Environmental Product Declaration

Cold Formed Steel Framing Systems

INTERIOR FRAMING, EXTERIOR FRAMING, INTERIOR FINISHING, EXTERIOR FINISHING, FLOOR FRAMING, STEEL FRAMING CONNECTORS, WOOD FRAMING CONNECTORS

ClarkDietrich proudly offers steel framing products and services nationwide, plus the backing of our Steel Framing Industry Association (SFIA) certification.

ClarkDietrich

ClarkDietrich is in an unprecedented position to help you bring change to the built environment. One of the ways we do that is by offering the industry's most comprehensive lineup of labor-saving, steel construction products and services across the United States and abroad. But also key to our leadership are the steps we've taken to be at the forefront of contributing to the sustainability of your projects.

This Environmental Product Declaration (EPD) document is just one of many actions that back our responsible stance. It is a standardized, internationally recognized tool containing data to help you evaluate our products' impact from a comprehensive level. Further, our EPDs are third-party verified based on an ISO-compliant assessment of our products' complete life cycle, from cradle to gate.

For more details, visit ClarkDietrich Sustainability

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

ClarkDietrich

ClarkDietrich
Cold-Formed Steel Framing Systems

According to ISO 14025 and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	**UL Solutions** WWW.UL.COM **333 Pfingstn Rd, Northbrook IL, 60062** **www.spot.ul.com**
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	UL Solutions Program Operator Rules v. 2.7 2022
MANUFACTURER NAME AND ADDRESS	ClarkDietrich | 9050 Centre Pointe Dr., Ste. 400 West Chester, OH 45069
DECLARATION NUMBER	4792186962.101.1
DECLARED PRODUCT & DECLARED UNIT	Cold-Formed Steel Framing 1 metric ton
REFERENCE PCR AND VERSION NUMBER	SmartEPD PCR Part A Product Category Rules for Building and Construction Products and Services, v1.2 (2025) SmartEPD PCR Part B for Designated Steel Construction Products, v3 (2025)
DESCRIPTION OF PRODUCT APPLICATION/USE	Cold-Formed Steel Framing products are most commonly used in compliance with the International Building Code and International Residential Code. Common applications include interior and exterior framing, interior and exterior finishing, floor framing, steel framing connectors, and wood framing connectors.
MARKETS OF APPLICABILITY	North America
DATE OF ISSUE	August 3rd, 2026
PERIOD OF VALIDITY	5 years
EPD TYPE	Product-specific, facility specific Type III
EPD SCOPE	Cradle to gate (A1-A3)
ACLCA PCR GUIDANCE CONFORMANCE LEVEL	Transparency, per ACLCA PCR Guidance version 1.0 (ACLCA, 2022)
YEAR(S) OF REPORTED PRIMARY DATA	April 2022 - March 2023
LCA SOFTWARE & VERSION NUMBER	Sphera LCA for Experts 10.9 (formerly GaBi)
LCI DATABASE(S) & VERSION NUMBER	Sphera Managed LCA Content Database 2025.2 (formerly GaBi Database)
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.2, IPCC AR6 GWP_{100}

Part A PCR review was conducted by:	Jack Geibig, Chair Terrie Boguski Hugues Imbeault-Tétrault, Eng., M.A. Sc.
The sub-category PCR review was conducted by:	Dr. Thomas Gloria (chair) Industrial Ecology Consulting t.gloria@industrial-ecology.com
This declaration and background LCA report were independently verified in accordance with ISO 14025: 2006. The SmartEPD Part A: Product Category Rules for Building and Construction Products and Services, v1.2, based on ISO 21930:2017, serves as the core PCR. ☐ INTERNAL ☒EXTERNAL	Beth Cassese, Horizon LCA Cooper McCollum, UL Solutions
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	WAP Sustainability
Further explanatory materials may be obtained from	epd@ul.com, UL Solutions, www.ul.com

The EPD owner has sole ownership, liability, and responsibility for the EPD.
Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences in results upstream or downstream of the life cycle stages declared.
EPDs are only comparable if they conform with ISO 21930, this sub-category PCR, include all relevant information modules, and are based on equivalent scenarios with respect to the construction works context.
A manufacturer shall not make claims based on an industry-average EPD which leads the market to believe the industry-average is representative of manufacturer-specific or product-specific results.
It is recognized that by following the typical ISO 21930:2017 definitions of module A1, A2 and A3 for a specific production facility, inconsistencies will occur in classifying individual processes as either A1 or A3 based on the scope of the operations that take place at a given facility. Care must be taken not to compare A1, A2 or A3 on an individual basis for a given product from various mill producers, but, instead on the aggregated total of A1, A2 and A3. Separate A1, A2 and A3 values are provided for a better understanding of the processes taking place at a given facility and a greater level of transparency.
Construction product environmental impact results provide a sufficient basis for comparison only when considered in the context of the construction works project. In all cases of comparing construction products, the principle that the basis for comparison of the assessment is the construction works level shall be maintained by ensuring that the same functional requirements are met and the criteria in ISO 21930:2017 Section 5.5 "Comparability of EPDs for construction products" are satisfied.
Note: A collection of manufacturer-average and/or facility-specific EPDs is insufficient for setting benchmarks and thresholds unless production volumes are taken into account. Benchmarking and threshold setting efforts shall also consider that some manufacturer-average data and facility-specific data may be represented in Industry-average EPDs and may result in double counting of the same data.

1. Product Definition and Information

1.1. Description of Organization

ClarkDietrich offers a comprehensive lineup of products and services for both cold-formed steel framing and drywall/plastering finishing systems. We manufacture innovative products for interior and exterior framing, interior and exterior finishing, floor and roof framing, as well as clips, connectors, metal lath and accessories.

As the demands for higher performance in all aspects of today's buildings rise, we partner with teams of architects, engineers, building developers and owners, contractors, and more on projects of all sizes, scope, and complexity.

Far beyond products, our collaborations increasingly involve efforts and expertise that support smarter installation and design, including resources for BIM and ClarkDietrich Engineering Services LLC.

Formed in 2011 through the combination of two established market leaders—ClarkWestern Building Systems and Dietrich Metal Framing—ClarkDietrich is in an unprecedented position to help you bring change to the built environment.

Figure 1: Manufacturing Facility Locations

Baltimore, MD	Dallas, TX	Riverside, CA	Vienna, OH
Bristol, CT	McDonough, GA	Rochelle, IL	Warren, OH East
Dade City, FL	Pasadena, TX	Sacramento, CA	Oklahoma City, OK

1.2. Product Description

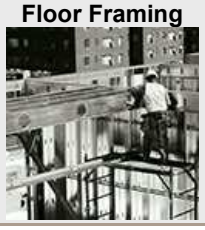
Product Identification

Cold-formed steel framing products have bare steel thicknesses in the range of 26 gauge (0.0120 inches or 0.305 mm) to 10 gauge (0.1180 inches or 3.00 mm). Using cold-formed steel, innovative products are manufactured for use as interior and exterior framing and finishing, floor framing, steel and wood framing connectors, metal lath and accessories. These products are most commonly used as specified and in compliance with the International Building Code,

International Residential Code and State and Local Building Codes.

This EPD covers ClarkDietrich's cold-formed steel products produced at 12 facilities in North America, listed under CSI divisions 05 40 00, 09 22 16, 09 24 00 and UN CPC Codes 41262 and 42190. Results specific to each facility are reported separately.

Table 1. Product Specification List

PRODUCT CATEGORY/IMAGE	PRODUCT DESCRIPTION (NON-EXHAUSTIVE LIST)
Interior Framing 	• ProSTUD® Drywall Framing • TRAKLOC® Drywall Framing System • BlazeFrame® RipTRAK™ • Shaftwall and Area Separation Wall Systems • 360 TRAK™ • RedHeader PRO® Rough Opening System • MaxTrak® Slotted Deflection Track • RC Deluxe® Resilient Channel and various channels and framing members
Exterior Framing 	• Structural Framing • HDS® Framing System • Furring/Hat Channel • L-Angle/Corner Angle • U-Channel (CRC) • Z-Girt for Rainscreen Framing
Interior Finishing 	• 103 Deluxe® Corner Bead • Quicksilver™ Corner Bead • Control Joints • Metal Lath • Commercial Beads
Exterior Finishing 	• Metal Lath • Corners and Casing Beads • Control Joints • Expansion Joints • Casing Beads • Weep & Sill Screeds
Floor Framing 	• TradeReady® Joist System • C-Joist • Structural Rim Track • Floor Framing Accessories

PRODUCT CATEGORY/IMAGE	PRODUCT DESCRIPTION (NON-EXHAUSTIVE LIST)
Steel and Wood Framing Connectors 	• Spazzer® 9200 and 5400 Spacing and Bridging Bar • SwiftClip™ Support Clips • EasyClip™ Support Clips • Various Connectors and Clips

For comprehensive product list reference: https://www.clarkdietrich.com/products

1.3. Application

Using cold-formed steel, innovative products are manufactured for interior framing, interior finishing, exterior framing, floor framing, as well as steel and wood framing connectors, metal lath, and accessories. These products are most commonly used in compliance with the International Building Code and the International Residential Code.

Common applications of cold-formed steel framing products are as follows:

- Interior Framing – Nonstructural and Structural Load Bearing
- Exterior Framing – Structural Load-Bearing and Curtain-Wall
- Interior Finishing – Nonstructural
- Exterior Finishing – Nonstructural
- Floor Framing – Structural Load-Bearing
- Steel Framing Connectors – Structural and Nonstructural
- Wood Framing Connectors – Structural and Nonstructural

1.4. Declaration of Methodological Framework

This LCA uses an attributional approach.

1.5. Technical Requirements

Applicable Product and Manufacturing Standards and Specifications per the International Building Code or as generally accepted practice in the industry if not referenced by the International Building Code. The products listed here are not intended to be all-inclusive or comprehensive. Please visit the following list for a comprehensive product list: https://www.clarkdietrich.com/products.

