kg CO2e	0.08	0.09	0.10	0.12
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.63E-06	4.98E-06	5.68E-06	6.83E-06
AP	kg SO2e	1.09	1.16	1.29	1.49
EPT	kg Ne	0.29	0.31	0.35	0.44
EPM	kg N-eq	0.19	0.20	0.22	0.25
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	27.06	28.61	31.66	36.39
ADP _f	MJ	1701.50	1805.21	2012.03	2402.56
ADP _e	kg Sbe	4.75E-05	5.15E-05	6.00E-05	1.02E-04
RPRE	MJ	39.13	41.97	47.81	67.99
NRPRE	MJ	1698.31	1801.21	2006.06	2371.95
NRSF	MJ	111.35	120.22	137.89	167.03
SM	kg	31.42	33.93	38.91	47.14
FW	m3	2.62	2.64	2.68	2.70
CCE	kg CO2e	102.19	110.33	126.55	153.29
HWD	kg	2.76E-03	2.98E-03	3.42E-03	4.14E-03
NHWD	kg	1.27	1.38	1.59	2.30
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 137. San Diego Metro benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	437.23	492.60	643.42	730.88
GWPF	kg CO2e	437.09	492.44	643.28	730.72
GWPB	kg CO2e	0.15	0.17	0.18	0.21
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	8.34E-06	9.47E-06	1.21E-05	1.38E-05
AP	kg SO2e	1.75	1.95	2.47	2.78
EPT	kg Ne	0.51	0.56	0.85	0.96
EPM	kg N-eq	0.29	0.32	0.41	0.46
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	42.64	47.38	58.76	65.94
ADP _f	MJ	2784.67	3085.79	4258.12	4803.24
ADP _e	kg Sbe	9.77E-05	1.00E-04	3.13E-04	3.58E-04
RPRE	MJ	72.12	77.32	167.11	190.28
NRPRE	MJ	2766.77	3073.23	4101.08	4623.18
NRSF	MJ	205.20	233.78	300.48	343.42
SM	kg	57.91	65.97	84.80	96.92
FW	m3	2.66	2.67	2.87	2.92
CCE	kg CO2e	188.32	214.55	275.77	315.18
HWD	kg	5.09E-03	5.79E-03	7.45E-03	8.51E-03
NHWD	kg	2.48	2.69	5.76	6.58
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 138. San Diego Metro benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	491.45	542.36	593.02
GWPF	kg CO2e	491.36	542.26	592.90
GWPB	kg CO2e	0.09	0.11	0.13
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.00E-06	6.99E-06	7.93E-06
AP	kg SO2e	2.70	2.89	3.09
EPT	kg Ne	1.00	1.06	1.12
EPM	kg N-eq	0.30	0.33	0.35
EPF	kg P-eq	0.11	0.12	0.13
SFP	kg O3e	45.32	49.66	53.93
ADP _f	MJ	3795.70	4087.39	4388.65
ADP _e	kg Sbe	4.13E-04	4.22E-04	4.37E-04
RPRE	MJ	302.30	310.93	322.74
NRPRE	MJ	3950.75	4246.39	4551.85
NRSF	MJ	131.52	156.43	179.99
SM	kg	37.12	44.15	50.79
FW	m3	1.71	1.72	1.72
CCE	kg CO2e	120.71	143.56	165.19
HWD	kg	3.27E-03	3.88E-03	4.46E-03
NHWD	kg	1.59	1.81	2.05
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

FLORIDA

Appendix D.16 / Regional concrete benchmark overview



Coverage: FL
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

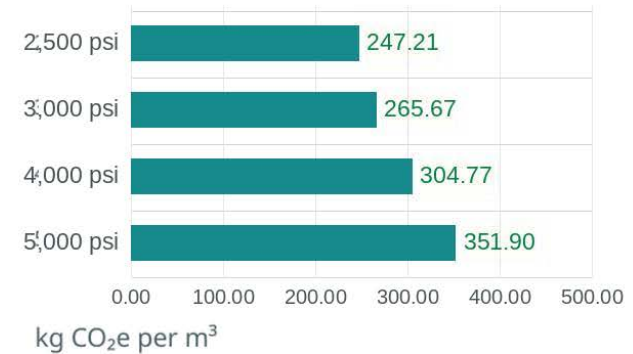
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 139. Florida A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	105.28	115.00	77.58	127.27	83.29	25.00	77.00	138.00	165.00
Rail Distance	mi	15.30	0.00	58.12	31.78	-1.17	0.00	0.00	0.00	0.00
Ocean Distance	mi	328.34	0.00	1,420.97	731.17	-74.49	0.00	0.00	0.00	0.00
Barge Distance	mi	10.59	0.00	55.69	22.60	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	90.25	65.00	75.93	112.11	68.39	20.30	50.00	98.00	152.00
Rail Distance	mi	1.73	0.00	16.55	6.50	-3.03	0.00	0.00	0.00	0.00
Ocean Distance	mi	2351.01	0.00	3801.65	3445.51	1256.51	0.00	0.00	0.00	7555.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	46.81	38.20	35.01	56.73	36.88	12.00	32.30	52.00	89.00
Rail Distance	mi	116.62	0.00	185.72	169.28	63.97	0.00	0.00	0.00	395.00
Ocean Distance	mi	112.86	0.00	430.50	234.90	-9.18	0.00	0.00	0.00	0.00
Barge Distance	mi	41.75	0.00	139.05	72.12	1.14E+01	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	239.07	132.00	214.22	299.80	178.34	53.90	104.00	179.00	560.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	120.72	0.00	800.71	289.39	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	42.78	30.00	32.52	57.39	28.17	23.00	25.00	36.00	69.00
Rail Distance	mi	366.35	561.00	282.31	493.16	239.54	0.00	364.00	561.00	653.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 140. Florida A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	84,281	77,929	44,872	93,656	74,905	56,765	69,745	86,881	119,608
Batch Waste	%	1.998	2.0000	1.126	2.279	1.717	2	2.0000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	3.732	3.581	9.011	4.282	3.183	2.094	2.800	3.838	5.550
Natural Gas - Used at Plant	ft3	0.1245	0	1.816	0.3024	0	0	0	0	0
Diesel - Used at Plant	gal	0.1326	0	0.3576	0.1990	0.06626	0	0	0	0.1198
Fuel Oil - Used at Plant	gal	7.407E-05	0	4.833E-04	1.764E-04	0	0	0	0	0
Gasoline - Used at Plant	gal	1.940E-05	0	9.392E-05	3.828E-05	5.171E-07	0	0.00E+00	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.002245	0	0.02008	0.004581	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	0.6178	0.1258	0.7461	0.7966	0.4390	0	0.06135	0.2448	1.147
Purchased Electricity From Green Grid	kWh	0	0	0	0	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	1.214E-05	0	7.750E-05	2.886E-05	0	0	0	0	0
Oil and Lubricants	lb	0.03844	3.750E-04	0.07954	0.05342	0.02347	0	0	0.01407	0.07463
Grease	lb	0.001189	0.00E+00	0.003120	0.001879	4.984E-04	0	0.00E+00	3.628E-05	0.002184
Total Water Use	gal	24.57	26.18	17.58	28.67	20.46	12.15	23.80	28.18	39.19
Percentage of Batch Water That Is Recycled Wash Water	%	0.06616	0	0.5330	0.1958	0	0	0	0	0
Hazardous Solid Waste	lb	0.3596	0	3.959	1.053	0	0	0	0	0.001112
Non-Hazardous Solid Waste	lb	2.048	0.9912	5.990	2.961	1.135	0	0.3814	1.050	2.756
Particulates, PM-2.5	lb	0	0	0	0	0	0	0	0	0
Particulates, PM-10	lb	0	0	0	0	0	0	0	0	0
Particulates, total	lb	0	0	0	0	0	0	0	0	0
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 141. Florida benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	229.4	252.9	301.2	359.3	214.8	231.2	266.0	321.7	395.4	450.6	579.2	662.0	252.8	299.6	345.4
PLC	Portland limestone cement	lb	88.34	97.38	116.0	138.4	82.71	89.01	102.4	123.9	152.3	173.5	223.0	254.9	97.33	115.4	133.0
SC	Slag cement	lb	102.6	113.1	134.7	160.7	96.09	103.4	119.0	143.9	176.9	201.6	259.1	296.1	113.1	134.0	154.5
FA	Fly ash	lb	25.81	28.45	33.88	40.42	24.16	26.00	29.92	36.19	44.48	50.69	65.15	74.46	28.43	33.70	38.85
CCA	Crushed coarse aggregate	lb	1,338.9	1,313.6	1,277.5	1,215.8	1,326.0	1,305.0	1,278.6	1,228.7	1,245.2	1,200.1	1,418.9	1,418.9	0	0	0
NCA	Natural coarse aggregate	lb	291.9	286.1	278.5	265.0	289.1	284.2	278.7	267.8	271.1	261.4	309.1	309.1	0	0	0
CFA	Crushed fine aggregate	lb	421.8	414.0	402.6	382.4	468.3	466.1	469.4	428.9	391.6	377.5	244.4	203.0	398.1	367.5	342.9
NFA	Natural fine aggregate	lb	1,053.0	1,033.6	1,005.1	956.9	1,169.1	1,163.6	1,171.7	1,073.5	980.1	944.7	611.7	508.0	995.8	919.8	857.7
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	927.3	939.0	940.7
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	41.58	41.58	41.58	43.00	44.61	44.61	44.61	46.58	40.39	40.39	40.39	40.39	42.03	42.03	42.03

Table 142. Florida benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	247.21	265.67	304.77	351.90
GWPF	kg CO2e	247.13	265.58	304.66	351.76
GWPB	kg CO2e	0.09	0.10	0.12	0.14
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.68E-06	6.24E-06	7.38E-06	8.77E-06
AP	kg SO2e	1.25	1.30	1.43	1.57
EPT	kg Ne	0.30	0.32	0.36	0.41
EPM	kg N-eq	0.21	0.21	0.22	0.24
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	30.64	31.82	34.42	37.34
ADP _f	MJ	1761.89	1840.42	2023.16	2248.11
ADP _e	kg Sbe	7.04E-05	6.77E-05	6.86E-05	7.52E-05
RPRE	MJ	46.27	46.92	50.74	57.40
NRPRE	MJ	1865.26	1961.05	2174.33	2431.89
NRSF	MJ	97.89	107.91	128.50	153.32
SM	kg	77.72	85.68	102.03	121.73
FW	m3	3.12	3.11	3.11	3.10
CCE	kg CO2e	89.84	99.03	117.93	140.71
HWD	kg	0.22	0.22	0.22	0.22
NHWD	kg	2.65	2.67	2.80	3.02
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 143. Florida benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	234.57	248.11	277.61	325.56
GWPF	kg CO2e	234.49	248.02	277.51	325.45
GWPB	kg CO2e	0.09	0.09	0.11	0.12
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.34E-06	5.72E-06	6.55E-06	7.88E-06
AP	kg SO2e	1.23	1.27	1.36	1.50
EPT	kg Ne	0.27	0.29	0.32	0.40
EPM	kg N-eq	0.21	0.21	0.22	0.23
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	30.46	31.32	33.41	35.92
ADP _f	MJ	1675.33	1744.15	1900.38	2183.76
ADP _e	kg Sbe	4.63E-05	5.01E-05	5.84E-05	1.00E-04
RPRE	MJ	36.14	38.73	44.35	63.96
NRPRE	MJ	1787.76	1864.29	2036.81	2324.60
NRSF	MJ	91.66	98.63	113.48	137.27
SM	kg	72.77	78.31	90.10	108.98
FW	m3	3.19	3.19	3.22	3.20
CCE	kg CO2e	84.11	90.52	104.15	125.97
HWD	kg	0.22	0.22	0.22	0.22
NHWD	kg	2.31	2.40	2.59	3.24
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 144. Florida benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	384.80	429.50	555.19	626.52
GWPF	kg CO2e	384.65	429.33	555.04	626.35
GWPB	kg CO2e	0.16	0.18	0.20	0.22
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	9.63E-06	1.09E-05	1.40E-05	1.60E-05
AP	kg SO2e	1.69	1.83	2.22	2.44
EPT	kg Ne	0.46	0.51	0.77	0.87
EPM	kg N-eq	0.25	0.26	0.31	0.33
EPF	kg P-eq	0.05	0.05	0.07	0.08
SFP	kg O3e	39.97	42.90	50.09	54.57
ADP _f	MJ	2450.87	2660.40	3617.72	4025.15
ADP _e	kg Sbe	9.53E-05	9.72E-05	3.10E-04	3.54E-04
RPRE	MJ	67.44	72.14	160.75	183.16
NRPRE	MJ	2643.04	2886.80	3766.96	4194.69
NRSF	MJ	168.72	192.28	247.15	282.47
SM	kg	133.96	152.66	196.22	224.27
FW	m3	3.17	3.17	3.32	3.34
CCE	kg CO2e	154.84	176.46	226.81	259.22
HWD	kg	0.22	0.22	0.22	0.23
NHWD	kg	3.36	3.52	6.47	7.22
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 145. Florida benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	455.55	496.20	534.15
GWPF	kg CO2e	455.45	496.09	534.02
GWPB	kg CO2e	0.10	0.12	0.14
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.82E-06	7.94E-06	9.03E-06
AP	kg SO2e	2.64	2.78	2.90
EPT	kg Ne	0.99	1.04	1.08
EPM	kg N-eq	0.26	0.27	0.28
EPF	kg P-eq	0.11	0.12	0.12
SFP	kg O3e	43.29	45.93	48.40
ADPf	MJ	3514.33	3720.51	3908.65
ADPe	kg Sbe	4.22E-04	4.31E-04	4.39E-04
RPRE	MJ	306.59	315.10	321.38
NRPRE	MJ	3807.08	4041.95	4254.89
NRSF	MJ	107.86	127.83	147.37
SM	kg	85.63	101.50	117.00
FW	m3	2.17	2.16	2.16
CCE	kg CO2e	98.98	117.32	135.24
HWD	kg	0.22	0.22	0.22
NHWD	kg	2.59	2.77	2.96
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

ILLINOIS

Appendix D.17 / Regional concrete benchmark overview



Coverage: IL
State assignments follow the V4 source map.

REGION INDEX

METHODS AND SOURCES

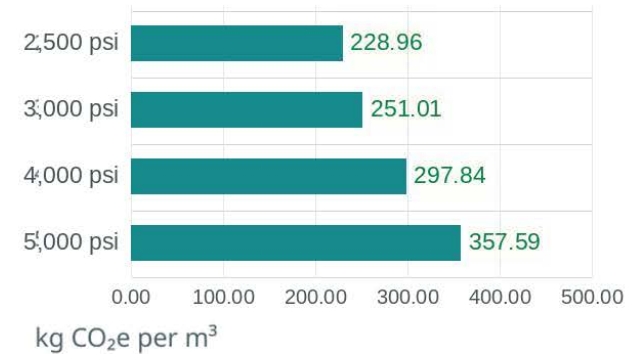
AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 146. Illinois A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	42.37	37.50	34.69	54.92	29.82	15.40	35.00	42.00	67.00
Rail Distance	mi	10.11	0.00	60.68	32.06	-1.18E+01	0.00	0.00	0.00	0.00
Ocean Distance	mi	1021.95	0.00	3,226.19	2,189.01	-145.11	0.00	0.00	0.00	0.00
Barge Distance	mi	297.81	359.00	383.01	436.36	159.26	0.00	0.00	359.00	395.00
SCM										
Truck Distance	mi	122.20	60.90	156.69	178.88	65.51	26.00	51.30	71.00	125.00
Rail Distance	mi	10.58	0.00	76.27	31.81	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	8390.37	15377.00	7,656.40	11160.04	5620.69	0.00	0.00	15377.00	15377.00
Barge Distance	mi	818.47	1500.00	746.87	1088.64	548.29	0.00	0.00	1500.00	1500.00
Aggregate										
Truck Distance	mi	28.54	25.80	26.56	38.21	18.87	0.00	17.30	33.00	46.00
Rail Distance	mi	3.49	0.00	18.88	10.36	-3.39	0.00	0.00	0.00	0.00
Ocean Distance	mi	1.92	0.00	15.29	7.49	-3.65	0.00	0.00	0.00	0.00
Barge Distance	mi	21.59	0.00	47.24	38.79	4.39	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	100.65	95.00	142.57	152.23	49.08	30.50	58.60	98.30	122.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	217.05	219.00	26.20	228.02	206.08	195.00	218.00	221.00	233.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 147. Illinois A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	85,519	80,095	67,015	104,679	66,360	26,176	73,357	84,466	116,757
Batch Waste	%	1.7824	2	0.5847	1.9325	1.632384	1.00E+00	2	2	2.0000
Purchased Electricity - Used at Plant	kWh	5.117	4.148	6.017	6.264	3.969	2.779	3.372	4.738	7.593
Natural Gas - Used at Plant	ft3	57.39	62.06	80.37	69.50	45.28	19.52	47.62	73.82	101.0
Diesel - Used at Plant	gal	0.02791	0	0.3507	0.04707	0.008756	0	0	0	0.04090
Fuel Oil - Used at Plant	gal	0.00E+00	0	0.00E+00	0.00E+00	0	0	0	0	0
Gasoline - Used at Plant	gal	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	1.926E-04	0	0.001491	5.735E-04	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0.001259	0	0.002893	0.002618	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	1.214	1.321	3.284	1.727	0.7000	0.5413	1.144	1.455	1.848
Purchased Electricity From Green Grid	kWh	0	0	0	0	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0.01629	0	0.09917	0.03912	0	0	0	0	0
Oil and Lubricants	lb	0.02414	0.00E+00	0.1046	0.04229	0.005985	0	0	5.222E-06	0.01044
Grease	lb	0.003362	0	0.04515	0.006377	3.463E-04	0	0	0.00E+00	0.003081
Total Water Use	gal	42.59	36.96	42.97	55.18	30.00	0.9996	21.74	56.52	67.21
Percentage of Batch Water That Is Recycled Wash Water	%	3.450	0	9.693	6.787	0.1127	0	0	0	0
Hazardous Solid Waste	lb	0	0	0	0	0	0	0	0	0
Non-Hazardous Solid Waste	lb	5.987	0	8.702	9.418	2.556	0	0	0.2309	5.899
Particulates, PM-2.5	lb	0.002128	1.593E-08	0.007976	0.003651	6.057E-04	0	0	2.320E-06	0.004159
Particulates, PM-10	lb	0.006646	2.514E-07	0.02221	0.01009	0.003205	0	0	1.227E-05	0.01969
Particulates, total	lb	0.01804	9.206E-07	0.05746	0.02748	0.008605	0	0	3.305E-05	0.05520
Lead	lb	0	0	0	0	0	0	0	0	0
Hg	lb	0	0	0	0	0	0	0	0	0

Table 148. Illinois benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	58.84	65.97	80.82	99.6	55.10	60.30	71.38	89.16	109.34	129.0	165.8	189.5	66.12	80.82	96.1
PLC	Portland limestone cement	lb	238.7	267.7	327.9	404.1	223.5	244.6	289.6	361.7	443.6	523.4	672.7	768.8	268.3	327.9	390.0
SC	Slag cement	lb	77.06	86.40	105.8	130.4	72.15	78.97	93.48	116.8	143.2	168.9	217.1	248.2	86.59	105.8	125.9
FA	Fly ash	lb	26.13	29.30	35.89	44.23	24.47	26.78	31.70	39.60	48.56	57.28	73.63	84.15	29.36	35.89	42.69
CCA	Crushed coarse aggregate	lb	1,516.5	1,488.5	1,444.5	1,386.5	1,530.7	1,505.3	1,472.0	1,424.3	1,420.4	1,365.9	1,639.4	1,639.6	0	0	0
NCA	Natural coarse aggregate	lb	244.9	239.9	232.9	223.9	247.2	242.6	237.4	230.0	229.3	219.9	263.9	263.9	0	0	0
CFA	Crushed fine aggregate	lb	14.00	14.00	13.99	12.99	15.84	16.05	16.61	14.82	13.9	12.93	8.50	7.06	14.00	12.00	10.99
NFA	Natural fine aggregate	lb	1,459.6	1,431.6	1,389.5	1,334.5	1,651.4	1,642.0	1,649.5	1,521.4	1,365.8	1,314.1	863.7	717.4	1,370.5	1,247.5	1,137.4
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	1,049.7	1,069.6	1,079.5
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	32.00	32.00	32.00	33.08	34.32	34.32	34.32	35.84	31.08	31.08	31.08	31.08	32.44	32.44	32.44

Table 149. Illinois benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	228.96	251.01	297.84	357.59
GWPF	kg CO2e	228.85	250.87	297.67	357.38
GWPB	kg CO2e	0.13	0.15	0.18	0.22
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.18E-06	5.77E-06	7.00E-06	8.56E-06
AP	kg SO2e	1.21	1.31	1.54	1.82
EPT	kg Ne	0.27	0.30	0.34	0.41
EPM	kg N-eq	0.19	0.21	0.24	0.29
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	28.50	31.10	36.57	43.49
ADP _f	MJ	1726.19	1844.78	2110.01	2457.81
ADP _e	kg Sbe	6.75E-05	6.49E-05	6.65E-05	7.44E-05
RPRE	MJ	43.69	44.46	48.61	56.04
NRPRE	MJ	1799.27	1934.05	2227.90	2607.44
NRSF	MJ	86.77	97.28	119.18	146.86
SM	kg	62.31	69.86	85.59	105.46
FW	m3	3.10	3.09	3.10	3.12
CCE	kg CO2e	79.62	89.27	109.36	134.76
HWD	kg	2.24E-03	2.51E-03	3.07E-03	3.78E-03
NHWD	kg	4.91	4.94	5.08	5.33
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 150. Illinois benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	215.98	232.72	268.69	328.43
GWPF	kg CO2e	215.86	232.59	268.54	328.24
GWPB	kg CO2e	0.13	0.14	0.16	0.20
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	4.87E-06	5.30E-06	6.22E-06	7.70E-06
AP	kg SO2e	1.16	1.23	1.41	1.68
EPT	kg Ne	0.25	0.27	0.31	0.40
EPM	kg N-eq	0.18	0.20	0.22	0.27
EPF	kg P-eq	0.02	0.03	0.03	0.04
SFP	kg O3e	27.44	29.35	33.50	39.95
ADP _f	MJ	1624.20	1724.56	1943.42	2344.93
ADP _e	kg Sbe	4.35E-05	4.76E-05	5.66E-05	9.93E-05
RPRE	MJ	33.80	36.58	42.59	62.83
NRPRE	MJ	1708.01	1815.72	2050.05	2454.94
NRSF	MJ	81.24	88.92	105.25	131.48
SM	kg	58.34	63.86	75.59	94.42
FW	m3	3.20	3.20	3.24	3.24
CCE	kg CO2e	74.55	81.59	96.58	120.65
HWD	kg	2.09E-03	2.29E-03	2.71E-03	3.38E-03
NHWD	kg	4.58	4.68	4.88	5.55
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 151. Illinois benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	391.04	453.26	590.65	669.52
GWPF	kg CO2e	390.80	452.98	590.36	669.19
GWPB	kg CO2e	0.25	0.29	0.34	0.39
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	9.37E-06	1.10E-05	1.40E-05	1.60E-05
AP	kg SO2e	1.98	2.28	2.89	3.26
EPT	kg Ne	0.46	0.52	0.80	0.91
EPM	kg N-eq	0.32	0.36	0.46	0.52
EPF	kg P-eq	0.04	0.05	0.07	0.07
SFP	kg O3e	47.32	54.58	68.36	77.11
ADP _f	MJ	2684.76	3040.85	4164.21	4678.92
ADP _e	kg Sbe	9.41E-05	9.82E-05	3.10E-04	3.55E-04
RPRE	MJ	65.73	71.98	160.10	182.27
NRPRE	MJ	2839.11	3231.53	4268.51	4797.44
NRSF	MJ	161.24	190.22	244.50	279.44
SM	kg	115.79	136.60	175.58	200.67
FW	m3	3.20	3.21	3.41	3.45
CCE	kg CO2e	147.96	174.55	224.35	256.42
HWD	kg	4.15E-03	4.89E-03	6.29E-03	7.19E-03
NHWD	kg	5.65	5.87	8.80	9.55
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 152. Illinois benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	491.12	542.41	593.52
GWPF	kg CO2e	490.98	542.24	593.31
GWPB	kg CO2e	0.15	0.18	0.22
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	6.45E-06	7.68E-06	8.95E-06
AP	kg SO2e	3.13	3.39	3.64
EPT	kg Ne	1.07	1.14	1.20
EPM	kg N-eq	0.34	0.38	0.41
EPF	kg P-eq	0.12	0.13	0.13
SFP	kg O3e	51.58	57.39	63.22
ADP _f	MJ	4096.21	4409.96	4717.65
ADP _e	kg Sbe	4.66E-04	4.79E-04	4.91E-04
RPRE	MJ	338.17	349.45	358.87
NRPRE	MJ	4383.52	4726.14	5060.29
NRSF	MJ	97.50	119.18	141.74
SM	kg	70.02	85.59	101.79
FW	m3	2.14	2.13	2.14
CCE	kg CO2e	89.47	109.36	130.06
HWD	kg	2.51E-03	3.07E-03	3.64E-03
NHWD	kg	4.86	5.05	5.28
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

DC METRO

Appendix D.18 / Metropolitan concrete benchmark overview



Coverage: DC Metro
State assignments follow the V4 source map.

REGION INDEX

Zip Directory

AT A GLANCE

Scope A1–A3

Basis 1 m³ of fresh concrete

BENCHMARK GWP

Normal-weight, air-entrained • 28 days



Other concrete classes remain in the full results.

Table 153. DC Metro A2 material transportation distance statistics

A2 Distance / Material-Mode	Unit	Average Facility A2 Distance	Median	St Dev	95% CI High	95% CI Low	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Cement										
Truck Distance	mi	95.17	84.00	43.18	121.20	69.14	72.00	83.00	91.00	97.00
Rail Distance	mi	1.81	0.00	11.30	8.62	-5.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCM										
Truck Distance	mi	74.77	56.00	35.02	95.88	53.67	51.60	55.40	62.00	125.00
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	2.65	0.00	16.54	12.62	-7.32	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aggregate										
Truck Distance	mi	32.86	32.60	26.86	49.06	16.67	8.00	9.00	32.60	64.00
Rail Distance	mi	5.32	0.00	15.06	14.40	-3.76	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Admixture										
Truck Distance	mi	289.57	178.00	344.52	497.25	81.88	57.70	178.00	184.00	192.50
Rail Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufactured Lightweight Aggregate										
Truck Distance	mi	202.13	346.00	177.92	309.38	94.87	6.00	15.00	370.00	373.00
Rail Distance	mi	154.90	0.00	176.49	261.30	48.51	0.00	0.00	356.00	356.00
Ocean Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barge Distance	mi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 154. DC Metro A3 manufacturing flow statistics

A3 Flow / Facility Parameter	Unit	Average Facility A3 Flow	Median	St Dev	Upper confidence limit	Lower confidence limit	20th Percentile	40th Percentile	60th Percentile	80th Percentile
Total Concrete Production	yd3	103,875	114,364	51,819	132,044	75,706	44,966	97,106	118,498	142,447
Batch Waste	%	1.743	2.0000	0.599	2.141	1.3458	1.00E+00	2.0000	2.000	2.000
Purchased Electricity - Used at Plant	kWh	4.312	4.479	2.294	5.514	3.110	3.396	3.955	4.790	6.234
Natural Gas - Used at Plant	ft3	14.24	0.1952	15.10	23.29	5.193	0	0	9.766	28.04
Diesel - Used at Plant	gal	0.1265	0	0.3727	0.3709	0	0	0	0	0
Fuel Oil - Used at Plant	gal	0	0	0	0	0	0	0	0	0
Gasoline - Used at Plant	gal	0	0	0	0	0	0	0	0	0
LPG (Liquified Propane Gas) - Used at Plant	gal	0.001790	0	0.003721	0.004636	0	0	0	0	0
Natural Gas - Used in Fleet	ft3	0	0	0	0	0	0	0	0	0
Transit Mix Only - Diesel - Used in Fleet	gal	1.488	1.145	1.251	2.268	0.7080	0.8760	1.053	1.324	1.506
Purchased Electricity From Green Grid	kWh	0	0	0	0	0	0	0	0	0
Site Generated Renewable Electricity (solar, wind) - Used at Plant	kWh	0	0	0	0	0	0	0	0	0
Road Dust Control Chemicals (e.g. chlorides)	lb	0	0	0	0	0	0	0	0	0
Oil and Lubricants	lb	0.005860	0.003654	0.03063	0.01199	0	0	0.003176	0.004114	0.007650
Grease	lb	0.003097	3.197E-04	0.005346	0.005661	5.332E-04	0	2.779E-04	0.002560	0.005135
Total Water Use	gal	43.15	34.72	24.84	53.94	32.37	27.10	34.01	39.42	73.32
Percentage of Batch Water That Is Recycled Wash Water	%	15.06	0	20.21	28.96	1.154	0	0	2.400	32.00
Hazardous Solid Waste	lb	0	0	0	0	0	0	0	0	0
Non-Hazardous Solid Waste	lb	9.820	0.4045	14.45	22.59	0	0	0	0.7311	10.87
Particulates, PM-2.5	lb	0	0	0	0	0	0	0	0	0
Particulates, PM-10	lb	0.004436	0	0.007661	0.009376	0	0	0	0	0.002357
Particulates, total	lb	0.003991	0	0.01422	0.01111	0	0	0	0	0
Lead	lb	0.001145	8.206E-08	0.002117	0.002414	0	0	0	8.365E-07	0.003045
Hg	lb	1.598E-06	0	3.046E-06	3.318E-06	0	0	0	0	5.340E-06

Table 155. DC Metro benchmark mix compositions - per 1 U.S. yd³ of fresh concrete; batch water in U.S. gal

Code	Material	Unit	NW-AE 2500	NW-AE 3000	NW-AE 4000	NW-AE 5000	NW-NAE 2500	NW-NAE 3000	NW-NAE 4000	NW-NAE 5000	NW-NAE 6000	NW-NAE 8000	NW-NAE 10000	NW-NAE 12000	LW-AE 3000	LW-AE 4000	LW-AE 5000
PC	Portland cement	lb	47.34	53.05	65.02	80.17	44.33	48.49	57.42	71.77	87.83	104.10	133.8	152.9	53.11	65.02	77.29
PLC	Portland limestone cement	lb	262.1	293.7	360.0	443.8	245.4	268.5	317.9	397.4	486.3	576.3	740.8	846.6	294.0	360.0	427.9
SC	Slag cement	lb	115.6	129.6	158.8	195.8	108.3	118.4	140.2	175.3	214.5	254.2	326.8	373.5	129.7	158.8	188.7
FA	Fly ash	lb	8.24	9.24	11.32	13.96	7.72	8.44	10.00	12.50	15.29	18.13	23.30	26.63	9.25	11.32	13.46
CCA	Crushed coarse aggregate	lb	1,393.2	1,366.4	1,326.8	1,261.7	1,390.2	1,365.2	1,331.8	1,270.8	1,291.6	1,230.1	1,418.7	1,408.4	0	0	0
NCA	Natural coarse aggregate	lb	325.5	319.6	310.7	294.9	324.8	319.3	311.8	297.0	302.5	287.6	331.7	329.2	0	0	0
CFA	Crushed fine aggregate	lb	186.3	182.3	177.4	168.5	208.3	206.6	207.5	188.3	172.1	164.7	104.1	85.83	182.4	164.4	149.5
NFA	Natural fine aggregate	lb	1,229.0	1,205.1	1,170.5	1,113.2	1,374.2	1,365.7	1,369.0	1,244.3	1,139.4	1,084.3	685.2	564.9	1,203.4	1,088.8	985.1
MLA	Manufactured lightweight aggregate	lb	0	0	0	0	0	0	0	0	0	0	0	0	991.9	1,012.6	1,023.2
AE	Air-entraining admixture	lb	0.0717	0.0717	0.0717	0.0717	0	0	0	0	0	0	0	0	0.0717	0.0717	0.0000
PSP	Plasticizer/superplasticizer	lb	0.2152	0.2152	0.2152	0.5020	0.8643	0.9561	1.1696	3.4508	0.2152	0.2152	5.5752	6.3720	0.2152	0.5020	0.5020
SA	Set accelerator	lb	1.7930	1.4344	1.0758	0.7172	0	0	0	0	1.7930	1.4344	7.9646	9.1028	1.0758	0.7172	0.7172
BW	Batch water	U.S. gal	34.61	34.61	34.61	35.79	37.13	37.13	37.13	38.77	33.62	33.62	33.62	33.62	35.04	35.04	35.04

Table 156. DC Metro benchmark - Normal-Weight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-AE-2500	NW-AE-3000	NW-AE-4000	NW-AE-5000
GWPT	kg CO2e	209.78	229.79	272.65	327.32
GWPF	kg CO2e	209.65	229.64	272.47	327.09
GWPB	kg CO2e	0.14	0.16	0.20	0.24
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.86E-06	6.54E-06	7.95E-06	9.74E-06
AP	kg SO2e	0.74	0.80	0.92	1.07
EPT	kg Ne	0.26	0.28	0.33	0.39
EPM	kg N-eq	0.08	0.08	0.09	0.10
EPF	kg P-eq	0.03	0.03	0.04	0.04
SFP	kg O3e	15.37	16.42	18.69	21.51
ADP _f	MJ	1394.79	1478.86	1673.77	1930.69
ADP _e	kg Sbe	7.02E-05	6.80E-05	7.03E-05	7.90E-05
RPRE	MJ	47.51	48.52	53.22	61.35
NRPRE	MJ	1510.97	1616.35	1850.75	2153.24
NRSF	MJ	89.78	100.60	123.30	152.03
SM	kg	74.77	83.78	102.68	126.61
FW	m3	2.89	2.88	2.89	2.88
CCE	kg CO2e	82.38	92.31	113.14	139.50
HWD	kg	2.37E-03	2.66E-03	3.26E-03	4.02E-03
NHWD	kg	7.25	7.28	7.43	7.69
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 157. DC Metro benchmark - Normal-Weight - Non-Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-2500	NW-NAE-3000	NW-NAE-4000	NW-NAE-5000
GWPT	kg CO2e	197.46	212.68	245.65	300.55
GWPF	kg CO2e	197.33	212.54	245.48	300.35
GWPB	kg CO2e	0.14	0.15	0.18	0.21
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	5.51E-06	6.01E-06	7.06E-06	8.75E-06
AP	kg SO2e	0.72	0.76	0.85	1.00
EPT	kg Ne	0.23	0.25	0.29	0.38
EPM	kg N-eq	0.08	0.08	0.08	0.09
EPF	kg P-eq	0.03	0.03	0.03	0.04
SFP	kg O3e	15.02	15.80	17.54	20.11
ADP _f	MJ	1305.67	1380.64	1546.20	1861.43
ADP _e	kg Sbe	4.61E-05	5.05E-05	6.00E-05	1.04E-04
RPRE	MJ	37.50	40.45	46.86	67.75
NRPRE	MJ	1429.80	1515.84	1705.00	2036.71
NRSF	MJ	84.06	91.96	108.89	136.11
SM	kg	70.00	76.58	90.68	113.35
FW	m3	2.97	2.97	2.99	2.97
CCE	kg CO2e	77.13	84.38	99.91	124.89
HWD	kg	2.22E-03	2.43E-03	2.87E-03	3.59E-03
NHWD	kg	6.92	7.02	7.23	7.91
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 158. DC Metro benchmark - High-Strength - A1-A3 total results per cubic meter

Indicator	Unit	NW-NAE-6000	NW-NAE-8000	NW-NAE-10000	NW-NAE-12000
GWPT	kg CO2e	357.39	415.79	543.20	615.85
GWPF	kg CO2e	357.14	415.49	542.88	615.49
GWPB	kg CO2e	0.27	0.32	0.37	0.42
GWPL	kg CO2e	-	-	-	-
ODP	kg CFC11e	1.06E-05	1.26E-05	1.61E-05	1.83E-05
AP	kg SO2e	1.15	1.31	1.66	1.86
EPT	kg Ne	0.43	0.50	0.76	0.87
EPM	kg N-eq	0.10	0.11	0.14	0.16
EPF	kg P-eq	0.05	0.06	0.07	0.08
SFP	kg O3e	23.18	26.23	31.98	35.62
ADP _f	MJ	2107.26	2375.65	3321.22	3724.20
ADP _e	kg Sbe	9.91E-05	1.04E-04	3.18E-04	3.64E-04
RPRE	MJ	71.27	78.49	167.94	190.98
NRPRE	MJ	2341.11	2661.48	3547.82	3982.48
NRSF	MJ	166.56	197.41	253.74	290.01
SM	kg	138.71	164.40	211.31	241.51
FW	m3	2.96	2.95	3.09	3.12
CCE	kg CO2e	152.84	181.14	232.83	266.11
HWD	kg	4.39E-03	5.21E-03	6.70E-03	7.65E-03
NHWD	kg	8.02	8.25	11.21	11.96
HLRW	m3	-	-	-	-
ILLRW	m3	-	-	-	-

Table 159. DC Metro benchmark - Lightweight - Air-Entrained - A1-A3 total results per cubic meter

Indicator	Unit	LW-AE-3000	LW-AE-4000	LW-AE-5000
GWPT	kg CO2e	458.39	506.16	553.07
GWPF	kg CO2e	458.24	505.97	552.85
GWPB	kg CO2e	0.16	0.20	0.24
GWPL	kg CO2e	-	-	-
ODP	kg CFC11e	7.18E-06	8.60E-06	1.01E-05
AP	kg SO2e	2.56	2.71	2.85
EPT	kg Ne	1.02	1.08	1.14
EPM	kg N-eq	0.21	0.22	0.23
EPF	kg P-eq	0.12	0.12	0.13
SFP	kg O3e	37.27	39.94	42.47
ADP _f	MJ	3626.06	3872.71	4107.74
ADP _e	kg Sbe	4.46E-04	4.61E-04	4.73E-04
RPRE	MJ	325.83	337.88	348.01
NRPRE	MJ	3950.95	4237.58	4510.22
NRSF	MJ	100.71	123.30	146.56
SM	kg	83.87	102.68	122.05
FW	m3	1.98	1.97	1.96
CCE	kg CO2e	92.41	113.14	134.48
HWD	kg	2.66E-03	3.26E-03	3.87E-03
NHWD	kg	7.21	7.41	7.64
HLRW	m3	-	-	-
ILLRW	m3	-	-	-

APPENDIX E — METRO ZIP CODE DIRECTORY

The four metropolitan benchmark study areas are defined by the ZIP-code lists below. Metro overview maps are illustrative and use matched 2020 Census ZIP Code Tabulation Areas (ZCTAs) where available; ZCTAs approximate ZIP service areas and are not a USPS boundary certification.

Greater Los Angeles Metro (706 ZIP codes)

Major-city context shown on the overview map: Los Angeles, Long Beach, Riverside, and San Bernardino.

