The future of building is all about the future of the environment.

ClarkDietrich Building Systems
ClarkDietrich Building Systems, Inc. is an active member of the U.S. Green Building Council with LEED Accredited Professionals on staff. ClarkDietrich is committed to supplying quality products and continually looking for new ways to develop greener building products and sustainable business practices. In total, ClarkDietrich products can help your project qualify for up to 7 LEED points under LEED v4 for BD+C.

LEED v4 - MATERIALS AND RESOURCES

LEED v4 MR Credit: Building Product Disclosure and Optimization — Environmental Product Declarations (1 point)
This credit requirement has an option of using 20 different permanently installed products sourced from at least five different manufacturers that meet special disclosure requirements. ClarkDietrich Building Systems has product specific Type III Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and has a cradle to gate scope. We manufacture multiple products that will contribute towards this credit.

An additional exemplary performance point is available here for sourcing at least 40 qualifying products from five manufacturers. (See below: LEED v4 IN Credit: Innovation)

LEED v4 MR Credit: Building Product Disclosure and Optimization — Sourcing of Raw Materials (1 point)
ClarkDietrich provides products and materials for which life cycle information is available. This helps you to select environmentally, economically, and socially preferable products. One LEED point can be obtained using the Recycled Content responsible extraction criteria under Option 2.

We support Supply Chain Transparency and are currently in the process on implementing compliance programs for The California Transparency in Supply Chains Act and for the Dodd-Frank Bill Section 1502, better known as the Conflict Minerals Requirement.

LEED v4 MR Credit: Building Product Disclosure and Optimization — Material Ingredients (1 point)
Using ClarkDietrich products can contribute to one LEED point for Material Ingredient Reporting with our published Health Product Declaration (HPD). The HPD program in Option 1 requires the use at least 20 different permanently installed products from at least five different manufacturers with HPDs.

An additional exemplary performance point is available here for sourcing at least 40 qualifying products from five manufacturers. (See below: LEED v4 IN Credit: Innovation)

LEED v4 MR Credit: Construction and Demolition Waste Management (up to 2 points)
ClarkDietrich products are manufactured from cold-formed steel. Steel is 100% recyclable. This attribute can help when diverting construction debris from the waste stream. Recycling construction waste contributes to LEED Credits. The specific contribution will vary by project and must be determined by the contractor.

LEED v4 IN Credit: Innovation (up to 2 points)
Achieve exemplary performance in an existing LEED v4 prerequisite or credit that allows exemplary performance, as specified in the LEED Reference Guide, v4 edition. An exemplary performance point is typically earned for achieving double the credit requirements or the next incremental percentage threshold.

*USGBC and the related logo are trademarks owned by the U.S. Green Building Council and are used by permission.

ClarkDietrich plant locations:
- Riverside, CA
- Sacramento, CA
- Bristol, CT
- Dade City, FL
- McDonough, GA
- Kapolei, HI
- Rochelle, IL
- Baltimore, MD
- Warren, OH
- Baytown, TX
- Dallas, TX
ENVIRONMENTAL PRODUCT DECLARATION
CLARKDIETRICH COLD-FORMED STEEL PRODUCTS

Certification is specific to ClarkDietrich Building Systems due to the declared system boundary of data collection. It is not applicable to the same or similar products produced by other manufacturers.
**ENVIRONMENTAL PRODUCT DECLARATION VERIFICATION**

### EPD INFORMATION

<table>
<thead>
<tr>
<th>Program Operator</th>
<th>NSF International</th>
</tr>
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<tbody>
<tr>
<td>Declaration Holder</td>
<td>ClarkDietrich Building Systems</td>
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<td><strong>Product</strong></td>
<td><strong>Approved</strong></td>
</tr>
<tr>
<td>Cold-Formed Steel Products</td>
<td>June 30, 2015</td>
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<tr>
<td><strong>Valid Until</strong></td>
<td><strong>Declaration #</strong></td>
</tr>
<tr>
<td></td>
<td>June 30, 2020</td>
</tr>
</tbody>
</table>


- **Internal**
- **External**

Lori Bestervelt  
Bestervelt@nsf.org

This life cycle assessment was independently verified by in accordance with ISO 14044 and the reference PCR:

Jack Geibig  
jgeibig@ecoform.com

### LCA INFORMATION

<table>
<thead>
<tr>
<th>Basis LCA</th>
<th>ProSTUD® Drywall Framing System &amp; Cold-Formed Steel Products, May 15, 2015</th>
</tr>
</thead>
</table>
| LCA Preparer                                  | thinkstep  
Takuma Ono  
takuma.ono@thinkstep.com                            |

This life cycle assessment was critically reviewed in accordance with ISO 14044 by:

Jack Geibig  
EcoForm  
jgeibig@ecoform.com

### PCR INFORMATION

<table>
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<tr>
<th>Program Operator</th>
<th>SCS Global Services</th>
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<td>Reference PCR</td>
<td>Designated Steel Construction Products</td>
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<tr>
<td>Date of Issue</td>
<td>May 5, 2015</td>
</tr>
</tbody>
</table>

PCR review was conducted by:

Dr. Thomas Gloria, Ph. D. (Chair)  
Industrial Ecology Consultants  
t.gloria@industrial-ecology.com
ABOUT US

ClarkDietrich Building Systems offers a comprehensive lineup of steel construction products and services across the United States and abroad. Using cold-formed steel, we manufacture innovative products for interior framing, interior finishing, exterior framing and floor framing, as well as clips, connectors, metal lath and accessories.

Within our facilities we actively recycle 100% of steel waste from all aspects of our processing, beginning with the slitting of the master coil and continuing through to the final roll-forming of our product. Every day at every plant. Steel is fully recyclable and we have always been diligent in this effort.

Product development is focused on labor savings systems, which incorporates optimal utilization of all raw materials. From concept to launch, our product offering consciously engages optimal use of material as well as ease of construction.

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.

ClarkDietrich Building Systems
9100 Centre Pointe Dr., Ste. 210
West Chester, OH  45069
p. 513-870-1100
www.clarkdietrich.com

Manufacturing Sites:
- Baltimore, MD
- Baytown, TX
- Bristol, CT
- Dade City, FL
- Dallas, TX
- Kapolei, HI
- McDonough, GA
- Riverside, CA
- Rochelle, IL
- Sacramento, CA
- Warren, OH East
- Warren, OH West

PRODUCT

Product Description and Application

Cold-formed steel framing products have bare steel thicknesses in the range of 0.0120 inches to 0.0966 inches. These products include interior framing, interior finishing trims and accessories, exterior framing, floor framing, clips/connectors, expanded metal lath, plaster trim and accessories.

Using cold-formed steel, innovative products are manufactured for use as interior framing, interior finishing, exterior framing, floor framing, as well as clips, 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
- Interior Finishing – Nonstructural
- Exterior Framing – Structural Load-Bearing
- Floor Framing – Structural Load-Bearing
- Roof Framing – Structural Load-Bearing
- Exterior Finishing
Technical Data
The following table lists metal thicknesses and strengths for all ProSTUD®, structural products and clips/connectors:

<table>
<thead>
<tr>
<th>Product</th>
<th>Gauge</th>
<th>Mils</th>
<th>Bare Steel Thickness (inches)</th>
<th>Design Thickness (inches)</th>
<th>Yield Strength (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories</td>
<td>26 min</td>
<td>12 min</td>
<td>0.012 min</td>
<td>0.01224 min</td>
<td>N/A</td>
</tr>
<tr>
<td>DW</td>
<td>25 to 20</td>
<td>15 to 33</td>
<td>0.0150 to 0.0329</td>
<td>0.0158 to 0.0346</td>
<td>33 to 65</td>
</tr>
<tr>
<td>STRUC</td>
<td>20 to 12</td>
<td>33 to 97</td>
<td>0.0329 to 0.0966</td>
<td>0.0346 to 0.1017</td>
<td>33 to 50</td>
</tr>
<tr>
<td>HDS</td>
<td>20 to 12</td>
<td>33 to 97</td>
<td>0.0329 to 0.0966</td>
<td>0.0346 to 0.1017</td>
<td>33 to 50</td>
</tr>
<tr>
<td>TradeReady</td>
<td>18 to 12</td>
<td>43 to 97</td>
<td>0.0428 to 0.0966</td>
<td>0.0451 to 0.1017</td>
<td>33 to 50</td>
</tr>
<tr>
<td>Clips/Connectors</td>
<td>20 to 10</td>
<td>33 to 118</td>
<td>0.0329 to 0.1180</td>
<td>0.0346 to 0.1242</td>
<td>33 to 50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Weight per Sq. Yd.</th>
<th>Sheet Size</th>
<th>Galvanization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Lath</td>
<td>2.5 or 3.4 lbs.</td>
<td>27” by 97”</td>
<td>G-60</td>
</tr>
</tbody>
</table>