Table 2. Technical Requirements by Product Category

PRODUCT CATEGORY	PRODUCT DESCRIPTION	PRODUCT SPECIFICATION	MATERIAL SPECIFICATION
Interior Framing	• ProSTUD® Drywall Framing • Trakloc® Drywall Framing System • Blazeframe® RipTRAK™ • Shaftwall and Area Separation Wall Systems • 360 TRAK™ • MaxTrak® Slotted Deflection Track • RC Deluxe® Resilient Channel • and various channels and framing members	AISI S220	ASTM A1003
	• RedHeader PRO™ Rough Opening System	AISI S240	ASTM A1003

Exterior Framing	• Structural Framing • HDS® Framing System	AISI S240	ASTM A1003
Interior Finishing	• 103 Deluxe® Corner Bead • Quicksilver™ Corner Bead • Metal Casing Beads and Control Joints	ASTM C1047	ASTM A653
Exterior Finishing	• Metal Lath	ASTM C847	ASTM A653
	• Corners, Casing Beads, Control Joints and Expansion Joints	ASTM C1861	ASTM A653
Floor Framing	• TradeReady® Joist System • C-Joist • Structural Rim Track and Accessories	AISI S240	ASTM A1003
Steel and Wood Framing Connectors	• Spazzer® 9200 and 5400 Spacing and Bridging Bar • SwiftClip™ Support Clips • EasyClip™ Support Clips • Various Connectors and Clips	AISI S100 AISI S220 AISI S240 As Applicable	ASTM A1003

1.6. Properties of Declared Product as Delivered

The following tables list metal thicknesses and strengths for all structural, nonstructural and finishing products:

Table 3. Metal Thicknesses and Strength for All Structural, Nonstructural, and Finishing Products (Imperial Units)

Product Category	Gauge	Mils	Base Steel Thickness (inches)	Design Thickness (inches)	Yield Strength (ksi)
Interior Framing	25 to 20	15 to 33	0.0150 to 0.0329	0.0158 to 0.0346	33 to 70
Exterior Framing	20 to 12	33 to 97	0.0329 to 0.0966	0.0346 to 0.1017	33 to 50
Interior Finishing	26 min	12 min	0.012 min	0.01224 min	N/A
Exterior Finishing	26 min	12 min	0.012 min	0.01224 min	N/A
Floor Framing	18 to 12	43 to 97	0.0428 to 0.0966	0.0451 to 0.1017	33 to 50
Steel Framing Connectors	20 to 10	33 to 118	0.0329 to 0.1180	0.0346 to 0.1242	33 to 50
Wood Framing Connectors	20 to 10	33 to 118	0.0329 to 0.1180	0.0346 to 0.1242	33 to 50
Product		**Weight per Sq. Yd.**		**Sheet Size**	**Galvanization**
Exterior Finishing – Metal Lath		2.5 or 3.4 lbs.		27” by 97”	G60 min

Table 4. Metal Thicknesses and Strength for All Structural, Nonstructural, and Finishing Products (SI Units)

Product Category	Gauge	Base Steel Thickness (mm)	Design Thickness (mm)	Yield Strength (MPa)
Interior Framing	25 to 20	0.381 to 0.836	0.401 to 0.879	228 to 483
Exterior Framing	20 to 12	0.836 to 2.53	0.879 to 2.58	228 to 345
Interior Finishing	26 min	0.305 min	0.311 min	N/A
Exterior Finishing	26 min	0.305 min	0.311 min	N/A
Floor Framing	18 to 12	1.09 to 2.53	1.15 to 2.58	228 to 345
Steel Framing Connectors	20 to 10	0.836 to 3.00	0.879 to 3.15	228 to 345
Wood Framing	20 to 10	0.836 to 3.00	0.879 to 3.15	228 to 345

Connectors				
PRODUCT	WEIGHT PER M^2.	SHEET SIZE	GALVANIZATION	
Exterior Finishing – Metal Lath	1.4 or 1.8 kg	686 mm by 2,464 mm	Z180 min	

NOTE: For more detailed product line information go to http://www.clarkdietrich.com/products.

1.7. Material Composition

Cold-formed steel framing products are made from coils of low alloy sheet steel with various metallic and conversion coatings for corrosion protection. Primary product components as follows and presented as a range for the product produced at all production facilities, per declared unit.

Table 5. Material Composition, per Declared Unit

COMPONENT	MASS % PER DECLARED UNIT
Alloys and Other Iron Units	35.7%–66.9%
Steel Scrap, Pre-Consumer	11.9%–22.6%
Steel Scrap, Post-Consumer	20.0%–48.9%

ClarkDietrich collects recycled content data from suppliers, published at https://clarkdietrich.ecomedes.com/. Recycled content is calculated using the most recent supplier recycled content declarations available multiplied by the percent mass each ClarkDietrich facility sources from each supplier during fiscal year 2024. Assumptions used if primary data are not available are detailed in the LCA background report.

Mass of coatings per declared unit varies with thickness of the steel and is excluded from the material composition table.

1.8. Manufacturing

Roll-Forming Production Process

Prime and secondary steel coils are received into the warehouse and slit into appropriate widths in a continuous slitting process. Then the slit coils are loaded into the roll forming machinery where continuous roll formers and/or expanders shape the slit coils into finished products. The finished products are packaged into skids, and the skids are loaded onto a truck where they will be shipped to the customer.

Connectors, Clips and Accessory Production Process

Prime and secondary steel coils are received into the warehouse and slit into appropriate widths with a continuous slitting process, then the slit coils are loaded onto an Uncoiler and the material passes through straightening and feeder equipment where it enters a make die. As it passes through the make die, it stamps various connector, clip and accessory profiles, with features that may include angles, slots, dimples, or pre-drilled holes for fasteners. The parts are then packaged and shipped to the customer. For the conventional process, Prime Steel Coils are processed into steel sheets. Conventional equipment such as presses, punches and drills utilize the sheet goods and produce the various connector, clip and accessory profiles, with features that may include angles, slots, dimples, or pre-drilled holes for fasteners. The parts are then packaged and shipped to the customer.

The diagram below shows the flow of cold-formed steel products through major processes. The arrows between processes indicate transportation of intermediate products. Material input flows have associated inbound transportation. Definitions of secondary and prime steel coils are detailed below.

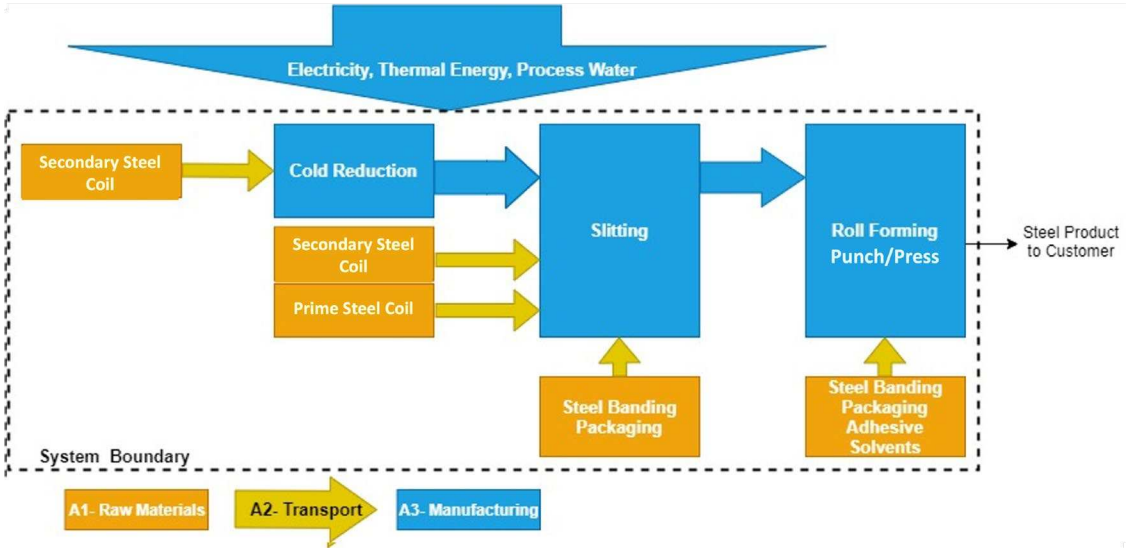


Figure 2: Manufacturing Process Flow Diagram

Definitions:

- **Electric Arc Furnaces (EAF) versus Basic Oxygen Furnaces (BOF):**
  - Both EAF and BOF are crucial players in steelmaking, but they differ significantly in their primary raw material inputs, energy source, environmental impact.
  - Raw material inputs for EAFs are primarily scrap steel (typically 60-99%). This promotes recycling and sustainability. Raw material inputs for BOFs are primarily molten iron (typically 70-80%) directly from blast furnaces, along with a smaller portion of scrap steel. BOFs use virgin resources, requiring mining and processing of iron ore.
  - Energy sources for EAFs are electrical grids which power high-intensity arcs to melt scrap. This offers flexibility in utilizing renewable energy sources. Energy sources for BOFs are oxygen blowing and exothermic reactions within the furnace generate heat. BOFs rely on fossil fuels to power blast furnaces and generate oxygen.
- **Prime Steel Coils:** Coils that are purchased directly from a steel mill to meet or exceed the specifications needed to manufacture a specific product or products.
- **Secondary Steel Coils:** Coils that are purchased on the secondary market that may or may not match exact specifications needed but can be cold reduced and/or coated as needed to meet desired specifications. Typically, the original source steel mill is not known for secondary coils, as is the transportation distance and mode.

1.9. Packaging

All of the various steel framed products are packaged and shipped using one of the following methods: skids, boxes, buckets or cartons.