ZIP codes (sorted; source list retained without deletions)									
90001	90002	90003	90004	90005	90006	90007	90008	90009	90010
90011	90012	90013	90014	90015	90016	90017	90018	90019	90020
90021	90022	90023	90024	90025	90026	90027	90028	90029	90030
90031	90032	90033	90034	90035	90036	90037	90038	90039	90040
90041	90042	90043	90044	90045	90046	90047	90048	90049	90050
90051	90052	90053	90054	90055	90056	90057	90058	90059	90060
90061	90062	90063	90064	90065	90066	90067	90068	90069	90070
90071	90072	90073	90074	90075	90076	90077	90078	90079	90080
90081	90082	90083	90084	90085	90086	90087	90088	90089	90091
90093	90094	90095	90096	90099	90134	90140	90189	90201	90202
90205	90209	90210	90211	90212	90213	90220	90221	90222	90223
90224	90230	90231	90232	90239	90240	90241	90242	90245	90247
90248	90249	90250	90251	90254	90255	90260	90262	90263	90264
90265	90266	90267	90270	90272	90274	90275	90277	90278	90280
90290	90291	90292	90293	90294	90295	90296	90301	90302	90303
90304	90305	90306	90307	90308	90309	90310	90311	90312	90401
90402	90403	90404	90405	90406	90407	90408	90409	90410	90411
90501	90502	90503	90504	90505	90506	90507	90508	90509	90510
90601	90602	90603	90604	90605	90606	90607	90608	90609	90610
90620	90621	90622	90623	90624	90630	90631	90632	90633	90637
90638	90639	90640	90650	90651	90652	90660	90661	90662	90670
90671	90680	90701	90702	90703	90706	90707	90710	90711	90712
90713	90714	90715	90716	90717	90720	90721	90723	90731	90732
90733	90734	90740	90742	90743	90744	90745	90746	90747	90748
90749	90755	90801	90802	90803	90804	90805	90806	90807	90808
90809	90810	90813	90814	90815	90822	90831	90832	90833	90840
90842	90844	90846	90847	90848	90853	90895	91001	91003	91006
91007	91008	91009	91010	91011	91012	91016	91017	91020	91021
91023	91024	91025	91030	91031	91040	91041	91042	91043	91046
91066	91077	91101	91102	91103	91104	91105	91106	91107	91108
91109	91110	91114	91115	91116	91117	91118	91121	91123	91124

ZIP codes (sorted; source list retained without deletions)									
91125	91126	91129	91182	91184	91185	91188	91189	91199	91201
91202	91203	91204	91205	91206	91207	91208	91209	91210	91214
91221	91222	91224	91225	91226	91301	91302	91303	91304	91305
91306	91307	91308	91309	91311	91313	91316	91321	91322	91324
91325	91326	91327	91328	91330	91331	91333	91334	91335	91337
91340	91341	91342	91343	91344	91345	91346	91352	91353	91355
91356	91357	91361	91362	91364	91365	91367	91371	91372	91376
91381	91385	91392	91393	91394	91395	91396	91401	91402	91403
91404	91405	91406	91407	91408	91409	91410	91411	91412	91413
91416	91423	91426	91436	91470	91482	91499	91501	91502	91503
91504	91505	91506	91507	91508	91510	91521	91522	91523	91601
91602	91603	91604	91605	91606	91607	91608	91609	91610	91614
91615	91616	91617	91618	91701	91702	91706	91708	91709	91710
91711	91714	91715	91716	91722	91723	91724	91729	91730	91731
91732	91733	91734	91735	91737	91739	91740	91741	91743	91744
91745	91746	91747	91748	91749	91750	91752	91754	91755	91756
91758	91761	91762	91763	91764	91765	91766	91767	91768	91769
91770	91771	91772	91773	91775	91776	91778	91780	91784	91785
91786	91788	91789	91790	91791	91792	91793	91801	91802	91803
91804	91896	91899	92313	92316	92318	92324	92331	92334	92335
92336	92337	92346	92350	92354	92357	92359	92369	92373	92374
92375	92376	92377	92399	92401	92402	92403	92404	92405	92406
92407	92408	92410	92411	92413	92415	92418	92423	92501	92502
92503	92504	92505	92506	92507	92508	92509	92513	92514	92516
92517	92518	92519	92521	92522	92530	92551	92552	92553	92554
92555	92556	92557	92570	92571	92602	92603	92604	92605	92606
92607	92609	92610	92612	92614	92615	92616	92617	92618	92619
92620	92623	92624	92625	92626	92627	92628	92629	92630	92637
92646	92647	92648	92649	92650	92651	92652	92653	92654	92655
92656	92657	92658	92659	92660	92661	92662	92663	92672	92673
92674	92675	92676	92677	92678	92679	92683	92684	92685	92688
92690	92691	92692	92693	92694	92697	92698	92701	92702	92703
92704	92705	92706	92707	92708	92709	92710	92711	92712	92725
92728	92735	92780	92781	92782	92799	92801	92802	92803	92804
92805	92806	92807	92808	92809	92811	92812	92814	92815	92816
92817	92821	92822	92823	92825	92831	92832	92833	92834	92835
92836	92837	92838	92840	92841	92842	92843	92844	92845	92846

ZIP codes (sorted; source list retained without deletions)									
92850	92856	92857	92859	92860	92861	92862	92863	92864	92865
92866	92867	92868	92869	92870	92871	92877	92878	92879	92880
92881	92882	92883	92885	92886	92887				

Bay Area Metro (281 ZIP codes)

Major-city context shown on the overview map: San Francisco, San Jose, Oakland, and Santa Rosa.

ZIP codes (sorted; source list retained without deletions)									
94002	94005	94010	94014	94015	94018	94019	94020	94021	94022
94024	94025	94027	94028	94030	94037	94038	94040	94041	94043
94044	94060	94061	94062	94063	94065	94066	94070	94074	94080
94085	94086	94087	94089	94102	94103	94104	94105	94107	94108
94109	94110	94111	94112	94114	94115	94116	94117	94118	94121
94122	94123	94124	94127	94128	94129	94130	94131	94132	94133
94134	94158	94188	94301	94303	94304	94305	94306	94401	94402
94403	94404	94501	94502	94503	94506	94507	94509	94510	94511
94512	94513	94514	94516	94517	94518	94519	94520	94521	94523
94525	94526	94528	94530	94531	94533	94534	94535	94536	94538
94539	94541	94542	94544	94545	94546	94547	94548	94549	94550
94551	94552	94553	94555	94556	94558	94559	94560	94561	94562
94563	94564	94565	94566	94568	94569	94571	94572	94573	94574
94575	94576	94577	94578	94579	94580	94582	94583	94585	94586
94587	94588	94589	94590	94591	94592	94595	94596	94597	94598
94599	94601	94602	94603	94605	94606	94607	94608	94609	94610
94611	94612	94613	94618	94619	94620	94621	94702	94703	94704
94705	94706	94707	94708	94709	94710	94720	94801	94803	94804
94805	94806	94901	94903	94904	94920	94922	94923	94924	94925
94928	94929	94930	94931	94933	94937	94938	94939	94940	94941
94945	94946	94947	94949	94951	94952	94954	94956	94957	94960
94963	94964	94965	94970	94971	94973	95002	95008	95013	95014
95020	95030	95032	95033	95035	95037	95046	95050	95051	95053
95054	95070	95110	95111	95112	95113	95116	95117	95118	95119
95120	95121	95122	95123	95124	95125	95126	95127	95128	95129
95130	95131	95132	95133	95134	95135	95136	95138	95139	95140
95148	95391	95401	95403	95404	95405	95407	95409	95416	95431
95433	95436	95439	95442	95444	95452	95472	95476	95492	95687
95688									

San Diego Metro (161 ZIP codes)

Major-city context shown on the overview map: San Diego, Oceanside, and Escondido.

ZIP codes (sorted; source list retained without deletions)									
91901	91902	91903	91908	91909	91910	91911	91912	91913	91914
91915	91921	91932	91933	91935	91941	91942	91943	91944	91945
91946	91950	91951	91976	91977	91978	91979	92003	92007	92008
92009	92010	92011	92013	92014	92018	92019	92020	92021	92022
92023	92024	92025	92026	92027	92028	92029	92030	92033	92037
92038	92039	92040	92046	92049	92051	92052	92054	92056	92057
92058	92059	92060	92061	92064	92065	92067	92068	92069	92070
92071	92072	92074	92075	92078	92079	92081	92082	92083	92084
92085	92091	92092	92093	92096	92101	92102	92103	92104	92105
92106	92107	92108	92109	92110	92111	92112	92113	92114	92115
92116	92117	92118	92119	92120	92121	92122	92123	92124	92126
92127	92128	92129	92130	92131	92132	92134	92135	92136	92137
92138	92139	92140	92142	92145	92147	92149	92150	92152	92153
92154	92155	92159	92160	92161	92163	92165	92166	92167	92168
92169	92170	92171	92172	92173	92174	92175	92176	92177	92178
92182	92186	92187	92191	92192	92193	92195	92196	92197	92198
92199									

DC Metro (612 ZIP codes)

Major-city context shown on the overview map: Washington, Arlington, Alexandria, and Rockville.

ZIP codes (sorted; source list retained without deletions)									
20001	20002	20003	20004	20005	20006	20007	20008	20009	20010
20011	20012	20013	20015	20016	20017	20018	20019	20020	20022
20024	20026	20027	20029	20030	20032	20033	20035	20036	20037
20038	20039	20040	20041	20042	20043	20044	20045	20047	20049
20050	20052	20053	20055	20056	20057	20058	20059	20060	20061
20062	20063	20064	20065	20066	20067	20068	20069	20070	20071
20073	20074	20075	20076	20077	20078	20080	20081	20082	20090
20091	20201	20202	20203	20204	20206	20207	20208	20210	20211
20212	20213	20214	20215	20216	20217	20218	20219	20220	20221
20222	20223	20224	20226	20227	20228	20229	20230	20232	20233
20235	20237	20238	20239	20240	20241	20242	20244	20245	20250
20251	20252	20254	20260	20261	20262	20265	20266	20268	20270
20277	20289	20299	20301	20303	20306	20310	20314	20317	20318

ZIP codes (sorted; source list retained without deletions)									
20319	20330	20340	20350	20355	20370	20372	20373	20374	20375
20376	20380	20388	20389	20390	20391	20392	20393	20394	20395
20398	20401	20402	20403	20404	20405	20406	20407	20408	20410
20411	20412	20413	20414	20415	20416	20417	20418	20419	20420
20421	20422	20423	20424	20425	20426	20427	20428	20429	20431
20433	20434	20435	20436	20437	20439	20440	20442	20444	20447
20451	20453	20456	20460	20463	20468	20469	20470	20472	20500
20501	20502	20503	20504	20505	20506	20507	20508	20509	20510
20511	20515	20520	20521	20522	20523	20524	20525	20526	20527
20528	20529	20530	20531	20533	20534	20535	20536	20537	20538
20539	20540	20541	20542	20543	20544	20546	20547	20548	20549
20551	20552	20553	20554	20555	20557	20559	20560	20565	20566
20570	20571	20572	20573	20575	20576	20577	20578	20579	20580
20581	20585	20586	20588	20590	20591	20593	20594	20597	20599
20601	20602	20603	20604	20606	20607	20608	20609	20610	20611
20612	20613	20615	20616	20617	20618	20619	20620	20621	20622
20623	20624	20625	20626	20627	20628	20629	20630	20632	20634
20635	20636	20637	20639	20640	20643	20645	20646	20650	20653
20656	20657	20658	20659	20660	20661	20662	20664	20667	20670
20674	20675	20676	20677	20678	20680	20682	20684	20685	20686
20687	20688	20689	20690	20692	20693	20695	20697	20701	20703
20704	20705	20706	20707	20708	20709	20710	20711	20712	20714
20715	20716	20717	20718	20719	20720	20721	20722	20723	20724
20725	20726	20731	20732	20733	20735	20736	20737	20738	20740
20741	20742	20743	20744	20745	20746	20747	20748	20749	20750
20751	20752	20753	20754	20755	20757	20758	20759	20762	20763
20764	20765	20768	20769	20770	20771	20772	20773	20774	20775
20776	20777	20778	20779	20781	20782	20783	20784	20785	20787
20788	20790	20791	20792	20794	20797	20799	20810	20811	20812
20813	20814	20815	20816	20817	20818	20824	20825	20827	20830
20832	20833	20837	20838	20839	20841	20842	20847	20848	20849
20850	20851	20852	20853	20854	20855	20857	20859	20860	20861
20862	20866	20868	20871	20872	20874	20875	20876	20877	20878
20879	20880	20882	20883	20884	20885	20886	20889	20891	20892
20894	20895	20896	20897	20898	20899	20901	20902	20903	20904

ZIP codes (sorted; source list retained without deletions)									
20905	20906	20907	20908	20910	20911	20912	20913	20914	20915
20916	20918	20993	20997	22003	22009	22015	22027	22030	22031
22032	22033	22034	22035	22036	22037	22038	22039	22040	22041
22042	22043	22044	22046	22060	22067	22079	22081	22082	22101
22102	22103	22106	22107	22108	22109	22116	22118	22119	22121
22122	22124	22125	22150	22151	22152	22153	22156	22158	22159
22160	22161	22180	22181	22182	22183	22185	22191	22192	22199
22201	22202	22203	22204	22205	22206	22207	22209	22210	22211
22212	22213	22214	22215	22216	22217	22219	22225	22226	22227
22230	22240	22241	22242	22243	22244	22245	22246	22301	22302
22303	22304	22305	22306	22307	22308	22309	22310	22311	22312
22313	22314	22315	22320	22331	22332	22333	22334	22350	56901
56902	56904	56908	56915	56920	56933	56935	56944	56945	56950
56965	56966								

APPENDIX F — SECONDARY DATA SOURCES AND DATA QUALITY SCHEDULE

This schedule summarizes the secondary data sources used in the V4 model for upstream materials, energy, water, and transportation processes. SimaPro desktop 10.4 was used to prepare and characterize the background material and process datasets and to generate the background impact factors used by the V4 model. WAP's Theta Concrete Version 1.2 applied those background factors to the NRMCA foreground inventories, transportation data, and benchmark mix designs to generate the published life cycle inventory and LCIA results. LCIA calculations use the methods required by NSF 1112-26 Concrete PCR Version 3, including TRACI 2.2 for the applicable non-GWP impact categories. Secondary-data selection follows NSF 1112-26 Annex A, Default Data Sources, Version 1 (July 2025).

Table 160. Input / process / V4 source / Geography

Input / process	Specific V4 source / dataset	Data year / version	Geography
Portland cement and portland-limestone cement	American Cement Association industry-average EPDs	2023	North America / U.S.
Slag cement	Slag Cement Association industry-average EPD	2021	North America / U.S.
Fly ash	No incoming production or preparation burden; participant-reported A2 transportation included	V4 PCR treatment	U.S.
Construction aggregates	NSSGA LCA Data for Construction Aggregates - exploded/washed or non-exploded/washed aggregate	2025	U.S.
Lightweight aggregate	ecoinvent 3.10 expanded clay production	ecoinvent 3.10	Appropriate geography
Concrete admixtures	European Federation of Concrete Admixture Associations industry EPDs	2021	Europe / proxy
Batch / process water	ecoinvent 3.10 Tap water {RoW} market for Cut-off	ecoinvent 3.10	RoW / generic proxy; no grid adjustment applied
Electricity - United States	Federal LCA Commons / USLCI DOE/NETL balancing-authority electricity datasets	2022	U.S. regional
Truck transport	USLCI combination truck, short-haul or long-haul, diesel powered, tkm/RNA	2010	U.S.
Rail transport	USLCI train, diesel powered, tkm/US	2012	U.S.
Ocean transport	USLCI ocean freighter, average fuel mix, tkm/US	2023	U.S. / global route
Barge transport	USLCI barge, average fuel mix	2007	U.S.
Natural gas - plant / fleet	Federal LCA Commons / USLCI natural-gas production and combustion datasets used in the controlled V4 source schedule	Created 2015; updated 2024	U.S.

Table 160 (continued)

Input / process	Specific V4 source / dataset	Data year / version	Geography
Diesel	Federal LCA Commons / USLCI diesel production and combustion datasets used in the controlled V4 source schedule	Created 2015; updated 2023	U.S.
Residual fuel oil	Federal LCA Commons / USLCI residual-fuel-oil production and combustion datasets	Created 2013; updated 2024	U.S.
Gasoline	Federal LCA Commons / USLCI gasoline production and combustion datasets	Created 2015; updated 2023	U.S.
Liquefied petroleum gas (LPG)	Federal LCA Commons / USLCI LPG production and combustion dataset	2014	U.S.
Hazardous solid waste	ecoinvent 3.10: Hazardous waste, for incineration {RoW} treatment of hazardous waste, hazardous waste incineration Alloc, Rec, U	ecoinvent 3.10	RoW
Non-hazardous solid waste	ecoinvent 3.10: Inert waste {RoW} treatment of, sanitary landfill Alloc Rec, U	ecoinvent 3.10	RoW
Road-dust-control chemicals	ecoinvent 3.10: Chemicals inorganic, at plant/GLO	ecoinvent 3.10	global
Oil and lubricants	Diesel, at refinery//US/ USLCI 2014 — used as a conservative proxy because these ancillary flows are minor contributors to A1-A3 results and no more representative U.S.-specific oil/grease dataset was available; the low-significance proxy does not affect the study conclusions.	2014	U.S.
Grease	Diesel, at refinery//US/ USLCI 2014 — used as a conservative proxy because these ancillary flows are minor contributors to A1-A3 results and no more representative U.S.-specific oil/grease dataset was available; the low-significance proxy does not affect the study conclusions.	2014	U.S.

APPENDIX G — NATIONAL A1-A3 MODULE BREAKDOWN RESULTS

This appendix reports the separate A1, A2, and A3 results per cubic meter for all 120 Version 4 national-average products. Total A1-A3 results are presented in Section 5.1.2.

Table 161. NRMCA national average - Normal-Weight 2,500 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	2500-00-FA/SL-AE	2500-20-FA-AE	2500-30-FA-AE	2500-30-SL-AE	2500-40-FA-AE	2500-40-SL-AE	2500-50-FA/SL-AE	2500-50-SL-AE
GWPT	kg CO2e	239.22	203.87	184.76	183.12	164.59	164.42	144.82	145.72
GWPF	kg CO2e	239.08	203.76	184.66	183.03	164.51	164.35	144.76	145.67
GWPB	kg CO2e	0.15	0.12	0.10	0.10	0.09	0.08	0.06	0.06
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	5.51E-06	4.65E-06	4.19E-06	5.75E-06	3.70E-06	5.83E-06	4.91E-06	5.91E-06
AP	kg SO2e	0.51	0.44	0.40	0.53	0.36	0.54	0.46	0.55
EPT	kg Ne	0.32	0.28	0.26	0.27	0.24	0.25	0.23	0.24
EPM	kg N-eq	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02
EPF	kg P-eq	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
SFP	kg O3e	9.78	8.47	7.76	10.29	7.02	10.45	9.00	10.62
ADP _f	MJ	1349.53	1182.46	1092.14	1041.25	996.81	938.49	857.95	835.73
ADP _e	kg Sbe	1.08E-04	1.05E-04	1.04E-04	1.01E-04	1.02E-04	9.92E-05	9.83E-05	9.71E-05
RPRE	MJ	59.36	55.35	53.19	53.45	50.91	51.48	49.14	49.51
NRPRE	MJ	1298.31	1128.60	1036.86	1142.77	940.03	1090.92	964.87	1039.07
NRSF	MJ	126.76	106.75	95.93	88.73	84.51	76.06	66.72	63.38
SM	kg	0.00	54.51	83.97	77.68	115.08	103.57	136.27	129.46
FW	m3	2.23	2.15	2.10	2.16	2.06	2.13	2.07	2.11
CCE	kg CO2e	116.32	97.95	88.03	81.42	77.55	69.79	61.22	58.16
HWD	kg	3.10E-03	2.61E-03	2.35E-03	2.41E-03	2.08E-03	2.18E-03	1.89E-03	1.95E-03
NHWD	kg	2.10	1.95	1.87	1.73	1.78	1.60	1.55	1.48
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 162. NRMCA national average - Normal-Weight 3,000 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	3000-00-FA/SL-AE	3000-20-FA-AE	3000-30-FA-AE	3000-30-SL-AE	3000-40-FA-AE	3000-40-SL-AE	3000-50-FA/SL-AE	3000-50-SL-AE
GWPT	kg CO2e	269.96	229.90	208.25	206.39	185.40	185.21	162.99	164.02
GWPF	kg CO2e	269.80	229.78	208.14	206.29	185.31	185.12	162.93	163.96
GWPB	kg CO2e	0.17	0.14	0.12	0.11	0.10	0.09	0.07	0.07
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	6.23E-06	5.26E-06	4.73E-06	6.50E-06	4.18E-06	6.59E-06	5.55E-06	6.68E-06
AP	kg SO2e	0.57	0.49	0.45	0.59	0.40	0.60	0.52	0.61
EPT	kg Ne	0.36	0.32	0.29	0.30	0.27	0.29	0.26	0.27
EPM	kg N-eq	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
EPF	kg P-eq	0.04	0.03	0.03	0.03	0.02	0.03	0.02	0.03
SFP	kg O3e	10.83	9.34	8.54	11.40	7.69	11.59	9.94	11.78
ADP _f	MJ	1513.08	1323.75	1221.42	1163.74	1113.39	1047.30	956.03	930.85
ADP _e	kg Sbe	1.22E-04	1.19E-04	1.17E-04	1.15E-04	1.15E-04	1.12E-04	1.11E-04	1.10E-04
RPRE	MJ	67.25	62.71	60.26	60.55	57.67	58.32	55.66	56.09
NRPRE	MJ	1455.01	1262.70	1158.74	1278.75	1049.02	1219.99	1077.16	1161.24
NRSF	MJ	143.64	120.96	108.70	100.55	95.76	86.18	75.60	71.82
SM	kg	0.00	61.77	95.16	88.02	130.40	117.36	154.42	146.70
FW	m3	2.25	2.16	2.11	2.17	2.05	2.14	2.07	2.11
CCE	kg CO2e	131.81	111.00	99.75	92.27	87.87	79.08	69.37	65.90
HWD	kg	3.51E-03	2.96E-03	2.66E-03	2.73E-03	2.35E-03	2.47E-03	2.14E-03	2.21E-03
NHWD	kg	2.38	2.21	2.11	1.96	2.01	1.82	1.76	1.68
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 163. NRMCA national average - Normal-Weight 4,000 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	4000-00-FA/SL-AE	4000-20-FA-AE	4000-30-FA-AE	4000-30-SL-AE	4000-40-FA-AE	4000-40-SL-AE	4000-50-FA/SL-AE	4000-50-SL-AE
GWPT	kg CO2e	339.58	288.87	261.45	259.10	232.52	232.27	204.15	205.45
GWPF	kg CO2e	339.38	288.71	261.32	258.97	232.40	232.17	204.07	205.37
GWPB	kg CO2e	0.21	0.17	0.15	0.14	0.12	0.11	0.09	0.09
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	7.86E-06	6.63E-06	5.97E-06	8.20E-06	5.27E-06	8.32E-06	6.99E-06	8.43E-06
AP	kg SO2e	0.70	0.60	0.55	0.74	0.49	0.75	0.64	0.76
EPT	kg Ne	0.45	0.40	0.37	0.38	0.34	0.35	0.32	0.33
EPM	kg N-eq	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.03
EPF	kg P-eq	0.05	0.04	0.03	0.04	0.03	0.03	0.03	0.03
SFP	kg O3e	13.20	11.32	10.30	13.92	9.23	14.16	12.07	14.40
ADP _f	MJ	1883.49	1643.78	1514.20	1441.18	1377.43	1293.75	1178.19	1146.31
ADP _e	kg Sbe	1.55E-04	1.51E-04	1.48E-04	1.45E-04	1.46E-04	1.42E-04	1.41E-04	1.39E-04
RPRE	MJ	85.11	79.37	76.26	76.64	72.98	73.81	70.45	70.99
NRPRE	MJ	1809.90	1566.40	1434.79	1586.73	1295.86	1512.34	1331.49	1437.95
NRSF	MJ	181.87	153.15	137.63	127.31	121.25	109.12	95.72	90.93
SM	kg	0.00	78.21	120.48	111.44	165.10	148.59	195.52	185.74
FW	m3	2.29	2.17	2.11	2.19	2.04	2.15	2.06	2.11
CCE	kg CO2e	166.89	140.54	126.29	116.82	111.26	100.13	87.84	83.44
HWD	kg	4.44E-03	3.75E-03	3.37E-03	3.46E-03	2.98E-03	3.13E-03	2.71E-03	2.80E-03
NHWD	kg	3.02	2.80	2.68	2.48	2.55	2.30	2.23	2.12
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 164. NRMCA national average - Normal-Weight 5,000 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	5000-00-FA/SL-AE	5000-20-FA-AE	5000-30-FA-AE	5000-30-SL-AE	5000-40-FA-AE	5000-40-SL-AE	5000-50-FA/SL-AE	5000-50-SL-AE
GWPT	kg CO2e	424.79	361.70	327.60	324.41	291.61	290.95	256.04	257.48
GWPF	kg CO2e	424.55	361.52	327.44	324.26	291.48	290.83	255.95	257.40
GWPB	kg CO2e	0.26	0.21	0.18	0.17	0.15	0.13	0.11	0.10
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.78E-06	8.25E-06	7.42E-06	1.02E-05	6.54E-06	1.04E-05	8.70E-06	1.05E-05
AP	kg SO2e	0.87	0.74	0.68	0.91	0.61	0.93	0.79	0.94
EPT	kg Ne	0.58	0.51	0.48	0.49	0.44	0.46	0.42	0.43
EPM	kg N-eq	0.06	0.05	0.05	0.05	0.04	0.05	0.04	0.04
EPF	kg P-eq	0.06	0.05	0.04	0.05	0.04	0.04	0.04	0.04
SFP	kg O3e	16.00	13.65	12.38	16.90	11.05	17.20	14.60	17.50
ADP _f	MJ	2391.64	2096.39	1936.80	1839.95	1768.34	1656.05	1515.67	1472.16
ADP _e	kg Sbe	2.25E-04	2.22E-04	2.20E-04	2.13E-04	2.18E-04	2.10E-04	2.09E-04	2.06E-04
RPRE	MJ	118.14	111.61	108.08	107.57	104.35	104.05	100.48	100.53
NRPRE	MJ	2275.51	1974.27	1811.43	1997.15	1639.55	1904.36	1681.26	1811.57
NRSF	MJ	226.84	191.03	171.67	158.79	151.23	136.11	119.39	113.42
SM	kg	0.00	97.55	150.28	139.00	205.93	185.34	243.87	231.67
FW	m3	2.37	2.22	2.14	2.23	2.05	2.19	2.08	2.14
CCE	kg CO2e	208.16	175.29	157.53	145.71	138.77	124.90	109.56	104.08
HWD	kg	5.54E-03	4.68E-03	4.21E-03	4.31E-03	3.71E-03	3.90E-03	3.38E-03	3.49E-03
NHWD	kg	4.17	3.91	3.77	3.49	3.62	3.27	3.20	3.05
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 165. NRMCA national average - Normal-Weight 2,500 psi - Non-Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	2500-00-FA/SL	2500-20-FA	2500-30-FA	2500-30-SL	2500-40-FA	2500-40-SL	2500-50-FA/SL	2500-50-SL
GWPT	kg CO2e	219.77	186.40	168.37	167.25	149.33	149.74	131.12	132.23
GWPF	kg CO2e	219.61	186.27	168.25	167.14	149.23	149.65	131.04	132.16
GWPB	kg CO2e	0.16	0.14	0.12	0.11	0.11	0.10	0.08	0.08
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	5.17E-06	4.37E-06	3.93E-06	5.39E-06	3.48E-06	5.47E-06	4.60E-06	5.54E-06
AP	kg SO2e	0.47	0.40	0.37	0.49	0.33	0.50	0.43	0.51
EPT	kg Ne	0.27	0.23	0.21	0.22	0.19	0.20	0.18	0.19
EPM	kg N-eq	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPF	kg P-eq	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02
SFP	kg O3e	9.36	8.13	7.47	9.83	6.77	9.99	8.63	10.14
ADP _f	MJ	1163.51	1001.10	913.31	874.87	820.64	778.66	697.27	682.44
ADP _e	kg Sbe	5.04E-05	4.52E-05	4.23E-05	4.44E-05	3.93E-05	4.24E-05	3.88E-05	4.04E-05
RPRE	MJ	36.51	31.76	29.19	30.98	26.48	29.14	25.94	27.30
NRPRE	MJ	1153.92	991.05	903.02	1008.28	810.10	959.73	837.75	911.19
NRSF	MJ	118.68	99.94	89.81	83.08	79.12	71.21	62.47	59.34
SM	kg	0.00	51.04	78.62	72.73	107.74	96.97	127.59	121.21
FW	m3	2.29	2.21	2.17	2.22	2.12	2.20	2.14	2.17
CCE	kg CO2e	108.91	91.71	82.42	76.24	72.61	65.34	57.32	54.45
HWD	kg	2.88E-03	2.42E-03	2.18E-03	2.23E-03	1.92E-03	2.02E-03	1.74E-03	1.80E-03
NHWD	kg	1.34	1.16	1.06	0.99	0.96	0.87	0.79	0.75
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 166. NRMCA national average - Normal-Weight 3,000 psi - Non-Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	3000-00-FA/SL	3000-20-FA	3000-30-FA	3000-30-SL	3000-40-FA	3000-40-SL	3000-50-FA/SL	3000-50-SL
GWPT	kg CO2e	242.18	205.27	185.32	184.09	164.26	164.72	144.12	145.35
GWPF	kg CO2e	242.01	205.13	185.19	183.96	164.15	164.62	144.03	145.27
GWPB	kg CO2e	0.18	0.15	0.13	0.12	0.12	0.11	0.09	0.09
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	5.71E-06	4.82E-06	4.34E-06	5.96E-06	3.83E-06	6.04E-06	5.08E-06	6.12E-06
AP	kg SO2e	0.51	0.44	0.40	0.54	0.36	0.55	0.47	0.55
EPT	kg Ne	0.29	0.25	0.23	0.24	0.20	0.22	0.20	0.21
EPM	kg N-eq	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPF	kg P-eq	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02
SFP	kg O3e	10.14	8.78	8.05	10.66	7.27	10.83	9.33	11.01
ADP _f	MJ	1273.59	1093.93	996.81	954.29	894.30	847.86	757.82	741.42
ADP _e	kg Sbe	5.57E-05	4.99E-05	4.68E-05	4.91E-05	4.35E-05	4.69E-05	4.29E-05	4.47E-05
RPRE	MJ	40.38	35.12	32.28	34.26	29.28	32.22	28.68	30.18
NRPRE	MJ	1262.95	1082.79	985.40	1101.84	882.61	1048.14	913.20	994.44
NRSF	MJ	131.29	110.56	99.35	91.90	87.53	78.77	69.10	65.65
SM	kg	0.00	56.46	86.97	80.45	119.19	107.27	141.14	134.09
FW	m3	2.30	2.21	2.16	2.22	2.11	2.20	2.13	2.17
CCE	kg CO2e	120.48	101.45	91.17	84.33	80.32	72.29	63.41	60.24
HWD	kg	3.18E-03	2.68E-03	2.41E-03	2.47E-03	2.12E-03	2.23E-03	1.93E-03	1.99E-03
NHWD	kg	1.48	1.28	1.18	1.09	1.06	0.96	0.88	0.83
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 167. NRMCA national average - Normal-Weight 4,000 psi - Non-Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	4000-00-FA/SL	4000-20-FA	4000-30-FA	4000-30-SL	4000-40-FA	4000-40-SL	4000-50-FA/SL	4000-50-SL
GWPT	kg CO2e	294.32	249.16	224.76	223.24	198.99	199.55	174.35	175.86
GWPF	kg CO2e	294.10	248.98	224.60	223.09	198.85	199.43	174.24	175.76
GWPB	kg CO2e	0.22	0.18	0.16	0.15	0.14	0.13	0.11	0.11
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	6.96E-06	5.87E-06	5.29E-06	7.26E-06	4.67E-06	7.36E-06	6.19E-06	7.46E-06
AP	kg SO2e	0.61	0.52	0.47	0.64	0.42	0.65	0.56	0.66
EPT	kg Ne	0.35	0.30	0.27	0.29	0.24	0.27	0.23	0.25
EPM	kg N-eq	0.04	0.03	0.03	0.03	0.02	0.03	0.02	0.02
EPF	kg P-eq	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
SFP	kg O3e	11.95	10.29	9.39	12.59	8.44	12.80	10.96	13.01
ADP _f	MJ	1529.62	1309.83	1191.03	1139.01	1065.63	1008.81	898.67	878.60
ADP _e	kg Sbe	6.81E-05	6.10E-05	5.72E-05	6.00E-05	5.31E-05	5.73E-05	5.24E-05	5.46E-05
RPRE	MJ	49.37	42.93	39.46	41.88	35.79	39.39	35.06	36.89
NRPRE	MJ	1516.55	1296.15	1177.01	1319.46	1051.26	1253.76	1088.69	1188.07
NRSF	MJ	160.61	135.25	121.54	112.43	107.07	96.37	84.53	80.31
SM	kg	0.00	69.07	106.40	98.42	145.81	131.23	172.66	164.03
FW	m3	2.32	2.22	2.16	2.23	2.10	2.20	2.12	2.17
CCE	kg CO2e	147.38	124.11	111.53	103.17	98.25	88.43	77.57	73.69
HWD	kg	3.89E-03	3.28E-03	2.95E-03	3.02E-03	2.59E-03	2.73E-03	2.36E-03	2.44E-03
NHWD	kg	1.81	1.57	1.44	1.34	1.30	1.18	1.07	1.02
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 168. NRMCA national average - Normal-Weight 5,000 psi - Non-Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	5000-00-FA/SL	5000-20-FA	5000-30-FA	5000-30-SL	5000-40-FA	5000-40-SL	5000-50-FA/SL	5000-50-SL
GWPT	kg CO2e	372.61	315.66	284.88	282.73	252.39	252.78	221.06	222.82
GWPF	kg CO2e	372.35	315.45	284.69	282.56	252.23	252.63	220.93	222.70
GWPB	kg CO2e	0.27	0.23	0.20	0.19	0.18	0.16	0.14	0.13
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	8.77E-06	7.40E-06	6.65E-06	9.15E-06	5.87E-06	9.28E-06	7.80E-06	9.41E-06
AP	kg SO2e	0.76	0.65	0.59	0.80	0.53	0.81	0.69	0.83
EPT	kg Ne	0.46	0.40	0.36	0.38	0.33	0.35	0.31	0.33
EPM	kg N-eq	0.05	0.04	0.04	0.04	0.03	0.04	0.03	0.03
EPF	kg P-eq	0.05	0.04	0.04	0.04	0.03	0.04	0.03	0.03
SFP	kg O3e	14.55	12.45	11.31	15.35	10.11	15.62	13.29	15.89
ADP _f	MJ	1962.53	1687.97	1539.56	1468.62	1382.90	1303.98	1168.06	1139.34
ADP _e	kg Sbe	1.15E-04	1.07E-04	1.03E-04	1.05E-04	9.91E-05	1.01E-04	9.65E-05	9.77E-05
RPRE	MJ	73.15	65.58	61.49	63.68	57.17	60.53	55.62	57.37
NRPRE	MJ	1924.20	1647.72	1498.27	1674.99	1340.52	1591.92	1385.39	1508.85
NRSF	MJ	203.09	171.02	153.69	142.16	135.39	121.85	106.89	101.54
SM	kg	0.00	87.33	134.54	124.45	184.37	165.93	218.33	207.41
FW	m3	2.34	2.21	2.13	2.22	2.06	2.18	2.08	2.14
CCE	kg CO2e	186.36	156.93	141.03	130.45	124.24	111.82	98.08	93.18
HWD	kg	4.92E-03	4.14E-03	3.72E-03	3.82E-03	3.28E-03	3.45E-03	2.98E-03	3.08E-03
NHWD	kg	2.65	2.36	2.21	2.05	2.04	1.85	1.73	1.65
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 169. NRMCA national average - High-Strength 6,000 psi - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	6000-00-FA/SL	6000-20-FA	6000-30-FA	6000-30-SL	6000-40-FA	6000-40-SL	6000-50-FA/SL	6000-50-SL
GWPT	kg CO2e	410.38	349.07	315.92	312.97	280.94	280.50	246.53	248.03
GWPF	kg CO2e	410.12	348.86	315.75	312.80	280.79	280.37	246.42	247.93
GWPB	kg CO2e	0.28	0.23	0.20	0.19	0.18	0.16	0.14	0.13
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.49E-06	8.01E-06	7.20E-06	9.91E-06	6.35E-06	1.00E-05	8.45E-06	1.02E-05
AP	kg SO2e	0.84	0.72	0.65	0.88	0.59	0.90	0.76	0.91
EPT	kg Ne	0.55	0.48	0.45	0.46	0.41	0.43	0.39	0.40
EPM	kg N-eq	0.05	0.05	0.04	0.05	0.04	0.04	0.04	0.04
EPF	kg P-eq	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04
SFP	kg O3e	15.61	13.34	12.11	16.49	10.82	16.78	14.26	17.07
ADP _f	MJ	2276.71	1987.99	1831.92	1741.40	1667.18	1562.96	1424.49	1384.52
ADP _e	kg Sbe	1.97E-04	1.93E-04	1.91E-04	1.86E-04	1.88E-04	1.83E-04	1.81E-04	1.79E-04
RPRE	MJ	106.55	99.78	96.12	96.29	92.26	92.87	88.98	89.45
NRPRE	MJ	2179.99	1886.28	1727.52	1909.90	1559.94	1819.86	1601.97	1729.83
NRSF	MJ	220.12	185.36	166.58	154.08	146.75	132.07	115.85	110.06
SM	kg	0.00	94.65	145.82	134.88	199.83	179.84	236.64	224.81
FW	m3	2.41	2.27	2.20	2.28	2.11	2.24	2.13	2.20
CCE	kg CO2e	201.99	170.09	152.85	141.39	134.66	121.19	106.31	100.99
HWD	kg	5.33E-03	4.49E-03	4.04E-03	4.14E-03	3.56E-03	3.74E-03	3.23E-03	3.34E-03
NHWD	kg	3.78	3.52	3.38	3.13	3.23	2.91	2.83	2.69
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 170. NRMCA national average - High-Strength 8,000 psi - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	8000-00-FA/SL	8000-20-FA	8000-30-FA	8000-30-SL	8000-40-FA	8000-40-SL	8000-50-FA/SL	8000-50-SL
GWPT	kg CO2e	476.92	405.92	367.54	363.95	327.02	326.30	287.01	288.64
GWPF	kg CO2e	476.63	405.69	367.34	363.77	326.86	326.15	286.89	288.53
GWPB	kg CO2e	0.32	0.26	0.23	0.22	0.20	0.18	0.15	0.14
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.10E-05	9.27E-06	8.33E-06	1.15E-05	7.35E-06	1.16E-05	9.78E-06	1.18E-05
AP	kg SO2e	0.97	0.83	0.75	1.02	0.67	1.03	0.88	1.05
EPT	kg Ne	0.65	0.57	0.53	0.55	0.49	0.52	0.47	0.48
EPM	kg N-eq	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
EPF	kg P-eq	0.06	0.05	0.05	0.05	0.04	0.05	0.04	0.04
SFP	kg O3e	17.79	15.15	13.73	18.81	12.22	19.14	16.22	19.48
ADP _f	MJ	2672.90	2340.44	2160.73	2052.07	1971.04	1845.13	1686.94	1638.19
ADP _e	kg Sbe	2.53E-04	2.49E-04	2.47E-04	2.40E-04	2.45E-04	2.36E-04	2.35E-04	2.31E-04
RPRE	MJ	132.46	125.08	121.09	120.56	116.88	116.60	112.56	112.63
NRPRE	MJ	2542.65	2203.46	2020.12	2229.41	1826.59	2124.99	1873.73	2020.58
NRSF	MJ	255.27	214.96	193.18	178.69	170.18	153.16	134.35	127.63
SM	kg	0.00	109.77	169.11	156.42	231.74	208.56	274.43	260.71
FW	m3	2.47	2.30	2.21	2.31	2.11	2.26	2.14	2.21
CCE	kg CO2e	234.24	197.26	177.27	163.97	156.16	140.55	123.29	117.12
HWD	kg	6.19E-03	5.21E-03	4.68E-03	4.80E-03	4.13E-03	4.34E-03	3.75E-03	3.88E-03
NHWD	kg	4.68	4.39	4.24	3.93	4.07	3.67	3.60	3.42
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 171. NRMCA national average - High-Strength 10,000 psi - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	10000-00-FA/SL	10000-20-FA	10000-30-FA	10000-30-SL	10000-40-FA	10000-40-SL	10000-50-FA/SL	10000-50-SL
GWPT	kg CO2e	610.59	519.33	469.99	465.39	417.92	416.99	366.48	368.59
GWPF	kg CO2e	610.22	519.03	469.74	465.16	417.71	416.80	366.33	368.44
GWPB	kg CO2e	0.41	0.34	0.30	0.28	0.26	0.23	0.20	0.19
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.41E-05	1.19E-05	1.07E-05	1.47E-05	9.42E-06	1.49E-05	1.25E-05	1.51E-05
AP	kg SO2e	1.22	1.05	0.95	1.29	0.85	1.31	1.12	1.33
EPT	kg Ne	0.83	0.73	0.68	0.70	0.63	0.66	0.60	0.61
EPM	kg N-eq	0.08	0.07	0.07	0.07	0.06	0.06	0.06	0.06
EPF	kg P-eq	0.08	0.07	0.06	0.06	0.05	0.06	0.05	0.05
SFP	kg O3e	22.31	18.92	17.08	23.61	15.15	24.04	20.28	24.48
ADP _f	MJ	3400.44	2973.10	2742.11	2602.45	2498.28	2336.45	2133.11	2070.45
ADP _e	kg Sbe	3.25E-04	3.20E-04	3.18E-04	3.08E-04	3.15E-04	3.03E-04	3.03E-04	2.97E-04
RPRE	MJ	170.22	160.74	155.61	154.93	150.20	149.83	144.64	144.73
NRPRE	MJ	3232.95	2796.97	2561.30	2830.31	2312.54	2696.10	2373.14	2561.89
NRSF	MJ	328.12	276.31	248.31	229.68	218.75	196.87	172.69	164.06
SM	kg	0.00	141.10	217.37	201.06	297.87	268.09	352.74	335.11
FW	m3	2.55	2.33	2.22	2.36	2.10	2.29	2.13	2.23
CCE	kg CO2e	301.09	253.55	227.85	210.76	200.73	180.66	158.47	150.55
HWD	kg	7.95E-03	6.70E-03	6.02E-03	6.17E-03	5.30E-03	5.58E-03	4.82E-03	4.98E-03
NHWD	kg	6.02	5.64	5.44	5.05	5.23	4.72	4.62	4.40
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 172. NRMCA national average - High-Strength 12,000 psi - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	12000-00-FA/SL	12000-20-FA	12000-30-FA	12000-30-SL	12000-40-FA	12000-40-SL	12000-50-FA/SL	12000-50-SL
GWPT	kg CO2e	696.64	592.33	535.95	530.68	476.43	475.36	417.64	420.05
GWPF	kg CO2e	696.21	591.99	535.66	530.41	476.19	475.15	417.47	419.88
GWPB	kg CO2e	0.47	0.39	0.34	0.32	0.29	0.26	0.22	0.21
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.61E-05	1.36E-05	1.22E-05	1.68E-05	1.07E-05	1.70E-05	1.43E-05	1.73E-05
AP	kg SO2e	1.39	1.19	1.08	1.46	0.96	1.49	1.27	1.51
EPT	kg Ne	0.94	0.83	0.77	0.79	0.71	0.75	0.68	0.70
EPM	kg N-eq	0.09	0.08	0.08	0.08	0.07	0.07	0.07	0.07
EPF	kg P-eq	0.09	0.08	0.07	0.07	0.06	0.07	0.06	0.06
SFP	kg O3e	25.21	21.34	19.24	26.70	17.03	27.20	22.90	27.69
ADP _f	MJ	3868.76	3380.35	3116.34	2956.72	2837.67	2652.71	2420.31	2348.69
ADP _e	kg Sbe	3.71E-04	3.66E-04	3.63E-04	3.52E-04	3.60E-04	3.46E-04	3.46E-04	3.40E-04
RPRE	MJ	194.53	183.69	177.83	177.05	171.65	171.22	165.29	165.40
NRPRE	MJ	3677.28	3179.00	2909.65	3217.11	2625.34	3063.71	2694.60	2910.32
NRSF	MJ	375.01	315.80	283.79	262.51	250.01	225.01	197.37	187.51
SM	kg	0.00	161.26	248.43	229.80	340.44	306.40	403.16	383.00
FW	m3	2.61	2.36	2.23	2.38	2.08	2.31	2.12	2.23
CCE	kg CO2e	344.12	289.79	260.42	240.89	229.41	206.47	181.12	172.06
HWD	kg	9.09E-03	7.65E-03	6.88E-03	7.05E-03	6.06E-03	6.37E-03	5.51E-03	5.69E-03
NHWD	kg	6.88	6.45	6.22	5.77	5.98	5.40	5.28	5.03
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 173. NRMCA national average - Lightweight 3,000 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	LW-3000-00-FA/SL-AE	LW-3000-20-FA-AE	LW-3000-30-FA-AE	LW-3000-30-SL-AE	LW-3000-40-FA-AE	LW-3000-40-SL-AE	LW-3000-50-FA/SL-AE	LW-3000-50-SL-AE
GWPT	kg CO2e	487.58	416.11	377.53	406.82	341.72	383.32	337.80	359.82
GWPF	kg CO2e	487.38	415.94	377.39	406.68	341.59	383.20	337.70	359.73
GWPB	kg CO2e	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.09
GWPL	kg CO2e	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ODP	kg CFC11e	7.49E-06	6.33E-06	5.71E-06	7.76E-06	5.06E-06	7.86E-06	6.64E-06	7.96E-06
AP	kg SO2e	2.02	1.74	1.59	1.98	1.46	1.99	1.74	2.00
EPT	kg Ne	1.02	0.88	0.81	0.93	0.74	0.90	0.80	0.88
EPM	kg N-eq	0.10	0.09	0.08	0.09	0.07	0.09	0.08	0.09
EPF	kg P-eq	0.12	0.10	0.10	0.11	0.09	0.11	0.09	0.10
SFP	kg O3e	25.24	21.76	19.88	25.17	18.24	25.38	22.14	25.59
ADP _f	MJ	3281.58	2824.11	2577.32	2802.02	2360.83	2672.87	2379.41	2543.71
ADP _e	kg Sbe	4.25E-04	3.69E-04	3.39E-04	3.99E-04	3.16E-04	3.96E-04	3.53E-04	3.93E-04
RPRE	MJ	309.52	267.54	244.92	288.40	227.60	285.92	254.25	283.45
NRPRE	MJ	3435.53	2954.56	2695.12	3139.12	2469.47	3073.95	2708.40	3008.78
NRSF	MJ	159.31	134.16	120.56	111.52	106.21	95.59	83.85	79.65
SM	kg	0.00	68.51	105.54	97.62	144.62	130.16	171.27	162.70
FW	m3	1.37	1.38	1.38	1.32	1.37	1.29	1.30	1.26
CCE	kg CO2e	146.19	123.10	110.63	102.33	97.46	87.71	76.94	73.09
HWD	kg	3.89E-03	3.28E-03	2.95E-03	3.03E-03	2.61E-03	2.74E-03	2.37E-03	2.45E-03
NHWD	kg	1.80	1.56	1.43	1.33	1.30	1.17	1.07	1.02
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 174. NRMCA national average - Lightweight 4,000 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	LW-4000-00-FA/SL-AE	LW-4000-20-FA-AE	LW-4000-30-FA-AE	LW-4000-30-SL-AE	LW-4000-40-FA-AE	LW-4000-40-SL-AE	LW-4000-50-FA/SL-AE	LW-4000-50-SL-AE
GWPT	kg CO2e	567.09	485.75	438.67	473.72	394.00	443.96	387.68	410.10
GWPF	kg CO2e	566.83	485.53	438.48	473.54	393.84	443.82	387.56	409.99
GWPB	kg CO2e	0.25	0.21	0.18	0.17	0.16	0.14	0.12	0.11
GWPL	kg CO2e	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ODP	kg CFC11e	9.31E-06	7.87E-06	7.09E-06	9.68E-06	6.27E-06	9.81E-06	8.26E-06	9.92E-06
AP	kg SO2e	2.19	1.91	1.73	2.20	1.57	2.22	1.92	2.20
EPT	kg Ne	1.12	0.97	0.88	1.03	0.81	1.00	0.88	0.96
EPM	kg N-eq	0.11	0.10	0.09	0.10	0.08	0.10	0.09	0.10
EPF	kg P-eq	0.13	0.11	0.10	0.12	0.09	0.12	0.10	0.11
SFP	kg O3e	28.14	24.36	22.11	28.66	20.07	28.92	24.92	28.91
ADP _f	MJ	3689.11	3192.03	2895.46	3161.69	2627.44	2998.16	2638.79	2797.79
ADP _e	kg Sbe	4.51E-04	3.97E-04	3.62E-04	4.33E-04	3.34E-04	4.30E-04	3.79E-04	4.19E-04
RPRE	MJ	328.07	287.14	260.87	313.19	239.84	310.06	271.77	301.45
NRPRE	MJ	3842.99	3324.00	3012.93	3555.09	2733.90	3472.57	3023.07	3349.70
NRSF	MJ	201.71	169.86	152.64	141.20	134.47	121.02	106.16	100.85
SM	kg	0.00	86.74	133.62	123.60	183.11	164.80	216.85	206.00
FW	m3	1.39	1.36	1.36	1.29	1.33	1.25	1.25	1.23
CCE	kg CO2e	185.09	155.87	140.07	129.57	123.40	111.06	97.42	92.55
HWD	kg	4.93E-03	4.16E-03	3.74E-03	3.83E-03	3.30E-03	3.47E-03	3.00E-03	3.10E-03
NHWD	kg	2.28	1.98	1.81	1.68	1.64	1.49	1.35	1.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 175. NRMCA national average - Lightweight 5,000 psi - Air-Entrained - A1 - Raw Material Supply results per cubic meter