Table 6. Packaging Type by Product Category

PACKAGING IMAGE	PRODUCT CATEGORY	PACKAGING DESCRIPTION
	Exterior Framing: Skid	Products are generally nested together in pairs, then stacked with other sets of nested pairs and are held together using banding and wood dunnage.
	Interior Framing: Skid	Products are generally nested together in pairs, then stacked with other sets of nested pairs and are held together using banding and wood dunnage.
	Exterior Finishing: Metal Lath – Skids	Product sheets are stacked on top of each other in a bundle and held together with plastic strapping. The bundles are stacked on top of each other and held together using banding and wood dunnage.
	Interior & Exterior Finishing: Boxes	Desired quantity of products are stacked on top of each other, then secured inside of a cardboard box. Then cardboard boxes are stacked together with other boxes to form a skid of product and held together using banding and wood dunnage.
	Steel and Wood Framing Connectors: Buckets or Cartons	Products are placed in a carton or plastic buckets then secured into the buckets with a plastic lid. The buckets or cartons are stacked together with other buckets or cartons to form a skid of product and held together using banding and wood dunnage.

Packaging mass per declared unit is in Table 8.

Table 7. Packaging, per Declared Unit

PACKAGING WASTE	MASS	UNIT	BIOGENIC CARBON	UNIT
Wood	9.89E+00	kg	4.25E+00	kg C
Cardboard	4.05E+00	kg	1.74E+00	kg C
Plastic Banding	1.49E+01	kg	0.00E+00	kg C

As required per ISO 21930 and the Part A PCR, information on packaging is provided to specify the end of life scenarios used for packaging or to support development of the end of life scenarios for packaging at the construction works level where the A5 module is not declared.

Table 8. Packaging Waste Details for A5 Scenario Development, per Declared Unit

PACKAGING WASTE	VALUE	UNIT
Plastic Packaging Waste to Landfill	1.42E+00	kg
Plastic Packaging Waste to Incineration	1.12E+01	kg
Plastic Packaging Waste to Recycling	2.24E+00	kg
Pulp Packaging Waste to Landfill	2.62E+00	kg
Pulp Packaging Waste to Incineration	1.15E+00	kg
Pulp Packaging Waste to Recycling	2.79E-01	kg
Biogenic Carbon in Packaging, Pulp	1.56E+01	kg CO_2
Wood Packaging Waste to Landfill	6.40E+00	kg
Wood Packaging Waste to Incineration	2.81E+00	kg
Wood Packaging Waste to Recycling	6.82E-01	kg
Biogenic Carbon in Packaging, Wood	6.39E+00	kg CO_2

1.10. Transportation

Transportation from suppliers to ClarkDietrich's facilities were calculated using primary data on the mode of transport, and distances were calculated based on the supplier location and the location of manufacturing. Because primary data on backhauls are not available, any short-haul supplier transport distances (<200 miles) are multiplied by 2 to model impacts related to backhauls, per the Part B PCR.

2. Life Cycle Assessment Background Information

2.1. Declared Unit

The declared unit of calculation is one metric ton of Cold-Formed Steel Product (1,000 kg). Product specifications required by the PCR Part B are reported in the table below. Production route representation in the supply chain is declared for all production facilities.

Table 9. Product Specifications, per Declared Unit

PARAMETER	VALUE	
System boundary option	Option 2. Manufactured product	
Form factor	Cold-Formed Steel Framing	
Production route representation	BOF	TRUE
	EAF	TRUE
	Unknown	TRUE
Steel type	Carbon / Alloy	
Options	Galvanized (Mill Process)	

2.2. System Boundary

The declared system boundary is cradle-to-gate (A1-A3). This includes the life cycle modules A1, A2, and A3. Module A1 represents cradle-to-gate impacts including raw material supply. Module A2 represents transport of hot rolled steel coil to ClarkDietrich's facility, and module A3 represents manufacturing of the cold-formed steel framing products. The declared system boundaries are shown in Figure 3 and Table 11.

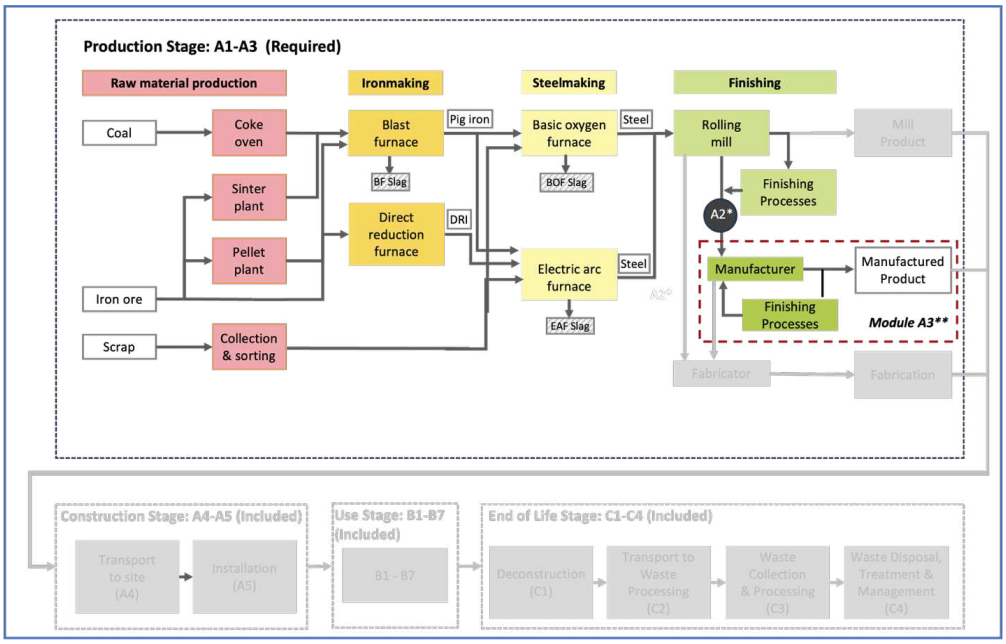


Figure 3: System Boundary Diagram

In primary data collected from the manufacturer, impacts from infrastructure and capital goods are excluded, as required by the PCR Part B. Environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process are not accounted for in the LCI.

Background datasets follow the Sphera (MLC) LCA Databases Modeling Principles (2025), which details the system boundaries for various categories of datasets (Sphera, 2025). Of note is that power plant construction is included for electricity and heat datasets.

2.3. Estimates and Assumptions

All estimates and assumptions are within the requirements of ISO 14040/44. The primary energy and ancillary material data were collected as annual totals including all utility usage and production information. For the LCA, the energy and ancillary usage information was divided by the production to use per metric ton.

Assumptions and limitations to the study have been identified as follows:

- Supplier EPDs are used for raw materials impacts, where available. Specific assumptions relating to supplier EPDs and supplier data modeling are detailed in the LCA report.
- Data for auxiliary materials and packaging materials used in A3 are not available for all facilities. The most conservative values from Vienna and Warren are used as a proxy.
- Transportation distances between supplier locations and manufacturing facilities are based on assumptions discussed and agreed upon with ClarkDietrich.
- Processing impacts for plastic and steel packaging materials were modeled based on default energy use and scrap rates from MLC background datasets.
- Availability of geographically more accurate background LCI datasets would have improved the accuracy of the study.
- Since this LCA uses the cut-off approach to model recycled material in the product, no credit is given to the product system. Instead, the manufacturer realizes reduced environmental impacts through the absence of the burden of extracting virgin material.

- Only known and quantifiable environmental impacts are considered.
- Due to the assumptions and value choices listed above, The LCA does not reflect real-life scenarios and hence cannot assess actual and exact impacts, but only potential environmental impacts.

2.4. Cut-off Criteria

Input and output flows of mass and energy greater than 1% (based on total mass final product and total energy usage of the product system) or greater than 1% of environmental impacts were included within the scope of analysis. Flows less than 1% were included if sufficient data were available to warrant inclusion and/or the flow was thought to have significant environmental impact. Cumulative excluded flows and environmental impacts are less than 5% per module based on total mass, energy usage, and impacts of the product system. Where data gaps were identified, they are filled by conservative assumptions with average, generic, or proxy data and assumptions are documented.

No known flows relevant to the product system are deliberately excluded from this LCA and EPD. Some material inputs may have been excluded within the MLC datasets used for this project. All MLC datasets have been critically reviewed and conform to the exclusion requirement of the PCR, Part A.

2.5. Data Sources

This temporal scope is production during ClarkDietrich's Fiscal Year 2022 from April 2022-March 2023 for all facilities, except Oklahoma City. The temporal scope at Oklahoma City is production during is February 2025-October 2025.

Supplier EPDs were utilized for steel coils purchased by ClarkDietrich, when available. Where supplier EPDs are not available for North American suppliers, the industry average dataset for hot dip galvanized coil from the American Iron and Steel Institute (AISI, 2020). Where suppliers are located outside of North America or supplier location is unknown the industry average dataset for hot dip galvanized coil from worldsteel (worldsteel, 2022) is used.

In cases where supplier EPDs do not represent the exact product purchased, additional processing impacts are modeled using industry average data for pickling and cold-rolling from AISI, and hot-dip galvanizing from the American Galvanizer's Association (AGA, 2022) steel coils to improve the technological representativeness.

Electricity mixes used in A3 vary per production facility and are modeled per the EPA eGRID region, and corresponding MLC dataset, that covers each production facility:

- Baltimore, MD: RFCE
- Dallas, TX: ERCT
- Riverside, CA: CAMX
- Vienna, OH: RFCW
- Bristol, CT: NEWE
- McDonough, GA: SRSO
- Rochelle, IL: RFCW
- Warren, OH East: RFCW
- Dade City, FL: FRCC
- Pasadena, TX: ERCT
- Sacramento, CA: CAMX
- Oklahoma, OK: SPSO

Per PCR Part B, secondary data for any unit process that contributes 10% or more to GWP-total in any disclosed information module are disclosed below.

Table 10. Datasets with Significant Contribution

CATEGORY	MODULE	MATERIAL/PROCESS NAME	DATASET NAME	GEOGRAPHY	REFERENCE YEAR
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	CA	2021

CATEGORY	MODULE	MATERIAL/PROCESS NAME	DATASET NAME	GEOGRAPHY	REFERENCE YEAR
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	US	2024
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	US	2021
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	US	2021
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	US	2021
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	US	2022
Material	A1	Cold Rolled Galvanized Coil	Supplier EPD	US	2021
Material	A1	Cold Rolled Galvanized Coil	Industry-average steel hot dip galvanized coil, AISI	RNA	2017
Material	A1	Cold Rolled Galvanized Coil	Industry-average steel hot dip galvanized coil, Worldsteel	GLO	2017-2022
Transport	A2	Truck	Truck – Heavy Heavy-duty Diesel Truck / 53,333 lb payload – 8b	US	2024
Transport	A2	Rail	Rail transport cargo - Diesel, average train, gross tonne weight 1,000t / 726t payload capacity	US	2024
Transport	A2	Ship	Bulk commodity carrier, 1.000 to 250.000 dwt payload capacity, deep sea	US	2024
Energy	A3	Electricity	Electricity Grid Mix from eGRID	US	2022
Energy	A3	Thermal Energy	Thermal Energy from Natural Gas	US	2022
Energy	A3	Thermal Energy	Thermal Energy from Propane	US	2021
Energy	A3	Thermal Energy	Thermal Energy from Diesel	US	2021

2.6. Data Quality

Geographic Coverage
The geographical scope for cold-formed steel framing production is the United States. Manufacturing takes place in facilities in North America. All primary data were collected from the manufacturer. The geographic coverage of primary data is considered very good.

The geographical scope of the raw material acquisition is United States, Canada, Mexico, and Brazil. Supplier EPDs, where available, are facility-specific and geographic coverage for the majority of the supply is considered very good. Geographic coverage relating to supplier EPDs and supplier data modeling are detailed in the LCA report. Where supplier EPDs are not available, industry average datasets for hot-dip galvanized coil are used, representing industry average production in the relevant regions. In absence of primary data, geogrpahical coverage of these data is considered good.

Time Coverage
Primary data were provided by the manufacturer and represent all information for fiscal year 2022, defined as April 2022 to March 2023 at all facilities except Oklahoma City. This deviates from PCR requirements for data to be no older than 2 years, but is deemed appropriate because facility engineers confirmed no significant changes in primary data since fiscal year 2022. Time coverage of this primary data is considered good.

Primary data for Oklahoma City were provided by the manufacturer and represent all information for February 2025-October 2025. This deviates from PCR requirements to use 12 months of data, but is justified due its recent acquisition.

Data necessary to model cradle-to-gate unit processes were sourced from Sphera's MLC LCI database, industry average datasets, and supplier EPDs. All secondary datasets are less than 10 years old, and all supplier EPDs are valid at the time of this study. Use of these data meets PCR requirements and time coverage is considered good.

Technological Coverage
Primary data provided by ClarkDietrich are specific to the technology the company uses in manufacturing their product. It is facility-specific and considered of good quality. Energy and water used in manufacturing includes overhead energy because sub-metering was not available; sub-metering would improve the data quality of technological coverage.

Supplier EPDs for steel coil represent technology specific to the suppliers and technological coverage of these data is considered very good. If supplier EPDs do not represent the exact product purchased, additional processing impacts are modeled using industry average data to improve the technological representativeness of raw materials. Where supplier EPDs are not available, industry average datasets for hot-dip galvanized coil are used, reprsenting industry average technology in the relevant regions. In absence of primary data, technological coverage of these data is considered good.

Data necessary to model cradle-to-gate unit processes were sourced from MLC LCI datasets. Technological coverage of the datasets is considered good relative to the actual supply chain of the manufacturer.

Supplier EPD consistency is considered good. Supplier EPDs used as primary data for hot rolled steel coil report LCIA impacts using different methods than this LCA for GWP (IPCC AR5) and other impacts (TRACI v2.1) in accordance with the Part B PCR v1. The primary differences between AR5 and AR6 relate to the characterization of methane and nitrous oxide. Because emissions from steel production are predominantly fossil CO_2, the influence of these differences is expected to be minimal. Accordingly, the use of supplier EPD results based on IPCC AR5 is justified as it is not expected to significantly affect the reported GWP results under AR6. The difference between TRACI v2.1 and v2.2 relate to the characterization of acidification potential (AP) and eutrophication potential (EP). For consistency in LCIA methods, AP and EP results per declared unit from the appropriate region-specific industry average dataset are used as a proxy.

LCA modeling software and databases used were not consistent across all supplier EPDs. Use of consistent LCA software and background LCA data would improve the consistency of this LCA.

Supply chain specificity as calculated per the 2022 ACLCA PCR Open Standard – Process and Methods Toolkit Guidance for Determining EPD Types and Calculating and Communicating Data Specificity Through the Supply Chain (ACLCA, 2025) is 0 for all facilities because supplier EPDs currently in the market do not report supply chain specificity scores. Over all of ClarkDietrich's facilities that produce cold-formed steel framing, 55% of their steel supply by mass in fiscal year 2022 is represented by facility-specific supplier EPDs.

2.7. Period under Review

The period under review is production during ClarkDietrich's fiscal year 2022 from April 2022-March 2023 for all facilities, except Oklahoma City.

The period under review at Oklahoma City is production during is February 2025-October 2025. Due to a recent acquisition, only 9 months of complete data for production at Oklahoma City were available at the time of the study.

2.8. Allocation

General principles of allocation were based on ISO 14040/44. Where possible, allocation was avoided. No co-product allocation was applied to the primary manufacturing data at all facilities except Warren, detailed in the LCA report

As a default, Sphera Managed LCA Content datasets use a physical mass basis for allocation.

Of relevance to the defined system boundary is the method in which recycled materials were handled. Throughout the study recycled materials were accounted for via the cut-off method. Under this method, impacts and benefits associated with the previous life of a raw material from recycled stock are excluded from the system boundary. Additionally, impacts and benefits associated with secondary functions of materials at end of life are also excluded (i.e., production into a third life or energy generation from the incineration plant). The study does include the impacts associated with reprocessing and preparation of recycled materials that are part of the bill of materials of the products under study.

3. Life Cycle Assessment Results

Table 11. Description of the system boundary modules

PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X=module is declared, MND=module not declared

The environmental impact results of products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

The reported impact assessment values in this EPD may not be a precise representation of potential environmental burdens.

A summary of IPCC AR6 GWP-total by facility is presented first, with all life cycle impact assessment and life cycle inventory results for all impact categories detailed in the following sections. LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 12. GWP-total Results: 1 metric ton of Cold-Formed Steel Framing, All Facilities

IPCC AR6 GWP-TOTAL [KG CO_{2EQ}]	A1	A2	A3	A1 – A3 TOTAL
Baltimore, MD	1.81E+03	6.69E+01	6.81E+01	**1.94E+03**
Dallas, TX	1.76E+03	4.74E+01	6.09E+01	**1.87E+03**
Riverside, CA	2.37E+03	2.43E+01	5.21E+01	**2.45E+03**
Vienna, OH	1.98E+03	5.83E+01	1.17E+02	**2.15E+03**
Bristol, CT	1.82E+03	7.87E+01	7.98E+01	**1.98E+03**
McDonough, GA	1.94E+03	4.89E+01	5.86E+01	**2.04E+03**
Rochelle, IL	1.56E+03	3.94E+01	8.71E+01	**1.69E+03**
Warren, OH	1.94E+03	3.78E+01	7.73E+01	**2.05E+03**
Dade City, FL	2.20E+03	7.81E+01	5.95E+01	**2.34E+03**
Pasadena, TX	1.62E+03	5.55E+01	5.41E+01	**1.73E+03**
Sacramento, CA	2.34E+03	3.52E+01	5.15E+01	**2.43E+03**
Oklahoma City, OK	1.85E+03	7.95E+01	9.39E+01	**2.02E+03**

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building or construction works has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase only when product or construction works performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate and could lead to erroneous selection of materials or products that are higher-impact, at least in some impact categories.

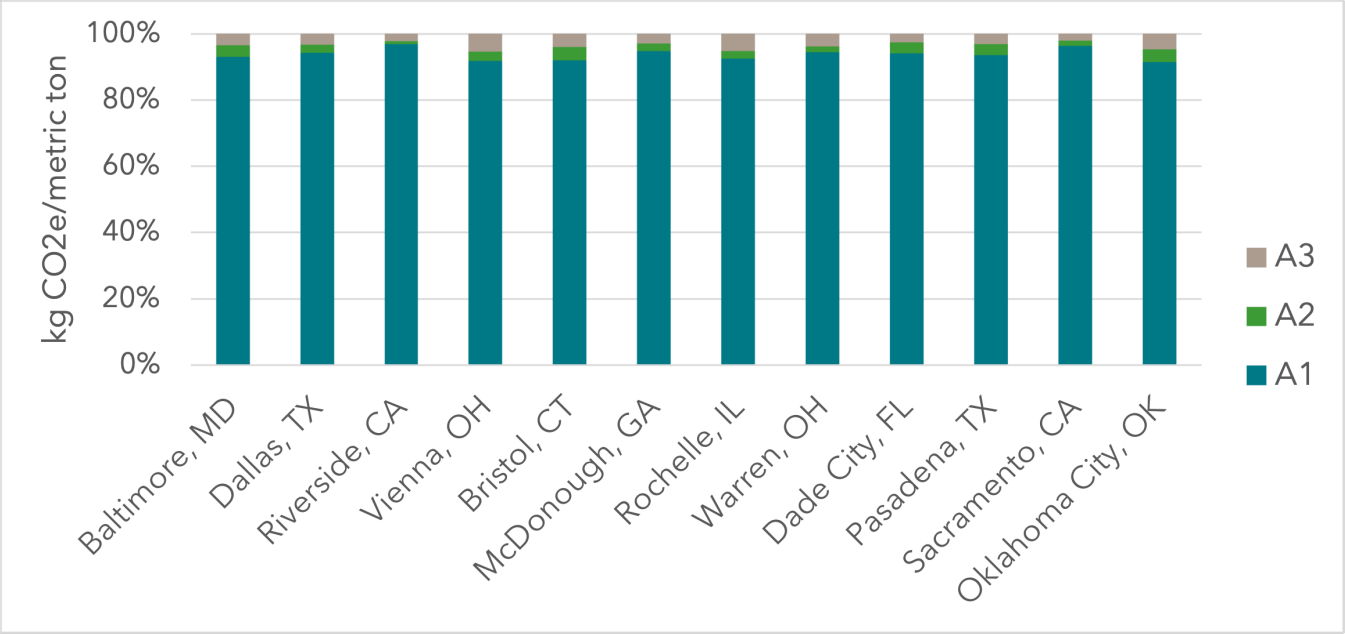


Figure 4: Cradle-to-Gate GWP Results per Declared Unit, by Facility

3.1. Life Cycle Assessment Results – Baltimore, MD

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 13. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Baltimore