Indicator	Unit	LW-5000-00-FA/SL-AE	LW-5000-20-FA-AE	LW-5000-30-FA-AE	LW-5000-30-SL-AE	LW-5000-40-FA-AE	LW-5000-40-SL-AE	LW-5000-50-FA/SL-AE	LW-5000-50-SL-AE
GWPT	kg CO2e	638.31	542.85	487.38	525.99	436.11	491.97	427.21	451.79
GWPF	kg CO2e	638.03	542.62	487.17	525.80	435.94	491.81	427.08	451.67
GWPB	kg CO2e	0.28	0.23	0.20	0.19	0.17	0.15	0.13	0.12
GWPL	kg CO2e	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
ODP	kg CFC11e	1.06E-05	8.94E-06	8.04E-06	1.10E-05	7.10E-06	1.11E-05	9.38E-06	1.13E-05
AP	kg SO2e	2.42	2.07	1.85	2.39	1.68	2.41	2.06	2.38
EPT	kg Ne	1.26	1.09	0.98	1.14	0.89	1.11	0.96	1.05
EPM	kg N-eq	0.13	0.11	0.10	0.11	0.09	0.11	0.10	0.11
EPF	kg P-eq	0.15	0.12	0.11	0.13	0.10	0.13	0.11	0.12
SFP	kg O3e	31.08	26.58	23.89	31.29	21.54	31.60	26.98	31.48
ADP _f	MJ	4163.19	3575.09	3222.35	3510.18	2915.50	3323.21	2910.98	3080.98
ADP _e	kg Sbe	5.26E-04	4.61E-04	4.19E-04	4.95E-04	3.88E-04	4.92E-04	4.34E-04	4.76E-04
RPRE	MJ	371.11	321.45	289.43	346.67	265.36	343.09	299.18	331.29
NRPRE	MJ	4303.99	3687.29	3315.76	3920.06	2995.34	3825.72	3308.65	3670.84
NRSF	MJ	230.62	194.21	174.53	161.44	153.75	138.37	121.38	115.31
SM	kg	0.00	99.17	152.78	141.32	209.37	188.43	247.93	235.54
FW	m3	1.38	1.35	1.36	1.28	1.33	1.24	1.24	1.22
CCE	kg CO2e	211.63	178.21	160.15	148.14	141.09	126.98	111.38	105.81
HWD	kg	5.63E-03	4.75E-03	4.28E-03	4.38E-03	3.78E-03	3.96E-03	3.43E-03	3.55E-03
NHWD	kg	3.01	2.69	2.51	2.33	2.33	2.11	1.97	1.88
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 176. NRMCA national average - Normal-Weight 2,500 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	2500-00-FA/SL-AE	2500-20-FA-AE	2500-30-FA-AE	2500-30-SL-AE	2500-40-FA-AE	2500-40-SL-AE	2500-50-FA/SL-AE	2500-50-SL-AE
GWPT	kg CO2e	22.47	24.13	25.02	24.56	25.97	25.25	26.32	25.95
GWPF	kg CO2e	22.47	24.13	25.02	24.56	25.97	25.25	26.32	25.95
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.09E-10	9.72E-10	1.01E-09	9.89E-10	1.04E-09	1.02E-09	1.06E-09	1.04E-09
AP	kg SO2e	0.31	0.34	0.36	0.35	0.38	0.36	0.38	0.37
EPT	kg Ne	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPM	kg N-eq	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.09
EPF	kg P-eq	2.70E-05	2.89E-05	2.99E-05	2.94E-05	3.10E-05	3.02E-05	3.14E-05	3.10E-05
SFP	kg O3e	8.48	9.34	9.81	9.53	10.30	9.87	10.44	10.22
ADP _f	MJ	310.45	332.00	343.65	337.82	355.94	346.95	360.81	356.07
ADP _e	kg Sbe	3.29E-08	3.46E-08	3.54E-08	3.51E-08	3.64E-08	3.58E-08	3.68E-08	3.65E-08
RPRE	MJ	2.87E-03	3.01E-03	3.09E-03	3.06E-03	3.17E-03	3.12E-03	3.21E-03	3.18E-03
NRPRE	MJ	313.74	335.50	347.26	341.38	359.67	350.59	364.59	359.81
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 177. NRMCA national average - Normal-Weight 3,000 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	3000-00-FA/SL-AE	3000-20-FA-AE	3000-30-FA-AE	3000-30-SL-AE	3000-40-FA-AE	3000-40-SL-AE	3000-50-FA/SL-AE	3000-50-SL-AE
GWPT	kg CO2e	23.47	25.34	26.36	25.83	27.43	26.62	27.83	27.40
GWPF	kg CO2e	23.47	25.34	26.36	25.83	27.43	26.62	27.83	27.40
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.48E-10	1.02E-09	1.06E-09	1.04E-09	1.10E-09	1.07E-09	1.12E-09	1.10E-09
AP	kg SO2e	0.33	0.36	0.38	0.37	0.40	0.39	0.41	0.40
EPT	kg Ne	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPM	kg N-eq	0.08	0.09	0.10	0.09	0.10	0.10	0.10	0.10
EPF	kg P-eq	2.82E-05	3.03E-05	3.15E-05	3.09E-05	3.27E-05	3.18E-05	3.32E-05	3.27E-05
SFP	kg O3e	8.97	9.94	10.47	10.15	11.03	10.55	11.19	10.94
ADP _f	MJ	323.58	348.00	361.20	354.59	375.13	364.93	380.65	375.27
ADP _e	kg Sbe	3.41E-08	3.59E-08	3.69E-08	3.65E-08	3.80E-08	3.73E-08	3.85E-08	3.81E-08
RPRE	MJ	2.97E-03	3.13E-03	3.22E-03	3.18E-03	3.31E-03	3.25E-03	3.35E-03	3.32E-03
NRPRE	MJ	327.00	351.65	364.98	358.32	379.04	368.76	384.62	379.20
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.05	0.05	0.05	0.06	0.05	0.06	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 178. NRMCA national average - Normal-Weight 4,000 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	4000-00-FA/SL-AE	4000-20-FA-AE	4000-30-FA-AE	4000-30-SL-AE	4000-40-FA-AE	4000-40-SL-AE	4000-50-FA/SL-AE	4000-50-SL-AE
GWPT	kg CO2e	25.72	28.10	29.38	28.72	30.74	29.71	31.25	30.71
GWPF	kg CO2e	25.72	28.10	29.38	28.72	30.74	29.71	31.25	30.71
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.03E-09	1.13E-09	1.17E-09	1.15E-09	1.23E-09	1.19E-09	1.25E-09	1.23E-09
AP	kg SO2e	0.37	0.41	0.44	0.42	0.46	0.44	0.47	0.46
EPT	kg Ne	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03
EPM	kg N-eq	0.09	0.10	0.11	0.11	0.12	0.11	0.12	0.11
EPF	kg P-eq	3.08E-05	3.35E-05	3.49E-05	3.42E-05	3.65E-05	3.54E-05	3.71E-05	3.65E-05
SFP	kg O3e	10.07	11.31	11.97	11.57	12.68	12.07	12.89	12.57
ADP _f	MJ	353.31	384.23	400.94	392.58	418.59	405.68	425.57	418.77
ADP _e	kg Sbe	3.67E-08	3.90E-08	4.03E-08	3.97E-08	4.16E-08	4.08E-08	4.22E-08	4.18E-08
RPRE	MJ	3.20E-03	3.40E-03	3.51E-03	3.46E-03	3.63E-03	3.55E-03	3.68E-03	3.64E-03
NRPRE	MJ	357.02	388.24	405.11	396.68	422.92	409.89	429.98	423.11
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 179. NRMCA national average - Normal-Weight 5,000 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	5000-00-FA/SL-AE	5000-20-FA-AE	5000-30-FA-AE	5000-30-SL-AE	5000-40-FA-AE	5000-40-SL-AE	5000-50-FA/SL-AE	5000-50-SL-AE
GWPT	kg CO2e	28.46	31.43	33.03	32.19	34.73	33.44	35.36	34.68
GWPF	kg CO2e	28.46	31.43	33.03	32.19	34.73	33.44	35.36	34.68
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.14E-09	1.25E-09	1.32E-09	1.28E-09	1.38E-09	1.33E-09	1.41E-09	1.38E-09
AP	kg SO2e	0.42	0.47	0.50	0.48	0.53	0.50	0.54	0.53
EPT	kg Ne	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
EPM	kg N-eq	0.10	0.12	0.12	0.12	0.13	0.13	0.13	0.13
EPF	kg P-eq	3.39E-05	3.73E-05	3.91E-05	3.82E-05	4.11E-05	3.96E-05	4.18E-05	4.11E-05
SFP	kg O3e	11.39	12.93	13.77	13.26	14.65	13.89	14.91	14.51
ADP _f	MJ	389.47	428.10	448.98	438.45	471.02	454.78	479.66	471.11
ADP _e	kg Sbe	3.98E-08	4.27E-08	4.43E-08	4.37E-08	4.60E-08	4.49E-08	4.68E-08	4.62E-08
RPRE	MJ	3.47E-03	3.73E-03	3.86E-03	3.81E-03	4.01E-03	3.92E-03	4.08E-03	4.03E-03
NRPRE	MJ	393.53	432.53	453.61	442.99	475.86	459.48	484.59	475.97
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 180. NRMCA national average - Normal-Weight 2,500 psi - Non-Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	2500-00-FA/SL	2500-20-FA	2500-30-FA	2500-30-SL	2500-40-FA	2500-40-SL	2500-50-FA/SL	2500-50-SL
GWPT	kg CO2e	22.51	24.06	24.89	24.47	25.77	25.12	26.11	25.77
GWPF	kg CO2e	22.51	24.06	24.89	24.47	25.77	25.12	26.11	25.77
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.12E-10	9.71E-10	1.00E-09	9.87E-10	1.04E-09	1.01E-09	1.05E-09	1.04E-09
AP	kg SO2e	0.31	0.34	0.35	0.35	0.37	0.36	0.38	0.37
EPT	kg Ne	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPM	kg N-eq	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09
EPF	kg P-eq	2.71E-05	2.89E-05	2.98E-05	2.94E-05	3.08E-05	3.01E-05	3.12E-05	3.09E-05
SFP	kg O3e	8.42	9.22	9.66	9.40	10.12	9.72	10.25	10.05
ADP _f	MJ	311.50	331.59	342.44	337.13	353.90	345.68	358.57	354.22
ADP _e	kg Sbe	3.33E-08	3.48E-08	3.56E-08	3.53E-08	3.64E-08	3.59E-08	3.69E-08	3.66E-08
RPRE	MJ	2.90E-03	3.03E-03	3.10E-03	3.07E-03	3.18E-03	3.13E-03	3.21E-03	3.19E-03
NRPRE	MJ	314.82	335.09	346.05	340.69	357.62	349.32	362.33	357.95
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 181. NRMCA national average - Normal-Weight 3,000 psi - Non-Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	3000-00-FA/SL	3000-20-FA	3000-30-FA	3000-30-SL	3000-40-FA	3000-40-SL	3000-50-FA/SL	3000-50-SL
GWPT	kg CO2e	23.25	24.95	25.88	25.40	26.85	26.12	27.23	26.84
GWPF	kg CO2e	23.25	24.95	25.88	25.40	26.85	26.12	27.23	26.84
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	9.40E-10	1.01E-09	1.04E-09	1.02E-09	1.08E-09	1.05E-09	1.09E-09	1.08E-09
AP	kg SO2e	0.32	0.36	0.37	0.36	0.39	0.37	0.40	0.39
EPT	kg Ne	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPM	kg N-eq	0.08	0.09	0.09	0.09	0.10	0.09	0.10	0.10
EPF	kg P-eq	2.80E-05	2.99E-05	3.10E-05	3.04E-05	3.21E-05	3.13E-05	3.25E-05	3.21E-05
SFP	kg O3e	8.78	9.67	10.15	9.86	10.66	10.22	10.81	10.58
ADP _f	MJ	321.12	343.34	355.35	349.47	368.03	358.92	373.18	368.37
ADP _e	kg Sbe	3.41E-08	3.57E-08	3.66E-08	3.63E-08	3.76E-08	3.70E-08	3.81E-08	3.78E-08
RPRE	MJ	2.97E-03	3.12E-03	3.20E-03	3.16E-03	3.28E-03	3.23E-03	3.32E-03	3.29E-03
NRPRE	MJ	324.53	346.96	359.08	353.15	371.88	362.70	377.09	372.24
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.05	0.05	0.05	0.06	0.05	0.06	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 182. NRMCA national average - Normal-Weight 4,000 psi - Non-Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	4000-00-FA/SL	4000-20-FA	4000-30-FA	4000-30-SL	4000-40-FA	4000-40-SL	4000-50-FA/SL	4000-50-SL
GWPT	kg CO2e	24.95	27.04	28.16	27.59	29.36	28.47	29.82	29.35
GWPF	kg CO2e	24.95	27.04	28.16	27.59	29.36	28.47	29.82	29.35
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.01E-09	1.09E-09	1.13E-09	1.11E-09	1.17E-09	1.14E-09	1.19E-09	1.18E-09
AP	kg SO2e	0.35	0.39	0.41	0.40	0.43	0.42	0.44	0.43
EPT	kg Ne	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02
EPM	kg N-eq	0.09	0.10	0.10	0.10	0.11	0.10	0.11	0.11
EPF	kg P-eq	2.99E-05	3.23E-05	3.36E-05	3.29E-05	3.49E-05	3.40E-05	3.55E-05	3.50E-05
SFP	kg O3e	9.61	10.70	11.29	10.94	11.91	11.38	12.10	11.82
ADP _f	MJ	343.49	370.67	385.36	378.18	400.87	389.74	407.18	401.30
ADP _e	kg Sbe	3.60E-08	3.80E-08	3.92E-08	3.87E-08	4.03E-08	3.96E-08	4.09E-08	4.05E-08
RPRE	MJ	3.14E-03	3.32E-03	3.41E-03	3.38E-03	3.52E-03	3.45E-03	3.57E-03	3.53E-03
NRPRE	MJ	347.11	374.55	389.39	382.13	405.04	393.81	411.42	405.48
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 183. NRMCA national average - Normal-Weight 5,000 psi - Non-Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	5000-00-FA/SL	5000-20-FA	5000-30-FA	5000-30-SL	5000-40-FA	5000-40-SL	5000-50-FA/SL	5000-50-SL
GWPT	kg CO2e	27.16	29.80	31.23	30.50	32.74	31.61	33.32	32.73
GWPF	kg CO2e	27.16	29.80	31.23	30.50	32.74	31.61	33.32	32.73
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.09E-09	1.19E-09	1.25E-09	1.22E-09	1.30E-09	1.26E-09	1.33E-09	1.31E-09
AP	kg SO2e	0.39	0.44	0.47	0.45	0.49	0.47	0.50	0.49
EPT	kg Ne	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
EPM	kg N-eq	0.10	0.11	0.12	0.11	0.12	0.12	0.13	0.12
EPF	kg P-eq	3.24E-05	3.54E-05	3.71E-05	3.63E-05	3.88E-05	3.75E-05	3.95E-05	3.88E-05
SFP	kg O3e	10.74	12.12	12.87	12.42	13.65	12.98	13.89	13.54
ADP _f	MJ	372.34	406.76	425.37	416.19	445.02	430.81	452.93	445.43
ADP _e	kg Sbe	3.84E-08	4.10E-08	4.24E-08	4.18E-08	4.39E-08	4.30E-08	4.46E-08	4.41E-08
RPRE	MJ	3.35E-03	3.57E-03	3.69E-03	3.65E-03	3.82E-03	3.75E-03	3.89E-03	3.85E-03
NRPRE	MJ	376.23	410.99	429.78	420.52	449.60	435.28	457.60	450.04
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 184. NRMCA national average - High-Strength 6,000 psi - A2 - Transportation results per cubic meter

Indicator	Unit	6000-00-FA/SL	6000-20-FA	6000-30-FA	6000-30-SL	6000-40-FA	6000-40-SL	6000-50-FA/SL	6000-50-SL
GWPT	kg CO2e	28.38	31.28	32.86	32.00	34.51	33.21	35.10	34.41
GWPF	kg CO2e	28.38	31.28	32.86	32.00	34.51	33.21	35.10	34.41
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.14E-09	1.25E-09	1.31E-09	1.28E-09	1.37E-09	1.32E-09	1.40E-09	1.37E-09
AP	kg SO2e	0.41	0.46	0.49	0.48	0.52	0.50	0.53	0.52
EPT	kg Ne	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
EPM	kg N-eq	0.10	0.12	0.12	0.12	0.13	0.12	0.13	0.13
EPF	kg P-eq	3.39E-05	3.72E-05	3.90E-05	3.80E-05	4.09E-05	3.94E-05	4.15E-05	4.08E-05
SFP	kg O3e	11.30	12.81	13.62	13.12	14.48	13.72	14.72	14.33
ADP _f	MJ	388.64	426.51	446.98	436.18	468.59	452.02	476.55	467.87
ADP _e	kg Sbe	3.99E-08	4.28E-08	4.43E-08	4.36E-08	4.59E-08	4.48E-08	4.67E-08	4.61E-08
RPRE	MJ	3.48E-03	3.73E-03	3.86E-03	3.80E-03	4.01E-03	3.91E-03	4.07E-03	4.02E-03
NRPRE	MJ	392.70	430.93	451.60	440.70	473.41	456.70	481.45	472.69
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 185. NRMCA national average - High-Strength 8,000 psi - A2 - Transportation results per cubic meter

Indicator	Unit	8000-00-FA/SL	8000-20-FA	8000-30-FA	8000-30-SL	8000-40-FA	8000-40-SL	8000-50-FA/SL	8000-50-SL
GWPT	kg CO2e	30.51	33.85	35.65	34.71	37.56	36.11	38.27	37.51
GWPF	kg CO2e	30.51	33.85	35.65	34.71	37.56	36.11	38.27	37.51
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.22E-09	1.35E-09	1.42E-09	1.38E-09	1.49E-09	1.44E-09	1.52E-09	1.49E-09
AP	kg SO2e	0.45	0.51	0.54	0.52	0.58	0.55	0.59	0.57
EPT	kg Ne	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
EPM	kg N-eq	0.11	0.13	0.14	0.13	0.14	0.14	0.15	0.14
EPF	kg P-eq	3.63E-05	4.01E-05	4.22E-05	4.11E-05	4.43E-05	4.27E-05	4.52E-05	4.44E-05
SFP	kg O3e	12.33	14.07	15.01	14.44	16.00	15.14	16.29	15.84
ADP _f	MJ	416.83	460.28	483.77	471.95	508.56	490.33	518.31	508.70
ADP _e	kg Sbe	4.24E-08	4.56E-08	4.74E-08	4.67E-08	4.93E-08	4.81E-08	5.02E-08	4.95E-08
RPRE	MJ	3.69E-03	3.98E-03	4.13E-03	4.07E-03	4.30E-03	4.19E-03	4.37E-03	4.32E-03
NRPRE	MJ	421.16	465.03	488.74	476.82	513.77	495.38	523.62	513.93
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 186. NRMCA national average - High-Strength 10,000 psi - A2 - Transportation results per cubic meter

Indicator	Unit	10000-00-FA/SL	10000-20-FA	10000-30-FA	10000-30-SL	10000-40-FA	10000-40-SL	10000-50-FA/SL	10000-50-SL
GWPT	kg CO2e	34.83	39.13	41.44	40.23	43.89	42.03	44.81	43.83
GWPF	kg CO2e	34.83	39.13	41.44	40.23	43.89	42.03	44.81	43.83
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.39E-09	1.55E-09	1.64E-09	1.60E-09	1.73E-09	1.67E-09	1.77E-09	1.74E-09
AP	kg SO2e	0.52	0.60	0.64	0.62	0.69	0.65	0.70	0.68
EPT	kg Ne	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04
EPM	kg N-eq	0.13	0.15	0.16	0.15	0.17	0.16	0.17	0.17
EPF	kg P-eq	4.13E-05	4.62E-05	4.88E-05	4.75E-05	5.16E-05	4.96E-05	5.27E-05	5.16E-05
SFP	kg O3e	14.44	16.67	17.88	17.15	19.15	18.05	19.52	18.95
ADP _f	MJ	473.79	529.64	559.83	544.64	591.70	568.26	604.23	591.88
ADP _e	kg Sbe	4.73E-08	5.15E-08	5.38E-08	5.28E-08	5.62E-08	5.47E-08	5.73E-08	5.65E-08
RPRE	MJ	4.12E-03	4.49E-03	4.69E-03	4.61E-03	4.90E-03	4.77E-03	5.00E-03	4.93E-03
NRPRE	MJ	478.68	535.06	565.54	550.22	597.72	574.07	610.37	597.92
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 187. NRMCA national average - High-Strength 12,000 psi - A2 - Transportation results per cubic meter

Indicator	Unit	12000-00-FA/SL	12000-20-FA	12000-30-FA	12000-30-SL	12000-40-FA	12000-40-SL	12000-50-FA/SL	12000-50-SL
GWPT	kg CO2e	37.62	42.52	45.17	43.79	47.97	45.84	49.01	47.90
GWPF	kg CO2e	37.62	42.52	45.17	43.79	47.97	45.84	49.01	47.90
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	1.50E-09	1.68E-09	1.79E-09	1.73E-09	1.89E-09	1.81E-09	1.93E-09	1.89E-09
AP	kg SO2e	0.57	0.66	0.71	0.68	0.76	0.72	0.77	0.75
EPT	kg Ne	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPM	kg N-eq	0.14	0.16	0.18	0.17	0.19	0.18	0.19	0.19
EPF	kg P-eq	4.45E-05	5.01E-05	5.31E-05	5.16E-05	5.63E-05	5.39E-05	5.75E-05	5.63E-05
SFP	kg O3e	15.80	18.35	19.73	18.89	21.18	19.92	21.61	20.95
ADP _f	MJ	510.45	574.29	608.79	591.43	645.22	618.43	659.53	645.42
ADP _e	kg Sbe	5.05E-08	5.53E-08	5.79E-08	5.68E-08	6.06E-08	5.89E-08	6.20E-08	6.10E-08
RPRE	MJ	4.40E-03	4.82E-03	5.05E-03	4.95E-03	5.29E-03	5.14E-03	5.40E-03	5.32E-03
NRPRE	MJ	515.70	580.14	614.98	597.47	651.75	624.72	666.21	651.98
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.09
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 188. NRMCA national average - Lightweight 3,000 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	LW-3000-00-FA/SL-AE	LW-3000-20-FA-AE	LW-3000-30-FA-AE	LW-3000-30-SL-AE	LW-3000-40-FA-AE	LW-3000-40-SL-AE	LW-3000-50-FA/SL-AE	LW-3000-50-SL-AE
GWPT	kg CO2e	21.40	23.82	25.13	24.16	26.44	25.03	26.63	25.90
GWPF	kg CO2e	21.40	23.82	25.13	24.16	26.44	25.03	26.63	25.90
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ODP	kg CFC11e	8.60E-10	9.53E-10	1.00E-09	9.66E-10	1.05E-09	1.00E-09	1.06E-09	1.03E-09
AP	kg SO2e	0.31	0.35	0.37	0.36	0.40	0.37	0.40	0.39
EPT	kg Ne	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
EPM	kg N-eq	0.08	0.09	0.09	0.09	0.10	0.09	0.10	0.10
EPF	kg P-eq	2.56E-05	2.84E-05	2.99E-05	2.87E-05	3.14E-05	2.97E-05	3.16E-05	3.07E-05
SFP	kg O3e	8.46	9.65	10.30	9.82	10.95	10.26	11.05	10.69
ADP _f	MJ	293.49	325.33	342.52	329.76	359.79	341.23	362.29	352.70
ADP _e	kg Sbe	3.03E-08	3.29E-08	3.43E-08	3.32E-08	3.56E-08	3.41E-08	3.58E-08	3.50E-08
RPRE	MJ	2.64E-03	2.87E-03	2.99E-03	2.89E-03	3.11E-03	2.97E-03	3.12E-03	3.05E-03
NRPRE	MJ	296.56	328.71	346.08	333.19	363.50	344.77	366.03	356.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 189. NRMCA national average - Lightweight 4,000 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	LW-4000-00-FA/SL-AE	LW-4000-20-FA-AE	LW-4000-30-FA-AE	LW-4000-30-SL-AE	LW-4000-40-FA-AE	LW-4000-40-SL-AE	LW-4000-50-FA/SL-AE	LW-4000-50-SL-AE
GWPT	kg CO2e	23.81	26.76	28.39	27.19	30.04	28.29	30.30	29.45
GWPF	kg CO2e	23.81	26.76	28.39	27.19	30.04	28.29	30.30	29.45
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ODP	kg CFC11e	9.53E-10	1.07E-09	1.13E-09	1.08E-09	1.19E-09	1.13E-09	1.20E-09	1.17E-09
AP	kg SO2e	0.35	0.40	0.43	0.41	0.46	0.43	0.47	0.45
EPT	kg Ne	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03
EPM	kg N-eq	0.09	0.10	0.11	0.10	0.12	0.11	0.12	0.11
EPF	kg P-eq	2.83E-05	3.17E-05	3.36E-05	3.22E-05	3.55E-05	3.35E-05	3.58E-05	3.48E-05
SFP	kg O3e	9.65	11.12	11.93	11.34	12.76	11.89	12.89	12.46
ADP _f	MJ	325.15	363.79	385.24	369.45	406.97	383.97	410.39	399.24
ADP _e	kg Sbe	3.30E-08	3.61E-08	3.78E-08	3.65E-08	3.95E-08	3.76E-08	3.97E-08	3.88E-08
RPRE	MJ	2.88E-03	3.14E-03	3.30E-03	3.18E-03	3.45E-03	3.28E-03	3.46E-03	3.39E-03
NRPRE	MJ	328.52	367.54	389.20	373.26	411.14	387.92	414.59	403.34
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.05	0.06	0.05	0.06	0.05	0.06	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 190. NRMCA national average - Lightweight 5,000 psi - Air-Entrained - A2 - Transportation results per cubic meter

Indicator	Unit	LW-5000-00-FA/SL-AE	LW-5000-20-FA-AE	LW-5000-30-FA-AE	LW-5000-30-SL-AE	LW-5000-40-FA-AE	LW-5000-40-SL-AE	LW-5000-50-FA/SL-AE	LW-5000-50-SL-AE
GWPT	kg CO2e	25.54	28.95	30.83	29.47	32.74	30.73	33.04	32.08
GWPF	kg CO2e	25.54	28.95	30.83	29.47	32.74	30.73	33.04	32.08
GWPB	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWPL	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ODP	kg CFC11e	1.02E-09	1.15E-09	1.22E-09	1.17E-09	1.30E-09	1.22E-09	1.31E-09	1.27E-09
AP	kg SO2e	0.38	0.44	0.47	0.45	0.51	0.47	0.51	0.49
EPT	kg Ne	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
EPM	kg N-eq	0.10	0.11	0.12	0.11	0.13	0.12	0.13	0.12
EPF	kg P-eq	3.03E-05	3.42E-05	3.64E-05	3.48E-05	3.86E-05	3.63E-05	3.89E-05	3.78E-05
SFP	kg O3e	10.49	12.19	13.12	12.44	14.07	13.07	14.23	13.73
ADP _f	MJ	347.94	392.67	417.55	399.62	442.49	416.22	446.59	433.94
ADP _e	kg Sbe	3.50E-08	3.86E-08	4.06E-08	3.91E-08	4.26E-08	4.04E-08	4.28E-08	4.18E-08
RPRE	MJ	3.05E-03	3.36E-03	3.54E-03	3.41E-03	3.71E-03	3.52E-03	3.73E-03	3.64E-03
NRPRE	MJ	351.54	396.70	421.83	403.72	447.01	420.48	451.15	438.38
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 191. NRMCA national average - Normal-Weight 2,500 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	2500-00-FA/SL-AE	2500-20-FA-AE	2500-30-FA-AE	2500-30-SL-AE	2500-40-FA-AE	2500-40-SL-AE	2500-50-FA/SL-AE	2500-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 192. NRMCA national average - Normal-Weight 3,000 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	3000-00-FA/SL-AE	3000-20-FA-AE	3000-30-FA-AE	3000-30-SL-AE	3000-40-FA-AE	3000-40-SL-AE	3000-50-FA/SL-AE	3000-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 193. NRMCA national average - Normal-Weight 4,000 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	4000-00-FA/SL-AE	4000-20-FA-AE	4000-30-FA-AE	4000-30-SL-AE	4000-40-FA-AE	4000-40-SL-AE	4000-50-FA/SL-AE	4000-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 194. NRMCA national average - Normal-Weight 5,000 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	5000-00-FA/SL-AE	5000-20-FA-AE	5000-30-FA-AE	5000-30-SL-AE	5000-40-FA-AE	5000-40-SL-AE	5000-50-FA/SL-AE	5000-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 195. NRMCA national average - Normal-Weight 2,500 psi - Non-Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	2500-00-FA/SL	2500-20-FA	2500-30-FA	2500-30-SL	2500-40-FA	2500-40-SL	2500-50-FA/SL	2500-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 196. NRMCA national average - Normal-Weight 3,000 psi - Non-Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	3000-00-FA/SL	3000-20-FA	3000-30-FA	3000-30-SL	3000-40-FA	3000-40-SL	3000-50-FA/SL	3000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 197. NRMCA national average - Normal-Weight 4,000 psi - Non-Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	4000-00-FA/SL	4000-20-FA	4000-30-FA	4000-30-SL	4000-40-FA	4000-40-SL	4000-50-FA/SL	4000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 198. NRMCA national average - Normal-Weight 5,000 psi - Non-Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	5000-00-FA/SL	5000-20-FA	5000-30-FA	5000-30-SL	5000-40-FA	5000-40-SL	5000-50-FA/SL	5000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 199. NRMCA national average - High-Strength 6,000 psi - A3 - Manufacturing results per cubic meter

Indicator	Unit	6000-00-FA/SL	6000-20-FA	6000-30-FA	6000-30-SL	6000-40-FA	6000-40-SL	6000-50-FA/SL	6000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 200. NRMCA national average - High-Strength 8,000 psi - A3 - Manufacturing results per cubic meter

Indicator	Unit	8000-00-FA/SL	8000-20-FA	8000-30-FA	8000-30-SL	8000-40-FA	8000-40-SL	8000-50-FA/SL	8000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 201. NRMCA national average - High-Strength 10,000 psi - A3 - Manufacturing results per cubic meter

Indicator	Unit	10000-00-FA/SL	10000-20-FA	10000-30-FA	10000-30-SL	10000-40-FA	10000-40-SL	10000-50-FA/SL	10000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 202. NRMCA national average - High-Strength 12,000 psi - A3 - Manufacturing results per cubic meter

Indicator	Unit	12000-00-FA/SL	12000-20-FA	12000-30-FA	12000-30-SL	12000-40-FA	12000-40-SL	12000-50-FA/SL	12000-50-SL
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	-	-	-	-	-	-	-	-
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 203. NRMCA national average - Lightweight 3,000 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	LW-3000-00-FA/SL-AE	LW-3000-20-FA-AE	LW-3000-30-FA-AE	LW-3000-30-SL-AE	LW-3000-40-FA-AE	LW-3000-40-SL-AE	LW-3000-50-FA/SL-AE	LW-3000-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 204. NRMCA national average - Lightweight 4,000 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	LW-4000-00-FA/SL-AE	LW-4000-20-FA-AE	LW-4000-30-FA-AE	LW-4000-30-SL-AE	LW-4000-40-FA-AE	LW-4000-40-SL-AE	LW-4000-50-FA/SL-AE	LW-4000-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

Table 205. NRMCA national average - Lightweight 5,000 psi - Air-Entrained - A3 - Manufacturing results per cubic meter

Indicator	Unit	LW-5000-00-FA/SL-AE	LW-5000-20-FA-AE	LW-5000-30-FA-AE	LW-5000-30-SL-AE	LW-5000-40-FA-AE	LW-5000-40-SL-AE	LW-5000-50-FA/SL-AE	LW-5000-50-SL-AE
GWPT	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPF	kg CO2e	10.91	10.91	10.91	10.91	10.91	10.91	10.91	10.91
GWPB	kg CO2e	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03
GWPL	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ODP	kg CFC11e	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07	2.26E-07
AP	kg SO2e	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EPT	kg Ne	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03	5.08E-03
EPM	kg N-eq	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03
EPF	kg P-eq	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
SFP	kg O3e	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
ADP _f	MJ	156.69	156.69	156.69	156.69	156.69	156.69	156.69	156.69
ADP _e	kg Sbe	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06	1.64E-06
RPRE	MJ	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
NRPRE	MJ	159.35	159.35	159.35	159.35	159.35	159.35	159.35	159.35
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CCE	kg CO2e	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWD	kg	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
NHWD	kg	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29
HLRW	m3	-	-	-	-	-	-	-	-
ILLRW	m3	-	-	-	-	-	-	-	-

APPENDIX H — NATIONAL PRODUCT STATISTICAL RESULTS

All results are per 1 m³ of fresh concrete. The Mean column is the direct A1-A3 product result from the 2026-10-04 Theta software output. A1 is fixed for each declared product. Product-level statistical variability reflects sampling uncertainty in A2 transportation and A3 manufacturing. A2 precision uses the applicable Kish effective sample size derived from production-volume weights; the corresponding observed material- and mode-specific N values are reported separately in Appendix B. A3 precision uses the applicable facility statistical population. A2 and A3 standard errors are combined by root-sum-of-squares. Accordingly, the product-level SD, MOE, and 95% CI do not correspond to a single common N of 1,238. Median, P20, P40, P60, and P80 are empirical order statistics. EPT is not included in these statistical tables; EPM and EPF are reported as the TRACI 2.2 eutrophication indicators. Confidence-interval basis and limitation: The 95% confidence intervals for product means use a two-sided Student t approximation applied to the combined A2 and A3 standard error. The A2 component is based on the applicable Kish effective sample size, while the A3 component is based on the applicable facility statistical population; the two standard errors are combined by root-sum-of-squares. The intervals therefore represent sampling precision in the modeled A2 transportation and A3 manufacturing inputs and do not include systematic uncertainty in background datasets or model structure.

Normal-Weight 2,500 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
2500-00-FA/SL-AE	GWPT	kg CO ₂ e	272.59	15.45	264.43	250.91	260.20	268.98	285.61	0.96	271.63 - 273.55
	ODP	kg CFC11e	5.736E-06	1.334E-07	5.705E-06	5.609E-06	5.671E-06	5.741E-06	5.827E-06	7.433E-09	5.729E-06 - 5.743E-06
	AP	kg SO ₂ e	0.860	0.156	0.720	0.620	0.688	0.760	0.921	0.010	0.850 - 0.870
	EPM	kg N eq	0.115	0.040	0.083	0.059	0.075	0.091	0.130	0.003	0.112 - 0.118
	EPF	kg P eq	0.033	0.000	0.033	0.033	0.033	0.033	0.033	1.15E-05	0.033 - 0.033
	SFP	kg O ₃ e	18.75	4.02	14.98	12.65	14.20	15.87	19.86	0.26	18.49 - 19.01
	ADP _f	MJ	1816.68	219.05	1712.29	1522.31	1651.57	1770.92	2015.08	13.57	1803.11 - 1830.25
	ADP _e	kg Sb eq	1.095E-04	1.132E-06	1.092E-04	1.083E-04	1.090E-04	1.096E-04	1.102E-04	6.304E-08	1.094E-04 - 1.096E-04
2500-20-FA-AE	GWPT	kg CO ₂ e	238.90	18.56	230.53	216.44	225.50	236.33	256.65	1.20	237.70 - 240.10
	ODP	kg CFC11e	4.880E-06	1.334E-07	4.849E-06	4.753E-06	4.815E-06	4.885E-06	4.971E-06	7.433E-09	4.873E-06 - 4.887E-06
	AP	kg SO ₂ e	0.821	0.243	0.668	0.556	0.625	0.724	1.005	0.016	0.805 - 0.837
	EPM	kg N eq	0.119	0.061	0.084	0.058	0.074	0.098	0.164	0.004	0.115 - 0.123
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O ₃ e	18.30	6.30	14.09	11.61	13.12	15.40	22.74	0.42	17.88 - 18.72
	ADP _f	MJ	1671.15	249.43	1563.89	1367.18	1495.07	1645.78	1910.31	16.06	1655.09 - 1687.21
	ADP _e	kg Sb eq	1.067E-04	1.132E-06	1.064E-04	1.055E-04	1.062E-04	1.068E-04	1.074E-04	6.304E-08	1.066E-04 - 1.068E-04
2500-30-FA-AE	GWPT	kg CO ₂ e	220.69	18.53	211.42	197.51	206.63	217.38	237.68	1.20	219.49 - 221.89
	ODP	kg CFC11e	4.417E-06	1.334E-07	4.386E-06	4.290E-06	4.352E-06	4.422E-06	4.508E-06	7.433E-09	4.410E-06 - 4.424E-06
	AP	kg SO ₂ e	0.800	0.260	0.632	0.520	0.589	0.691	1.000	0.017	0.783 - 0.817
	EPM	kg N eq	0.121	0.066	0.082	0.056	0.072	0.096	0.171	0.004	0.117 - 0.125
	EPF	kg P eq	0.025	0.000	0.025	0.025	0.025	0.025	0.025	1.16E-05	0.025 - 0.025
	SFP	kg O ₃ e	18.06	6.58	13.37	10.92	12.45	14.76	22.53	0.43	17.63 - 18.49
	ADP _f	MJ	1592.49	252.85	1478.01	1277.86	1407.35	1558.70	1827.51	16.29	1576.20 - 1608.78
	ADP _e	kg Sb eq	1.052E-04	1.132E-06	1.049E-04	1.040E-04	1.047E-04	1.053E-04	1.059E-04	6.304E-08	1.051E-04 - 1.053E-04
2500-30-SL-AE	GWPT	kg CO ₂ e	218.58	18.59	209.73	195.63	204.92	215.83	235.88	1.20	217.38 - 219.78
	ODP	kg CFC11e	5.976E-06	1.334E-07	5.945E-06	5.849E-06	5.911E-06	5.981E-06	6.067E-06	7.433E-09	5.969E-06 - 5.983E-06
	AP	kg SO ₂ e	0.922	0.262	0.763	0.650	0.719	0.823	1.132	0.017	0.905 - 0.939
	EPM	kg N eq	0.119	0.064	0.082	0.056	0.072	0.097	0.167	0.004	0.115 - 0.123
	EPF	kg P eq	0.027	0.000	0.027	0.027	0.027	0.027	0.027	1.16E-05	0.027 - 0.027
	SFP	kg O ₃ e	20.30	6.84	15.83	13.38	14.91	17.30	25.44	0.45	19.85 - 20.75
	ADP _f	MJ	1535.76	257.65	1425.94	1224.01	1354.98	1511.15	1781.48	16.61	1519.15 - 1552.37
	ADP _e	kg Sb eq	1.031E-04	1.132E-06	1.028E-04	1.019E-04	1.026E-04	1.032E-04	1.038E-04	6.305E-08	1.030E-04 - 1.032E-04

Normal-Weight 2,500 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
2500-40-FA-AE	GWPT	kg CO2e	201.46	17.98	191.58	177.37	186.74	197.26	216.54	1.16	200.30 - 202.62
	ODP	kg CFC11e	3.929E-06	1.334E-07	3.898E-06	3.802E-06	3.863E-06	3.934E-06	4.020E-06	7.433E-09	3.922E-06 - 3.936E-06
	AP	kg SO2e	0.778	0.252	0.594	0.482	0.552	0.653	0.948	0.017	0.761 - 0.795
	EPM	kg N eq	0.123	0.061	0.080	0.054	0.070	0.095	0.160	0.004	0.119 - 0.127
	EPF	kg P eq	0.023	0.000	0.023	0.023	0.023	0.023	0.023	1.16E-05	0.023 - 0.023
	SFP	kg O3e	17.80	6.57	12.62	10.20	11.70	14.08	21.79	0.43	17.37 - 18.23
	ADP _f	MJ	1509.45	255.54	1385.96	1184.97	1315.52	1464.39	1740.73	16.47	1492.98 - 1525.92
	ADP _e	kg Sb eq	1.036E-04	1.132E-06	1.033E-04	1.024E-04	1.031E-04	1.037E-04	1.043E-04	6.305E-08	1.035E-04 - 1.037E-04
2500-40-SL-AE	GWPT	kg CO2e	200.58	18.51	191.15	176.80	186.54	197.36	216.92	1.19	199.39 - 201.77
	ODP	kg CFC11e	6.057E-06	1.334E-07	6.026E-06	5.930E-06	5.992E-06	6.062E-06	6.148E-06	7.433E-09	6.050E-06 - 6.064E-06
	AP	kg SO2e	0.943	0.247	0.772	0.657	0.730	0.831	1.114	0.016	0.927 - 0.959
	EPM	kg N eq	0.121	0.061	0.081	0.054	0.072	0.096	0.161	0.004	0.117 - 0.125
	EPF	kg P eq	0.025	0.000	0.025	0.025	0.025	0.025	0.025	1.16E-05	0.025 - 0.025
	SFP	kg O3e	20.81	6.63	16.01	13.43	15.08	17.51	25.10	0.44	20.37 - 21.25
	ADP _f	MJ	1442.13	264.58	1323.56	1121.79	1257.33	1408.38	1694.51	17.08	1425.05 - 1459.21
	ADP _e	kg Sb eq	1.009E-04	1.132E-06	1.006E-04	9.972E-05	1.004E-04	1.010E-04	1.016E-04	6.305E-08	1.008E-04 - 1.010E-04
2500-50-FA/SL-AE	GWPT	kg CO2e	182.05	18.25	171.90	157.52	167.18	177.49	197.29	1.18	180.87 - 183.23
	ODP	kg CFC11e	5.133E-06	1.334E-07	5.102E-06	5.006E-06	5.067E-06	5.138E-06	5.224E-06	7.433E-09	5.126E-06 - 5.140E-06
	AP	kg SO2e	0.887	0.230	0.700	0.580	0.659	0.756	1.007	0.015	0.872 - 0.902
	EPM	kg N eq	0.123	0.056	0.080	0.052	0.070	0.093	0.148	0.004	0.119 - 0.127
	EPF	kg P eq	0.022	0.000	0.022	0.022	0.022	0.022	0.022	1.16E-05	0.022 - 0.022
	SFP	kg O3e	19.93	6.49	14.74	11.96	13.73	16.06	23.40	0.43	19.50 - 20.36
	ADP _f	MJ	1375.45	256.92	1247.97	1045.29	1177.83	1323.38	1604.88	16.56	1358.89 - 1392.01
	ADP _e	kg Sb eq	9.995E-05	1.132E-06	9.969E-05	9.876E-05	9.943E-05	1.000E-04	1.006E-04	6.305E-08	9.989E-05 - 1.000E-04
2500-50-SL-AE	GWPT	kg CO2e	182.58	18.29	172.71	158.28	168.02	178.54	198.06	1.18	181.40 - 183.76
	ODP	kg CFC11e	6.137E-06	1.334E-07	6.106E-06	6.010E-06	6.071E-06	6.142E-06	6.228E-06	7.433E-09	6.130E-06 - 6.144E-06
	AP	kg SO2e	0.963	0.225	0.783	0.665	0.742	0.840	1.082	0.015	0.948 - 0.978
	EPM	kg N eq	0.122	0.056	0.080	0.052	0.070	0.094	0.150	0.004	0.118 - 0.126
	EPF	kg P eq	0.023	0.000	0.023	0.023	0.023	0.023	0.023	1.15E-05	0.023 - 0.023
	SFP	kg O3e	21.33	6.24	16.34	13.51	15.28	17.64	24.50	0.41	20.92 - 21.74
	ADP _f	MJ	1348.49	248.62	1226.45	1020.95	1156.67	1294.22	1566.87	16.00	1332.49 - 1364.49
	ADP _e	kg Sb eq	9.878E-05	1.132E-06	9.852E-05	9.759E-05	9.826E-05	9.884E-05	9.948E-05	6.305E-08	9.872E-05 - 9.884E-05

Normal-Weight 3,000 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
3000-00-FA/SL-AE	GWPT	kg CO2e	304.33	15.36	295.73	282.09	291.55	300.18	316.64	0.95	303.38 - 305.28
	ODP	kg CFC11e	6.456E-06	1.334E-07	6.425E-06	6.329E-06	6.391E-06	6.461E-06	6.546E-06	7.433E-09	6.449E-06 - 6.463E-06
	AP	kg SO2e	0.936	0.158	0.788	0.686	0.753	0.827	0.989	0.010	0.926 - 0.946
	EPM	kg N eq	0.123	0.041	0.087	0.064	0.080	0.096	0.137	0.003	0.120 - 0.126
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.15E-05	0.037 - 0.037
	SFP	kg O3e	20.28	3.91	16.27	13.83	15.43	17.12	20.84	0.25	20.03 - 20.53
	ADPf	MJ	1993.35	214.22	1881.85	1692.42	1824.28	1941.58	2176.01	13.25	1980.10 - 2006.60
	ADPe	kg Sb eq	1.238E-04	1.132E-06	1.235E-04	1.226E-04	1.233E-04	1.239E-04	1.245E-04	6.304E-08	1.237E-04 - 1.239E-04
3000-20-FA-AE	GWPT	kg CO2e	266.15	19.24	256.85	243.02	252.12	262.67	284.66	1.24	264.91 - 267.39
	ODP	kg CFC11e	5.485E-06	1.334E-07	5.454E-06	5.358E-06	5.420E-06	5.490E-06	5.576E-06	7.433E-09	5.478E-06 - 5.492E-06
	AP	kg SO2e	0.892	0.250	0.724	0.615	0.682	0.780	1.078	0.016	0.876 - 0.908
	EPM	kg N eq	0.128	0.063	0.090	0.064	0.079	0.102	0.174	0.004	0.124 - 0.132
	EPF	kg P eq	0.031	0.000	0.031	0.031	0.031	0.031	0.031	1.16E-05	0.031 - 0.031
	SFP	kg O3e	19.77	6.43	15.15	12.66	14.17	16.37	24.05	0.42	19.35 - 20.19
	ADPf	MJ	1828.45	260.97	1713.43	1515.54	1642.30	1790.84	2082.06	16.84	1811.61 - 1845.29
	ADPe	kg Sb eq	1.207E-04	1.132E-06	1.204E-04	1.195E-04	1.202E-04	1.208E-04	1.214E-04	6.304E-08	1.206E-04 - 1.208E-04
3000-30-FA-AE	GWPT	kg CO2e	245.51	19.32	235.42	221.41	230.68	241.50	263.11	1.25	244.26 - 246.76
	ODP	kg CFC11e	4.961E-06	1.334E-07	4.930E-06	4.834E-06	4.895E-06	4.966E-06	5.052E-06	7.433E-09	4.954E-06 - 4.968E-06
	AP	kg SO2e	0.869	0.259	0.682	0.575	0.643	0.741	1.054	0.017	0.852 - 0.886
	EPM	kg N eq	0.130	0.067	0.087	0.061	0.077	0.101	0.178	0.004	0.126 - 0.134
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O3e	19.50	6.65	14.35	11.86	13.41	15.69	23.61	0.44	19.06 - 19.94
	ADPf	MJ	1739.31	263.12	1613.79	1416.05	1543.74	1698.42	1984.73	16.98	1722.33 - 1756.29
	ADPe	kg Sb eq	1.190E-04	1.132E-06	1.187E-04	1.178E-04	1.185E-04	1.191E-04	1.197E-04	6.305E-08	1.189E-04 - 1.191E-04
3000-30-SL-AE	GWPT	kg CO2e	243.13	18.97	233.51	219.35	228.61	239.63	260.29	1.22	241.91 - 244.35
	ODP	kg CFC11e	6.728E-06	1.334E-07	6.697E-06	6.601E-06	6.662E-06	6.733E-06	6.819E-06	7.433E-09	6.721E-06 - 6.735E-06
	AP	kg SO2e	1.006	0.266	0.830	0.718	0.788	0.892	1.208	0.018	0.988 - 1.024
	EPM	kg N eq	0.128	0.068	0.087	0.061	0.077	0.102	0.179	0.004	0.124 - 0.132
	EPF	kg P eq	0.030	0.000	0.030	0.030	0.030	0.030	0.030	1.16E-05	0.030 - 0.030
	SFP	kg O3e	22.04	6.68	17.16	14.64	16.24	18.55	26.44	0.44	21.60 - 22.48
	ADPf	MJ	1675.03	260.51	1556.17	1352.84	1483.89	1637.41	1916.79	16.81	1658.22 - 1691.84
	ADPe	kg Sb eq	1.165E-04	1.132E-06	1.162E-04	1.153E-04	1.160E-04	1.166E-04	1.172E-04	6.305E-08	1.164E-04 - 1.166E-04

Normal-Weight 3,000 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
3000-40-FA-AE	GWPT	kg CO ₂ e	223.73	18.21	212.99	198.68	208.07	218.50	238.34	1.17	222.56 - 224.90
	ODP	kg CFC11e	4.408E-06	1.334E-07	4.376E-06	4.281E-06	4.342E-06	4.413E-06	4.499E-06	7.433E-09	4.401E-06 - 4.415E-06
	AP	kg SO ₂ e	0.844	0.262	0.642	0.530	0.601	0.698	1.015	0.017	0.827 - 0.861
	EPM	kg N eq	0.132	0.066	0.085	0.059	0.076	0.099	0.173	0.004	0.128 - 0.136
	EPF	kg P eq	0.025	0.000	0.025	0.025	0.025	0.025	0.025	1.16E-05	0.025 - 0.025
	SFP	kg O ₃ e	19.21	6.70	13.56	11.08	12.60	14.84	22.93	0.44	18.77 - 19.65
	ADP _f	MJ	1645.22	254.32	1509.73	1308.88	1439.68	1585.45	1863.28	16.39	1628.83 - 1661.61
	ADP _e	kg Sb eq	1.172E-04	1.132E-06	1.169E-04	1.160E-04	1.167E-04	1.173E-04	1.179E-04	6.305E-08	1.171E-04 - 1.173E-04
3000-40-SL-AE	GWPT	kg CO ₂ e	222.73	18.37	212.64	198.21	207.73	218.45	238.09	1.18	221.55 - 223.91
	ODP	kg CFC11e	6.819E-06	1.334E-07	6.788E-06	6.692E-06	6.753E-06	6.824E-06	6.910E-06	7.433E-09	6.812E-06 - 6.826E-06
	AP	kg SO ₂ e	1.030	0.257	0.842	0.727	0.799	0.902	1.202	0.017	1.013 - 1.047
	EPM	kg N eq	0.130	0.062	0.086	0.059	0.076	0.101	0.168	0.004	0.126 - 0.134
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O ₃ e	22.62	6.77	17.32	14.84	16.38	18.81	26.76	0.45	22.17 - 23.07
	ADP _f	MJ	1568.93	262.11	1443.05	1238.46	1370.70	1523.47	1805.79	16.91	1552.02 - 1585.84
	ADP _e	kg Sb eq	1.141E-04	1.132E-06	1.138E-04	1.129E-04	1.136E-04	1.142E-04	1.148E-04	6.305E-08	1.140E-04 - 1.142E-04
3000-50-FA/SL-AE	GWPT	kg CO ₂ e	201.73	18.45	190.49	176.14	185.86	196.08	216.35	1.19	200.54 - 202.92
	ODP	kg CFC11e	5.772E-06	1.334E-07	5.740E-06	5.645E-06	5.706E-06	5.777E-06	5.863E-06	7.433E-09	5.765E-06 - 5.779E-06
	AP	kg SO ₂ e	0.966	0.246	0.759	0.644	0.720	0.818	1.099	0.016	0.950 - 0.982
	EPM	kg N eq	0.132	0.061	0.084	0.057	0.075	0.098	0.162	0.004	0.128 - 0.136
	EPF	kg P eq	0.024	0.000	0.024	0.024	0.024	0.024	0.024	1.16E-05	0.024 - 0.024
	SFP	kg O ₃ e	21.62	6.77	15.89	13.20	14.93	17.17	25.19	0.45	21.17 - 22.07
	ADP _f	MJ	1493.38	262.61	1353.66	1149.86	1282.58	1430.40	1719.82	16.95	1476.43 - 1510.33
	ADP _e	kg Sb eq	1.130E-04	1.132E-06	1.127E-04	1.118E-04	1.125E-04	1.131E-04	1.137E-04	6.305E-08	1.129E-04 - 1.131E-04
3000-50-SL-AE	GWPT	kg CO ₂ e	202.33	18.64	191.55	177.08	186.79	197.11	217.62	1.20	201.13 - 203.53
	ODP	kg CFC11e	6.910E-06	1.334E-07	6.878E-06	6.783E-06	6.844E-06	6.915E-06	7.001E-06	7.433E-09	6.903E-06 - 6.917E-06
	AP	kg SO ₂ e	1.053	0.243	0.853	0.735	0.813	0.914	1.184	0.016	1.037 - 1.069
	EPM	kg N eq	0.131	0.059	0.085	0.057	0.075	0.099	0.159	0.004	0.127 - 0.135
	EPF	kg P eq	0.026	0.000	0.026	0.026	0.026	0.026	0.026	1.16E-05	0.026 - 0.026
	SFP	kg O ₃ e	23.21	6.68	17.70	14.91	16.71	19.00	26.72	0.44	22.77 - 23.65
	ADP _f	MJ	1462.82	261.86	1328.08	1123.22	1255.09	1403.99	1691.35	16.90	1445.92 - 1479.72
	ADP _e	kg Sb eq	1.117E-04	1.132E-06	1.114E-04	1.105E-04	1.112E-04	1.118E-04	1.124E-04	6.305E-08	1.116E-04 - 1.118E-04

Normal-Weight 4,000 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
4000-00-FA/SL-AE	GWPT	kg CO2e	376.21	15.08	366.18	352.77	362.06	370.90	386.67	0.93	375.28 - 377.14
	ODP	kg CFC11e	8.085E-06	1.334E-07	8.054E-06	7.958E-06	8.019E-06	8.090E-06	8.175E-06	7.433E-09	8.078E-06 - 8.092E-06
	AP	kg SO2e	1.109	0.156	0.934	0.830	0.902	0.975	1.131	0.010	1.099 - 1.119
	EPM	kg N eq	0.142	0.040	0.100	0.076	0.094	0.110	0.148	0.003	0.139 - 0.145
	EPF	kg P eq	0.046	0.000	0.046	0.046	0.046	0.046	0.046	1.15E-05	0.046 - 0.046
	SFP	kg O3e	23.75	4.03	19.03	16.38	18.20	19.82	23.63	0.26	23.49 - 24.01
	ADPf	MJ	2393.50	212.05	2265.83	2078.16	2206.42	2327.79	2555.96	13.11	2380.39 - 2406.61
	ADPe	kg Sb eq	1.562E-04	1.132E-06	1.559E-04	1.550E-04	1.557E-04	1.563E-04	1.569E-04	6.304E-08	1.561E-04 - 1.563E-04
4000-20-FA-AE	GWPT	kg CO2e	327.87	20.49	316.66	302.88	312.23	322.40	347.05	1.33	326.54 - 329.20
	ODP	kg CFC11e	6.857E-06	1.334E-07	6.825E-06	6.730E-06	6.791E-06	6.862E-06	6.948E-06	7.433E-09	6.850E-06 - 6.864E-06
	AP	kg SO2e	1.053	0.258	0.852	0.746	0.812	0.902	1.226	0.017	1.036 - 1.070
	EPM	kg N eq	0.147	0.065	0.100	0.075	0.091	0.112	0.189	0.004	0.143 - 0.151
	EPF	kg P eq	0.039	0.000	0.039	0.039	0.039	0.039	0.039	1.16E-05	0.039 - 0.039
	SFP	kg O3e	23.11	6.80	17.47	14.91	16.71	18.70	27.03	0.45	22.66 - 23.56
	ADPf	MJ	2184.70	290.10	2042.17	1845.53	1978.75	2122.67	2470.04	18.80	2165.90 - 2203.50
	ADPe	kg Sb eq	1.522E-04	1.132E-06	1.519E-04	1.510E-04	1.517E-04	1.523E-04	1.529E-04	6.305E-08	1.521E-04 - 1.523E-04
4000-30-FA-AE	GWPT	kg CO2e	301.74	21.13	289.74	275.84	285.29	295.28	321.30	1.37	300.37 - 303.11
	ODP	kg CFC11e	6.193E-06	1.334E-07	6.161E-06	6.066E-06	6.127E-06	6.198E-06	6.284E-06	7.433E-09	6.186E-06 - 6.200E-06
	AP	kg SO2e	1.023	0.259	0.800	0.694	0.766	0.855	1.175	0.017	1.006 - 1.040
	EPM	kg N eq	0.150	0.066	0.098	0.073	0.089	0.111	0.190	0.004	0.146 - 0.154
	EPF	kg P eq	0.035	0.000	0.035	0.035	0.035	0.035	0.035	1.16E-05	0.035 - 0.035
	SFP	kg O3e	22.76	6.74	16.56	13.91	15.69	17.89	25.86	0.44	22.32 - 23.20
	ADPf	MJ	2071.84	288.59	1921.48	1726.30	1856.88	1996.33	2349.41	18.70	2053.14 - 2090.54
	ADPe	kg Sb eq	1.501E-04	1.132E-06	1.498E-04	1.489E-04	1.496E-04	1.502E-04	1.508E-04	6.305E-08	1.500E-04 - 1.502E-04
4000-30-SL-AE	GWPT	kg CO2e	298.72	21.34	287.34	273.04	282.76	293.35	318.71	1.38	297.34 - 300.10
	ODP	kg CFC11e	8.431E-06	1.334E-07	8.399E-06	8.304E-06	8.365E-06	8.436E-06	8.522E-06	7.433E-09	8.424E-06 - 8.438E-06
	AP	kg SO2e	1.198	0.266	0.988	0.878	0.949	1.043	1.371	0.018	1.180 - 1.216
	EPM	kg N eq	0.148	0.068	0.099	0.073	0.090	0.113	0.192	0.004	0.144 - 0.152
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.16E-05	0.037 - 0.037
	SFP	kg O3e	25.97	6.81	20.08	17.56	19.18	21.42	29.61	0.45	25.52 - 26.42
	ADPf	MJ	1990.46	279.32	1849.09	1645.59	1778.19	1929.24	2246.94	18.07	1972.39 - 2008.53
	ADPe	kg Sb eq	1.470E-04	1.132E-06	1.467E-04	1.458E-04	1.465E-04	1.471E-04	1.477E-04	6.305E-08	1.469E-04 - 1.471E-04

Normal-Weight 4,000 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
4000-40-FA-AE	GWPT	kg CO2e	274.16	19.91	261.25	247.38	256.69	266.67	290.50	1.29	272.87 - 275.45
	ODP	kg CFC11e	5.492E-06	1.334E-07	5.460E-06	5.365E-06	5.426E-06	5.497E-06	5.583E-06	7.433E-09	5.485E-06 - 5.499E-06
	AP	kg SO2e	0.991	0.254	0.747	0.637	0.714	0.799	1.111	0.017	0.974 - 1.008
	EPM	kg N eq	0.153	0.066	0.096	0.070	0.088	0.109	0.186	0.004	0.149 - 0.157
	EPF	kg P eq	0.031	0.000	0.031	0.031	0.031	0.031	0.031	1.16E-05	0.031 - 0.031
	SFP	kg O3e	22.39	6.98	15.59	12.90	14.61	16.84	25.27	0.46	21.93 - 22.85
	ADPf	MJ	1952.71	264.85	1790.20	1593.34	1720.59	1864.92	2168.84	17.10	1935.61 - 1969.81
	ADPe	kg Sb eq	1.478E-04	1.132E-06	1.475E-04	1.466E-04	1.473E-04	1.479E-04	1.485E-04	6.305E-08	1.477E-04 - 1.479E-04
4000-40-SL-AE	GWPT	kg CO2e	272.89	19.13	260.93	246.59	256.06	266.46	288.05	1.24	271.65 - 274.13
	ODP	kg CFC11e	8.546E-06	1.334E-07	8.514E-06	8.419E-06	8.480E-06	8.551E-06	8.637E-06	7.433E-09	8.539E-06 - 8.553E-06
	AP	kg SO2e	1.227	0.266	1.003	0.885	0.965	1.058	1.379	0.018	1.209 - 1.245
	EPM	kg N eq	0.150	0.070	0.098	0.070	0.089	0.111	0.193	0.005	0.145 - 0.155
	EPF	kg P eq	0.034	0.000	0.034	0.034	0.034	0.034	0.034	1.16E-05	0.034 - 0.034
	SFP	kg O3e	26.71	6.99	20.41	17.79	19.45	21.63	30.19	0.46	26.25 - 27.17
	ADPf	MJ	1856.12	267.04	1705.37	1503.51	1633.92	1782.89	2081.72	17.25	1838.87 - 1873.37
	ADPe	kg Sb eq	1.439E-04	1.132E-06	1.436E-04	1.427E-04	1.434E-04	1.440E-04	1.446E-04	6.305E-08	1.438E-04 - 1.440E-04
4000-50-FA/SL-AE	GWPT	kg CO2e	246.30	18.37	233.04	218.73	228.12	238.39	258.75	1.18	245.12 - 247.48
	ODP	kg CFC11e	7.221E-06	1.334E-07	7.189E-06	7.094E-06	7.155E-06	7.226E-06	7.311E-06	7.433E-09	7.214E-06 - 7.228E-06
	AP	kg SO2e	1.147	0.256	0.900	0.782	0.862	0.952	1.258	0.017	1.130 - 1.164
	EPM	kg N eq	0.153	0.066	0.095	0.067	0.086	0.107	0.184	0.004	0.149 - 0.157
	EPF	kg P eq	0.030	0.000	0.030	0.030	0.030	0.030	0.030	1.16E-05	0.030 - 0.030
	SFP	kg O3e	25.45	7.10	18.49	15.71	17.49	19.66	28.31	0.47	24.98 - 25.92
	ADPf	MJ	1760.46	259.43	1591.86	1390.70	1522.89	1667.91	1955.37	16.73	1743.73 - 1777.19
	ADPe	kg Sb eq	1.425E-04	1.132E-06	1.422E-04	1.413E-04	1.420E-04	1.426E-04	1.432E-04	6.305E-08	1.424E-04 - 1.426E-04
4000-50-SL-AE	GWPT	kg CO2e	247.06	18.73	234.16	219.68	229.28	239.79	260.33	1.21	245.85 - 248.27
	ODP	kg CFC11e	8.661E-06	1.334E-07	8.629E-06	8.534E-06	8.595E-06	8.666E-06	8.752E-06	7.433E-09	8.654E-06 - 8.668E-06
	AP	kg SO2e	1.257	0.262	1.019	0.901	0.980	1.071	1.388	0.017	1.240 - 1.274
	EPM	kg N eq	0.152	0.067	0.097	0.068	0.087	0.109	0.186	0.004	0.148 - 0.156
	EPF	kg P eq	0.032	0.000	0.032	0.032	0.032	0.032	0.032	1.16E-05	0.032 - 0.032
	SFP	kg O3e	27.46	7.27	20.75	18.00	19.83	21.98	30.91	0.48	26.98 - 27.94
	ADPf	MJ	1721.77	265.19	1559.35	1353.80	1490.97	1637.55	1929.22	17.12	1704.65 - 1738.89
	ADPe	kg Sb eq	1.409E-04	1.132E-06	1.406E-04	1.397E-04	1.404E-04	1.410E-04	1.416E-04	6.305E-08	1.408E-04 - 1.410E-04

Normal-Weight 5,000 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
5000-00-FA/SL-AE	GWPT	kg CO2e	464.16	15.23	452.85	439.38	448.41	457.80	473.41	0.94	463.22 - 465.10
	ODP	kg CFC11e	1.000E-05	1.334E-07	9.968E-06	9.873E-06	9.934E-06	1.000E-05	1.009E-05	7.433E-09	9.993E-06 - 1.001E-05
	AP	kg SO2e	1.321	0.166	1.116	1.005	1.086	1.158	1.323	0.010	1.311 - 1.331
	EPM	kg N eq	0.166	0.042	0.117	0.092	0.111	0.127	0.167	0.003	0.163 - 0.169
	EPF	kg P eq	0.056	0.000	0.056	0.056	0.056	0.056	0.056	1.15E-05	0.056 - 0.056
	SFP	kg O3e	27.87	4.32	22.30	19.44	21.43	23.11	27.20	0.27	27.60 - 28.14
	ADPf	MJ	2937.80	217.50	2790.27	2603.45	2730.71	2860.16	3089.70	13.47	2924.33 - 2951.27
	ADPe	kg Sb eq	2.265E-04	1.132E-06	2.262E-04	2.253E-04	2.260E-04	2.266E-04	2.272E-04	6.304E-08	2.264E-04 - 2.266E-04
5000-20-FA-AE	GWPT	kg CO2e	404.04	21.27	391.19	377.10	386.95	396.48	422.98	1.38	402.66 - 405.42
	ODP	kg CFC11e	8.472E-06	1.334E-07	8.440E-06	8.345E-06	8.406E-06	8.477E-06	8.563E-06	7.433E-09	8.465E-06 - 8.479E-06
	AP	kg SO2e	1.252	0.267	1.016	0.897	0.974	1.067	1.392	0.018	1.234 - 1.270
	EPM	kg N eq	0.173	0.070	0.117	0.090	0.108	0.130	0.213	0.005	0.168 - 0.178
	EPF	kg P eq	0.048	0.000	0.048	0.048	0.048	0.048	0.048	1.16E-05	0.048 - 0.048
	SFP	kg O3e	27.07	7.28	20.35	17.47	19.48	21.72	30.38	0.48	26.59 - 27.55
	ADPf	MJ	2681.19	304.55	2519.13	2319.11	2456.99	2589.91	2974.98	19.77	2661.42 - 2700.96
	ADPe	kg Sb eq	2.232E-04	1.132E-06	2.229E-04	2.220E-04	2.227E-04	2.233E-04	2.239E-04	6.305E-08	2.231E-04 - 2.233E-04
5000-30-FA-AE	GWPT	kg CO2e	371.54	21.91	357.60	343.35	353.12	362.71	390.45	1.42	370.12 - 372.96
	ODP	kg CFC11e	7.644E-06	1.334E-07	7.612E-06	7.517E-06	7.578E-06	7.649E-06	7.735E-06	7.433E-09	7.637E-06 - 7.651E-06
	AP	kg SO2e	1.215	0.262	0.953	0.837	0.910	1.003	1.323	0.017	1.198 - 1.232
	EPM	kg N eq	0.176	0.068	0.114	0.087	0.104	0.127	0.206	0.004	0.172 - 0.180
	EPF	kg P eq	0.043	0.000	0.043	0.043	0.043	0.043	0.043	1.16E-05	0.043 - 0.043
	SFP	kg O3e	26.64	7.07	19.16	16.37	18.23	20.46	28.90	0.47	26.17 - 27.11
	ADPf	MJ	2542.47	307.20	2368.65	2165.68	2300.59	2437.57	2825.26	19.95	2522.52 - 2562.42
	ADPe	kg Sb eq	2.215E-04	1.132E-06	2.212E-04	2.203E-04	2.210E-04	2.216E-04	2.222E-04	6.305E-08	2.214E-04 - 2.216E-04
5000-30-SL-AE	GWPT	kg CO2e	367.51	22.50	354.12	339.80	349.84	359.47	388.00	1.46	366.05 - 368.97
	ODP	kg CFC11e	1.043E-05	1.334E-07	1.040E-05	1.030E-05	1.036E-05	1.043E-05	1.052E-05	7.433E-09	1.042E-05 - 1.044E-05
	AP	kg SO2e	1.432	0.272	1.182	1.066	1.146	1.237	1.572	0.018	1.414 - 1.450
	EPM	kg N eq	0.173	0.069	0.115	0.087	0.106	0.128	0.209	0.005	0.168 - 0.178
	EPF	kg P eq	0.046	0.000	0.046	0.046	0.046	0.046	0.046	1.16E-05	0.046 - 0.046
	SFP	kg O3e	30.65	7.11	23.66	20.78	22.64	24.98	33.33	0.47	30.18 - 31.12
	ADPf	MJ	2435.10	300.56	2268.96	2066.35	2206.14	2340.73	2714.04	19.50	2415.60 - 2454.60
	ADPe	kg Sb eq	2.150E-04	1.132E-06	2.147E-04	2.138E-04	2.145E-04	2.151E-04	2.157E-04	6.305E-08	2.149E-04 - 2.151E-04