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.81E+03	6.69E+01	6.81E+01	**1.94E+03**
GWP-fossil [kg CO_2 eq]	1.81E+03	6.68E+01	9.48E+01	**1.97E+03**
GWP-biogenic [kg CO_2 eq]	-1.28E+00	5.73E-02	-2.67E+01	**-2.80E+01**
GWP-luluc [kg CO_2 eq]	5.88E-02	3.49E-02	9.30E-02	**1.87E-01**
ODP [kg CFC 11 eq]	9.27E-06	1.88E-11	2.61E-10	**9.27E-06**
AP [kg SO_2 eq]	4.17E+00	2.20E-01	1.76E-01	**4.56E+00**

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
EP-freshwater [kg P eq]	3.37E-03	5.39E-05	1.21E-04	**3.55E-03**
EP-marine [kg N eq]	2.19E+00	1.92E-01	1.19E-01	**2.50E+00**
SFP [kg O_3 eq]	7.19E+01	5.11E+00	4.19E+00	**8.12E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 14. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Baltimore

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use	3.16E+03	3.54E+01	6.46E+01	**3.26E+03**
RPR_E [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_M [MJ, LHV]	3.01E+03	3.54E+01	3.26E+02	**3.37E+03**
RPR_T [MJ, LHV]	2.65E+04	8.58E+02	1.81E+03	**2.92E+04**
$NRPR_E$ [MJ, LHV]	1.18E+03	0.00E+00	3.73E+02	**1.55E+03**
$NRPR_M$ [MJ, LHV]	2.52E+04	8.58E+02	2.18E+03	**2.82E+04**
$NRPR_T$ [MJ, LHV]	6.07E+02	0.00E+00	0.00E+00	**6.07E+02**
SM [kg]	2.34E-04	0.00E+00	0.00E+00	**2.34E-04**
RSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
NRSF [MJ, LHV]	7.99E-02	0.00E+00	0.00E+00	**7.99E-02**
RE [MJ, LHV]	4.62E+03	8.49E+02	1.95E+03	**7.42E+03**
ADPf [MJ, LHV]	2.54E+01	3.82E-02	3.83E-01	**2.58E+01**
FW [m^3]				
Waste Parameters and Output Flows	3.37E+00	1.42E-07	1.33E-06	**3.37E+00**
HWD [kg]	3.60E+01	8.74E-02	1.72E+00	**3.78E+01**
NHWD [kg]	1.63E-03	3.49E-06	1.13E-04	**1.75E-03**
HLRW [kg]	4.13E-02	2.94E-03	9.50E-02	**1.39E-01**
ILLRW [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CRU [kg]	2.25E+01	0.00E+00	0.00E+00	**2.25E+01**
MR [kg]	2.03E-05	0.00E+00	0.00E+00	**2.03E-05**
MER [kg]	6.06E-02	0.00E+00	9.69E-02	**1.58E-01**
EEE [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**
EET [MJ, LHV]	3.16E+03	3.54E+01	6.46E+01	**3.26E+03**

3.2. Life Cycle Assessment Results – Dallas, TX

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 15. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Dallas

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP$_{100}$, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.76E+03	4.74E+01	6.09E+01	**1.87E+03**
GWP-fossil [kg CO_2 eq]	1.77E+03	4.73E+01	8.76E+01	**1.90E+03**
GWP-biogenic [kg CO_2 eq]	-4.30E+00	3.60E-02	-2.68E+01	**-3.10E+01**
GWP-luluc [kg CO_2 eq]	2.59E-01	2.44E-02	8.34E-02	**3.67E-01**
ODP [kg CFC 11 eq]	8.39E-06	1.32E-11	4.62E-10	**8.39E-06**
AP [kg SO_2 eq]	5.31E+00	2.38E-01	1.82E-01	**5.73E+00**
EP-freshwater [kg P eq]	2.17E-02	3.76E-05	1.15E-04	**2.19E-02**
EP-marine [kg N eq]	1.71E+00	2.18E-01	1.23E-01	**2.05E+00**
SFP [kg O_3 eq]	9.40E+01	6.93E+00	4.37E+00	**1.05E+02**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 16. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Dallas

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.19E+03	2.47E+01	1.85E+02	**1.40E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.14E+03	2.47E+01	4.47E+02	**1.61E+03**
$NRPR_E$ [MJ, LHV]	1.84E+04	6.09E+02	1.59E+03	**2.06E+04**
$NRPR_M$ [MJ, LHV]	7.27E+02	0.00E+00	3.73E+02	**1.10E+03**
$NRPR_T$ [MJ, LHV]	1.72E+04	6.09E+02	1.96E+03	**1.98E+04**
SM [kg]	4.55E+02	0.00E+00	0.00E+00	**4.55E+02**
RSF [MJ, LHV]	1.97E-03	0.00E+00	0.00E+00	**1.97E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	6.76E-01	0.00E+00	0.00E+00	**6.76E-01**

PARAMETER	A1	A2	A3	A1-A3 TOTAL
ADPf [MJ, LHV]	6.44E+03	6.03E+02	1.83E+03	**8.87E+03**
FW [m^3]	2.10E+01	2.67E-02	3.53E-01	**2.14E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.15E+01	9.90E-08	1.79E-06	**1.15E+01**
NHWD [kg]	1.42E+02	6.13E-02	1.68E+00	**1.44E+02**
HLRW [kg]	8.73E-04	2.44E-06	6.68E-05	**9.42E-04**
ILLRW [kg]	2.17E-01	2.05E-03	5.65E-02	**2.76E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	1.03E+02	0.00E+00	0.00E+00	**1.03E+02**
MER [kg]	1.72E-04	0.00E+00	0.00E+00	**1.72E-04**
EEE [MJ, LHV]	5.13E-01	0.00E+00	9.69E-02	**6.10E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.3. Life Cycle Assessment Results – Riverside, CA

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 17. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Riverside

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	2.37E+03	2.43E+01	5.21E+01	**2.45E+03**
GWP-fossil [kg CO_2 eq]	2.37E+03	2.43E+01	7.87E+01	**2.47E+03**
GWP-biogenic [kg CO_2 eq]	-1.24E-01	1.92E-02	-2.67E+01	**-2.68E+01**
GWP-luluc [kg CO_2 eq]	5.94E-01	1.22E-02	1.46E-01	**7.52E-01**
ODP [kg CFC 11 eq]	6.12E-06	6.68E-12	7.80E-10	**6.12E-06**
AP [kg SO_2 eq]	4.93E+00	1.05E-01	1.57E-01	**5.20E+00**
EP-freshwater [kg P eq]	1.20E-03	1.88E-05	1.30E-04	**1.35E-03**
EP-marine [kg N eq]	2.24E+00	9.70E-02	1.04E-01	**2.44E+00**
SFP [kg O_3 eq]	8.34E+01	2.85E+00	3.62E+00	**8.98E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 18. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Riverside

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.57E+03	1.24E+01	2.19E+02	**1.80E+03**
RPR_M [MJ, LHV]	1.22E+00	0.00E+00	2.62E+02	**2.63E+02**
RPR_T [MJ, LHV]	1.23E+03	1.24E+01	4.81E+02	**1.72E+03**
$NRPR_E$ [MJ, LHV]	2.83E+04	3.13E+02	1.47E+03	**3.01E+04**
$NRPR_M$ [MJ, LHV]	1.32E+01	0.00E+00	3.73E+02	**3.86E+02**
$NRPR_T$ [MJ, LHV]	2.29E+04	3.13E+02	1.84E+03	**2.51E+04**
SM [kg]	3.56E+02	0.00E+00	0.00E+00	**3.56E+02**
RSF [MJ, LHV]	3.07E-05	0.00E+00	0.00E+00	**3.07E-05**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	1.05E-02	0.00E+00	0.00E+00	**1.05E-02**
ADPf [MJ, LHV]	2.64E+04	3.11E+02	1.73E+03	**2.85E+04**
FW [m^3]	4.18E+01	1.34E-02	4.63E-01	**4.23E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.57E-01	4.94E-08	1.42E-06	**1.57E-01**
NHWD [kg]	9.07E+01	3.09E-02	1.72E+00	**9.25E+01**
HLRW [kg]	1.23E-03	1.22E-06	5.89E-05	**1.29E-03**
ILLRW [kg]	6.95E-01	1.02E-03	5.00E-02	**7.46E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	3.92E+00	0.00E+00	0.00E+00	**3.92E+00**
MER [kg]	2.68E-06	0.00E+00	0.00E+00	**2.68E-06**
EEE [MJ, LHV]	7.98E-03	0.00E+00	9.69E-02	**1.05E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.4. Life Cycle Assessment Results – Vienna, OH