Normal-Weight 5,000 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
5000-40-FA-AE	GWPT	kg CO ₂ e	337.24	21.46	322.16	307.61	317.30	326.76	353.88	1.39	335.85 - 338.63
	ODP	kg CFC11e	6.770E-06	1.334E-07	6.738E-06	6.643E-06	6.704E-06	6.775E-06	6.861E-06	7.433E-09	6.763E-06 - 6.777E-06
	AP	kg SO ₂ e	1.176	0.256	0.886	0.767	0.842	0.932	1.242	0.017	1.159 - 1.193
	EPM	kg N eq	0.180	0.066	0.112	0.084	0.101	0.123	0.200	0.004	0.176 - 0.184
	EPF	kg P eq	0.038	0.000	0.038	0.038	0.038	0.038	0.038	1.16E-05	0.038 - 0.038
	SFP	kg O ₃ e	26.18	7.22	17.88	15.10	16.85	19.33	27.81	0.48	25.70 - 26.66
	ADP _f	MJ	2396.06	293.00	2206.51	2000.53	2136.79	2270.63	2633.97	18.99	2377.07 - 2415.05
	ADP _e	kg Sb eq	2.196E-04	1.132E-06	2.193E-04	2.184E-04	2.191E-04	2.197E-04	2.203E-04	6.305E-08	2.195E-04 - 2.197E-04
5000-40-SL-AE	GWPT	kg CO ₂ e	335.29	21.62	321.08	306.83	316.58	326.51	353.25	1.40	333.89 - 336.69
	ODP	kg CFC11e	1.058E-05	1.334E-07	1.055E-05	1.045E-05	1.051E-05	1.058E-05	1.067E-05	7.433E-09	1.057E-05 - 1.059E-05
	AP	kg SO ₂ e	1.469	0.268	1.203	1.085	1.161	1.254	1.582	0.018	1.451 - 1.487
	EPM	kg N eq	0.176	0.069	0.114	0.085	0.104	0.126	0.207	0.005	0.171 - 0.181
	EPF	kg P eq	0.042	0.000	0.042	0.042	0.042	0.042	0.042	1.16E-05	0.042 - 0.042
	SFP	kg O ₃ e	31.57	7.48	24.04	21.15	22.95	25.24	34.39	0.49	31.08 - 32.06
	ADP _f	MJ	2267.53	286.18	2089.24	1885.96	2021.01	2161.63	2504.02	18.54	2248.99 - 2286.07
	ADP _e	kg Sb eq	2.112E-04	1.132E-06	2.109E-04	2.100E-04	2.107E-04	2.113E-04	2.119E-04	6.305E-08	2.111E-04 - 2.113E-04
5000-50-FA/SL-AE	GWPT	kg CO ₂ e	302.30	19.88	286.69	271.98	281.79	291.55	315.12	1.29	301.01 - 303.59
	ODP	kg CFC11e	8.926E-06	1.334E-07	8.894E-06	8.799E-06	8.860E-06	8.931E-06	9.016E-06	7.433E-09	8.919E-06 - 8.933E-06
	AP	kg SO ₂ e	1.369	0.260	1.073	0.950	1.027	1.116	1.433	0.017	1.352 - 1.386
	EPM	kg N eq	0.180	0.066	0.111	0.081	0.099	0.121	0.196	0.004	0.176 - 0.184
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.16E-05	0.037 - 0.037
	SFP	kg O ₃ e	29.99	7.40	21.56	18.59	20.37	22.78	31.65	0.49	29.50 - 30.48
	ADP _f	MJ	2152.02	263.58	1954.82	1747.66	1882.10	2023.83	2321.55	17.01	2135.01 - 2169.03
	ADP _e	kg Sb eq	2.112E-04	1.132E-06	2.109E-04	2.100E-04	2.107E-04	2.113E-04	2.119E-04	6.305E-08	2.111E-04 - 2.113E-04
5000-50-SL-AE	GWPT	kg CO ₂ e	303.07	19.41	288.00	273.28	283.03	293.16	315.37	1.25	301.82 - 304.32
	ODP	kg CFC11e	1.072E-05	1.334E-07	1.069E-05	1.059E-05	1.065E-05	1.072E-05	1.081E-05	7.433E-09	1.071E-05 - 1.073E-05
	AP	kg SO ₂ e	1.506	0.263	1.223	1.096	1.177	1.267	1.584	0.017	1.489 - 1.523
	EPM	kg N eq	0.178	0.068	0.111	0.082	0.101	0.123	0.202	0.005	0.173 - 0.183
	EPF	kg P eq	0.039	0.000	0.039	0.039	0.039	0.039	0.039	1.16E-05	0.039 - 0.039
	SFP	kg O ₃ e	32.49	7.43	24.44	21.44	23.26	25.64	34.56	0.49	32.00 - 32.98
	ADP _f	MJ	2099.96	265.94	1907.54	1701.98	1837.66	1981.05	2279.92	17.17	2082.79 - 2117.13
	ADP _e	kg Sb eq	2.074E-04	1.132E-06	2.071E-04	2.062E-04	2.069E-04	2.075E-04	2.081E-04	6.305E-08	2.073E-04 - 2.075E-04

Normal-Weight 2,500 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
2500-00-FA/SL	GWPT	kg CO2e	253.19	15.94	245.21	231.45	240.77	249.67	267.10	0.99	252.20 - 254.18
	ODP	kg CFC11e	5.396E-06	1.334E-07	5.365E-06	5.269E-06	5.331E-06	5.401E-06	5.487E-06	7.433E-09	5.389E-06 - 5.403E-06
	AP	kg SO2e	0.820	0.164	0.685	0.579	0.651	0.724	0.893	0.010	0.810 - 0.830
	EPM	kg N eq	0.110	0.042	0.079	0.054	0.071	0.087	0.129	0.003	0.107 - 0.113
	EPF	kg P eq	0.031	0.000	0.031	0.031	0.031	0.031	0.031	1.15E-05	0.031 - 0.031
	SFP	kg O3e	18.26	4.18	14.54	12.21	13.78	15.48	19.71	0.27	17.99 - 18.53
	ADPf	MJ	1631.71	225.37	1527.89	1335.35	1463.32	1588.81	1838.90	13.98	1617.73 - 1645.69
	ADPe	kg Sb eq	5.210E-05	1.132E-06	5.185E-05	5.092E-05	5.158E-05	5.216E-05	5.279E-05	6.304E-08	5.204E-05 - 5.216E-05
2500-20-FA	GWPT	kg CO2e	221.37	18.34	212.84	198.86	208.13	219.34	238.51	1.18	220.19 - 222.55
	ODP	kg CFC11e	4.595E-06	1.334E-07	4.564E-06	4.468E-06	4.530E-06	4.600E-06	4.686E-06	7.433E-09	4.588E-06 - 4.602E-06
	AP	kg SO2e	0.783	0.244	0.637	0.520	0.592	0.692	0.971	0.016	0.767 - 0.799
	EPM	kg N eq	0.113	0.062	0.079	0.052	0.069	0.093	0.160	0.004	0.109 - 0.117
	EPF	kg P eq	0.027	0.000	0.027	0.027	0.027	0.027	0.027	1.16E-05	0.027 - 0.027
	SFP	kg O3e	17.84	6.44	13.81	11.22	12.74	15.23	22.52	0.42	17.42 - 18.26
	ADPf	MJ	1489.38	251.28	1382.94	1182.45	1313.63	1472.16	1726.61	16.18	1473.20 - 1505.56
	ADPe	kg Sb eq	4.684E-05	1.132E-06	4.659E-05	4.566E-05	4.632E-05	4.690E-05	4.754E-05	6.304E-08	4.678E-05 - 4.690E-05
2500-30-FA	GWPT	kg CO2e	204.17	18.88	195.04	180.90	190.34	201.49	221.64	1.22	202.95 - 205.39
	ODP	kg CFC11e	4.161E-06	1.334E-07	4.130E-06	4.034E-06	4.096E-06	4.166E-06	4.252E-06	7.433E-09	4.154E-06 - 4.168E-06
	AP	kg SO2e	0.763	0.265	0.601	0.487	0.556	0.661	0.975	0.017	0.746 - 0.780
	EPM	kg N eq	0.114	0.063	0.077	0.050	0.066	0.091	0.160	0.004	0.110 - 0.118
	EPF	kg P eq	0.024	0.000	0.024	0.024	0.024	0.024	0.024	1.16E-05	0.024 - 0.024
	SFP	kg O3e	17.61	6.99	13.12	10.57	12.10	14.59	22.88	0.46	17.15 - 18.07
	ADPf	MJ	1412.45	263.50	1294.19	1095.13	1228.20	1389.11	1662.45	17.01	1395.44 - 1429.46
	ADPe	kg Sb eq	4.400E-05	1.132E-06	4.375E-05	4.282E-05	4.348E-05	4.406E-05	4.470E-05	6.305E-08	4.394E-05 - 4.406E-05
2500-30-SL	GWPT	kg CO2e	202.62	18.95	193.56	179.61	188.97	200.52	220.35	1.22	201.40 - 203.84
	ODP	kg CFC11e	5.621E-06	1.334E-07	5.590E-06	5.494E-06	5.556E-06	5.626E-06	5.712E-06	7.433E-09	5.614E-06 - 5.628E-06
	AP	kg SO2e	0.878	0.257	0.724	0.608	0.679	0.785	1.081	0.017	0.861 - 0.895
	EPM	kg N eq	0.113	0.064	0.077	0.050	0.067	0.093	0.162	0.004	0.109 - 0.117
	EPF	kg P eq	0.026	0.000	0.026	0.026	0.026	0.026	0.026	1.16E-05	0.026 - 0.026
	SFP	kg O3e	19.71	7.16	15.48	12.75	14.43	16.91	25.36	0.47	19.24 - 20.18
	ADPf	MJ	1368.70	261.24	1255.85	1054.51	1189.28	1352.78	1616.57	16.86	1351.84 - 1385.56
	ADPe	kg Sb eq	4.609E-05	1.132E-06	4.584E-05	4.491E-05	4.557E-05	4.615E-05	4.679E-05	6.305E-08	4.603E-05 - 4.615E-05

Normal-Weight 2,500 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
2500-40-FA	GWPT	kg CO ₂ e	186.01	18.69	176.23	161.94	171.58	182.47	202.38	1.21	184.80 - 187.22
	ODP	kg CFC11e	3.704E-06	1.334E-07	3.673E-06	3.577E-06	3.638E-06	3.709E-06	3.795E-06	7.433E-09	3.697E-06 - 3.711E-06
	AP	kg SO ₂ e	0.742	0.251	0.564	0.448	0.522	0.626	0.911	0.017	0.725 - 0.759
	EPM	kg N eq	0.116	0.063	0.075	0.047	0.065	0.090	0.156	0.004	0.112 - 0.120
	EPF	kg P eq	0.022	0.000	0.022	0.022	0.022	0.022	0.022	1.16E-05	0.022 - 0.022
	SFP	kg O ₃ e	17.37	6.73	12.37	9.80	11.47	13.89	21.65	0.44	16.93 - 17.81
	ADP _f	MJ	1331.24	267.45	1209.85	1004.28	1142.10	1292.87	1582.69	17.27	1313.97 - 1348.51
	ADP _e	kg Sb eq	4.101E-05	1.132E-06	4.076E-05	3.982E-05	4.049E-05	4.107E-05	4.171E-05	6.305E-08	4.095E-05 - 4.107E-05
2500-40-SL	GWPT	kg CO ₂ e	185.77	19.25	176.49	162.02	171.94	183.03	203.50	1.24	184.53 - 187.01
	ODP	kg CFC11e	5.696E-06	1.334E-07	5.665E-06	5.569E-06	5.631E-06	5.701E-06	5.787E-06	7.433E-09	5.689E-06 - 5.703E-06
	AP	kg SO ₂ e	0.897	0.242	0.728	0.615	0.688	0.796	1.059	0.016	0.881 - 0.913
	EPM	kg N eq	0.115	0.059	0.076	0.049	0.066	0.093	0.151	0.004	0.111 - 0.119
	EPF	kg P eq	0.024	0.000	0.024	0.024	0.024	0.024	0.024	1.16E-05	0.024 - 0.024
	SFP	kg O ₃ e	20.19	6.80	15.60	12.87	14.59	17.10	24.82	0.45	19.74 - 20.64
	ADP _f	MJ	1281.03	266.84	1162.52	960.33	1099.91	1248.04	1538.44	17.23	1263.80 - 1298.26
	ADP _e	kg Sb eq	4.409E-05	1.132E-06	4.384E-05	4.290E-05	4.357E-05	4.415E-05	4.479E-05	6.305E-08	4.403E-05 - 4.415E-05
2500-50-FA/SL	GWPT	kg CO ₂ e	168.14	18.74	158.17	143.62	153.53	163.71	184.41	1.21	166.93 - 169.35
	ODP	kg CFC11e	4.832E-06	1.334E-07	4.801E-06	4.705E-06	4.766E-06	4.837E-06	4.923E-06	7.433E-09	4.825E-06 - 4.839E-06
	AP	kg SO ₂ e	0.844	0.229	0.664	0.543	0.622	0.725	0.965	0.015	0.829 - 0.859
	EPM	kg N eq	0.117	0.058	0.075	0.047	0.065	0.090	0.147	0.004	0.113 - 0.121
	EPF	kg P eq	0.021	0.000	0.021	0.021	0.021	0.021	0.021	1.16E-05	0.021 - 0.021
	SFP	kg O ₃ e	19.36	6.28	14.32	11.45	13.28	15.73	22.47	0.41	18.95 - 19.77
	ADP _f	MJ	1212.53	253.04	1086.58	882.97	1019.87	1158.69	1437.16	16.30	1196.23 - 1228.83
	ADP _e	kg Sb eq	4.052E-05	1.132E-06	4.026E-05	3.933E-05	4.000E-05	4.058E-05	4.122E-05	6.305E-08	4.046E-05 - 4.058E-05
2500-50-SL	GWPT	kg CO ₂ e	168.91	18.46	159.05	144.66	154.63	164.79	184.90	1.19	167.72 - 170.10
	ODP	kg CFC11e	5.772E-06	1.334E-07	5.741E-06	5.645E-06	5.706E-06	5.777E-06	5.863E-06	7.433E-09	5.765E-06 - 5.779E-06
	AP	kg SO ₂ e	0.917	0.229	0.743	0.621	0.701	0.803	1.045	0.015	0.902 - 0.932
	EPM	kg N eq	0.116	0.057	0.076	0.047	0.066	0.091	0.146	0.004	0.112 - 0.120
	EPF	kg P eq	0.022	0.000	0.022	0.022	0.022	0.022	0.022	1.16E-05	0.022 - 0.022
	SFP	kg O ₃ e	20.68	6.17	15.83	12.96	14.80	17.30	23.79	0.41	20.27 - 21.09
	ADP _f	MJ	1193.36	252.58	1070.31	865.11	1005.58	1141.41	1419.40	16.27	1177.09 - 1209.63
	ADP _e	kg Sb eq	4.208E-05	1.132E-06	4.182E-05	4.089E-05	4.156E-05	4.214E-05	4.278E-05	6.305E-08	4.202E-05 - 4.214E-05

Normal-Weight 3,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
3000-00-FA/SL	GWPT	kg CO2e	276.34	15.96	267.99	254.09	263.54	272.40	289.80	0.99	275.35 - 277.33
	ODP	kg CFC11e	5.934E-06	1.334E-07	5.903E-06	5.807E-06	5.869E-06	5.939E-06	6.025E-06	7.433E-09	5.927E-06 - 5.941E-06
	AP	kg SO2e	0.875	0.163	0.731	0.627	0.696	0.770	0.939	0.010	0.865 - 0.885
	EPM	kg N eq	0.115	0.042	0.082	0.058	0.073	0.090	0.131	0.003	0.112 - 0.118
	EPF	kg P eq	0.034	0.000	0.034	0.034	0.034	0.034	0.034	1.15E-05	0.034 - 0.034
	SFP	kg O3e	19.40	4.13	15.47	13.08	14.69	16.41	20.49	0.26	19.14 - 19.66
	ADP _f	MJ	1751.41	224.96	1643.77	1450.39	1580.04	1704.08	1953.59	13.96	1737.45 - 1765.37
	ADP _e	kg Sb eq	5.742E-05	1.132E-06	5.717E-05	5.624E-05	5.690E-05	5.748E-05	5.811E-05	6.304E-08	5.736E-05 - 5.748E-05
	GWPT	kg CO2e	241.13	18.98	232.28	218.08	227.27	238.40	259.00	1.23	239.90 - 242.36
	ODP	kg CFC11e	5.047E-06	1.334E-07	5.016E-06	4.920E-06	4.982E-06	5.052E-06	5.138E-06	7.433E-09	5.040E-06 - 5.054E-06
3000-20-FA	AP	kg SO2e	0.834	0.252	0.677	0.560	0.631	0.731	1.026	0.017	0.817 - 0.851
	EPM	kg N eq	0.119	0.064	0.083	0.055	0.072	0.097	0.166	0.004	0.115 - 0.123
	EPF	kg P eq	0.029	0.000	0.029	0.029	0.029	0.029	0.029	1.16E-05	0.029 - 0.029
	SFP	kg O3e	18.93	6.50	14.57	12.04	13.57	15.93	23.50	0.43	18.50 - 19.36
	ADP _f	MJ	1593.96	256.74	1482.91	1281.85	1411.50	1567.57	1837.57	16.55	1577.41 - 1610.51
	ADP _e	kg Sb eq	5.161E-05	1.132E-06	5.136E-05	5.043E-05	5.109E-05	5.167E-05	5.231E-05	6.304E-08	5.155E-05 - 5.167E-05
	GWPT	kg CO2e	222.10	19.26	212.46	198.24	207.62	218.66	239.74	1.24	220.86 - 223.34
	ODP	kg CFC11e	4.567E-06	1.334E-07	4.536E-06	4.440E-06	4.501E-06	4.572E-06	4.658E-06	7.433E-09	4.560E-06 - 4.574E-06
	AP	kg SO2e	0.812	0.271	0.638	0.523	0.593	0.700	1.021	0.018	0.794 - 0.830
	EPM	kg N eq	0.121	0.069	0.081	0.054	0.070	0.095	0.174	0.005	0.116 - 0.126
3000-30-FA	EPF	kg P eq	0.026	0.000	0.026	0.026	0.026	0.026	0.026	1.16E-05	0.026 - 0.026
	SFP	kg O3e	18.68	6.87	13.81	11.28	12.84	15.25	23.40	0.45	18.23 - 19.13
	ADP _f	MJ	1508.86	261.68	1387.27	1186.15	1316.36	1475.66	1750.46	16.88	1491.98 - 1525.74
	ADP _e	kg Sb eq	4.847E-05	1.132E-06	4.822E-05	4.728E-05	4.795E-05	4.853E-05	4.917E-05	6.305E-08	4.841E-05 - 4.853E-05
	GWPT	kg CO2e	220.40	19.19	211.10	196.79	206.31	217.62	238.06	1.24	219.16 - 221.64
	ODP	kg CFC11e	6.183E-06	1.334E-07	6.152E-06	6.056E-06	6.117E-06	6.188E-06	6.274E-06	7.433E-09	6.176E-06 - 6.190E-06
	AP	kg SO2e	0.940	0.271	0.775	0.659	0.729	0.835	1.157	0.018	0.922 - 0.958
	EPM	kg N eq	0.120	0.065	0.082	0.054	0.071	0.097	0.167	0.004	0.116 - 0.124
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O3e	21.00	7.12	16.41	13.82	15.38	17.92	26.34	0.47	20.53 - 21.47
3000-30-SL	ADP _f	MJ	1460.46	268.33	1339.95	1138.51	1272.97	1435.92	1714.57	17.33	1443.13 - 1477.79
	ADP _e	kg Sb eq	5.077E-05	1.132E-06	5.052E-05	4.958E-05	5.025E-05	5.083E-05	5.147E-05	6.305E-08	5.071E-05 - 5.083E-05

Normal-Weight 3,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
3000-40-FA	GWPT	kg CO ₂ e	202.02	18.49	191.63	177.30	186.94	197.61	217.43	1.19	200.83 - 203.21
	ODP	kg CFC11e	4.061E-06	1.334E-07	4.029E-06	3.934E-06	3.995E-06	4.066E-06	4.152E-06	7.433E-09	4.054E-06 - 4.068E-06
	AP	kg SO ₂ e	0.789	0.257	0.598	0.483	0.555	0.659	0.956	0.017	0.772 - 0.806
	EPM	kg N eq	0.123	0.063	0.079	0.052	0.068	0.093	0.161	0.004	0.119 - 0.127
	EPF	kg P eq	0.024	0.000	0.024	0.024	0.024	0.024	0.024	1.16E-05	0.024 - 0.024
	SFP	kg O ₃ e	18.41	6.86	13.01	10.52	12.08	14.48	22.61	0.45	17.96 - 18.86
	ADPf	MJ	1419.02	264.54	1289.25	1085.27	1217.99	1372.77	1656.67	17.08	1401.94 - 1436.10
	ADPe	kg Sb eq	4.515E-05	1.132E-06	4.489E-05	4.396E-05	4.463E-05	4.521E-05	4.585E-05	6.305E-08	4.509E-05 - 4.521E-05
3000-40-SL	GWPT	kg CO ₂ e	201.75	19.19	191.92	177.32	187.27	198.35	218.66	1.24	200.51 - 202.99
	ODP	kg CFC11e	6.266E-06	1.334E-07	6.235E-06	6.139E-06	6.200E-06	6.271E-06	6.357E-06	7.433E-09	6.259E-06 - 6.273E-06
	AP	kg SO ₂ e	0.961	0.256	0.782	0.665	0.739	0.846	1.136	0.017	0.944 - 0.978
	EPM	kg N eq	0.121	0.062	0.079	0.051	0.069	0.095	0.160	0.004	0.117 - 0.125
	EPF	kg P eq	0.026	0.000	0.026	0.026	0.026	0.026	0.026	1.16E-05	0.026 - 0.026
	SFP	kg O ₃ e	21.54	6.93	16.55	13.88	15.60	18.06	26.07	0.46	21.08 - 22.00
	ADPf	MJ	1363.48	274.44	1239.88	1032.29	1173.19	1327.55	1623.09	17.75	1345.73 - 1381.23
	ADPe	kg Sb eq	4.856E-05	1.132E-06	4.830E-05	4.737E-05	4.804E-05	4.862E-05	4.926E-05	6.305E-08	4.850E-05 - 4.862E-05
3000-50-FA/SL	GWPT	kg CO ₂ e	182.25	18.89	171.60	157.07	166.82	177.60	197.95	1.22	181.03 - 183.47
	ODP	kg CFC11e	5.309E-06	1.334E-07	5.277E-06	5.182E-06	5.243E-06	5.314E-06	5.400E-06	7.433E-09	5.302E-06 - 5.316E-06
	AP	kg SO ₂ e	0.902	0.238	0.707	0.585	0.665	0.765	1.024	0.016	0.886 - 0.918
	EPM	kg N eq	0.123	0.058	0.078	0.049	0.068	0.092	0.149	0.004	0.119 - 0.127
	EPF	kg P eq	0.023	0.000	0.023	0.023	0.023	0.023	0.023	1.16E-05	0.023 - 0.023
	SFP	kg O ₃ e	20.62	6.59	15.17	12.35	14.18	16.62	23.94	0.43	20.19 - 21.05
	ADPf	MJ	1287.70	262.92	1154.35	949.20	1084.63	1224.47	1522.42	16.97	1270.73 - 1304.67
	ADPe	kg Sb eq	4.461E-05	1.132E-06	4.435E-05	4.342E-05	4.409E-05	4.467E-05	4.531E-05	6.305E-08	4.455E-05 - 4.467E-05
3000-50-SL	GWPT	kg CO ₂ e	183.10	18.97	172.78	158.10	168.09	178.76	199.15	1.22	181.88 - 184.32
	ODP	kg CFC11e	6.349E-06	1.334E-07	6.317E-06	6.222E-06	6.283E-06	6.354E-06	6.440E-06	7.433E-09	6.342E-06 - 6.356E-06
	AP	kg SO ₂ e	0.982	0.235	0.794	0.672	0.753	0.855	1.106	0.015	0.967 - 0.997
	EPM	kg N eq	0.122	0.059	0.078	0.049	0.068	0.093	0.151	0.004	0.118 - 0.126
	EPF	kg P eq	0.024	0.000	0.024	0.024	0.024	0.024	0.024	1.16E-05	0.024 - 0.024
	SFP	kg O ₃ e	22.07	6.40	16.84	13.92	15.77	18.22	25.18	0.42	21.65 - 22.49
	ADPf	MJ	1266.49	256.45	1136.11	930.34	1067.49	1208.22	1490.60	16.53	1249.96 - 1283.02
	ADPe	kg Sb eq	4.634E-05	1.132E-06	4.608E-05	4.515E-05	4.582E-05	4.640E-05	4.704E-05	6.305E-08	4.628E-05 - 4.640E-05

Normal-Weight 4,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
4000-00-FA/SL	GWPT	kg CO2e	330.17	15.75	320.90	307.03	316.58	325.31	342.35	0.98	329.19 - 331.15
	ODP	kg CFC11e	7.183E-06	1.334E-07	7.152E-06	7.056E-06	7.118E-06	7.188E-06	7.273E-06	7.433E-09	7.176E-06 - 7.190E-06
	AP	kg SO2e	1.004	0.166	0.842	0.737	0.807	0.882	1.054	0.011	0.993 - 1.015
	EPM	kg N eq	0.128	0.042	0.089	0.065	0.082	0.098	0.139	0.003	0.125 - 0.131
	EPF	kg P eq	0.041	0.000	0.041	0.041	0.041	0.041	0.041	1.15E-05	0.041 - 0.041
	SFP	kg O3e	22.05	4.11	17.66	15.13	16.76	18.56	22.47	0.26	21.79 - 22.31
	ADP _f	MJ	2029.81	220.01	1911.45	1717.91	1849.94	1967.80	2213.14	13.63	2016.18 - 2043.44
	ADP _e	kg Sb eq	6.980E-05	1.132E-06	6.955E-05	6.862E-05	6.928E-05	6.986E-05	7.049E-05	6.304E-08	6.974E-05 - 6.986E-05
	GWPT	kg CO2e	287.11	20.42	276.97	262.78	272.07	282.94	306.58	1.32	285.79 - 288.43
	ODP	kg CFC11e	6.099E-06	1.334E-07	6.068E-06	5.972E-06	6.033E-06	6.104E-06	6.190E-06	7.433E-09	6.092E-06 - 6.106E-06
4000-20-FA	AP	kg SO2e	0.954	0.261	0.770	0.660	0.727	0.823	1.144	0.017	0.937 - 0.971
	EPM	kg N eq	0.133	0.066	0.091	0.065	0.080	0.103	0.180	0.004	0.129 - 0.137
	EPF	kg P eq	0.035	0.000	0.035	0.035	0.035	0.035	0.035	1.16E-05	0.035 - 0.035
	SFP	kg O3e	21.48	6.74	16.35	13.81	15.37	17.66	25.71	0.44	21.04 - 21.92
	ADP _f	MJ	1837.20	282.30	1709.89	1508.02	1638.23	1793.37	2113.76	18.27	1818.93 - 1855.47
	ADP _e	kg Sb eq	6.269E-05	1.132E-06	6.244E-05	6.150E-05	6.217E-05	6.275E-05	6.339E-05	6.305E-08	6.263E-05 - 6.275E-05
	GWPT	kg CO2e	263.83	20.31	252.63	238.50	247.93	259.09	282.01	1.32	262.51 - 265.15
	ODP	kg CFC11e	5.512E-06	1.334E-07	5.480E-06	5.385E-06	5.446E-06	5.517E-06	5.603E-06	7.433E-09	5.505E-06 - 5.519E-06
	AP	kg SO2e	0.927	0.268	0.722	0.611	0.683	0.781	1.107	0.018	0.909 - 0.945
	EPM	kg N eq	0.135	0.069	0.087	0.062	0.078	0.101	0.183	0.005	0.130 - 0.140
4000-30-FA	EPF	kg P eq	0.032	0.000	0.032	0.032	0.032	0.032	0.032	1.16E-05	0.032 - 0.032
	SFP	kg O3e	21.17	6.93	15.50	12.94	14.52	16.84	25.19	0.46	20.71 - 21.63
	ADP _f	MJ	1733.09	274.82	1594.27	1392.50	1522.38	1681.70	1982.39	17.77	1715.32 - 1750.86
	ADP _e	kg Sb eq	5.885E-05	1.132E-06	5.859E-05	5.766E-05	5.833E-05	5.891E-05	5.955E-05	6.305E-08	5.879E-05 - 5.891E-05
	GWPT	kg CO2e	261.74	19.88	251.34	236.77	246.18	257.73	279.31	1.29	260.45 - 263.03
	ODP	kg CFC11e	7.488E-06	1.334E-07	7.456E-06	7.361E-06	7.422E-06	7.493E-06	7.579E-06	7.433E-09	7.481E-06 - 7.495E-06
	AP	kg SO2e	1.083	0.280	0.889	0.775	0.846	0.952	1.289	0.018	1.065 - 1.101
	EPM	kg N eq	0.134	0.071	0.089	0.062	0.079	0.104	0.186	0.005	0.129 - 0.139
	EPF	kg P eq	0.033	0.000	0.033	0.033	0.033	0.033	0.033	1.16E-05	0.033 - 0.033
	SFP	kg O3e	24.01	6.98	18.66	16.02	17.65	20.02	28.34	0.46	23.55 - 24.47
4000-30-SL	ADP _f	MJ	1673.88	276.78	1542.25	1337.64	1470.00	1634.17	1929.71	17.90	1655.98 - 1691.78
	ADP _e	kg Sb eq	6.167E-05	1.132E-06	6.141E-05	6.048E-05	6.115E-05	6.173E-05	6.237E-05	6.305E-08	6.161E-05 - 6.173E-05

Normal-Weight 4,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
4000-40-FA	GWPT	kg CO ₂ e	239.26	19.16	227.17	213.03	222.46	233.07	254.48	1.24	238.02 - 240.50
	ODP	kg CFC11e	4.893E-06	1.334E-07	4.861E-06	4.766E-06	4.827E-06	4.898E-06	4.984E-06	7.433E-09	4.886E-06 - 4.900E-06
	AP	kg SO ₂ e	0.898	0.271	0.673	0.558	0.637	0.735	1.060	0.018	0.880 - 0.916
	EPM	kg N eq	0.137	0.071	0.084	0.058	0.075	0.099	0.181	0.005	0.132 - 0.142
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O ₃ e	20.84	6.90	14.66	12.05	13.69	15.88	24.28	0.46	20.38 - 21.30
	ADP _f	MJ	1623.19	265.37	1473.05	1272.40	1402.54	1553.09	1846.84	17.13	1606.06 - 1640.32
	ADP _e	kg Sb eq	5.479E-05	1.132E-06	5.453E-05	5.360E-05	5.427E-05	5.485E-05	5.549E-05	6.305E-08	5.473E-05 - 5.485E-05
	GWPT	kg CO ₂ e	238.93	19.37	227.77	213.12	222.86	233.81	254.87	1.25	237.68 - 240.18
	ODP	kg CFC11e	7.590E-06	1.334E-07	7.558E-06	7.463E-06	7.524E-06	7.595E-06	7.681E-06	7.433E-09	7.583E-06 - 7.597E-06
4000-40-SL	AP	kg SO ₂ e	1.109	0.281	0.901	0.784	0.859	0.964	1.299	0.018	1.091 - 1.127
	EPM	kg N eq	0.135	0.067	0.087	0.059	0.076	0.102	0.175	0.004	0.131 - 0.139
	EPF	kg P eq	0.031	0.000	0.031	0.031	0.031	0.031	0.031	1.16E-05	0.031 - 0.031
	SFP	kg O ₃ e	24.67	7.03	18.85	16.24	17.88	20.31	28.64	0.46	24.21 - 25.13
	ADP _f	MJ	1555.24	271.52	1415.26	1207.11	1344.37	1498.76	1792.23	17.55	1537.69 - 1572.79
	ADP _e	kg Sb eq	5.896E-05	1.132E-06	5.870E-05	5.777E-05	5.844E-05	5.902E-05	5.966E-05	6.305E-08	5.890E-05 - 5.902E-05
	GWPT	kg CO ₂ e	215.07	19.05	202.80	188.22	197.94	208.51	229.46	1.23	213.84 - 216.30
	ODP	kg CFC11e	6.419E-06	1.334E-07	6.387E-06	6.292E-06	6.353E-06	6.424E-06	6.510E-06	7.433E-09	6.412E-06 - 6.426E-06
	AP	kg SO ₂ e	1.037	0.260	0.809	0.691	0.768	0.869	1.170	0.017	1.020 - 1.054
	EPM	kg N eq	0.138	0.065	0.084	0.057	0.075	0.099	0.171	0.004	0.134 - 0.142
4000-50-FA/SL	EPF	kg P eq	0.027	0.000	0.027	0.027	0.027	0.027	0.027	1.16E-05	0.027 - 0.027
	SFP	kg O ₃ e	23.54	7.09	17.11	14.47	16.18	18.49	27.01	0.47	23.07 - 24.01
	ADP _f	MJ	1462.54	269.56	1309.41	1100.22	1237.20	1388.84	1682.46	17.42	1445.12 - 1479.96
	ADP _e	kg Sb eq	5.413E-05	1.132E-06	5.387E-05	5.294E-05	5.361E-05	5.419E-05	5.483E-05	6.305E-08	5.407E-05 - 5.419E-05
	GWPT	kg CO ₂ e	216.12	19.44	204.25	189.46	199.26	210.24	231.34	1.26	214.86 - 217.38
	ODP	kg CFC11e	7.691E-06	1.334E-07	7.659E-06	7.564E-06	7.625E-06	7.696E-06	7.782E-06	7.433E-09	7.684E-06 - 7.698E-06
	AP	kg SO ₂ e	1.135	0.259	0.915	0.796	0.874	0.976	1.274	0.017	1.118 - 1.152
	EPM	kg N eq	0.137	0.063	0.086	0.057	0.076	0.101	0.167	0.004	0.133 - 0.141
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O ₃ e	25.32	7.20	19.13	16.42	18.14	20.58	29.12	0.48	24.84 - 25.80
4000-50-SL	ADP _f	MJ	1436.60	275.57	1288.62	1078.46	1216.00	1369.43	1671.76	17.82	1418.78 - 1454.42
	ADP _e	kg Sb eq	5.625E-05	1.132E-06	5.599E-05	5.506E-05	5.573E-05	5.631E-05	5.695E-05	6.305E-08	5.619E-05 - 5.631E-05

Normal-Weight 5,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
5000-00-FA/SL	GWPT	kg CO2e	410.67	15.36	399.94	386.32	395.70	404.83	420.71	0.95	409.72 - 411.62
	ODP	kg CFC11e	8.994E-06	1.334E-07	8.962E-06	8.867E-06	8.928E-06	8.999E-06	9.084E-06	7.433E-09	8.987E-06 - 9.001E-06
	AP	kg SO2e	1.193	0.165	1.003	0.893	0.969	1.043	1.209	0.010	1.183 - 1.203
	EPM	kg N eq	0.149	0.042	0.104	0.079	0.097	0.113	0.153	0.003	0.146 - 0.152
	EPF	kg P eq	0.051	0.000	0.051	0.051	0.051	0.051	0.051	1.15E-05	0.051 - 0.051
	SFP	kg O3e	25.78	4.18	20.62	17.87	19.83	21.43	25.41	0.27	25.51 - 26.05
	ADPf	MJ	2491.56	216.87	2352.92	2164.28	2294.08	2420.38	2650.29	13.43	2478.13 - 2504.99
	ADPe	kg Sb eq	1.165E-04	1.132E-06	1.162E-04	1.153E-04	1.160E-04	1.166E-04	1.172E-04	6.304E-08	1.164E-04 - 1.166E-04
5000-20-FA	GWPT	kg CO2e	356.37	21.34	344.35	330.23	339.75	350.22	375.94	1.38	354.99 - 357.75
	ODP	kg CFC11e	7.622E-06	1.334E-07	7.590E-06	7.495E-06	7.556E-06	7.627E-06	7.713E-06	7.433E-09	7.615E-06 - 7.629E-06
	AP	kg SO2e	1.130	0.269	0.909	0.799	0.870	0.959	1.300	0.018	1.112 - 1.148
	EPM	kg N eq	0.154	0.066	0.102	0.077	0.093	0.114	0.194	0.004	0.150 - 0.158
	EPF	kg P eq	0.043	0.000	0.043	0.043	0.043	0.043	0.043	1.16E-05	0.043 - 0.043
	SFP	kg O3e	25.05	7.08	18.89	16.16	18.02	20.16	28.74	0.47	24.58 - 25.52
	ADPf	MJ	2251.43	295.29	2097.83	1901.46	2034.18	2179.06	2535.63	19.15	2232.28 - 2270.58
	ADPe	kg Sb eq	1.090E-04	1.132E-06	1.087E-04	1.078E-04	1.085E-04	1.091E-04	1.097E-04	6.305E-08	1.089E-04 - 1.091E-04
5000-30-FA	GWPT	kg CO2e	327.02	22.24	313.74	299.86	309.45	319.34	347.48	1.45	325.57 - 328.47
	ODP	kg CFC11e	6.881E-06	1.334E-07	6.849E-06	6.754E-06	6.815E-06	6.886E-06	6.972E-06	7.433E-09	6.874E-06 - 6.888E-06
	AP	kg SO2e	1.096	0.268	0.851	0.740	0.819	0.904	1.240	0.018	1.078 - 1.114
	EPM	kg N eq	0.157	0.068	0.099	0.073	0.092	0.113	0.194	0.005	0.152 - 0.162
	EPF	kg P eq	0.039	0.000	0.039	0.039	0.039	0.039	0.039	1.16E-05	0.039 - 0.039
	SFP	kg O3e	24.66	6.90	17.86	15.04	16.92	19.16	27.25	0.45	24.21 - 25.11
	ADPf	MJ	2121.63	297.81	1952.35	1760.30	1890.84	2032.59	2400.34	19.32	2102.31 - 2140.95
	ADPe	kg Sb eq	1.050E-04	1.132E-06	1.047E-04	1.038E-04	1.045E-04	1.051E-04	1.057E-04	6.305E-08	1.049E-04 - 1.051E-04
5000-30-SL	GWPT	kg CO2e	324.14	21.56	311.37	297.48	307.13	317.61	343.60	1.40	322.74 - 325.54
	ODP	kg CFC11e	9.379E-06	1.334E-07	9.347E-06	9.252E-06	9.313E-06	9.384E-06	9.470E-06	7.433E-09	9.372E-06 - 9.386E-06
	AP	kg SO2e	1.293	0.274	1.064	0.952	1.026	1.120	1.459	0.018	1.275 - 1.311
	EPM	kg N eq	0.155	0.070	0.101	0.075	0.092	0.114	0.197	0.005	0.150 - 0.160
	EPF	kg P eq	0.041	0.000	0.041	0.041	0.041	0.041	0.041	1.16E-05	0.041 - 0.041
	SFP	kg O3e	28.26	7.11	21.76	19.08	20.92	23.17	31.67	0.47	27.79 - 28.73
	ADPf	MJ	2041.50	291.74	1881.49	1685.86	1813.99	1964.70	2311.27	18.91	2022.59 - 2060.41
	ADPe	kg Sb eq	1.062E-04	1.132E-06	1.059E-04	1.050E-04	1.057E-04	1.063E-04	1.069E-04	6.305E-08	1.061E-04 - 1.063E-04

Normal-Weight 5,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
5000-40-FA	GWPT	kg CO2e	296.04	20.92	281.91	267.80	277.38	287.29	312.88	1.36	294.68 - 297.40
	ODP	kg CFC11e	6.098E-06	1.334E-07	6.066E-06	5.971E-06	6.032E-06	6.103E-06	6.189E-06	7.433E-09	6.091E-06 - 6.105E-06
	AP	kg SO2e	1.061	0.263	0.795	0.681	0.757	0.847	1.170	0.017	1.044 - 1.078
	EPM	kg N eq	0.160	0.068	0.097	0.070	0.089	0.110	0.190	0.004	0.156 - 0.164
	EPF	kg P eq	0.035	0.000	0.035	0.035	0.035	0.035	0.035	1.16E-05	0.035 - 0.035
	SFP	kg O3e	24.25	7.17	16.76	14.01	15.69	17.94	26.71	0.47	23.78 - 24.72
	ADPf	MJ	1984.61	278.94	1806.44	1608.15	1738.82	1881.16	2211.67	18.05	1966.56 - 2002.66
	ADPe	kg Sb eq	1.007E-04	1.132E-06	1.004E-04	9.951E-05	1.002E-04	1.008E-04	1.014E-04	6.305E-08	1.006E-04 - 1.008E-04
5000-40-SL	GWPT	kg CO2e	295.29	20.09	282.00	267.80	277.30	287.92	311.06	1.30	293.99 - 296.59
	ODP	kg CFC11e	9.508E-06	1.334E-07	9.476E-06	9.381E-06	9.442E-06	9.513E-06	9.599E-06	7.433E-09	9.501E-06 - 9.515E-06
	AP	kg SO2e	1.326	0.270	1.077	0.961	1.042	1.136	1.461	0.018	1.308 - 1.344
	EPM	kg N eq	0.157	0.071	0.099	0.072	0.090	0.113	0.196	0.005	0.152 - 0.162
	EPF	kg P eq	0.038	0.000	0.038	0.038	0.038	0.038	0.038	1.16E-05	0.038 - 0.038
	SFP	kg O3e	29.08	7.34	22.13	19.41	21.23	23.42	32.43	0.48	28.60 - 29.56
	ADPf	MJ	1891.49	272.32	1723.76	1522.37	1653.14	1806.86	2109.27	17.60	1873.89 - 1909.09
	ADPe	kg Sb eq	1.028E-04	1.132E-06	1.025E-04	1.016E-04	1.023E-04	1.029E-04	1.035E-04	6.305E-08	1.027E-04 - 1.029E-04
5000-50-FA/SL	GWPT	kg CO2e	265.29	18.48	250.81	236.37	245.80	256.21	276.58	1.19	264.10 - 266.48
	ODP	kg CFC11e	8.028E-06	1.334E-07	7.996E-06	7.901E-06	7.962E-06	8.033E-06	8.118E-06	7.433E-09	8.021E-06 - 8.035E-06
	AP	kg SO2e	1.235	0.265	0.963	0.839	0.923	1.014	1.330	0.017	1.218 - 1.252
	EPM	kg N eq	0.161	0.068	0.097	0.069	0.088	0.110	0.189	0.005	0.156 - 0.166
	EPF	kg P eq	0.033	0.000	0.033	0.033	0.033	0.033	0.033	1.16E-05	0.033 - 0.033
	SFP	kg O3e	27.67	7.24	19.99	17.10	18.90	21.27	29.89	0.48	27.19 - 28.15
	ADPf	MJ	1777.68	262.00	1594.98	1391.38	1523.04	1670.63	1960.22	16.91	1760.77 - 1794.59
	ADPe	kg Sb eq	9.822E-05	1.132E-06	9.796E-05	9.703E-05	9.770E-05	9.828E-05	9.892E-05	6.305E-08	9.816E-05 - 9.828E-05
5000-50-SL	GWPT	kg CO2e	266.45	18.91	252.45	237.98	247.35	258.02	278.94	1.22	265.23 - 267.67
	ODP	kg CFC11e	9.636E-06	1.334E-07	9.604E-06	9.509E-06	9.570E-06	9.641E-06	9.727E-06	7.433E-09	9.629E-06 - 9.643E-06
	AP	kg SO2e	1.359	0.267	1.098	0.975	1.057	1.152	1.470	0.018	1.341 - 1.377
	EPM	kg N eq	0.160	0.069	0.099	0.070	0.089	0.111	0.191	0.005	0.155 - 0.165
	EPF	kg P eq	0.035	0.000	0.035	0.035	0.035	0.035	0.035	1.16E-05	0.035 - 0.035
	SFP	kg O3e	29.91	7.38	22.49	19.66	21.51	23.77	32.74	0.49	29.42 - 30.40
	ADPf	MJ	1741.47	268.11	1565.89	1358.91	1493.62	1643.25	1939.00	17.32	1724.15 - 1758.79
	ADPe	kg Sb eq	9.939E-05	1.132E-06	9.913E-05	9.820E-05	9.887E-05	9.945E-05	1.001E-04	6.305E-08	9.933E-05 - 9.945E-05

High-Strength 6,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
6000-00-FA/SL	GWPT	kg CO2e	449.66	15.33	438.53	424.83	433.96	443.28	459.09	0.95	448.71 - 450.61
	ODP	kg CFC11e	9.720E-06	1.334E-07	9.688E-06	9.593E-06	9.654E-06	9.725E-06	9.810E-06	7.433E-09	9.713E-06 - 9.727E-06
	AP	kg SO2e	1.290	0.170	1.087	0.976	1.057	1.129	1.302	0.011	1.279 - 1.301
	EPM	kg N eq	0.162	0.043	0.114	0.088	0.107	0.123	0.165	0.003	0.159 - 0.165
	EPF	kg P eq	0.055	0.000	0.055	0.055	0.055	0.055	0.055	1.15E-05	0.055 - 0.055
	SFP	kg O3e	27.40	4.36	21.93	19.02	21.12	22.75	26.87	0.28	27.12 - 27.68
	ADPf	MJ	2822.05	220.89	2676.58	2484.40	2616.42	2746.05	2977.48	13.69	2808.36 - 2835.74
	ADPe	kg Sb eq	1.991E-04	1.132E-06	1.988E-04	1.979E-04	1.986E-04	1.992E-04	1.998E-04	6.304E-08	1.990E-04 - 1.992E-04
6000-20-FA	GWPT	kg CO2e	391.26	21.78	378.59	364.34	373.91	384.07	411.00	1.41	389.85 - 392.67
	ODP	kg CFC11e	8.233E-06	1.334E-07	8.201E-06	8.106E-06	8.167E-06	8.238E-06	8.324E-06	7.433E-09	8.226E-06 - 8.240E-06
	AP	kg SO2e	1.223	0.273	0.990	0.872	0.950	1.041	1.379	0.018	1.205 - 1.241
	EPM	kg N eq	0.169	0.069	0.114	0.087	0.105	0.127	0.209	0.005	0.164 - 0.174
	EPF	kg P eq	0.046	0.000	0.046	0.046	0.046	0.046	0.046	1.16E-05	0.046 - 0.046
	SFP	kg O3e	26.63	7.25	20.09	17.19	19.06	21.40	30.00	0.48	26.15 - 27.11
	ADPf	MJ	2571.19	304.19	2412.48	2209.67	2346.29	2486.71	2862.35	19.75	2551.44 - 2590.94
	ADPe	kg Sb eq	1.949E-04	1.132E-06	1.946E-04	1.937E-04	1.944E-04	1.950E-04	1.956E-04	6.305E-08	1.948E-04 - 1.950E-04
6000-30-FA	GWPT	kg CO2e	359.69	22.07	345.86	331.72	341.26	351.24	378.97	1.43	358.26 - 361.12
	ODP	kg CFC11e	7.430E-06	1.334E-07	7.398E-06	7.303E-06	7.364E-06	7.435E-06	7.521E-06	7.433E-09	7.423E-06 - 7.437E-06
	AP	kg SO2e	1.187	0.270	0.928	0.812	0.890	0.980	1.313	0.018	1.169 - 1.205
	EPM	kg N eq	0.172	0.070	0.111	0.084	0.102	0.124	0.206	0.005	0.167 - 0.177
	EPF	kg P eq	0.042	0.000	0.042	0.042	0.042	0.042	0.042	1.16E-05	0.042 - 0.042
	SFP	kg O3e	26.22	7.20	18.93	16.03	17.98	20.18	28.80	0.47	25.75 - 26.69
	ADPf	MJ	2435.59	310.08	2261.35	2060.12	2197.87	2338.79	2723.87	20.14	2415.45 - 2455.73
	ADPe	kg Sb eq	1.926E-04	1.132E-06	1.923E-04	1.914E-04	1.921E-04	1.927E-04	1.933E-04	6.305E-08	1.925E-04 - 1.927E-04
6000-30-SL	GWPT	kg CO2e	355.87	22.73	342.70	328.25	338.16	348.20	376.76	1.48	354.39 - 357.35
	ODP	kg CFC11e	1.014E-05	1.334E-07	1.011E-05	1.001E-05	1.007E-05	1.014E-05	1.023E-05	7.433E-09	1.013E-05 - 1.015E-05
	AP	kg SO2e	1.397	0.276	1.148	1.037	1.115	1.206	1.548	0.018	1.379 - 1.415
	EPM	kg N eq	0.169	0.071	0.111	0.084	0.103	0.125	0.208	0.005	0.164 - 0.174
	EPF	kg P eq	0.044	0.000	0.044	0.044	0.044	0.044	0.044	1.16E-05	0.044 - 0.044
	SFP	kg O3e	30.09	7.14	23.23	20.35	22.25	24.60	32.96	0.47	29.62 - 30.56
	ADPf	MJ	2334.27	307.65	2169.48	1965.96	2102.81	2246.02	2624.31	19.98	2314.29 - 2354.25
	ADPe	kg Sb eq	1.880E-04	1.132E-06	1.877E-04	1.868E-04	1.875E-04	1.881E-04	1.887E-04	6.305E-08	1.879E-04 - 1.881E-04

High-Strength 6,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
6000-40-FA	GWPT	kg CO ₂ e	326.36	21.70	311.34	296.89	306.78	316.49	343.54	1.41	324.95 - 327.77
	ODP	kg CFC11e	6.581E-06	1.334E-07	6.549E-06	6.454E-06	6.515E-06	6.586E-06	6.672E-06	7.433E-09	6.574E-06 - 6.588E-06
	AP	kg SO ₂ e	1.149	0.266	0.865	0.745	0.822	0.912	1.239	0.018	1.131 - 1.167
	EPM	kg N eq	0.176	0.068	0.109	0.081	0.099	0.121	0.201	0.004	0.172 - 0.180
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.16E-05	0.037 - 0.037
	SFP	kg O ₃ e	25.78	7.35	17.70	14.88	16.63	19.00	27.86	0.48	25.30 - 26.26
	ADP _f	MJ	2292.46	294.68	2104.96	1899.35	2036.06	2174.79	2534.38	19.11	2273.35 - 2311.57
	ADP _e	kg Sb eq	1.901E-04	1.132E-06	1.898E-04	1.889E-04	1.896E-04	1.902E-04	1.908E-04	6.305E-08	1.900E-04 - 1.902E-04
6000-40-SL	GWPT	kg CO ₂ e	324.61	21.50	310.75	296.23	305.97	316.28	342.28	1.39	323.22 - 326.00
	ODP	kg CFC11e	1.028E-05	1.334E-07	1.025E-05	1.015E-05	1.021E-05	1.028E-05	1.037E-05	7.433E-09	1.027E-05 - 1.029E-05
	AP	kg SO ₂ e	1.433	0.271	1.170	1.052	1.133	1.223	1.556	0.018	1.415 - 1.451
	EPM	kg N eq	0.172	0.071	0.110	0.082	0.101	0.123	0.207	0.005	0.167 - 0.177
	EPF	kg P eq	0.041	0.000	0.041	0.041	0.041	0.041	0.041	1.16E-05	0.041 - 0.041
	SFP	kg O ₃ e	30.99	7.56	23.62	20.71	22.53	24.92	34.06	0.50	30.49 - 31.49
	ADP _f	MJ	2171.67	283.98	1996.29	1790.26	1924.28	2073.56	2401.21	18.39	2153.28 - 2190.06
	ADP _e	kg Sb eq	1.843E-04	1.132E-06	1.840E-04	1.831E-04	1.838E-04	1.844E-04	1.850E-04	6.305E-08	1.842E-04 - 1.844E-04
6000-50-FA/SL	GWPT	kg CO ₂ e	292.53	19.51	277.17	262.40	272.21	282.30	304.72	1.26	291.27 - 293.79
	ODP	kg CFC11e	8.673E-06	1.334E-07	8.641E-06	8.546E-06	8.607E-06	8.678E-06	8.763E-06	7.433E-09	8.666E-06 - 8.680E-06
	AP	kg SO ₂ e	1.337	0.267	1.048	0.922	1.002	1.093	1.417	0.018	1.319 - 1.355
	EPM	kg N eq	0.176	0.068	0.108	0.078	0.097	0.119	0.198	0.005	0.171 - 0.181
	EPF	kg P eq	0.036	0.000	0.036	0.036	0.036	0.036	0.036	1.16E-05	0.036 - 0.036
	SFP	kg O ₃ e	29.47	7.57	21.25	18.21	20.09	22.46	31.59	0.50	28.97 - 29.97
	ADP _f	MJ	2057.74	266.01	1862.01	1656.48	1791.64	1934.78	2234.64	17.18	2040.56 - 2074.92
	ADP _e	kg Sb eq	1.831E-04	1.132E-06	1.828E-04	1.819E-04	1.826E-04	1.832E-04	1.838E-04	6.305E-08	1.830E-04 - 1.832E-04
6000-50-SL	GWPT	kg CO ₂ e	293.35	19.02	278.47	263.81	273.49	284.04	305.02	1.23	292.12 - 294.58
	ODP	kg CFC11e	1.042E-05	1.334E-07	1.039E-05	1.029E-05	1.035E-05	1.042E-05	1.051E-05	7.433E-09	1.041E-05 - 1.043E-05
	AP	kg SO ₂ e	1.469	0.271	1.192	1.061	1.148	1.241	1.564	0.018	1.451 - 1.487
	EPM	kg N eq	0.174	0.070	0.109	0.079	0.099	0.121	0.202	0.005	0.169 - 0.179
	EPF	kg P eq	0.038	0.000	0.038	0.038	0.038	0.038	0.038	1.16E-05	0.038 - 0.038
	SFP	kg O ₃ e	31.88	7.42	24.01	21.01	22.89	25.28	34.12	0.49	31.39 - 32.37
	ADP _f	MJ	2009.08	268.98	1820.44	1613.70	1747.32	1898.27	2195.03	17.38	1991.70 - 2026.46
	ADP _e	kg Sb eq	1.805E-04	1.132E-06	1.802E-04	1.793E-04	1.800E-04	1.806E-04	1.812E-04	6.305E-08	1.804E-04 - 1.806E-04

High-Strength 8,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
8000-00-FA/SL	GWPT	kg CO ₂ e	518.34	15.67	505.90	492.49	501.56	510.95	527.43	0.97	517.37 - 519.31
	ODP	kg CFC11e	1.122E-05	1.334E-07	1.119E-05	1.109E-05	1.115E-05	1.122E-05	1.131E-05	7.433E-09	1.121E-05 - 1.123E-05
	AP	kg SO ₂ e	1.455	0.175	1.231	1.113	1.196	1.273	1.446	0.011	1.444 - 1.466
	EPM	kg N eq	0.181	0.044	0.128	0.101	0.120	0.138	0.179	0.003	0.178 - 0.184
	EPF	kg P eq	0.063	0.000	0.063	0.063	0.063	0.063	0.063	1.15E-05	0.063 - 0.063
	SFP	kg O ₃ e	30.61	4.51	24.43	21.48	23.53	25.34	29.55	0.29	30.32 - 30.90
	ADP _f	MJ	3246.42	225.77	3087.50	2894.77	3027.31	3156.45	3397.90	14.01	3232.41 - 3260.43
	ADP _e	kg Sb eq	2.545E-04	1.132E-06	2.542E-04	2.533E-04	2.540E-04	2.546E-04	2.552E-04	6.304E-08	2.544E-04 - 2.546E-04
	GWPT	kg CO ₂ e	450.67	22.40	436.63	422.25	432.09	442.03	470.15	1.46	449.21 - 452.13
	ODP	kg CFC11e	9.494E-06	1.334E-07	9.462E-06	9.367E-06	9.428E-06	9.499E-06	9.585E-06	7.433E-09	9.487E-06 - 9.501E-06
8000-20-FA	AP	kg SO ₂ e	1.378	0.276	1.116	0.991	1.072	1.166	1.503	0.018	1.360 - 1.396
	EPM	kg N eq	0.189	0.073	0.128	0.098	0.117	0.141	0.226	0.005	0.184 - 0.194
	EPF	kg P eq	0.053	0.000	0.053	0.053	0.053	0.053	0.053	1.16E-05	0.053 - 0.053
	SFP	kg O ₃ e	29.71	7.61	22.28	19.22	21.47	23.49	32.80	0.50	29.21 - 30.21
	ADP _f	MJ	2957.41	310.64	2779.09	2576.36	2717.31	2849.01	3244.24	20.18	2937.23 - 2977.59
	ADP _e	kg Sb eq	2.508E-04	1.132E-06	2.505E-04	2.496E-04	2.503E-04	2.509E-04	2.515E-04	6.305E-08	2.507E-04 - 2.509E-04
	GWPT	kg CO ₂ e	414.10	22.58	398.65	383.96	394.03	403.73	432.29	1.47	412.63 - 415.57
	ODP	kg CFC11e	8.562E-06	1.334E-07	8.530E-06	8.435E-06	8.496E-06	8.567E-06	8.653E-06	7.433E-09	8.555E-06 - 8.569E-06
	AP	kg SO ₂ e	1.336	0.271	1.042	0.923	0.997	1.101	1.420	0.018	1.318 - 1.354
	EPM	kg N eq	0.193	0.070	0.124	0.096	0.113	0.138	0.218	0.005	0.188 - 0.198
8000-30-FA	EPF	kg P eq	0.048	0.000	0.048	0.048	0.048	0.048	0.048	1.16E-05	0.048 - 0.048
	SFP	kg O ₃ e	29.22	7.51	20.88	18.01	20.05	22.26	31.34	0.50	28.72 - 29.72
	ADP _f	MJ	2801.19	317.89	2609.07	2400.74	2539.47	2676.57	3080.62	20.66	2780.53 - 2821.85
	ADP _e	kg Sb eq	2.488E-04	1.132E-06	2.485E-04	2.476E-04	2.483E-04	2.489E-04	2.495E-04	6.305E-08	2.487E-04 - 2.489E-04
	GWPT	kg CO ₂ e	409.57	23.10	395.00	380.40	390.35	400.27	429.65	1.50	408.07 - 411.07
	ODP	kg CFC11e	1.170E-05	1.334E-07	1.167E-05	1.157E-05	1.163E-05	1.170E-05	1.179E-05	7.433E-09	1.169E-05 - 1.171E-05
	AP	kg SO ₂ e	1.580	0.278	1.306	1.185	1.263	1.356	1.700	0.018	1.562 - 1.598
	EPM	kg N eq	0.189	0.072	0.124	0.096	0.114	0.137	0.223	0.005	0.184 - 0.194
	EPF	kg P eq	0.051	0.000	0.051	0.051	0.051	0.051	0.051	1.16E-05	0.051 - 0.051
	SFP	kg O ₃ e	33.73	7.47	25.95	22.97	24.94	27.34	36.17	0.49	33.24 - 34.22
8000-30-SL	ADP _f	MJ	2680.72	320.32	2497.89	2291.18	2430.54	2572.25	2974.14	20.83	2659.89 - 2701.55
	ADP _e	kg Sb eq	2.415E-04	1.132E-06	2.412E-04	2.403E-04	2.410E-04	2.416E-04	2.422E-04	6.305E-08	2.414E-04 - 2.416E-04

High-Strength 8,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
8000-40-FA	GWPT	kg CO2e	375.49	22.00	358.59	343.77	353.49	363.44	390.91	1.43	374.06 - 376.92
	ODP	kg CFC11e	7.578E-06	1.334E-07	7.546E-06	7.451E-06	7.512E-06	7.583E-06	7.669E-06	7.433E-09	7.571E-06 - 7.585E-06
	AP	kg SO2e	1.292	0.265	0.970	0.845	0.924	1.019	1.335	0.017	1.275 - 1.309
	EPM	kg N eq	0.197	0.066	0.121	0.092	0.110	0.133	0.208	0.004	0.193 - 0.201
	EPF	kg P eq	0.042	0.000	0.042	0.042	0.042	0.042	0.042	1.16E-05	0.042 - 0.042
	SFP	kg O3e	28.71	7.37	19.44	16.52	18.42	20.91	29.50	0.49	28.22 - 29.20
	ADPf	MJ	2636.29	310.42	2422.75	2217.21	2351.79	2484.84	2884.23	20.16	2616.13 - 2656.45
	ADPe	kg Sb eq	2.467E-04	1.132E-06	2.464E-04	2.455E-04	2.462E-04	2.468E-04	2.474E-04	6.305E-08	2.466E-04 - 2.468E-04
8000-40-SL	GWPT	kg CO2e	373.32	22.46	357.82	343.02	352.93	363.00	391.00	1.46	371.86 - 374.78
	ODP	kg CFC11e	1.186E-05	1.334E-07	1.183E-05	1.173E-05	1.179E-05	1.186E-05	1.195E-05	7.433E-09	1.185E-05 - 1.187E-05
	AP	kg SO2e	1.622	0.278	1.327	1.201	1.280	1.376	1.715	0.018	1.604 - 1.640
	EPM	kg N eq	0.192	0.071	0.123	0.093	0.111	0.134	0.218	0.005	0.187 - 0.197
	EPF	kg P eq	0.047	0.000	0.047	0.047	0.047	0.047	0.047	1.16E-05	0.047 - 0.047
	SFP	kg O3e	34.77	7.72	26.33	23.38	25.24	27.70	37.01	0.51	34.26 - 35.28
	ADPf	MJ	2492.16	306.98	2295.91	2084.65	2225.53	2368.64	2741.76	19.93	2472.23 - 2512.09
	ADPe	kg Sb eq	2.372E-04	1.132E-06	2.369E-04	2.360E-04	2.367E-04	2.373E-04	2.379E-04	6.305E-08	2.371E-04 - 2.373E-04
8000-50-FA/SL	GWPT	kg CO2e	336.18	21.72	318.83	303.95	313.89	323.60	350.64	1.41	334.77 - 337.59
	ODP	kg CFC11e	1.000E-05	1.334E-07	9.968E-06	9.873E-06	9.934E-06	1.000E-05	1.009E-05	7.433E-09	9.993E-06 - 1.001E-05
	AP	kg SO2e	1.509	0.268	1.180	1.051	1.128	1.223	1.547	0.018	1.491 - 1.527
	EPM	kg N eq	0.197	0.069	0.120	0.088	0.107	0.131	0.208	0.005	0.192 - 0.202
	EPF	kg P eq	0.041	0.000	0.041	0.041	0.041	0.041	0.041	1.16E-05	0.041 - 0.041
	SFP	kg O3e	32.99	7.51	23.62	20.43	22.36	24.85	33.66	0.50	32.49 - 33.49
	ADPf	MJ	2361.94	282.38	2144.33	1933.87	2072.26	2209.51	2545.73	18.28	2343.66 - 2380.22
	ADPe	kg Sb eq	2.372E-04	1.132E-06	2.369E-04	2.360E-04	2.367E-04	2.373E-04	2.379E-04	6.305E-08	2.371E-04 - 2.373E-04
8000-50-SL	GWPT	kg CO2e	337.06	20.95	320.50	305.22	315.36	325.30	350.36	1.36	335.70 - 338.42
	ODP	kg CFC11e	1.203E-05	1.334E-07	1.200E-05	1.190E-05	1.196E-05	1.203E-05	1.212E-05	7.433E-09	1.202E-05 - 1.204E-05
	AP	kg SO2e	1.664	0.274	1.348	1.220	1.299	1.394	1.727	0.018	1.646 - 1.682
	EPM	kg N eq	0.195	0.069	0.121	0.090	0.109	0.132	0.211	0.005	0.190 - 0.200
	EPF	kg P eq	0.043	0.000	0.043	0.043	0.043	0.043	0.043	1.16E-05	0.043 - 0.043
	SFP	kg O3e	35.81	7.77	26.81	23.69	25.58	28.11	37.38	0.51	35.30 - 36.32
	ADPf	MJ	2303.59	275.69	2093.13	1879.37	2018.64	2164.35	2475.47	17.83	2285.76 - 2321.42
	ADPe	kg Sb eq	2.329E-04	1.132E-06	2.326E-04	2.317E-04	2.324E-04	2.330E-04	2.336E-04	6.305E-08	2.328E-04 - 2.330E-04

High-Strength 10,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
10000-00-FA/SL	GWPT	kg CO2e	656.33	16.66	641.34	627.64	636.61	646.70	664.35	1.04	655.29 - 657.37
	ODP	kg CFC11e	1.432E-05	1.334E-07	1.429E-05	1.419E-05	1.425E-05	1.432E-05	1.441E-05	7.433E-09	1.431E-05 - 1.433E-05
	AP	kg SO2e	1.786	0.183	1.514	1.389	1.473	1.562	1.733	0.012	1.774 - 1.798
	EPM	kg N eq	0.217	0.047	0.152	0.123	0.143	0.164	0.205	0.003	0.214 - 0.220
	EPF	kg P eq	0.080	0.000	0.080	0.080	0.080	0.080	0.080	1.15E-05	0.080 - 0.080
	SFP	kg O3e	37.23	5.06	29.80	26.38	28.44	30.78	35.25	0.32	36.91 - 37.55
	ADP _f	MJ	4030.92	233.29	3840.83	3649.71	3773.60	3909.08	4165.84	14.50	4016.42 - 4045.42
	ADP _e	kg Sb eq	3.265E-04	1.132E-06	3.262E-04	3.253E-04	3.260E-04	3.266E-04	3.272E-04	6.305E-08	3.264E-04 - 3.266E-04
10000-20-FA	GWPT	kg CO2e	569.36	23.50	552.11	537.86	547.39	557.37	587.83	1.53	567.83 - 570.89
	ODP	kg CFC11e	1.211E-05	1.334E-07	1.208E-05	1.198E-05	1.204E-05	1.211E-05	1.220E-05	7.433E-09	1.210E-05 - 1.212E-05
	AP	kg SO2e	1.687	0.278	1.358	1.233	1.317	1.411	1.748	0.018	1.669 - 1.705
	EPM	kg N eq	0.227	0.071	0.149	0.120	0.142	0.162	0.246	0.005	0.222 - 0.232
	EPF	kg P eq	0.068	0.000	0.068	0.068	0.068	0.068	0.068	1.16E-05	0.068 - 0.068
	SFP	kg O3e	36.07	7.65	26.99	23.61	25.95	28.12	37.20	0.50	35.57 - 36.57
	ADP _f	MJ	3659.44	319.15	3442.87	3237.40	3374.05	3512.17	3919.34	20.75	3638.69 - 3680.19
	ADP _e	kg Sb eq	3.218E-04	1.132E-06	3.215E-04	3.206E-04	3.213E-04	3.219E-04	3.225E-04	6.306E-08	3.217E-04 - 3.219E-04
10000-30-FA	GWPT	kg CO2e	522.35	23.54	503.36	488.42	498.11	508.36	538.39	1.53	520.82 - 523.88
	ODP	kg CFC11e	1.091E-05	1.334E-07	1.088E-05	1.078E-05	1.084E-05	1.091E-05	1.100E-05	7.433E-09	1.090E-05 - 1.092E-05
	AP	kg SO2e	1.633	0.279	1.263	1.146	1.224	1.329	1.659	0.018	1.615 - 1.651
	EPM	kg N eq	0.232	0.072	0.145	0.116	0.136	0.160	0.242	0.005	0.227 - 0.237
	EPF	kg P eq	0.061	0.000	0.061	0.061	0.061	0.061	0.061	1.16E-05	0.061 - 0.061
	SFP	kg O3e	35.45	7.82	24.98	21.99	24.19	26.50	35.84	0.52	34.93 - 35.97
	ADP _f	MJ	3458.64	327.32	3220.47	3007.55	3147.74	3285.45	3705.12	21.30	3437.34 - 3479.94
	ADP _e	kg Sb eq	3.192E-04	1.132E-06	3.189E-04	3.180E-04	3.187E-04	3.193E-04	3.199E-04	6.306E-08	3.191E-04 - 3.193E-04
10000-30-SL	GWPT	kg CO2e	516.53	24.24	498.59	483.32	493.72	504.33	534.48	1.58	514.95 - 518.11
	ODP	kg CFC11e	1.495E-05	1.334E-07	1.492E-05	1.482E-05	1.488E-05	1.495E-05	1.504E-05	7.433E-09	1.494E-05 - 1.496E-05
	AP	kg SO2e	1.947	0.291	1.602	1.477	1.558	1.663	2.011	0.019	1.928 - 1.966
	EPM	kg N eq	0.228	0.076	0.147	0.117	0.137	0.161	0.251	0.005	0.223 - 0.233
	EPF	kg P eq	0.065	0.000	0.065	0.065	0.065	0.065	0.065	1.16E-05	0.065 - 0.065
	SFP	kg O3e	41.24	8.01	31.40	28.36	30.68	32.95	42.57	0.53	40.71 - 41.77
	ADP _f	MJ	3303.79	337.95	3080.82	2865.09	3007.08	3147.18	3581.97	22.01	3281.78 - 3325.80
	ADP _e	kg Sb eq	3.099E-04	1.132E-06	3.096E-04	3.087E-04	3.094E-04	3.100E-04	3.106E-04	6.306E-08	3.098E-04 - 3.100E-04

High-Strength 10,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
10000-40-FA	GWPT	kg CO2e	472.72	23.39	451.34	436.78	446.49	456.81	486.43	1.52	471.20 - 474.24
	ODP	kg CFC11e	9.645E-06	1.334E-07	9.613E-06	9.517E-06	9.579E-06	9.649E-06	9.736E-06	7.433E-09	9.638E-06 - 9.652E-06
	AP	kg SO2e	1.576	0.268	1.173	1.048	1.126	1.228	1.542	0.018	1.558 - 1.594
	EPM	kg N eq	0.237	0.069	0.141	0.112	0.131	0.155	0.232	0.005	0.232 - 0.242
	EPF	kg P eq	0.054	0.000	0.054	0.054	0.054	0.054	0.054	1.16E-05	0.054 - 0.054
	SFP	kg O3e	34.78	7.36	23.14	20.10	22.18	24.76	33.04	0.49	34.29 - 35.27
	ADPf	MJ	3246.68	326.36	2974.72	2772.03	2907.15	3050.73	3465.82	21.23	3225.45 - 3267.91
	ADPe	kg Sb eq	3.165E-04	1.132E-06	3.162E-04	3.153E-04	3.160E-04	3.166E-04	3.172E-04	6.306E-08	3.164E-04 - 3.166E-04
	GWPT	kg CO2e	469.93	23.86	450.47	435.25	445.39	456.13	485.66	1.55	468.38 - 471.48
	ODP	kg CFC11e	1.515E-05	1.334E-07	1.512E-05	1.502E-05	1.508E-05	1.515E-05	1.524E-05	7.433E-09	1.514E-05 - 1.516E-05
10000-40-SL	AP	kg SO2e	2.001	0.274	1.633	1.501	1.581	1.689	2.003	0.018	1.983 - 2.019
	EPM	kg N eq	0.231	0.072	0.144	0.112	0.132	0.158	0.238	0.005	0.226 - 0.236
	EPF	kg P eq	0.059	0.000	0.059	0.059	0.059	0.059	0.059	1.16E-05	0.059 - 0.059
	SFP	kg O3e	42.58	7.72	32.00	28.79	31.00	33.52	42.39	0.51	42.07 - 43.09
	ADPf	MJ	3061.41	329.02	2817.58	2604.44	2743.14	2885.27	3303.77	21.41	3040.00 - 3082.82
	ADPe	kg Sb eq	3.044E-04	1.132E-06	3.041E-04	3.032E-04	3.039E-04	3.045E-04	3.051E-04	6.306E-08	3.043E-04 - 3.045E-04
	GWPT	kg CO2e	422.20	23.04	400.03	385.09	395.09	406.18	433.82	1.50	420.70 - 423.70
	ODP	kg CFC11e	1.276E-05	1.334E-07	1.273E-05	1.263E-05	1.269E-05	1.276E-05	1.285E-05	7.433E-09	1.275E-05 - 1.277E-05
	AP	kg SO2e	1.856	0.248	1.442	1.314	1.390	1.491	1.771	0.016	1.840 - 1.872
	EPM	kg N eq	0.238	0.066	0.140	0.109	0.128	0.152	0.225	0.004	0.234 - 0.242
10000-50-FA/SL	EPF	kg P eq	0.051	0.000	0.051	0.051	0.051	0.051	0.051	1.16E-05	0.051 - 0.051
	SFP	kg O3e	40.29	7.13	28.36	25.26	27.26	29.99	37.74	0.47	39.82 - 40.76
	ADPf	MJ	2894.03	321.48	2615.63	2401.81	2544.71	2699.07	3082.76	20.90	2873.13 - 2914.93
	ADPe	kg Sb eq	3.043E-04	1.132E-06	3.040E-04	3.031E-04	3.038E-04	3.044E-04	3.050E-04	6.306E-08	3.042E-04 - 3.044E-04
	GWPT	kg CO2e	423.32	23.45	402.32	386.94	397.17	407.76	436.62	1.53	421.79 - 424.85
	ODP	kg CFC11e	1.536E-05	1.334E-07	1.533E-05	1.523E-05	1.529E-05	1.536E-05	1.545E-05	7.433E-09	1.535E-05 - 1.537E-05
	AP	kg SO2e	2.054	0.261	1.658	1.528	1.608	1.710	2.009	0.017	2.037 - 2.071
	EPM	kg N eq	0.235	0.068	0.141	0.110	0.128	0.153	0.229	0.005	0.230 - 0.240
	EPF	kg P eq	0.054	0.000	0.054	0.054	0.054	0.054	0.054	1.16E-05	0.054 - 0.054
	SFP	kg O3e	43.91	7.40	32.53	29.29	31.35	34.08	42.26	0.49	43.42 - 44.40
10000-50-SL	ADPf	MJ	2819.03	322.43	2553.86	2337.40	2483.30	2632.68	3021.82	20.97	2798.06 - 2840.00
	ADPe	kg Sb eq	2.988E-04	1.132E-06	2.985E-04	2.976E-04	2.983E-04	2.989E-04	2.995E-04	6.306E-08	2.987E-04 - 2.989E-04

High-Strength 12,000 psi - Non-Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
12000-00-FA/SL	GWPT	kg CO2e	745.16	17.24	728.38	714.79	723.63	734.34	752.44	1.07	744.09 - 746.23
	ODP	kg CFC11e	1.632E-05	1.334E-07	1.629E-05	1.619E-05	1.625E-05	1.632E-05	1.641E-05	7.433E-09	1.631E-05 - 1.633E-05
	AP	kg SO2e	2.000	0.192	1.697	1.569	1.650	1.743	1.929	0.012	1.988 - 2.012
	EPM	kg N eq	0.240	0.050	0.168	0.138	0.156	0.179	0.224	0.003	0.237 - 0.243
	EPF	kg P eq	0.091	0.000	0.091	0.091	0.091	0.091	0.091	1.15E-05	0.091 - 0.091
	SFP	kg O3e	41.50	5.29	33.17	29.62	31.65	34.34	38.79	0.34	41.16 - 41.84
	ADPf	MJ	4535.90	243.67	4321.33	4133.55	4250.88	4392.46	4668.32	15.17	4520.73 - 4551.07
	ADPe	kg Sb eq	3.729E-04	1.132E-06	3.726E-04	3.717E-04	3.724E-04	3.730E-04	3.736E-04	6.305E-08	3.728E-04 - 3.730E-04
	GWPT	kg CO2e	645.75	23.46	626.31	612.32	621.20	631.79	662.03	1.53	644.22 - 647.28
	ODP	kg CFC11e	1.379E-05	1.334E-07	1.376E-05	1.366E-05	1.372E-05	1.379E-05	1.388E-05	7.433E-09	1.378E-05 - 1.380E-05
12000-20-FA	AP	kg SO2e	1.886	0.278	1.517	1.392	1.484	1.574	1.909	0.018	1.868 - 1.904
	EPM	kg N eq	0.251	0.072	0.164	0.134	0.156	0.178	0.261	0.005	0.246 - 0.256
	EPF	kg P eq	0.077	0.000	0.077	0.077	0.077	0.077	0.077	1.16E-05	0.077 - 0.077
	SFP	kg O3e	40.17	7.85	29.96	26.49	28.77	31.13	40.37	0.52	39.65 - 40.69
	ADPf	MJ	4111.33	339.89	3866.08	3663.87	3792.67	3937.88	4382.69	22.14	4089.19 - 4133.47
	ADPe	kg Sb eq	3.675E-04	1.132E-06	3.672E-04	3.663E-04	3.670E-04	3.676E-04	3.682E-04	6.306E-08	3.674E-04 - 3.676E-04
	GWPT	kg CO2e	592.02	23.82	570.77	555.97	565.02	575.67	606.34	1.55	590.47 - 593.57
	ODP	kg CFC11e	1.242E-05	1.334E-07	1.239E-05	1.229E-05	1.235E-05	1.242E-05	1.251E-05	7.433E-09	1.241E-05 - 1.243E-05
	AP	kg SO2e	1.824	0.292	1.408	1.286	1.373	1.473	1.824	0.019	1.805 - 1.843
	EPM	kg N eq	0.257	0.073	0.159	0.129	0.151	0.174	0.257	0.005	0.252 - 0.262
12000-30-FA	EPF	kg P eq	0.069	0.000	0.069	0.069	0.069	0.069	0.069	1.16E-05	0.069 - 0.069
	SFP	kg O3e	39.45	7.65	27.80	24.56	26.82	29.34	38.04	0.51	38.94 - 39.96
	ADPf	MJ	3881.83	338.75	3614.05	3403.46	3533.76	3677.93	4120.48	22.06	3859.77 - 3903.89
	ADPe	kg Sb eq	3.645E-04	1.132E-06	3.642E-04	3.633E-04	3.640E-04	3.646E-04	3.652E-04	6.306E-08	3.644E-04 - 3.646E-04
	GWPT	kg CO2e	585.37	24.76	565.35	549.90	559.88	570.53	602.03	1.61	583.76 - 586.98
	ODP	kg CFC11e	1.703E-05	1.334E-07	1.700E-05	1.690E-05	1.696E-05	1.703E-05	1.712E-05	7.433E-09	1.702E-05 - 1.704E-05
	AP	kg SO2e	2.183	0.295	1.793	1.670	1.751	1.861	2.209	0.019	2.164 - 2.202
	EPM	kg N eq	0.252	0.076	0.160	0.129	0.151	0.176	0.262	0.005	0.247 - 0.257
	EPF	kg P eq	0.073	0.000	0.073	0.073	0.073	0.073	0.073	1.16E-05	0.073 - 0.073
	SFP	kg O3e	46.08	8.24	35.01	31.87	34.18	36.61	46.45	0.54	45.54 - 46.62
12000-30-SL	ADPf	MJ	3704.85	343.50	3453.83	3233.36	3378.02	3521.02	3959.74	22.38	3682.47 - 3727.23
	ADPe	kg Sb eq	3.539E-04	1.132E-06	3.536E-04	3.527E-04	3.534E-04	3.540E-04	3.546E-04	6.306E-08	3.538E-04 - 3.540E-04