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 19. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Vienna

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.98E+03	5.83E+01	1.17E+02	**2.15E+03**
GWP-fossil [kg CO_2 eq]	1.98E+03	5.82E+01	1.44E+02	**2.18E+03**
GWP-biogenic [kg CO_2 eq]	-2.31E+00	5.10E-02	-2.68E+01	**-2.90E+01**
GWP-luluc [kg CO_2 eq]	1.87E-01	3.07E-02	1.05E-01	**3.23E-01**
ODP [kg CFC 11 eq]	9.65E-06	1.64E-11	2.92E-10	**9.65E-06**
AP [kg SO_2 eq]	4.39E+00	1.65E-01	2.09E-01	**4.76E+00**
EP-freshwater [kg P eq]	1.31E-02	4.74E-05	1.08E-04	**1.32E-02**

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
EP-marine [kg N eq]	1.97E+00	1.49E-01	1.25E-01	**2.24E+00**
SFP [kg O_3 eq]	7.81E+01	3.70E+00	4.41E+00	**8.63E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 20. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Vienna

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.82E+03	3.11E+01	1.29E+02	**1.98E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.52E+03	3.11E+01	3.91E+02	**1.94E+03**
$NRPR_E$ [MJ, LHV]	2.19E+04	7.48E+02	2.53E+03	**2.51E+04**
$NRPR_M$ [MJ, LHV]	2.33E+03	0.00E+00	3.73E+02	**2.70E+03**
$NRPR_T$ [MJ, LHV]	1.90E+04	7.48E+02	2.90E+03	**2.27E+04**
SM [kg]	4.09E+02	0.00E+00	0.00E+00	**4.09E+02**
RSF [MJ, LHV]	1.16E-03	0.00E+00	0.00E+00	**1.16E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	3.96E-01	0.00E+00	0.00E+00	**3.96E-01**
ADPf [MJ, LHV]	7.44E+03	7.41E+02	2.53E+03	**1.07E+04**
FW [m^3]	3.72E+01	3.36E-02	5.01E-01	**3.77E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.53E+01	1.24E-07	1.62E-06	**1.53E+01**
NHWD [kg]	8.59E+01	7.65E-02	1.82E+00	**8.78E+01**
HLRW [kg]	1.20E-03	3.05E-06	1.69E-04	**1.38E-03**
ILLRW [kg]	7.93E-02	2.57E-03	1.42E-01	**2.24E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	4.09E+01	0.00E+00	0.00E+00	**4.09E+01**
MER [kg]	1.01E-04	0.00E+00	0.00E+00	**1.01E-04**
EEE [MJ, LHV]	3.00E-01	0.00E+00	9.69E-02	**3.97E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.5. Life Cycle Assessment Results – Bristol, CT

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 21. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Bristol

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP$_{100}$, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.82E+03	7.87E+01	7.98E+01	**1.98E+03**
GWP-fossil [kg CO_2 eq]	1.82E+03	7.86E+01	1.06E+02	**2.00E+03**
GWP-biogenic [kg CO_2 eq]	-9.46E-01	6.81E-02	-2.67E+01	**-2.76E+01**
GWP-luluc [kg CO_2 eq]	3.50E-02	4.15E-02	1.96E-01	**2.73E-01**
ODP [kg CFC 11 eq]	8.42E-06	2.22E-11	3.76E-10	**8.42E-06**
AP [kg SO_2 eq]	4.15E+00	2.37E-01	1.77E-01	**4.57E+00**
EP-freshwater [kg P eq]	1.20E-03	6.40E-05	9.83E-05	**1.36E-03**
EP-marine [kg N eq]	2.22E+00	2.15E-01	1.18E-01	**2.55E+00**
SFP [kg O_3 eq]	7.16E+01	5.56E+00	4.16E+00	**8.13E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 22. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Bristol

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	3.50E+03	4.20E+01	1.71E+02	**3.71E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	3.38E+03	4.20E+01	4.32E+02	**3.85E+03**
$NRPR_E$ [MJ, LHV]	2.80E+04	1.01E+03	1.98E+03	**3.10E+04**
$NRPR_M$ [MJ, LHV]	1.25E+03	0.00E+00	3.73E+02	**1.63E+03**
$NRPR_T$ [MJ, LHV]	2.74E+04	1.01E+03	2.35E+03	**3.07E+04**
SM [kg]	6.32E+02	0.00E+00	0.00E+00	**6.32E+02**
RSF [MJ, LHV]	2.75E-05	0.00E+00	0.00E+00	**2.75E-05**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	9.41E-03	0.00E+00	0.00E+00	**9.41E-03**
ADPf [MJ, LHV]	4.24E+03	1.00E+03	2.13E+03	**7.37E+03**

PARAMETER	A1	A2	A3	A1-A3 TOTAL
FW [m^3]	2.28E+01	4.53E-02	5.41E-01	**2.34E+01**
Waste Parameters and Output Flows				
HWD [kg]	2.65E+00	1.67E-07	1.41E-06	**2.65E+00**
NHWD [kg]	2.66E+01	1.03E-01	1.76E+00	**2.84E+01**
HLRW [kg]	1.68E-03	4.12E-06	1.06E-04	**1.79E-03**
ILLRW [kg]	3.77E-02	3.46E-03	8.89E-02	**1.30E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	1.47E+01	0.00E+00	0.00E+00	**1.47E+01**
MER [kg]	2.39E-06	0.00E+00	0.00E+00	**2.39E-06**
EEE [MJ, LHV]	7.14E-03	0.00E+00	9.69E-02	**1.04E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.6. Life Cycle Assessment Results – McDonough, GA

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 23. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, McDonough

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.94E+03	4.89E+01	5.86E+01	**2.04E+03**
GWP-fossil [kg CO_2 eq]	1.94E+03	4.88E+01	8.53E+01	**2.07E+03**
GWP-biogenic [kg CO_2 eq]	-5.86E+00	3.92E-02	-2.68E+01	**-3.26E+01**
GWP-luluc [kg CO_2 eq]	2.06E-01	2.55E-02	9.70E-02	**3.29E-01**
ODP [kg CFC 11 eq]	9.48E-06	1.38E-11	3.52E-10	**9.48E-06**
AP [kg SO_2 eq]	5.67E+00	2.12E-01	1.54E-01	**6.04E+00**
EP-freshwater [kg P eq]	1.76E-02	3.93E-05	1.01E-04	**1.78E-02**
EP-marine [kg N eq]	1.81E+00	1.90E-01	1.00E-01	**2.10E+00**
SFP [kg O_3 eq]	1.04E+02	5.81E+00	3.53E+00	**1.13E+02**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 24. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, McDonough

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	2.04E+03	2.59E+01	8.25E+01	**2.15E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.82E+03	2.59E+01	3.44E+02	**2.19E+03**
$NRPR_E$ [MJ, LHV]	2.30E+04	6.27E+02	1.59E+03	**2.52E+04**
$NRPR_M$ [MJ, LHV]	1.14E+03	0.00E+00	3.73E+02	**1.51E+03**
$NRPR_T$ [MJ, LHV]	1.97E+04	6.27E+02	1.96E+03	**2.23E+04**
SM [kg]	4.40E+02	0.00E+00	0.00E+00	**4.40E+02**
RSF [MJ, LHV]	1.59E-03	0.00E+00	0.00E+00	**1.59E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	5.44E-01	0.00E+00	0.00E+00	**5.44E-01**
ADPf [MJ, LHV]	6.77E+03	6.21E+02	1.80E+03	**9.19E+03**
FW [m^3]	3.73E+01	2.79E-02	3.85E-01	**3.77E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.06E+01	1.04E-07	1.27E-06	**1.06E+01**
NHWD [kg]	1.23E+02	6.39E-02	1.62E+00	**1.25E+02**
HLRW [kg]	7.55E-04	2.55E-06	7.98E-05	**8.37E-04**
ILLRW [kg]	1.14E-01	2.15E-03	6.74E-02	**1.84E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	8.50E+01	0.00E+00	0.00E+00	**8.50E+01**
MER [kg]	1.39E-04	0.00E+00	0.00E+00	**1.39E-04**
EEE [MJ, LHV]	4.13E-01	0.00E+00	9.69E-02	**5.10E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.7. Life Cycle Assessment Results – Rochelle, IL

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 25. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Rochelle

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.56E+03	3.94E+01	8.71E+01	**1.69E+03**
GWP-fossil [kg CO_2 eq]	1.56E+03	3.93E+01	1.14E+02	**1.71E+03**
GWP-biogenic [kg CO_2 eq]	-8.71E-01	3.42E-02	-2.67E+01	**-2.76E+01**
GWP-luluc [kg CO_2 eq]	3.69E-01	2.07E-02	9.34E-02	**4.83E-01**
ODP [kg CFC 11 eq]	1.54E-05	1.11E-11	2.54E-10	**1.54E-05**
AP [kg SO_2 eq]	4.64E+00	1.15E-01	1.78E-01	**4.93E+00**
EP-freshwater [kg P eq]	4.78E-02	3.20E-05	1.27E-04	**4.80E-02**

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
EP-marine [kg N eq]	1.05E+00	1.04E-01	1.11E-01	**1.26E+00**
SFP [kg O_3 eq]	7.90E+01	2.64E+00	3.92E+00	**8.56E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 26. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Rochelle