High-Strength 12,000 psi - Non-Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
12000-40-FA	GWPT	kg CO2e	535.31	23.39	511.25	496.30	506.57	516.96	545.95	1.52	533.79 - 536.83
	ODP	kg CFC11e	1.097E-05	1.334E-07	1.094E-05	1.084E-05	1.090E-05	1.097E-05	1.106E-05	7.433E-09	1.096E-05 - 1.098E-05
	AP	kg SO2e	1.759	0.287	1.299	1.175	1.254	1.363	1.700	0.019	1.740 - 1.778
	EPM	kg N eq	0.263	0.073	0.154	0.125	0.144	0.169	0.252	0.005	0.258 - 0.268
	EPF	kg P eq	0.061	0.000	0.061	0.061	0.061	0.061	0.061	1.16E-05	0.061 - 0.061
	SFP	kg O3e	38.70	7.62	25.66	22.40	24.59	27.20	35.80	0.50	38.20 - 39.20
	ADP _f	MJ	3639.58	326.68	3335.56	3126.52	3265.70	3409.05	3821.01	21.25	3618.33 - 3660.83
	ADP _e	kg Sb eq	3.615E-04	1.132E-06	3.612E-04	3.603E-04	3.610E-04	3.616E-04	3.622E-04	6.306E-08	3.614E-04 - 3.616E-04
12000-40-SL	GWPT	kg CO2e	532.11	24.43	510.37	494.71	504.99	515.76	546.19	1.59	530.52 - 533.70
	ODP	kg CFC11e	1.727E-05	1.334E-07	1.724E-05	1.714E-05	1.720E-05	1.727E-05	1.736E-05	7.433E-09	1.726E-05 - 1.728E-05
	AP	kg SO2e	2.245	0.284	1.828	1.696	1.780	1.887	2.216	0.019	2.226 - 2.264
	EPM	kg N eq	0.256	0.074	0.157	0.126	0.146	0.172	0.254	0.005	0.251 - 0.261
	EPF	kg P eq	0.068	0.000	0.068	0.068	0.068	0.068	0.068	1.16E-05	0.068 - 0.068
	SFP	kg O3e	47.60	7.80	35.57	32.35	34.61	37.28	46.05	0.51	47.09 - 48.11
	ADP _f	MJ	3427.83	341.45	3147.89	2935.19	3076.20	3226.14	3655.39	22.24	3405.59 - 3450.07
	ADP _e	kg Sb eq	3.476E-04	1.132E-06	3.473E-04	3.464E-04	3.471E-04	3.477E-04	3.483E-04	6.306E-08	3.475E-04 - 3.477E-04
12000-50-FA/SL	GWPT	kg CO2e	477.56	23.33	452.88	437.37	447.74	458.93	486.62	1.52	476.04 - 479.08
	ODP	kg CFC11e	1.454E-05	1.334E-07	1.451E-05	1.441E-05	1.447E-05	1.454E-05	1.463E-05	7.433E-09	1.453E-05 - 1.455E-05
	AP	kg SO2e	2.079	0.267	1.609	1.477	1.561	1.670	1.967	0.018	2.061 - 2.097
	EPM	kg N eq	0.264	0.070	0.151	0.121	0.141	0.167	0.243	0.005	0.259 - 0.269
	EPF	kg P eq	0.058	0.000	0.058	0.058	0.058	0.058	0.058	1.16E-05	0.058 - 0.058
	SFP	kg O3e	44.99	7.29	31.46	28.27	30.37	33.06	41.05	0.48	44.51 - 45.47
	ADP _f	MJ	3236.53	333.55	2918.01	2706.57	2852.00	3005.75	3410.59	21.71	3214.82 - 3258.24
	ADP _e	kg Sb eq	3.475E-04	1.132E-06	3.472E-04	3.463E-04	3.470E-04	3.476E-04	3.482E-04	6.306E-08	3.474E-04 - 3.476E-04
12000-50-SL	GWPT	kg CO2e	478.85	23.89	454.95	439.51	449.95	461.14	489.82	1.56	477.29 - 480.41
	ODP	kg CFC11e	1.751E-05	1.334E-07	1.748E-05	1.738E-05	1.744E-05	1.751E-05	1.760E-05	7.433E-09	1.750E-05 - 1.752E-05
	AP	kg SO2e	2.306	0.265	1.858	1.726	1.805	1.916	2.212	0.017	2.289 - 2.323
	EPM	kg N eq	0.260	0.071	0.153	0.122	0.141	0.168	0.244	0.005	0.255 - 0.265
	EPF	kg P eq	0.062	0.000	0.062	0.062	0.062	0.062	0.062	1.16E-05	0.062 - 0.062
	SFP	kg O3e	49.13	7.67	36.20	32.96	35.14	37.86	46.41	0.51	48.62 - 49.64
	ADP _f	MJ	3150.81	340.00	2848.26	2629.02	2777.64	2934.71	3344.10	22.14	3128.67 - 3172.95
	ADP _e	kg Sb eq	3.412E-04	1.132E-06	3.409E-04	3.400E-04	3.407E-04	3.413E-04	3.419E-04	6.306E-08	3.411E-04 - 3.413E-04

Structural Lightweight 3,000 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
3000-00-FA/SL-AE	GWPT	kg CO2e	304.33	15.36	295.73	282.09	291.55	300.18	316.64	0.95	303.38 - 305.28
	ODP	kg CFC11e	6.456E-06	1.334E-07	6.425E-06	6.329E-06	6.391E-06	6.461E-06	6.546E-06	7.433E-09	6.449E-06 - 6.463E-06
	AP	kg SO2e	0.936	0.158	0.788	0.686	0.753	0.827	0.989	0.010	0.926 - 0.946
	EPM	kg N eq	0.123	0.041	0.087	0.064	0.080	0.096	0.137	0.003	0.120 - 0.126
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.15E-05	0.037 - 0.037
	SFP	kg O3e	20.28	3.91	16.27	13.83	15.43	17.12	20.84	0.25	20.03 - 20.53
	ADPf	MJ	1993.35	214.22	1881.85	1692.42	1824.28	1941.58	2176.01	13.25	1980.10 - 2006.60
	ADPe	kg Sb eq	1.238E-04	1.132E-06	1.235E-04	1.226E-04	1.233E-04	1.239E-04	1.245E-04	6.304E-08	1.237E-04 - 1.239E-04
3000-20-FA-AE	GWPT	kg CO2e	266.15	19.24	256.85	243.02	252.12	262.67	284.66	1.24	264.91 - 267.39
	ODP	kg CFC11e	5.485E-06	1.334E-07	5.454E-06	5.358E-06	5.420E-06	5.490E-06	5.576E-06	7.433E-09	5.478E-06 - 5.492E-06
	AP	kg SO2e	0.892	0.250	0.724	0.615	0.682	0.780	1.078	0.016	0.876 - 0.908
	EPM	kg N eq	0.128	0.063	0.090	0.064	0.079	0.102	0.174	0.004	0.124 - 0.132
	EPF	kg P eq	0.031	0.000	0.031	0.031	0.031	0.031	0.031	1.16E-05	0.031 - 0.031
	SFP	kg O3e	19.77	6.43	15.15	12.66	14.17	16.37	24.05	0.42	19.35 - 20.19
	ADPf	MJ	1828.45	260.97	1713.43	1515.54	1642.30	1790.84	2082.06	16.84	1811.61 - 1845.29
	ADPe	kg Sb eq	1.207E-04	1.132E-06	1.204E-04	1.195E-04	1.202E-04	1.208E-04	1.214E-04	6.304E-08	1.206E-04 - 1.208E-04
3000-30-FA-AE	GWPT	kg CO2e	245.51	19.32	235.42	221.41	230.68	241.50	263.11	1.25	244.26 - 246.76
	ODP	kg CFC11e	4.961E-06	1.334E-07	4.930E-06	4.834E-06	4.895E-06	4.966E-06	5.052E-06	7.433E-09	4.954E-06 - 4.968E-06
	AP	kg SO2e	0.869	0.259	0.682	0.575	0.643	0.741	1.054	0.017	0.852 - 0.886
	EPM	kg N eq	0.130	0.067	0.087	0.061	0.077	0.101	0.178	0.004	0.126 - 0.134
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O3e	19.50	6.65	14.35	11.86	13.41	15.69	23.61	0.44	19.06 - 19.94
	ADPf	MJ	1739.31	263.12	1613.79	1416.05	1543.74	1698.42	1984.73	16.98	1722.33 - 1756.29
	ADPe	kg Sb eq	1.190E-04	1.132E-06	1.187E-04	1.178E-04	1.185E-04	1.191E-04	1.197E-04	6.305E-08	1.189E-04 - 1.191E-04
3000-30-SL-AE	GWPT	kg CO2e	243.13	18.97	233.51	219.35	228.61	239.63	260.29	1.22	241.91 - 244.35
	ODP	kg CFC11e	6.728E-06	1.334E-07	6.697E-06	6.601E-06	6.662E-06	6.733E-06	6.819E-06	7.433E-09	6.721E-06 - 6.735E-06
	AP	kg SO2e	1.006	0.266	0.830	0.718	0.788	0.892	1.208	0.018	0.988 - 1.024
	EPM	kg N eq	0.128	0.068	0.087	0.061	0.077	0.102	0.179	0.004	0.124 - 0.132
	EPF	kg P eq	0.030	0.000	0.030	0.030	0.030	0.030	0.030	1.16E-05	0.030 - 0.030
	SFP	kg O3e	22.04	6.68	17.16	14.64	16.24	18.55	26.44	0.44	21.60 - 22.48
	ADPf	MJ	1675.03	260.51	1556.17	1352.84	1483.89	1637.41	1916.79	16.81	1658.22 - 1691.84
	ADPe	kg Sb eq	1.165E-04	1.132E-06	1.162E-04	1.153E-04	1.160E-04	1.166E-04	1.172E-04	6.305E-08	1.164E-04 - 1.166E-04

Structural Lightweight 3,000 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
3000-40-FA-AE	GWPT	kg CO2e	223.73	18.21	212.99	198.68	208.07	218.50	238.34	1.17	222.56 - 224.90
	ODP	kg CFC11e	4.408E-06	1.334E-07	4.376E-06	4.281E-06	4.342E-06	4.413E-06	4.499E-06	7.433E-09	4.401E-06 - 4.415E-06
	AP	kg SO2e	0.844	0.262	0.642	0.530	0.601	0.698	1.015	0.017	0.827 - 0.861
	EPM	kg N eq	0.132	0.066	0.085	0.059	0.076	0.099	0.173	0.004	0.128 - 0.136
	EPF	kg P eq	0.025	0.000	0.025	0.025	0.025	0.025	0.025	1.16E-05	0.025 - 0.025
	SFP	kg O3e	19.21	6.70	13.56	11.08	12.60	14.84	22.93	0.44	18.77 - 19.65
	ADPf	MJ	1645.22	254.32	1509.73	1308.88	1439.68	1585.45	1863.28	16.39	1628.83 - 1661.61
	ADPe	kg Sb eq	1.172E-04	1.132E-06	1.169E-04	1.160E-04	1.167E-04	1.173E-04	1.179E-04	6.305E-08	1.171E-04 - 1.173E-04
3000-40-SL-AE	GWPT	kg CO2e	222.73	18.37	212.64	198.21	207.73	218.45	238.09	1.18	221.55 - 223.91
	ODP	kg CFC11e	6.819E-06	1.334E-07	6.788E-06	6.692E-06	6.753E-06	6.824E-06	6.910E-06	7.433E-09	6.812E-06 - 6.826E-06
	AP	kg SO2e	1.030	0.257	0.842	0.727	0.799	0.902	1.202	0.017	1.013 - 1.047
	EPM	kg N eq	0.130	0.062	0.086	0.059	0.076	0.101	0.168	0.004	0.126 - 0.134
	EPF	kg P eq	0.028	0.000	0.028	0.028	0.028	0.028	0.028	1.16E-05	0.028 - 0.028
	SFP	kg O3e	22.62	6.77	17.32	14.84	16.38	18.81	26.76	0.45	22.17 - 23.07
	ADPf	MJ	1568.93	262.11	1443.05	1238.46	1370.70	1523.47	1805.79	16.91	1552.02 - 1585.84
	ADPe	kg Sb eq	1.141E-04	1.132E-06	1.138E-04	1.129E-04	1.136E-04	1.142E-04	1.148E-04	6.305E-08	1.140E-04 - 1.142E-04
3000-50-FA/SL-AE	GWPT	kg CO2e	201.73	18.45	190.49	176.14	185.86	196.08	216.35	1.19	200.54 - 202.92
	ODP	kg CFC11e	5.772E-06	1.334E-07	5.740E-06	5.645E-06	5.706E-06	5.777E-06	5.863E-06	7.433E-09	5.765E-06 - 5.779E-06
	AP	kg SO2e	0.966	0.246	0.759	0.644	0.720	0.818	1.099	0.016	0.950 - 0.982
	EPM	kg N eq	0.132	0.061	0.084	0.057	0.075	0.098	0.162	0.004	0.128 - 0.136
	EPF	kg P eq	0.024	0.000	0.024	0.024	0.024	0.024	0.024	1.16E-05	0.024 - 0.024
	SFP	kg O3e	21.62	6.77	15.89	13.20	14.93	17.17	25.19	0.45	21.17 - 22.07
	ADPf	MJ	1493.38	262.61	1353.66	1149.86	1282.58	1430.40	1719.82	16.95	1476.43 - 1510.33
	ADPe	kg Sb eq	1.130E-04	1.132E-06	1.127E-04	1.118E-04	1.125E-04	1.131E-04	1.137E-04	6.305E-08	1.129E-04 - 1.131E-04
3000-50-SL-AE	GWPT	kg CO2e	202.33	18.64	191.55	177.08	186.79	197.11	217.62	1.20	201.13 - 203.53
	ODP	kg CFC11e	6.910E-06	1.334E-07	6.878E-06	6.783E-06	6.844E-06	6.915E-06	7.001E-06	7.433E-09	6.903E-06 - 6.917E-06
	AP	kg SO2e	1.053	0.243	0.853	0.735	0.813	0.914	1.184	0.016	1.037 - 1.069
	EPM	kg N eq	0.131	0.059	0.085	0.057	0.075	0.099	0.159	0.004	0.127 - 0.135
	EPF	kg P eq	0.026	0.000	0.026	0.026	0.026	0.026	0.026	1.16E-05	0.026 - 0.026
	SFP	kg O3e	23.21	6.68	17.70	14.91	16.71	19.00	26.72	0.44	22.77 - 23.65
	ADPf	MJ	1462.82	261.86	1328.08	1123.22	1255.09	1403.99	1691.35	16.90	1445.92 - 1479.72
	ADPe	kg Sb eq	1.117E-04	1.132E-06	1.114E-04	1.105E-04	1.112E-04	1.118E-04	1.124E-04	6.305E-08	1.116E-04 - 1.118E-04

Structural Lightweight 4,000 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
4000-00-FA/SL-AE	GWPT	kg CO2e	376.21	15.08	366.18	352.77	362.06	370.90	386.67	0.93	375.28 - 377.14
	ODP	kg CFC11e	8.085E-06	1.334E-07	8.054E-06	7.958E-06	8.019E-06	8.090E-06	8.175E-06	7.433E-09	8.078E-06 - 8.092E-06
	AP	kg SO2e	1.109	0.156	0.934	0.830	0.902	0.975	1.131	0.010	1.099 - 1.119
	EPM	kg N eq	0.142	0.040	0.100	0.076	0.094	0.110	0.148	0.003	0.139 - 0.145
	EPF	kg P eq	0.046	0.000	0.046	0.046	0.046	0.046	0.046	1.15E-05	0.046 - 0.046
	SFP	kg O3e	23.75	4.03	19.03	16.38	18.20	19.82	23.63	0.26	23.49 - 24.01
	ADPf	MJ	2393.50	212.05	2265.83	2078.16	2206.42	2327.79	2555.96	13.11	2380.39 - 2406.61
	ADPe	kg Sb eq	1.562E-04	1.132E-06	1.559E-04	1.550E-04	1.557E-04	1.563E-04	1.569E-04	6.304E-08	1.561E-04 - 1.563E-04
4000-20-FA-AE	GWPT	kg CO2e	327.87	20.49	316.66	302.88	312.23	322.40	347.05	1.33	326.54 - 329.20
	ODP	kg CFC11e	6.857E-06	1.334E-07	6.825E-06	6.730E-06	6.791E-06	6.862E-06	6.948E-06	7.433E-09	6.850E-06 - 6.864E-06
	AP	kg SO2e	1.053	0.258	0.852	0.746	0.812	0.902	1.226	0.017	1.036 - 1.070
	EPM	kg N eq	0.147	0.065	0.100	0.075	0.091	0.112	0.189	0.004	0.143 - 0.151
	EPF	kg P eq	0.039	0.000	0.039	0.039	0.039	0.039	0.039	1.16E-05	0.039 - 0.039
	SFP	kg O3e	23.11	6.80	17.47	14.91	16.71	18.70	27.03	0.45	22.66 - 23.56
	ADPf	MJ	2184.70	290.10	2042.17	1845.53	1978.75	2122.67	2470.04	18.80	2165.90 - 2203.50
	ADPe	kg Sb eq	1.522E-04	1.132E-06	1.519E-04	1.510E-04	1.517E-04	1.523E-04	1.529E-04	6.305E-08	1.521E-04 - 1.523E-04
4000-30-FA-AE	GWPT	kg CO2e	301.74	21.13	289.74	275.84	285.29	295.28	321.30	1.37	300.37 - 303.11
	ODP	kg CFC11e	6.193E-06	1.334E-07	6.161E-06	6.066E-06	6.127E-06	6.198E-06	6.284E-06	7.433E-09	6.186E-06 - 6.200E-06
	AP	kg SO2e	1.023	0.259	0.800	0.694	0.766	0.855	1.175	0.017	1.006 - 1.040
	EPM	kg N eq	0.150	0.066	0.098	0.073	0.089	0.111	0.190	0.004	0.146 - 0.154
	EPF	kg P eq	0.035	0.000	0.035	0.035	0.035	0.035	0.035	1.16E-05	0.035 - 0.035
	SFP	kg O3e	22.76	6.74	16.56	13.91	15.69	17.89	25.86	0.44	22.32 - 23.20
	ADPf	MJ	2071.84	288.59	1921.48	1726.30	1856.88	1996.33	2349.41	18.70	2053.14 - 2090.54
	ADPe	kg Sb eq	1.501E-04	1.132E-06	1.498E-04	1.489E-04	1.496E-04	1.502E-04	1.508E-04	6.305E-08	1.500E-04 - 1.502E-04
4000-30-SL-AE	GWPT	kg CO2e	298.72	21.34	287.34	273.04	282.76	293.35	318.71	1.38	297.34 - 300.10
	ODP	kg CFC11e	8.431E-06	1.334E-07	8.399E-06	8.304E-06	8.365E-06	8.436E-06	8.522E-06	7.433E-09	8.424E-06 - 8.438E-06
	AP	kg SO2e	1.198	0.266	0.988	0.878	0.949	1.043	1.371	0.018	1.180 - 1.216
	EPM	kg N eq	0.148	0.068	0.099	0.073	0.090	0.113	0.192	0.004	0.144 - 0.152
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.16E-05	0.037 - 0.037
	SFP	kg O3e	25.97	6.81	20.08	17.56	19.18	21.42	29.61	0.45	25.52 - 26.42
	ADPf	MJ	1990.46	279.32	1849.09	1645.59	1778.19	1929.24	2246.94	18.07	1972.39 - 2008.53
	ADPe	kg Sb eq	1.470E-04	1.132E-06	1.467E-04	1.458E-04	1.465E-04	1.471E-04	1.477E-04	6.305E-08	1.469E-04 - 1.471E-04

Structural Lightweight 4,000 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
4000-40-FA-AE	GWPT	kg CO2e	274.16	19.91	261.25	247.38	256.69	266.67	290.50	1.29	272.87 - 275.45
	ODP	kg CFC11e	5.492E-06	1.334E-07	5.460E-06	5.365E-06	5.426E-06	5.497E-06	5.583E-06	7.433E-09	5.485E-06 - 5.499E-06
	AP	kg SO2e	0.991	0.254	0.747	0.637	0.714	0.799	1.111	0.017	0.974 - 1.008
	EPM	kg N eq	0.153	0.066	0.096	0.070	0.088	0.109	0.186	0.004	0.149 - 0.157
	EPF	kg P eq	0.031	0.000	0.031	0.031	0.031	0.031	0.031	1.16E-05	0.031 - 0.031
	SFP	kg O3e	22.39	6.98	15.59	12.90	14.61	16.84	25.27	0.46	21.93 - 22.85
	ADPf	MJ	1952.71	264.85	1790.20	1593.34	1720.59	1864.92	2168.84	17.10	1935.61 - 1969.81
	ADPe	kg Sb eq	1.478E-04	1.132E-06	1.475E-04	1.466E-04	1.473E-04	1.479E-04	1.485E-04	6.305E-08	1.477E-04 - 1.479E-04
4000-40-SL-AE	GWPT	kg CO2e	272.89	19.13	260.93	246.59	256.06	266.46	288.05	1.24	271.65 - 274.13
	ODP	kg CFC11e	8.546E-06	1.334E-07	8.514E-06	8.419E-06	8.480E-06	8.551E-06	8.637E-06	7.433E-09	8.539E-06 - 8.553E-06
	AP	kg SO2e	1.227	0.266	1.003	0.885	0.965	1.058	1.379	0.018	1.209 - 1.245
	EPM	kg N eq	0.150	0.070	0.098	0.070	0.089	0.111	0.193	0.005	0.145 - 0.155
	EPF	kg P eq	0.034	0.000	0.034	0.034	0.034	0.034	0.034	1.16E-05	0.034 - 0.034
	SFP	kg O3e	26.71	6.99	20.41	17.79	19.45	21.63	30.19	0.46	26.25 - 27.17
	ADPf	MJ	1856.12	267.04	1705.37	1503.51	1633.92	1782.89	2081.72	17.25	1838.87 - 1873.37
	ADPe	kg Sb eq	1.439E-04	1.132E-06	1.436E-04	1.427E-04	1.434E-04	1.440E-04	1.446E-04	6.305E-08	1.438E-04 - 1.440E-04
4000-50-FA/SL-AE	GWPT	kg CO2e	246.30	18.37	233.04	218.73	228.12	238.39	258.75	1.18	245.12 - 247.48
	ODP	kg CFC11e	7.221E-06	1.334E-07	7.189E-06	7.094E-06	7.155E-06	7.226E-06	7.311E-06	7.433E-09	7.214E-06 - 7.228E-06
	AP	kg SO2e	1.147	0.256	0.900	0.782	0.862	0.952	1.258	0.017	1.130 - 1.164
	EPM	kg N eq	0.153	0.066	0.095	0.067	0.086	0.107	0.184	0.004	0.149 - 0.157
	EPF	kg P eq	0.030	0.000	0.030	0.030	0.030	0.030	0.030	1.16E-05	0.030 - 0.030
	SFP	kg O3e	25.45	7.10	18.49	15.71	17.49	19.66	28.31	0.47	24.98 - 25.92
	ADPf	MJ	1760.46	259.43	1591.86	1390.70	1522.89	1667.91	1955.37	16.73	1743.73 - 1777.19
	ADPe	kg Sb eq	1.425E-04	1.132E-06	1.422E-04	1.413E-04	1.420E-04	1.426E-04	1.432E-04	6.305E-08	1.424E-04 - 1.426E-04
4000-50-SL-AE	GWPT	kg CO2e	247.06	18.73	234.16	219.68	229.28	239.79	260.33	1.21	245.85 - 248.27
	ODP	kg CFC11e	8.661E-06	1.334E-07	8.629E-06	8.534E-06	8.595E-06	8.666E-06	8.752E-06	7.433E-09	8.654E-06 - 8.668E-06
	AP	kg SO2e	1.257	0.262	1.019	0.901	0.980	1.071	1.388	0.017	1.240 - 1.274
	EPM	kg N eq	0.152	0.067	0.097	0.068	0.087	0.109	0.186	0.004	0.148 - 0.156
	EPF	kg P eq	0.032	0.000	0.032	0.032	0.032	0.032	0.032	1.16E-05	0.032 - 0.032
	SFP	kg O3e	27.46	7.27	20.75	18.00	19.83	21.98	30.91	0.48	26.98 - 27.94
	ADPf	MJ	1721.77	265.19	1559.35	1353.80	1490.97	1637.55	1929.22	17.12	1704.65 - 1738.89
	ADPe	kg Sb eq	1.409E-04	1.132E-06	1.406E-04	1.397E-04	1.404E-04	1.410E-04	1.416E-04	6.305E-08	1.408E-04 - 1.410E-04

Structural Lightweight 5,000 psi - Air-Entrained

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
5000-00-FA/SL-AE	GWPT	kg CO2e	464.16	15.23	452.85	439.38	448.41	457.80	473.41	0.94	463.22 - 465.10
	ODP	kg CFC11e	1.000E-05	1.334E-07	9.968E-06	9.873E-06	9.934E-06	1.000E-05	1.009E-05	7.433E-09	9.993E-06 - 1.001E-05
	AP	kg SO2e	1.321	0.166	1.116	1.005	1.086	1.158	1.323	0.010	1.311 - 1.331
	EPM	kg N eq	0.166	0.042	0.117	0.092	0.111	0.127	0.167	0.003	0.163 - 0.169
	EPF	kg P eq	0.056	0.000	0.056	0.056	0.056	0.056	0.056	1.15E-05	0.056 - 0.056
	SFP	kg O3e	27.87	4.32	22.30	19.44	21.43	23.11	27.20	0.27	27.60 - 28.14
	ADPf	MJ	2937.80	217.50	2790.27	2603.45	2730.71	2860.16	3089.70	13.47	2924.33 - 2951.27
	ADPe	kg Sb eq	2.265E-04	1.132E-06	2.262E-04	2.253E-04	2.260E-04	2.266E-04	2.272E-04	6.304E-08	2.264E-04 - 2.266E-04
	GWPT	kg CO2e	404.04	21.27	391.19	377.10	386.95	396.48	422.98	1.38	402.66 - 405.42
	ODP	kg CFC11e	8.472E-06	1.334E-07	8.440E-06	8.345E-06	8.406E-06	8.477E-06	8.563E-06	7.433E-09	8.465E-06 - 8.479E-06
5000-20-FA-AE	AP	kg SO2e	1.252	0.267	1.016	0.897	0.974	1.067	1.392	0.018	1.234 - 1.270
	EPM	kg N eq	0.173	0.070	0.117	0.090	0.108	0.130	0.213	0.005	0.168 - 0.178
	EPF	kg P eq	0.048	0.000	0.048	0.048	0.048	0.048	0.048	1.16E-05	0.048 - 0.048
	SFP	kg O3e	27.07	7.28	20.35	17.47	19.48	21.72	30.38	0.48	26.59 - 27.55
	ADPf	MJ	2681.19	304.55	2519.13	2319.11	2456.99	2589.91	2974.98	19.77	2661.42 - 2700.96
	ADPe	kg Sb eq	2.232E-04	1.132E-06	2.229E-04	2.220E-04	2.227E-04	2.233E-04	2.239E-04	6.305E-08	2.231E-04 - 2.233E-04
	GWPT	kg CO2e	371.54	21.91	357.60	343.35	353.12	362.71	390.45	1.42	370.12 - 372.96
	ODP	kg CFC11e	7.644E-06	1.334E-07	7.612E-06	7.517E-06	7.578E-06	7.649E-06	7.735E-06	7.433E-09	7.637E-06 - 7.651E-06
	AP	kg SO2e	1.215	0.262	0.953	0.837	0.910	1.003	1.323	0.017	1.198 - 1.232
	EPM	kg N eq	0.176	0.068	0.114	0.087	0.104	0.127	0.206	0.004	0.172 - 0.180
5000-30-FA-AE	EPF	kg P eq	0.043	0.000	0.043	0.043	0.043	0.043	0.043	1.16E-05	0.043 - 0.043
	SFP	kg O3e	26.64	7.07	19.16	16.37	18.23	20.46	28.90	0.47	26.17 - 27.11
	ADPf	MJ	2542.47	307.20	2368.65	2165.68	2300.59	2437.57	2825.26	19.95	2522.52 - 2562.42
	ADPe	kg Sb eq	2.215E-04	1.132E-06	2.212E-04	2.203E-04	2.210E-04	2.216E-04	2.222E-04	6.305E-08	2.214E-04 - 2.216E-04
	GWPT	kg CO2e	367.51	22.50	354.12	339.80	349.84	359.47	388.00	1.46	366.05 - 368.97
	ODP	kg CFC11e	1.043E-05	1.334E-07	1.040E-05	1.030E-05	1.036E-05	1.043E-05	1.052E-05	7.433E-09	1.042E-05 - 1.044E-05
	AP	kg SO2e	1.432	0.272	1.182	1.066	1.146	1.237	1.572	0.018	1.414 - 1.450
	EPM	kg N eq	0.173	0.069	0.115	0.087	0.106	0.128	0.209	0.005	0.168 - 0.178
	EPF	kg P eq	0.046	0.000	0.046	0.046	0.046	0.046	0.046	1.16E-05	0.046 - 0.046
	SFP	kg O3e	30.65	7.11	23.66	20.78	22.64	24.98	33.33	0.47	30.18 - 31.12
5000-30-SL-AE	ADPf	MJ	2435.10	300.56	2268.96	2066.35	2206.14	2340.73	2714.04	19.50	2415.60 - 2454.60
	ADPe	kg Sb eq	2.150E-04	1.132E-06	2.147E-04	2.138E-04	2.145E-04	2.151E-04	2.157E-04	6.305E-08	2.149E-04 - 2.151E-04

Structural Lightweight 5,000 psi - Air-Entrained (continued)

Product	Indicator	Unit	Mean	SD	Median	P20	P40	P60	P80	MOE	95% CI
5000-40-FA-AE	GWPT	kg CO2e	337.24	21.46	322.16	307.61	317.30	326.76	353.88	1.39	335.85 - 338.63
	ODP	kg CFC11e	6.770E-06	1.334E-07	6.738E-06	6.643E-06	6.704E-06	6.775E-06	6.861E-06	7.433E-09	6.763E-06 - 6.777E-06
	AP	kg SO2e	1.176	0.256	0.886	0.767	0.842	0.932	1.242	0.017	1.159 - 1.193
	EPM	kg N eq	0.180	0.066	0.112	0.084	0.101	0.123	0.200	0.004	0.176 - 0.184
	EPF	kg P eq	0.038	0.000	0.038	0.038	0.038	0.038	0.038	1.16E-05	0.038 - 0.038
	SFP	kg O3e	26.18	7.22	17.88	15.10	16.85	19.33	27.81	0.48	25.70 - 26.66
	ADPf	MJ	2396.06	293.00	2206.51	2000.53	2136.79	2270.63	2633.97	18.99	2377.07 - 2415.05
	ADPe	kg Sb eq	2.196E-04	1.132E-06	2.193E-04	2.184E-04	2.191E-04	2.197E-04	2.203E-04	6.305E-08	2.195E-04 - 2.197E-04
5000-40-SL-AE	GWPT	kg CO2e	335.29	21.62	321.08	306.83	316.58	326.51	353.25	1.40	333.89 - 336.69
	ODP	kg CFC11e	1.058E-05	1.334E-07	1.055E-05	1.045E-05	1.051E-05	1.058E-05	1.067E-05	7.433E-09	1.057E-05 - 1.059E-05
	AP	kg SO2e	1.469	0.268	1.203	1.085	1.161	1.254	1.582	0.018	1.451 - 1.487
	EPM	kg N eq	0.176	0.069	0.114	0.085	0.104	0.126	0.207	0.005	0.171 - 0.181
	EPF	kg P eq	0.042	0.000	0.042	0.042	0.042	0.042	0.042	1.16E-05	0.042 - 0.042
	SFP	kg O3e	31.57	7.48	24.04	21.15	22.95	25.24	34.39	0.49	31.08 - 32.06
	ADPf	MJ	2267.53	286.18	2089.24	1885.96	2021.01	2161.63	2504.02	18.54	2248.99 - 2286.07
	ADPe	kg Sb eq	2.112E-04	1.132E-06	2.109E-04	2.100E-04	2.107E-04	2.113E-04	2.119E-04	6.305E-08	2.111E-04 - 2.113E-04
5000-50-FA/SL-AE	GWPT	kg CO2e	302.30	19.88	286.69	271.98	281.79	291.55	315.12	1.29	301.01 - 303.59
	ODP	kg CFC11e	8.926E-06	1.334E-07	8.894E-06	8.799E-06	8.860E-06	8.931E-06	9.016E-06	7.433E-09	8.919E-06 - 8.933E-06
	AP	kg SO2e	1.369	0.260	1.073	0.950	1.027	1.116	1.433	0.017	1.352 - 1.386
	EPM	kg N eq	0.180	0.066	0.111	0.081	0.099	0.121	0.196	0.004	0.176 - 0.184
	EPF	kg P eq	0.037	0.000	0.037	0.037	0.037	0.037	0.037	1.16E-05	0.037 - 0.037
	SFP	kg O3e	29.99	7.40	21.56	18.59	20.37	22.78	31.65	0.49	29.50 - 30.48
	ADPf	MJ	2152.02	263.58	1954.82	1747.66	1882.10	2023.83	2321.55	17.01	2135.01 - 2169.03
	ADPe	kg Sb eq	2.112E-04	1.132E-06	2.109E-04	2.100E-04	2.107E-04	2.113E-04	2.119E-04	6.305E-08	2.111E-04 - 2.113E-04
5000-50-SL-AE	GWPT	kg CO2e	303.07	19.41	288.00	273.28	283.03	293.16	315.37	1.25	301.82 - 304.32
	ODP	kg CFC11e	1.072E-05	1.334E-07	1.069E-05	1.059E-05	1.065E-05	1.072E-05	1.081E-05	7.433E-09	1.071E-05 - 1.073E-05
	AP	kg SO2e	1.506	0.263	1.223	1.096	1.177	1.267	1.584	0.017	1.489 - 1.523
	EPM	kg N eq	0.178	0.068	0.111	0.082	0.101	0.123	0.202	0.005	0.173 - 0.183
	EPF	kg P eq	0.039	0.000	0.039	0.039	0.039	0.039	0.039	1.16E-05	0.039 - 0.039
	SFP	kg O3e	32.49	7.43	24.44	21.44	23.26	25.64	34.56	0.49	32.00 - 32.98
	ADPf	MJ	2099.96	265.94	1907.54	1701.98	1837.66	1981.05	2279.92	17.17	2082.79 - 2117.13
	ADPe	kg Sb eq	2.074E-04	1.132E-06	2.071E-04	2.062E-04	2.069E-04	2.075E-04	2.081E-04	6.305E-08	2.073E-04 - 2.075E-04

APPENDIX I - SITE VARIATION

Variation among declared products and participating sites was evaluated in accordance with NSF 1112-26 Section 5.3. Each of the 120 national mix designs is separately declared; therefore differences among those named products are reported directly rather than combined into one product result. The assessment covers GWPT, ODP, AP, EPM, EPF, SFP, ADPf and ADPe; EPT is excluded because it is the supplemental TRACI 2.1 eutrophication indicator. Facility A3 results are constructed from the normalized 1,238-facility flows, while facility batch-waste variation is propagated through A1 and A2 material demand.