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	5.43E+02	2.10E+01	8.14E+01	**6.45E+02**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	5.38E+02	2.10E+01	3.43E+02	**9.02E+02**
$NRPR_E$ [MJ, LHV]	1.07E+04	5.05E+02	2.02E+03	**1.33E+04**
$NRPR_M$ [MJ, LHV]	1.13E+03	0.00E+00	3.73E+02	**1.50E+03**
$NRPR_T$ [MJ, LHV]	9.42E+03	5.05E+02	2.40E+03	**1.23E+04**
SM [kg]	1.71E+02	0.00E+00	0.00E+00	**1.71E+02**
RSF [MJ, LHV]	4.45E-03	0.00E+00	0.00E+00	**4.45E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	1.52E+00	0.00E+00	0.00E+00	**1.52E+00**
ADPf [MJ, LHV]	3.31E+03	5.00E+02	2.17E+03	**5.98E+03**
FW [m^3]	1.86E+01	2.27E-02	4.04E-01	**1.91E+01**
Waste Parameters and Output Flows				
HWD [kg]	2.10E+01	8.37E-08	1.44E-06	**2.10E+01**
NHWD [kg]	2.71E+02	5.17E-02	1.79E+00	**2.73E+02**
HLRW [kg]	1.35E-03	2.06E-06	1.09E-04	**1.46E-03**
ILLRW [kg]	1.45E-01	1.73E-03	9.22E-02	**2.39E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	1.54E+02	0.00E+00	0.00E+00	**1.54E+02**
MER [kg]	3.88E-04	0.00E+00	0.00E+00	**3.88E-04**
EEE [MJ, LHV]	1.16E+00	0.00E+00	9.69E-02	**1.25E+00**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.8. Life Cycle Assessment Results – Warren, OH

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 27. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Warren

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP$_{100}$, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.94E+03	3.78E+01	7.73E+01	**2.05E+03**
GWP-fossil [kg CO_2 eq]	1.94E+03	3.78E+01	1.04E+02	**2.08E+03**
GWP-biogenic [kg CO_2 eq]	-2.21E+00	3.26E-02	-2.68E+01	**-2.89E+01**
GWP-luluc [kg CO_2 eq]	1.82E-01	1.99E-02	9.23E-02	**2.95E-01**
ODP [kg CFC 11 eq]	9.50E-06	1.07E-11	2.51E-10	**9.50E-06**
AP [kg SO_2 eq]	4.30E+00	1.16E-01	1.71E-01	**4.59E+00**
EP-freshwater [kg P eq]	1.28E-02	3.07E-05	9.86E-05	**1.30E-02**
EP-marine [kg N eq]	1.93E+00	1.05E-01	1.06E-01	**2.14E+00**
SFP [kg O_3 eq]	7.66E+01	2.76E+00	3.76E+00	**8.31E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 28. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Warren

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.78E+03	2.02E+01	7.84E+01	**1.88E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.50E+03	2.02E+01	3.40E+02	**1.86E+03**
$NRPR_E$ [MJ, LHV]	2.14E+04	4.85E+02	1.88E+03	**2.38E+04**
$NRPR_M$ [MJ, LHV]	2.29E+03	0.00E+00	3.73E+02	**2.67E+03**
$NRPR_T$ [MJ, LHV]	1.87E+04	4.85E+02	2.26E+03	**2.15E+04**
SM [kg]	4.02E+02	0.00E+00	0.00E+00	**4.02E+02**
RSF [MJ, LHV]	1.14E-03	0.00E+00	0.00E+00	**1.14E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	3.89E-01	0.00E+00	0.00E+00	**3.89E-01**
ADPf [MJ, LHV]	7.20E+03	4.81E+02	2.04E+03	**9.72E+03**

PARAMETER	A1	A2	A3	A1-A3 TOTAL
FW [m^3]	3.58E+01	2.18E-02	3.98E-01	**3.63E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.50E+01	8.04E-08	1.42E-06	**1.50E+01**
NHWD [kg]	8.42E+01	4.96E-02	1.68E+00	**8.59E+01**
HLRW [kg]	1.18E-03	1.98E-06	1.06E-04	**1.29E-03**
ILLRW [kg]	7.81E-02	1.66E-03	8.95E-02	**1.69E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	4.03E+01	0.00E+00	0.00E+00	**4.03E+01**
MER [kg]	9.89E-05	0.00E+00	0.00E+00	**9.89E-05**
EEE [MJ, LHV]	2.95E-01	0.00E+00	9.69E-02	**3.92E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.9. Life Cycle Assessment Results – Dade City, FL

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 29. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Dade City

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	2.20E+03	7.81E+01	5.95E+01	**2.34E+03**
GWP-fossil [kg CO_2 eq]	2.21E+03	7.80E+01	8.62E+01	**2.37E+03**
GWP-biogenic [kg CO_2 eq]	-6.23E+00	6.08E-02	-2.68E+01	**-3.29E+01**
GWP-luluc [kg CO_2 eq]	3.80E-01	3.52E-02	8.27E-02	**4.98E-01**
ODP [kg CFC 11 eq]	7.05E-06	2.11E-11	4.12E-10	**7.05E-06**
AP [kg SO_2 eq]	5.66E+00	4.95E-01	1.51E-01	**6.31E+00**
EP-freshwater [kg P eq]	2.16E-02	5.40E-05	9.78E-05	**2.17E-02**
EP-marine [kg N eq]	1.74E+00	3.35E-01	9.92E-02	**2.17E+00**
SFP [kg O_3 eq]	3.61E+02	1.00E+01	3.48E+00	**3.74E+02**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 30. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Dade City

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.98E+03	3.61E+01	8.10E+01	**2.10E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.23E+03	3.61E+01	3.43E+02	**1.61E+03**
$NRPR_E$ [MJ, LHV]	2.45E+04	9.90E+02	1.60E+03	**2.71E+04**
$NRPR_M$ [MJ, LHV]	5.54E+02	0.00E+00	3.73E+02	**9.26E+02**
$NRPR_T$ [MJ, LHV]	1.24E+04	9.90E+02	1.97E+03	**1.53E+04**
SM [kg]	2.80E+02	0.00E+00	0.00E+00	**2.80E+02**
RSF [MJ, LHV]	1.97E-03	0.00E+00	0.00E+00	**1.97E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	6.75E-01	0.00E+00	0.00E+00	**6.75E-01**
ADPf [MJ, LHV]	1.48E+04	9.81E+02	1.84E+03	**1.76E+04**
FW [m^3]	7.97E+01	3.94E-02	3.49E-01	**8.01E+01**
Waste Parameters and Output Flows				
HWD [kg]	9.76E+00	1.59E-07	1.28E-06	**9.76E+00**
NHWD [kg]	1.58E+02	9.46E-02	1.64E+00	**1.60E+02**
HLRW [kg]	9.02E-04	3.89E-06	7.04E-05	**9.76E-04**
ILLRW [kg]	2.29E-01	3.27E-03	5.95E-02	**2.92E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	1.72E+02	0.00E+00	0.00E+00	**1.72E+02**
MER [kg]	1.72E-04	0.00E+00	0.00E+00	**1.72E-04**
EEE [MJ, LHV]	5.12E-01	0.00E+00	9.69E-02	**6.09E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.10. Life Cycle Assessment Results – Pasadena, TX

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 31. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Pasadena

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.62E+03	5.55E+01	5.41E+01	**1.73E+03**
GWP-fossil [kg CO_2 eq]	1.62E+03	5.54E+01	8.08E+01	**1.76E+03**
GWP-biogenic [kg CO_2 eq]	-4.17E+00	4.51E-02	-2.67E+01	**-3.09E+01**
GWP-luluc [kg CO_2 eq]	1.93E-01	2.92E-02	8.16E-02	**3.04E-01**
ODP [kg CFC 11 eq]	9.54E-06	1.57E-11	3.74E-10	**9.54E-06**
AP [kg SO_2 eq]	5.38E+00	2.23E-01	1.54E-01	**5.76E+00**
EP-freshwater [kg P eq]	2.66E-02	4.51E-05	1.24E-04	**2.68E-02**

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
EP-marine [kg N eq]	1.58E+00	2.06E-01	9.85E-02	**1.88E+00**
SFP [kg O_3 eq]	9.13E+01	6.17E+00	3.47E+00	**1.01E+02**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 32. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Pasadena

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.17E+03	2.96E+01	1.30E+02	**1.33E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.23E+03	2.96E+01	3.92E+02	**1.65E+03**
$NRPR_E$ [MJ, LHV]	1.66E+04	7.13E+02	1.49E+03	**1.88E+04**
$NRPR_M$ [MJ, LHV]	7.40E+02	0.00E+00	3.73E+02	**1.11E+03**
$NRPR_T$ [MJ, LHV]	1.68E+04	7.13E+02	1.86E+03	**1.94E+04**
SM [kg]	4.85E+02	0.00E+00	0.00E+00	**4.85E+02**
RSF [MJ, LHV]	2.44E-03	0.00E+00	0.00E+00	**2.44E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	8.35E-01	0.00E+00	0.00E+00	**8.35E-01**
ADPf [MJ, LHV]	2.19E+03	7.06E+02	1.75E+03	**4.65E+03**
FW [m^3]	1.24E+01	3.20E-02	3.33E-01	**1.27E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.39E+01	1.18E-07	1.60E-06	**1.39E+01**
NHWD [kg]	1.60E+02	7.28E-02	1.69E+00	**1.62E+02**
HLRW [kg]	9.69E-04	2.91E-06	5.90E-05	**1.03E-03**
ILLRW [kg]	1.76E-01	2.44E-03	5.00E-02	**2.29E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	1.69E+02	0.00E+00	0.00E+00	**1.69E+02**
MER [kg]	2.12E-04	0.00E+00	0.00E+00	**2.12E-04**
EEE [MJ, LHV]	6.33E-01	0.00E+00	9.69E-02	**7.30E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.11. Life Cycle Assessment Results – Sacramento, CA

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 33. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Sacramento

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP$_{100}$, TRACI 2.2				
GWP-total [kg CO_2 eq]	2.34E+03	3.52E+01	5.15E+01	**2.43E+03**
GWP-fossil [kg CO_2 eq]	2.34E+03	3.51E+01	7.81E+01	**2.45E+03**
GWP-biogenic [kg CO_2 eq]	3.47E+00	3.07E-02	-2.67E+01	**-2.32E+01**
GWP-luluc [kg CO_2 eq]	6.52E-01	1.85E-02	1.64E-01	**8.34E-01**
ODP [kg CFC 11 eq]	5.79E-07	9.91E-12	9.41E-10	**5.80E-07**
AP [kg SO_2 eq]	4.68E+00	9.99E-02	1.55E-01	**4.93E+00**
EP-freshwater [kg P eq]	9.44E-04	2.86E-05	9.40E-05	**1.07E-03**
EP-marine [kg N eq]	2.26E+00	9.01E-02	1.01E-01	**2.45E+00**
SFP [kg O_3 eq]	8.08E+01	2.24E+00	3.54E+00	**8.66E+01**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 34. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Sacramento

PARAMETER	A1	A2	A3	A1-A3 TOTAL
Resource Use				
RPR_E [MJ, LHV]	1.50E+03	1.88E+01	2.72E+02	**1.79E+03**
RPR_M [MJ, LHV]	1.18E-01	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.49E+03	1.88E+01	5.34E+02	**2.04E+03**
$NRPR_E$ [MJ, LHV]	2.84E+04	4.51E+02	1.47E+03	**3.04E+04**
$NRPR_M$ [MJ, LHV]	5.38E-02	0.00E+00	3.73E+02	**3.73E+02**
$NRPR_T$ [MJ, LHV]	2.84E+04	4.51E+02	1.84E+03	**3.07E+04**
SM [kg]	3.84E+02	0.00E+00	0.00E+00	**3.84E+02**
RSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
ADPf [MJ, LHV]	2.62E+04	4.47E+02	1.72E+03	**2.84E+04**

PARAMETER	A1	A2	A3	A1-A3 TOTAL
FW [m^3]	1.16E+01	2.02E-02	5.09E-01	**1.21E+01**
Waste Parameters and Output Flows				
HWD [kg]	2.78E-03	7.48E-08	1.46E-06	**2.78E-03**
NHWD [kg]	9.48E+01	4.62E-02	1.63E+00	**9.64E+01**
HLRW [kg]	1.10E-03	1.84E-06	6.28E-05	**1.17E-03**
ILLRW [kg]	8.89E-01	1.55E-03	5.32E-02	**9.44E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	3.78E-01	0.00E+00	0.00E+00	**3.78E-01**
MER [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
EEE [MJ, LHV]	0.00E+00	0.00E+00	9.69E-02	**9.69E-02**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

3.12. Life Cycle Assessment Results – Oklahoma City, OK

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 35. North American Impact Assessment Results: 1 metric ton of Cold-Formed Steel Framing, Oklahoma City

PARAMETER	A1	A2	A3	A1 – A3 TOTAL
IPCC AR6 GWP_{100}, TRACI 2.2				
GWP-total [kg CO_2 eq]	1.85E+03	7.95E+01	9.39E+01	**2.02E+03**
GWP-fossil [kg CO_2 eq]	1.85E+03	7.94E+01	1.21E+02	**2.05E+03**
GWP-biogenic [kg CO_2 eq]	-4.51E+00	6.39E-02	-2.67E+01	**-3.12E+01**
GWP-luluc [kg CO_2 eq]	2.72E-01	4.13E-02	1.22E-01	**4.35E-01**
ODP [kg CFC 11 eq]	8.80E-06	2.23E-11	2.70E-10	**8.81E-06**
AP [kg SO_2 eq]	5.57E+00	3.34E-01	2.38E-01	**6.14E+00**
EP-freshwater [kg P eq]	2.28E-02	6.37E-05	1.22E-04	**2.30E-02**
EP-marine [kg N eq]	1.79E+00	3.05E-01	1.51E-01	**2.25E+00**
SFP [kg O_3 eq]	9.86E+01	9.16E+00	5.37E+00	**1.13E+02**
Carbon Emissions and Removals				
BCRP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEP [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCRK [kg CO_2]	0.00E+00	0.00E+00	2.20E+01	**2.20E+01**
BCEK [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
BCEW [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCE [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CCR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
CWNR [kg CO_2]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 36. Resource Use, Waste Parameters, and Output Flows: 1 metric ton of Cold-Formed Steel Framing, Oklahoma City

Parameter	A1	A2	A3	A1-A3 Total
Resource Use				
RPR_E [MJ, LHV]	1.25E+03	4.19E+01	3.33E+02	**1.63E+03**
RPR_M [MJ, LHV]	0.00E+00	0.00E+00	2.62E+02	**2.62E+02**
RPR_T [MJ, LHV]	1.20E+03	4.19E+01	5.94E+02	**1.84E+03**
$NRPR_E$ [MJ, LHV]	1.93E+04	1.02E+03	1.94E+03	**2.23E+04**
$NRPR_M$ [MJ, LHV]	7.63E+02	0.00E+00	3.75E+02	**1.14E+03**
$NRPR_T$ [MJ, LHV]	1.81E+04	1.02E+03	2.32E+03	**2.14E+04**
SM [kg]	4.77E+02	0.00E+00	0.00E+00	**4.77E+02**
RSF [MJ, LHV]	2.07E-03	0.00E+00	0.00E+00	**2.07E-03**
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
RE [MJ, LHV]	7.09E-01	0.00E+00	0.00E+00	**7.09E-01**
ADPf [MJ, LHV]	6.75E+03	1.01E+03	2.23E+03	**1.00E+04**
FW [m^3]	2.20E+01	4.52E-02	4.72E-01	**2.26E+01**
Waste Parameters and Output Flows				
HWD [kg]	1.20E+01	1.67E-07	2.50E-06	**1.20E+01**
NHWD [kg]	1.49E+02	1.03E-01	1.80E+00	**1.51E+02**
HLRW [kg]	9.16E-04	4.12E-06	4.97E-05	**9.69E-04**
ILLRW [kg]	2.28E-01	3.46E-03	4.23E-02	**2.74E-01**
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
MR [kg]	1.08E+02	0.00E+00	0.00E+00	**1.08E+02**
MER [kg]	1.80E-04	0.00E+00	0.00E+00	**1.80E-04**
EEE [MJ, LHV]	5.38E-01	0.00E+00	9.69E-02	**6.35E-01**
EET [MJ, LHV]	0.00E+00	0.00E+00	4.56E-02	**4.56E-02**

4. Life Cycle Assessment Interpretation

The greatest contributor to life cycle impacts for cold-formed steel framing products is raw materials (A1), accounting for 80% or more of cradle-to-gate impacts across all impact categories at all facilities. Raw material transport (A2) is insignificant to all impact categories at all facilities except EP-marine for Dallas, Dade City, and Pasadena. Manufacturing (A3) is insignificant to all impact categories at all facilities.

GWP-total is dominated by A1, where materials account for over 90% of cradle-to-gate GWP at all facilities. GWP-total by facility varies with the type of raw material supplied at each facility. GWP-total per declared unit is lower where the facility sources more EAF coils relative to coils made with BOF or unknown steelmaking technology.

5. Additional Environmental Information

Product specific sustainability related documents can be found at https://clarkdietrich.ecomedes.com/.

No substances required to be reported as hazardous per the EPA's Resource Conservation and Recovery Act were identified during the LCA associated with the production or disposal of this product.

Additional information such as Safety Data Sheets (SDS) and Code Evaluation Reports may be found at

https://www.clarkdietrich.com/support-tools/support-docs.

6. References

ACLCA. (2022). *2022 ACLCA PCR Guidance - Process and Methods Toolkit, Version 1.0*. American Center for Life Cycle Assessment.

ACLCA. (2025). *2022 ACLCA PCR Open Standard - Process and Methods Toolkit Guidance for Determining EPD Types and Calculating and Communicating Data Specificity Through the Supply Chain*. American Center for Life Cycle Assessment. Retrieved from https://cdn.prod.website-files.com/685abecf52079050b589879c/685abecf52079050b58988f5_EPD%20Classifications%20Addendum%20Final%202025.pdf

AGA. (2022). *Hot-Dip Galvanized Steel After Fabrication.* Retrieved from https://galvanizeit.org/hot-dip-galvanizing/is-galvanizing-sustainable/hdg-and-leed/environmental-product-declaration-epd

AISI. (2020). *Life Cycle Inventories of North American Steel Products*. Sphera.

worldsteel. (2022). *Global Life Cycle Inventory Study for Steel Products.* Retrieved from https://worldsteel.org/wp-content/uploads/2021-LCA-Study-Report.pdf

CML - Department of Industrial Ecology. (2016, September 5). *CML-IA Characterisation Factors*. Retrieved from https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors

IPCC. (2021). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press.

ISO. (2006). *ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures*. Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14040/Amd 1:2020: Environmental management - Life cycle assessment - Principles and framework.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14044/Amd 1:2017/Amd 2:2020: Environmental Management - Life cycle assessment - Requirements and Guidelines.* Geneva: International Organization for Standardization.

ISO. (2017). *ISO 21930: Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services*. Geneva: International Organization for Standardization.

Smart EPD. (2025, April 3). *Smart EPD PCR Part B for Designated Steel Construction Products, Standard 1000-008, version 3.0*. Retrieved from Smart EPD PCR Library: https://smartepd.com/pcr-library

Smart EPD. (2025, March 14). *Smart EPD Part A Product Category Rules for Building and Construction Products and Services, Standard 1000, v1.2.* Retrieved from Smart EPD PCR Library: https://smartepd.com/pcr-library

Sphera. (2025). *Sphera Managed LCA Content (MLC) LCA Databases Modeling Principles 2025*. Sphera Solutions, Inc.

US EPA. (2021). *TRACI: The Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts. Version 2.2.* Retrieved from https://www.epa.gov/chemical-research/tool-reduction-and-assessment-chemicals-and-other-environmental-impacts-traci

WAP Sustainability. (2026). *Life Cycle Assessment of ClarkDietrich Cold-Formed Steel Framing*.