Normal-Weight 2,500 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
2500-00-FA/SL-AE	272.59	239.23	323.77	5.736E-06	5.513E-06	6.076E-06	0.860	0.506	1.246	0.115	0.032	0.206
2500-20-FA-AE	238.90	203.88	300.86	4.880E-06	4.657E-06	5.221E-06	0.821	0.437	1.478	0.119	0.028	0.276
2500-30-FA-AE	220.69	184.77	281.84	4.417E-06	4.194E-06	4.758E-06	0.800	0.400	1.500	0.121	0.026	0.291
2500-30-SL-AE	218.58	183.13	280.24	5.976E-06	5.753E-06	6.317E-06	0.922	0.531	1.637	0.119	0.026	0.284
2500-40-FA-AE	201.46	164.60	259.73	3.929E-06	3.706E-06	4.270E-06	0.778	0.361	1.436	0.123	0.024	0.271
2500-40-SL-AE	200.58	164.44	261.23	6.057E-06	5.834E-06	6.398E-06	0.943	0.540	1.594	0.121	0.025	0.273
2500-50-FA/SL-AE	182.05	144.83	240.94	5.133E-06	4.910E-06	5.474E-06	0.887	0.464	1.460	0.123	0.023	0.252
2500-50-SL-AE	182.58	145.74	241.87	6.137E-06	5.914E-06	6.477E-06	0.963	0.548	1.528	0.122	0.023	0.255

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADPf mean	ADPf min	ADPf max	ADPe mean	ADPe min	ADPe max
2500-00-FA/SL-AE	0.033	0.033	0.033	18.75	9.78	27.60	1816.68	1346.22	2553.18	1.095E-04	1.079E-04	1.124E-04
2500-20-FA-AE	0.028	0.028	0.029	18.30	8.46	34.28	1671.15	1179.12	2511.72	1.067E-04	1.051E-04	1.096E-04
2500-30-FA-AE	0.025	0.025	0.026	18.06	7.76	34.52	1592.49	1088.80	2435.43	1.052E-04	1.036E-04	1.081E-04
2500-30-SL-AE	0.027	0.027	0.028	20.30	10.28	37.88	1535.76	1037.92	2399.62	1.031E-04	1.015E-04	1.060E-04
2500-40-FA-AE	0.023	0.023	0.024	17.80	7.00	33.79	1509.45	993.46	2352.70	1.036E-04	1.020E-04	1.065E-04
2500-40-SL-AE	0.025	0.025	0.026	20.81	10.44	37.24	1442.13	935.16	2323.94	1.009E-04	9.933E-05	1.038E-04
2500-50-FA/SL-AE	0.022	0.022	0.023	19.93	8.99	35.31	1375.45	854.60	2218.62	9.995E-05	9.838E-05	1.028E-04
2500-50-SL-AE	0.023	0.023	0.024	21.33	10.61	36.02	1348.49	832.40	2164.45	9.878E-05	9.721E-05	1.017E-04

Normal-Weight 3,000 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
3000-00-FA/SL-AE	304.33	269.97	354.63	6.456E-06	6.233E-06	6.796E-06	0.936	0.565	1.317	0.123	0.035	0.214
3000-20-FA-AE	266.15	229.91	329.95	5.485E-06	5.262E-06	5.826E-06	0.892	0.487	1.562	0.128	0.032	0.288
3000-30-FA-AE	245.51	208.25	308.68	4.961E-06	4.738E-06	5.302E-06	0.869	0.445	1.552	0.130	0.029	0.299
3000-30-SL-AE	243.13	206.40	305.32	6.728E-06	6.505E-06	7.069E-06	1.006	0.593	1.719	0.128	0.030	0.301
3000-40-FA-AE	223.73	185.40	281.90	4.408E-06	4.185E-06	4.749E-06	0.844	0.401	1.518	0.132	0.027	0.293
3000-40-SL-AE	222.73	185.22	282.07	6.819E-06	6.596E-06	7.160E-06	1.030	0.603	1.699	0.130	0.029	0.282
3000-50-FA/SL-AE	201.73	163.00	260.35	5.772E-06	5.549E-06	6.113E-06	0.966	0.517	1.578	0.132	0.025	0.274
3000-50-SL-AE	202.33	164.03	261.97	6.910E-06	6.687E-06	7.251E-06	1.053	0.612	1.659	0.131	0.026	0.268

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
3000-00-FA/SL-AE	0.037	0.037	0.037	20.28	10.82	28.44	1993.35	1509.73	2705.44	1.238E-04	1.222E-04	1.267E-04
3000-20-FA-AE	0.031	0.031	0.032	19.77	9.33	35.77	1828.45	1320.39	2702.30	1.207E-04	1.191E-04	1.236E-04
3000-30-FA-AE	0.028	0.028	0.029	19.50	8.53	35.71	1739.31	1218.03	2610.91	1.190E-04	1.174E-04	1.219E-04
3000-30-SL-AE	0.030	0.030	0.031	22.04	11.39	38.61	1675.03	1160.38	2538.96	1.165E-04	1.149E-04	1.194E-04
3000-40-FA-AE	0.025	0.025	0.026	19.21	7.68	35.08	1645.22	1110.00	2472.19	1.172E-04	1.156E-04	1.201E-04
3000-40-SL-AE	0.028	0.028	0.029	22.62	11.58	39.09	1568.93	1043.94	2430.74	1.141E-04	1.125E-04	1.170E-04
3000-50-FA/SL-AE	0.024	0.024	0.025	21.62	9.93	37.52	1493.38	952.65	2344.10	1.130E-04	1.114E-04	1.159E-04
3000-50-SL-AE	0.026	0.026	0.027	23.21	11.77	38.93	1462.82	927.48	2314.49	1.117E-04	1.101E-04	1.146E-04

Normal-Weight 4,000 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
4000-00-FA/SL-AE	376.21	339.58	424.19	8.085E-06	7.862E-06	8.425E-06	1.109	0.699	1.458	0.142	0.045	0.224
4000-20-FA-AE	327.87	288.87	394.39	6.857E-06	6.634E-06	7.198E-06	1.053	0.600	1.718	0.147	0.039	0.306
4000-30-FA-AE	301.74	261.45	369.69	6.193E-06	5.970E-06	6.534E-06	1.023	0.547	1.670	0.150	0.036	0.310
4000-30-SL-AE	298.72	259.10	367.72	8.431E-06	8.208E-06	8.772E-06	1.198	0.735	1.879	0.148	0.038	0.315
4000-40-FA-AE	274.16	232.52	336.80	5.492E-06	5.269E-06	5.833E-06	0.991	0.490	1.600	0.153	0.033	0.305
4000-40-SL-AE	272.89	232.27	333.19	8.546E-06	8.323E-06	8.887E-06	1.227	0.747	1.889	0.150	0.035	0.318
4000-50-FA/SL-AE	246.30	204.15	302.54	7.221E-06	6.998E-06	7.561E-06	1.147	0.638	1.751	0.153	0.032	0.304
4000-50-SL-AE	247.06	205.45	304.86	8.661E-06	8.438E-06	9.002E-06	1.257	0.759	1.891	0.152	0.033	0.308

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
4000-00-FA/SL-AE	0.046	0.046	0.046	23.75	13.18	31.45	2393.50	1880.06	3081.95	1.562E-04	1.546E-04	1.591E-04
4000-20-FA-AE	0.039	0.039	0.040	23.11	11.31	39.32	2184.70	1640.32	3139.75	1.522E-04	1.506E-04	1.551E-04
4000-30-FA-AE	0.035	0.035	0.036	22.76	10.29	38.13	2071.84	1510.73	3014.43	1.501E-04	1.485E-04	1.530E-04
4000-30-SL-AE	0.037	0.037	0.038	25.97	13.90	41.96	1990.46	1437.74	2900.68	1.470E-04	1.454E-04	1.499E-04
4000-40-FA-AE	0.031	0.031	0.032	22.39	9.21	37.91	1952.71	1373.94	2794.42	1.478E-04	1.462E-04	1.507E-04
4000-40-SL-AE	0.034	0.034	0.035	26.71	14.14	42.81	1856.12	1290.30	2713.37	1.439E-04	1.423E-04	1.468E-04
4000-50-FA/SL-AE	0.030	0.030	0.031	25.45	12.06	41.14	1760.46	1174.72	2573.13	1.425E-04	1.409E-04	1.454E-04
4000-50-SL-AE	0.032	0.032	0.033	27.46	14.39	44.01	1721.77	1142.86	2558.61	1.409E-04	1.393E-04	1.438E-04

Normal-Weight 5,000 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
5000-00-FA/SL-AE	464.16	424.78	511.32	1.000E-05	9.777E-06	1.034E-05	1.321	0.865	1.667	0.166	0.057	0.248
5000-20-FA-AE	404.04	361.69	471.54	8.472E-06	8.249E-06	8.813E-06	1.252	0.742	1.903	0.173	0.051	0.339
5000-30-FA-AE	371.54	327.59	440.10	7.644E-06	7.421E-06	7.985E-06	1.215	0.676	1.824	0.176	0.047	0.328
5000-30-SL-AE	367.51	324.40	438.71	1.043E-05	1.021E-05	1.077E-05	1.432	0.910	2.090	0.173	0.048	0.334
5000-40-FA-AE	337.24	291.59	402.70	6.770E-06	6.547E-06	7.111E-06	1.176	0.606	1.734	0.180	0.043	0.320
5000-40-SL-AE	335.29	290.93	402.50	1.058E-05	1.036E-05	1.092E-05	1.469	0.925	2.095	0.176	0.046	0.332
5000-50-FA/SL-AE	302.30	256.02	361.42	8.926E-06	8.703E-06	9.266E-06	1.369	0.789	1.931	0.180	0.041	0.315
5000-50-SL-AE	303.07	257.47	360.97	1.072E-05	1.050E-05	1.106E-05	1.506	0.940	2.088	0.178	0.042	0.325

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
5000-00-FA/SL-AE	0.056	0.056	0.056	27.87	15.98	35.53	2937.80	2387.99	3627.89	2.265E-04	2.249E-04	2.294E-04
5000-20-FA-AE	0.048	0.048	0.049	27.07	13.63	43.58	2681.19	2092.71	3666.40	2.232E-04	2.216E-04	2.261E-04
5000-30-FA-AE	0.043	0.043	0.044	26.64	12.37	41.72	2542.47	1933.08	3521.73	2.215E-04	2.199E-04	2.244E-04
5000-30-SL-AE	0.046	0.046	0.047	30.65	16.88	46.25	2435.10	1836.29	3399.82	2.150E-04	2.134E-04	2.179E-04
5000-40-FA-AE	0.038	0.038	0.039	26.18	11.03	40.91	2396.06	1764.61	3305.94	2.196E-04	2.180E-04	2.225E-04
5000-40-SL-AE	0.042	0.042	0.043	31.57	17.18	47.87	2267.53	1652.38	3166.48	2.112E-04	2.096E-04	2.141E-04
5000-50-FA/SL-AE	0.037	0.037	0.038	29.99	14.58	45.04	2152.02	1511.96	2945.89	2.112E-04	2.096E-04	2.141E-04
5000-50-SL-AE	0.039	0.039	0.040	32.49	17.47	47.99	2099.96	1468.48	2909.14	2.074E-04	2.058E-04	2.103E-04

Normal-Weight 2,500 psi - Non-Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
2500-00-FA/SL	253.19	219.80	306.18	5.396E-06	5.173E-06	5.736E-06	0.820	0.468	1.232	0.110	0.027	0.208
2500-20-FA	221.37	186.43	282.53	4.595E-06	4.372E-06	4.936E-06	0.783	0.403	1.446	0.113	0.023	0.273
2500-30-FA	204.17	168.40	266.61	4.161E-06	3.938E-06	4.502E-06	0.763	0.368	1.484	0.114	0.020	0.276
2500-30-SL	202.62	167.27	265.55	5.621E-06	5.398E-06	5.962E-06	0.878	0.492	1.579	0.113	0.021	0.279
2500-40-FA	186.01	149.36	246.98	3.704E-06	3.481E-06	4.045E-06	0.742	0.331	1.399	0.116	0.018	0.272
2500-40-SL	185.77	149.77	249.20	5.696E-06	5.473E-06	6.037E-06	0.897	0.499	1.534	0.115	0.021	0.261
2500-50-FA/SL	168.14	131.15	228.93	4.832E-06	4.609E-06	5.173E-06	0.844	0.428	1.419	0.117	0.018	0.254
2500-50-SL	168.91	132.26	228.96	5.772E-06	5.549E-06	6.113E-06	0.917	0.507	1.500	0.116	0.019	0.253

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
2500-00-FA/SL	0.031	0.031	0.031	18.26	9.35	27.73	1631.71	1160.39	2389.92	5.210E-05	5.053E-05	5.497E-05
2500-20-FA	0.027	0.027	0.028	17.84	8.13	34.35	1489.38	997.96	2334.63	4.684E-05	4.527E-05	4.971E-05
2500-30-FA	0.024	0.024	0.025	17.61	7.46	35.58	1412.45	910.17	2292.70	4.400E-05	4.243E-05	4.688E-05
2500-30-SL	0.026	0.026	0.027	19.71	9.82	38.36	1368.70	871.74	2244.25	4.609E-05	4.452E-05	4.897E-05
2500-40-FA	0.022	0.022	0.023	17.37	6.76	33.94	1331.24	817.50	2217.48	4.101E-05	3.944E-05	4.389E-05
2500-40-SL	0.024	0.024	0.025	20.19	9.98	37.29	1281.03	775.52	2171.76	4.409E-05	4.252E-05	4.697E-05
2500-50-FA/SL	0.021	0.021	0.022	19.36	8.62	34.11	1212.53	694.13	2043.07	4.052E-05	3.895E-05	4.340E-05
2500-50-SL	0.022	0.022	0.023	20.68	10.14	35.28	1193.36	679.31	2024.41	4.208E-05	4.051E-05	4.496E-05

Normal-Weight 3,000 psi - Non-Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
3000-00-FA/SL	276.34	242.21	328.94	5.934E-06	5.711E-06	6.274E-06	0.875	0.510	1.276	0.115	0.029	0.210
3000-20-FA	241.13	205.30	304.06	5.047E-06	4.824E-06	5.388E-06	0.834	0.438	1.514	0.119	0.025	0.282
3000-30-FA	222.10	185.34	285.30	4.567E-06	4.344E-06	4.908E-06	0.812	0.399	1.540	0.121	0.023	0.299
3000-30-SL	220.40	184.11	283.62	6.183E-06	5.960E-06	6.524E-06	0.940	0.537	1.677	0.120	0.024	0.286
3000-40-FA	202.02	164.29	261.63	4.061E-06	3.838E-06	4.402E-06	0.789	0.359	1.453	0.123	0.021	0.277
3000-40-SL	201.75	164.74	264.26	6.266E-06	6.043E-06	6.607E-06	0.961	0.546	1.633	0.121	0.022	0.275
3000-50-FA/SL	182.25	144.14	242.89	5.309E-06	5.086E-06	5.650E-06	0.902	0.466	1.491	0.123	0.019	0.257
3000-50-SL	183.10	145.37	244.25	6.349E-06	6.126E-06	6.690E-06	0.982	0.554	1.569	0.122	0.020	0.261

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
3000-00-FA/SL	0.034	0.034	0.034	19.40	10.13	28.44	1751.41	1270.46	2503.83	5.742E-05	5.585E-05	6.029E-05
3000-20-FA	0.029	0.029	0.030	18.93	8.77	35.38	1593.96	1090.78	2453.77	5.161E-05	5.004E-05	5.448E-05
3000-30-FA	0.026	0.026	0.027	18.68	8.04	35.89	1508.86	993.67	2376.35	4.847E-05	4.690E-05	5.135E-05
3000-30-SL	0.028	0.028	0.029	21.00	10.65	39.28	1460.46	951.15	2354.08	5.077E-05	4.920E-05	5.365E-05
3000-40-FA	0.024	0.024	0.025	18.41	7.26	35.09	1419.02	891.15	2286.56	4.515E-05	4.358E-05	4.803E-05
3000-40-SL	0.026	0.026	0.027	21.54	10.83	38.71	1363.48	844.72	2271.74	4.856E-05	4.699E-05	5.144E-05
3000-50-FA/SL	0.023	0.023	0.024	20.62	9.32	36.07	1287.70	754.67	2145.25	4.461E-05	4.304E-05	4.749E-05
3000-50-SL	0.024	0.024	0.025	22.07	11.00	37.02	1266.49	738.27	2103.07	4.634E-05	4.477E-05	4.922E-05

Normal-Weight 4,000 psi - Non-Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
4000-00-FA/SL	330.17	294.34	381.10	7.183E-06	6.960E-06	7.523E-06	1.004	0.610	1.396	0.128	0.035	0.218
4000-20-FA	287.11	249.19	354.02	6.099E-06	5.876E-06	6.440E-06	0.954	0.522	1.644	0.133	0.030	0.299
4000-30-FA	263.83	224.78	329.41	5.512E-06	5.289E-06	5.853E-06	0.927	0.474	1.620	0.135	0.027	0.307
4000-30-SL	261.74	223.27	326.10	7.488E-06	7.265E-06	7.829E-06	1.083	0.642	1.822	0.134	0.029	0.314
4000-40-FA	239.26	199.02	299.74	4.893E-06	4.670E-06	5.234E-06	0.898	0.424	1.579	0.137	0.024	0.308
4000-40-SL	238.93	199.58	300.67	7.590E-06	7.367E-06	7.931E-06	1.109	0.653	1.835	0.135	0.026	0.298
4000-50-FA/SL	215.07	174.37	274.59	6.419E-06	6.196E-06	6.760E-06	1.037	0.556	1.671	0.138	0.023	0.291
4000-50-SL	216.12	175.89	277.30	7.691E-06	7.468E-06	8.032E-06	1.135	0.663	1.776	0.137	0.025	0.283

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
4000-00-FA/SL	0.041	0.041	0.041	22.05	11.94	30.42	2029.81	1526.47	2753.14	6.980E-05	6.823E-05	7.267E-05
4000-20-FA	0.035	0.035	0.036	21.48	10.28	37.95	1837.20	1306.67	2773.29	6.269E-05	6.112E-05	6.557E-05
4000-30-FA	0.032	0.032	0.033	21.17	9.39	37.75	1733.09	1187.86	2630.59	5.885E-05	5.728E-05	6.173E-05
4000-30-SL	0.033	0.033	0.034	24.01	12.58	41.01	1673.88	1135.85	2583.47	6.167E-05	6.010E-05	6.455E-05
4000-40-FA	0.028	0.028	0.029	20.84	8.43	36.76	1623.19	1062.45	2476.11	5.479E-05	5.322E-05	5.767E-05
4000-40-SL	0.031	0.031	0.032	24.67	12.80	41.41	1555.24	1005.64	2435.02	5.896E-05	5.739E-05	6.184E-05
4000-50-FA/SL	0.027	0.027	0.028	23.54	10.95	39.85	1462.54	895.49	2320.93	5.413E-05	5.256E-05	5.701E-05
4000-50-SL	0.028	0.028	0.029	25.32	13.00	42.19	1436.60	875.44	2321.17	5.625E-05	5.468E-05	5.913E-05

Normal-Weight 5,000 psi - Non-Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
5000-00-FA/SL	410.67	372.62	458.86	8.994E-06	8.771E-06	9.334E-06	1.193	0.760	1.551	0.149	0.046	0.232
5000-20-FA	356.37	315.67	424.85	7.622E-06	7.399E-06	7.963E-06	1.130	0.649	1.812	0.154	0.039	0.313
5000-30-FA	327.02	284.89	397.73	6.881E-06	6.658E-06	7.222E-06	1.096	0.588	1.751	0.157	0.036	0.317
5000-30-SL	324.14	282.75	392.92	9.379E-06	9.156E-06	9.720E-06	1.293	0.801	1.979	0.155	0.037	0.322
5000-40-FA	296.04	252.40	360.91	6.098E-06	5.875E-06	6.439E-06	1.061	0.526	1.673	0.160	0.032	0.312
5000-40-SL	295.29	252.79	357.92	9.508E-06	9.285E-06	9.849E-06	1.326	0.814	1.978	0.157	0.035	0.323
5000-50-FA/SL	265.29	221.08	320.62	8.028E-06	7.805E-06	8.368E-06	1.235	0.691	1.838	0.161	0.031	0.313
5000-50-SL	266.45	222.83	323.78	9.636E-06	9.413E-06	9.977E-06	1.359	0.827	1.983	0.160	0.033	0.316

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
5000-00-FA/SL	0.051	0.051	0.051	25.78	14.54	33.50	2491.56	1959.24	3186.94	1.165E-04	1.149E-04	1.194E-04
5000-20-FA	0.043	0.043	0.044	25.05	12.43	41.55	2251.43	1684.67	3214.25	1.090E-04	1.074E-04	1.119E-04
5000-30-FA	0.039	0.039	0.040	24.66	11.30	39.81	2121.63	1536.25	3081.61	1.050E-04	1.034E-04	1.079E-04
5000-30-SL	0.041	0.041	0.042	28.26	15.35	44.55	2041.50	1465.31	2984.73	1.062E-04	1.046E-04	1.091E-04
5000-40-FA	0.035	0.035	0.036	24.25	10.10	39.65	1984.61	1379.57	2861.38	1.007E-04	9.912E-05	1.036E-04
5000-40-SL	0.038	0.038	0.039	29.08	15.61	45.65	1891.49	1300.68	2751.57	1.028E-04	1.012E-04	1.057E-04
5000-50-FA/SL	0.033	0.033	0.034	27.67	13.29	43.01	1777.68	1164.74	2583.12	9.822E-05	9.664E-05	1.011E-04
5000-50-SL	0.035	0.035	0.036	29.91	15.88	46.05	1741.47	1136.04	2573.76	9.939E-05	9.781E-05	1.023E-04

High-Strength 6,000 psi — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
6000-00-FA/SL	449.66	410.37	497.18	9.720E-06	9.497E-06	1.006E-05	1.290	0.837	1.653	0.162	0.054	0.247
6000-20-FA	391.26	349.07	460.57	8.233E-06	8.010E-06	8.574E-06	1.223	0.717	1.898	0.169	0.048	0.334
6000-30-FA	359.69	315.92	428.94	7.430E-06	7.207E-06	7.771E-06	1.187	0.653	1.828	0.172	0.044	0.331
6000-30-SL	355.87	312.96	427.96	1.014E-05	9.917E-06	1.048E-05	1.397	0.880	2.072	0.169	0.045	0.335
6000-40-FA	326.36	280.93	392.90	6.581E-06	6.358E-06	6.922E-06	1.149	0.584	1.746	0.176	0.041	0.324
6000-40-SL	324.61	280.50	391.46	1.028E-05	1.006E-05	1.062E-05	1.433	0.894	2.072	0.172	0.043	0.334
6000-50-FA/SL	292.53	246.52	350.50	8.673E-06	8.450E-06	9.013E-06	1.337	0.764	1.927	0.176	0.039	0.322
6000-50-SL	293.35	248.03	350.09	1.042E-05	1.020E-05	1.076E-05	1.469	0.909	2.083	0.174	0.040	0.329

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
6000-00-FA/SL	0.055	0.055	0.055	27.40	15.60	35.29	2822.05	2273.18	3522.94	1.991E-04	1.975E-04	2.020E-04
6000-20-FA	0.046	0.046	0.047	26.63	13.32	43.13	2571.19	1984.42	3555.37	1.949E-04	1.933E-04	1.978E-04
6000-30-FA	0.042	0.042	0.043	26.22	12.10	41.83	2435.59	1828.33	3427.16	1.926E-04	1.910E-04	1.955E-04
6000-30-SL	0.044	0.044	0.045	30.09	16.47	45.94	2334.27	1737.85	3324.09	1.880E-04	1.864E-04	1.909E-04
6000-40-FA	0.037	0.037	0.038	25.78	10.80	41.14	2292.46	1663.57	3210.93	1.901E-04	1.885E-04	1.930E-04
6000-40-SL	0.041	0.041	0.042	30.99	16.77	47.70	2171.67	1559.40	3062.59	1.843E-04	1.827E-04	1.872E-04
6000-50-FA/SL	0.036	0.036	0.037	29.47	14.25	45.25	2057.74	1420.92	2863.78	1.831E-04	1.815E-04	1.860E-04
6000-50-SL	0.038	0.038	0.039	31.88	17.05	47.55	2009.08	1380.96	2831.45	1.805E-04	1.789E-04	1.834E-04

High-Strength 8,000 psi — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
8000-00-FA/SL	518.34	476.91	566.14	1.122E-05	1.100E-05	1.156E-05	1.455	0.965	1.806	0.181	0.064	0.263
8000-20-FA	450.67	405.90	520.73	9.494E-06	9.271E-06	9.835E-06	1.378	0.828	2.029	0.189	0.057	0.358
8000-30-FA	414.10	367.52	483.16	8.562E-06	8.339E-06	8.903E-06	1.336	0.753	1.940	0.193	0.053	0.346
8000-30-SL	409.57	363.94	481.42	1.170E-05	1.148E-05	1.204E-05	1.580	1.016	2.229	0.189	0.054	0.352
8000-40-FA	375.49	327.00	440.80	7.578E-06	7.354E-06	7.919E-06	1.292	0.674	1.844	0.197	0.049	0.329
8000-40-SL	373.32	326.29	441.76	1.186E-05	1.164E-05	1.220E-05	1.622	1.033	2.245	0.192	0.051	0.346
8000-50-FA/SL	336.18	286.99	400.05	1.000E-05	9.776E-06	1.034E-05	1.509	0.880	2.060	0.197	0.046	0.333
8000-50-SL	337.06	288.63	398.61	1.203E-05	1.181E-05	1.237E-05	1.664	1.051	2.250	0.195	0.048	0.336

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
8000-00-FA/SL	0.063	0.063	0.063	30.61	17.78	38.25	3246.42	2669.20	3951.99	2.545E-04	2.529E-04	2.574E-04
8000-20-FA	0.053	0.053	0.054	29.71	15.14	46.51	2957.41	2336.70	3946.19	2.508E-04	2.492E-04	2.537E-04
8000-30-FA	0.048	0.048	0.049	29.22	13.71	44.89	2801.19	2156.97	3795.89	2.488E-04	2.472E-04	2.517E-04
8000-30-SL	0.051	0.051	0.052	33.73	18.79	49.69	2680.72	2048.36	3695.14	2.415E-04	2.399E-04	2.444E-04
8000-40-FA	0.042	0.042	0.043	28.71	12.21	42.88	2636.29	1967.25	3584.67	2.467E-04	2.451E-04	2.496E-04
8000-40-SL	0.047	0.047	0.048	34.77	19.13	50.93	2492.16	1841.42	3441.39	2.372E-04	2.356E-04	2.401E-04
8000-50-FA/SL	0.041	0.041	0.042	32.99	16.20	47.27	2361.94	1683.18	3201.49	2.372E-04	2.356E-04	2.401E-04
8000-50-SL	0.043	0.043	0.044	35.81	19.46	51.41	2303.59	1634.47	3122.95	2.329E-04	2.313E-04	2.358E-04

High-Strength 10,000 psi — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
10000-00-FA/SL	656.33	610.56	705.01	1.432E-05	1.410E-05	1.466E-05	1.786	1.222	2.111	0.217	0.082	0.295
10000-20-FA	569.36	519.30	640.18	1.211E-05	1.189E-05	1.245E-05	1.687	1.045	2.278	0.227	0.073	0.374
10000-30-FA	522.35	469.97	590.94	1.091E-05	1.069E-05	1.125E-05	1.633	0.949	2.193	0.232	0.067	0.373
10000-30-SL	516.53	465.36	588.47	1.495E-05	1.473E-05	1.529E-05	1.947	1.288	2.564	0.228	0.069	0.388
10000-40-FA	472.72	417.89	538.76	9.645E-06	9.421E-06	9.986E-06	1.576	0.847	2.057	0.237	0.061	0.358
10000-40-SL	469.93	416.96	539.02	1.515E-05	1.493E-05	1.549E-05	2.001	1.310	2.530	0.231	0.064	0.369
10000-50-FA/SL	422.20	366.46	485.90	1.276E-05	1.254E-05	1.310E-05	1.856	1.114	2.253	0.238	0.059	0.346
10000-50-SL	423.32	368.55	489.26	1.536E-05	1.514E-05	1.570E-05	2.054	1.331	2.513	0.235	0.061	0.353

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
10000-00-FA/SL	0.080	0.080	0.080	37.23	22.28	44.99	4030.92	3396.56	4733.11	3.265E-04	3.249E-04	3.294E-04
10000-20-FA	0.068	0.068	0.069	36.07	18.89	51.04	3659.44	2969.17	4636.53	3.218E-04	3.202E-04	3.247E-04
10000-30-FA	0.061	0.061	0.062	35.45	17.06	49.96	3458.64	2738.15	4436.61	3.192E-04	3.176E-04	3.221E-04
10000-30-SL	0.065	0.065	0.066	41.24	23.58	57.01	3303.79	2598.55	4332.31	3.099E-04	3.083E-04	3.128E-04
10000-40-FA	0.054	0.054	0.055	34.78	15.12	46.50	3246.68	2494.29	4196.40	3.165E-04	3.149E-04	3.194E-04
10000-40-SL	0.059	0.059	0.060	42.58	24.02	56.43	3061.41	2332.55	4039.18	3.044E-04	3.028E-04	3.073E-04
10000-50-FA/SL	0.051	0.051	0.052	40.29	20.26	50.86	2894.03	2129.15	3810.79	3.043E-04	3.027E-04	3.072E-04
10000-50-SL	0.054	0.054	0.055	43.91	24.45	55.82	2819.03	2066.54	3750.52	2.988E-04	2.972E-04	3.017E-04

High-Strength 12,000 psi — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
12000-00-FA/SL	745.16	696.60	794.29	1.632E-05	1.610E-05	1.666E-05	2.000	1.389	2.322	0.240	0.093	0.319
12000-20-FA	645.75	592.28	714.36	1.379E-05	1.357E-05	1.413E-05	1.886	1.185	2.440	0.251	0.082	0.392
12000-30-FA	592.02	535.90	659.32	1.242E-05	1.220E-05	1.276E-05	1.824	1.075	2.380	0.257	0.076	0.390
12000-30-SL	585.37	530.64	656.79	1.703E-05	1.681E-05	1.737E-05	2.183	1.463	2.770	0.252	0.078	0.400
12000-40-FA	535.31	476.39	598.44	1.097E-05	1.075E-05	1.131E-05	1.759	0.959	2.248	0.263	0.070	0.384
12000-40-SL	532.11	475.33	600.52	1.727E-05	1.705E-05	1.761E-05	2.245	1.488	2.759	0.256	0.073	0.387
12000-50-FA/SL	477.56	417.60	539.30	1.454E-05	1.432E-05	1.488E-05	2.079	1.264	2.484	0.264	0.067	0.371
12000-50-SL	478.85	420.01	543.45	1.751E-05	1.729E-05	1.785E-05	2.306	1.513	2.726	0.260	0.068	0.373

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
12000-00-FA/SL	0.091	0.091	0.091	41.50	25.19	49.01	4535.90	3864.76	5254.06	3.729E-04	3.713E-04	3.758E-04
12000-20-FA	0.077	0.077	0.078	40.17	21.31	54.56	4111.33	3376.29	5134.62	3.675E-04	3.659E-04	3.704E-04
12000-30-FA	0.069	0.069	0.070	39.45	19.21	51.98	3881.83	3112.25	4870.55	3.645E-04	3.629E-04	3.674E-04
12000-30-SL	0.073	0.073	0.074	46.08	26.68	61.30	3704.85	2952.70	4720.86	3.539E-04	3.523E-04	3.568E-04
12000-40-FA	0.061	0.061	0.062	38.70	17.00	49.69	3639.58	2833.54	4553.08	3.615E-04	3.599E-04	3.644E-04
12000-40-SL	0.068	0.068	0.069	47.60	27.17	60.26	3427.83	2648.68	4414.53	3.476E-04	3.460E-04	3.505E-04
12000-50-FA/SL	0.058	0.058	0.059	44.99	22.87	54.44	3236.53	2416.22	4159.05	3.475E-04	3.459E-04	3.504E-04
12000-50-SL	0.062	0.062	0.063	49.13	27.66	60.43	3150.81	2344.66	4105.12	3.412E-04	3.396E-04	3.441E-04

Lightweight 3,000 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
LW-3000-00-FA/SL-AE	519.89	471.65	587.42	7.714E-06	7.491E-06	8.055E-06	2.370	1.823	2.927	0.184	0.051	0.322
LW-3000-20-FA-AE	450.84	400.35	551.66	6.559E-06	6.335E-06	6.901E-06	2.131	1.545	3.555	0.181	0.037	0.512
LW-3000-30-FA-AE	413.57	363.76	522.37	5.934E-06	5.711E-06	6.277E-06	2.002	1.418	3.704	0.179	0.036	0.596
LW-3000-30-SL-AE	441.88	393.37	547.83	7.986E-06	7.763E-06	8.328E-06	2.375	1.811	3.959	0.186	0.049	0.571
LW-3000-40-FA-AE	379.06	327.46	484.73	5.290E-06	5.066E-06	5.632E-06	1.901	1.287	3.503	0.178	0.028	0.578
LW-3000-40-SL-AE	419.26	370.01	519.86	8.087E-06	7.863E-06	8.429E-06	2.401	1.824	3.884	0.188	0.047	0.557
LW-3000-50-FA/SL-AE	375.33	320.97	486.17	6.865E-06	6.641E-06	7.208E-06	2.184	1.535	3.700	0.185	0.026	0.573
LW-3000-50-SL-AE	396.63	346.69	496.56	8.188E-06	7.964E-06	8.530E-06	2.427	1.836	3.797	0.190	0.046	0.530

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
LW-3000-00-FA/SL-AE	0.122	0.121	0.122	34.18	20.04	47.63	3731.76	3052.22	4710.04	4.271E-04	4.256E-04	4.300E-04
LW-3000-20-FA-AE	0.105	0.104	0.105	31.90	16.61	70.74	3306.13	2597.16	4651.90	3.711E-04	3.695E-04	3.741E-04
LW-3000-30-FA-AE	0.095	0.095	0.096	30.66	15.38	79.03	3076.54	2378.56	4521.20	3.410E-04	3.394E-04	3.439E-04
LW-3000-30-SL-AE	0.110	0.109	0.110	35.47	20.77	79.79	3288.48	2607.85	4689.78	4.002E-04	3.987E-04	4.032E-04
LW-3000-40-FA-AE	0.088	0.087	0.088	29.68	13.58	78.60	2877.31	2155.17	4321.62	3.181E-04	3.165E-04	3.211E-04
LW-3000-40-SL-AE	0.107	0.107	0.108	36.12	21.03	80.63	3170.79	2480.74	4526.54	3.976E-04	3.960E-04	4.005E-04
LW-3000-50-FA/SL-AE	0.095	0.095	0.096	33.68	16.65	80.75	2898.39	2137.40	4524.54	3.551E-04	3.535E-04	3.581E-04
LW-3000-50-SL-AE	0.105	0.105	0.105	36.77	21.30	76.22	3053.10	2354.02	4450.29	3.949E-04	3.933E-04	3.978E-04

Lightweight 4,000 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
LW-4000-00-FA/SL-AE	601.81	553.07	662.82	9.534E-06	9.311E-06	9.875E-06	2.585	2.021	3.078	0.205	0.067	0.328
LW-4000-20-FA-AE	523.41	472.51	632.18	8.098E-06	7.875E-06	8.441E-06	2.348	1.741	4.022	0.203	0.055	0.592
LW-4000-30-FA-AE	477.97	425.51	597.69	7.313E-06	7.089E-06	7.656E-06	2.197	1.563	4.054	0.201	0.046	0.658
LW-4000-30-SL-AE	511.81	457.98	632.03	9.905E-06	9.681E-06	1.025E-05	2.655	2.010	4.493	0.210	0.052	0.663
LW-4000-40-FA-AE	434.95	377.73	556.11	6.499E-06	6.275E-06	6.842E-06	2.074	1.372	3.973	0.200	0.028	0.674
LW-4000-40-SL-AE	483.16	427.38	599.43	1.003E-05	9.808E-06	1.038E-05	2.688	2.013	4.441	0.212	0.047	0.650
LW-4000-50-FA/SL-AE	428.89	374.80	531.34	8.489E-06	8.265E-06	8.831E-06	2.423	1.758	3.882	0.208	0.046	0.560
LW-4000-50-SL-AE	450.46	397.97	546.86	1.015E-05	9.924E-06	1.049E-05	2.692	2.051	4.132	0.213	0.057	0.569

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
LW-4000-00-FA/SL-AE	0.133	0.133	0.134	38.28	23.57	50.60	4170.95	3486.95	5055.81	4.526E-04	4.510E-04	4.555E-04
LW-4000-20-FA-AE	0.115	0.115	0.116	35.97	20.04	82.46	3712.51	3000.95	5178.02	3.985E-04	3.969E-04	4.014E-04
LW-4000-30-FA-AE	0.105	0.104	0.105	34.53	17.81	86.42	3437.40	2705.29	5047.28	3.635E-04	3.620E-04	3.665E-04
LW-4000-30-SL-AE	0.122	0.122	0.123	40.48	23.52	90.76	3687.84	2935.08	5282.23	4.349E-04	4.333E-04	4.378E-04
LW-4000-40-FA-AE	0.095	0.095	0.096	33.32	14.76	91.08	3191.11	2393.27	4860.26	3.359E-04	3.343E-04	3.388E-04
LW-4000-40-SL-AE	0.119	0.118	0.119	41.30	23.51	94.57	3538.83	2759.54	5128.68	4.315E-04	4.299E-04	4.344E-04
LW-4000-50-FA/SL-AE	0.104	0.103	0.104	38.30	20.72	82.24	3205.87	2452.78	4589.29	3.802E-04	3.786E-04	3.832E-04
LW-4000-50-SL-AE	0.114	0.114	0.115	41.86	24.95	85.21	3353.73	2622.30	4690.11	4.205E-04	4.189E-04	4.235E-04

Lightweight 5,000 psi - Air-Entrained — Site Variation

Product	GWPT mean	GWPT min	GWPT max	ODP mean	ODP min	ODP max	AP mean	AP min	AP max	EPM mean	EPM min	EPM max
LW-5000-00-FA/SL-AE	674.76	626.46	728.04	1.082E-05	1.059E-05	1.116E-05	2.841	2.273	3.318	0.226	0.088	0.339
LW-5000-20-FA-AE	582.71	530.77	698.00	9.166E-06	8.942E-06	9.509E-06	2.551	1.921	4.335	0.223	0.069	0.657
LW-5000-30-FA-AE	529.12	470.98	663.29	8.263E-06	8.039E-06	8.606E-06	2.367	1.651	4.479	0.220	0.045	0.734
LW-5000-30-SL-AE	566.36	509.22	700.58	1.122E-05	1.100E-05	1.157E-05	2.881	2.184	4.888	0.230	0.059	0.716
LW-5000-40-FA-AE	479.75	419.79	601.57	7.331E-06	7.107E-06	7.674E-06	2.224	1.476	4.228	0.219	0.036	0.723
LW-5000-40-SL-AE	533.61	476.11	653.18	1.137E-05	1.114E-05	1.171E-05	2.919	2.211	4.848	0.232	0.059	0.715
LW-5000-50-FA/SL-AE	471.17	411.08	585.19	9.602E-06	9.378E-06	9.945E-06	2.612	1.860	4.232	0.228	0.044	0.632
LW-5000-50-SL-AE	494.77	435.51	609.48	1.150E-05	1.127E-05	1.184E-05	2.913	2.176	4.585	0.233	0.053	0.653

Product	EPF mean	EPF min	EPF max	SFP mean	SFP min	SFP max	ADP _f mean	ADP _f min	ADP _f max	ADP _e mean	ADP _e min	ADP _e max
LW-5000-00-FA/SL-AE	0.147	0.146	0.147	42.06	27.21	53.02	4667.83	3991.70	5451.92	5.276E-04	5.260E-04	5.305E-04
LW-5000-20-FA-AE	0.125	0.125	0.126	39.26	22.64	90.12	4124.45	3400.26	5677.73	4.627E-04	4.611E-04	4.656E-04
LW-5000-30-FA-AE	0.112	0.112	0.113	37.49	18.54	96.49	3796.59	2986.50	5603.80	4.204E-04	4.188E-04	4.234E-04
LW-5000-30-SL-AE	0.132	0.131	0.132	44.22	25.82	99.52	4066.49	3269.07	5849.01	4.971E-04	4.955E-04	5.001E-04
LW-5000-40-FA-AE	0.101	0.101	0.102	36.10	16.22	97.86	3514.68	2680.75	5169.59	3.892E-04	3.876E-04	3.922E-04
LW-5000-40-SL-AE	0.128	0.128	0.129	45.16	26.42	103.81	3896.12	3094.93	5576.46	4.932E-04	4.916E-04	4.962E-04
LW-5000-50-FA/SL-AE	0.111	0.110	0.111	41.70	21.72	92.55	3514.26	2678.77	5067.38	4.353E-04	4.337E-04	4.383E-04
LW-5000-50-SL-AE	0.122	0.121	0.122	45.70	26.17	97.08	3671.62	2846.66	5245.18	4.780E-04	4.764E-04	4.810E-04