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

Constructional Data
Placing on the market / Application rules
Most commonly used and referred to codes in the steel framing industry. List is not intended to be all-inclusive or comprehensive.

Manufacturing Codes
- ASTM C645, Specification for Nonstructural Steel Framing Members
  - Interior Framing – Nonstructural
- ASTM C955, Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases
  - Exterior Framing – Structural Load-Bearing
  - Floor Framing – Structural Load-Bearing
  - Roof Framing – Structural Load-Bearing
- ASTM C1047, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
  - Interior Finishing – Nonstructural
- ASTM C847, Specification for Metal Lath
  - Metal Lath

Construction and Building Codes
- International Building Code (IBC)
  - Chapter 22, Section 2210, Cold-Formed Steel
  - Chapter 25, Section 2505, Shear Wall Construction
  - Chapter 25, Section 2506, Gypsum Board and Gypsum Panel Product Materials
  - Chapter 25, Section 2507, Lathing and Plastering
- International Residential Code (IRC)
  - Section R505: Cold-Formed Steel Floor Framing
  - Section R603: Cold-Formed Steel Wall Framing
  - Section R804: Cold-Formed Steel Roof Framing
Structural Engineering Codes

- American Iron and Steel Institute (AISI)
  - AISI S100: North American Specification for the Design of Cold-Formed Steel Structural Members
  - AISI S200: North American Standard for Cold-Formed Steel Framing – General Provisions
  - AISI S201: North American Standard for Cold-Formed Steel Framing – Product Data
  - AISI S210: North American Standard for Cold-Formed Steel Framing – Floor and Roof System Design
  - AISI S211: North American Standard for Cold-Formed Steel Framing – Wall Stud Design
  - AISI S212: North American Standard for Cold-Formed Steel Framing – Header Design
  - AISI S213: North American Standard for Cold-Formed Steel Framing – Lateral Design
  - AISI S214: North American Standard for Cold-Formed Steel Framing – Truss Design
  - AISI S220: North American Standard for Cold-Formed Steel Framing – Nonstructural Members
  - AISI S230: Standard for Cold-Formed Steel Framing – Prescriptive Method for One and Two Family Dwellings
- American Society of Civil Engineers (ASCE)
  - ASCE 7: Minimum Design Loads for Buildings and other Structures

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

Structural Load-Bearing Members – Skid (See Figure 1)
- Products are generally nested together in pairs, then stacked with other sets of nested pairs and are held together using banding and wood dunnage

Nonstructural Framing Members – Skid (See Figure 2)
- Products are generally nested together in pairs, then stacked with other sets of nested pairs and are held together using banding and wood dunnage.

Metal Lath – Skids (See Figure 3)
- 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.

Corner Beads, Trims and Finishing Products – Boxes (See Figure 4 and 5)
- 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.

Clips and Connectors – Buckets or Cartons (See Figure 6 and Figure 7)
- 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.
Package Figures:

Figure 1: Skid of Structural Framing

Figure 2: Skid of Nonstructural Framing

Figure 3: Skid of Metal Lath

Figure 4: Box of Corner Bead

Figure 5: Skid of Corner Bead Boxes

Figure 6: Plastic Bucket of Clips

Figure 7: Carton of Clips
Base Materials / Ancillary Materials
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:

<table>
<thead>
<tr>
<th>Component Name</th>
<th>Mass by % of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Metal</td>
<td>&gt; 97.9%</td>
</tr>
<tr>
<td>Metallic Coating</td>
<td>&lt; 2.1%</td>
</tr>
</tbody>
</table>

Manufacture

Definitions:
- Prime Steel Coil - Manufactured in North America
- Steel coils that are purchased to meet or exceed the specifications needed to manufacture a specific product or products.
- Secondary Steel Coils
  - Steel coils that are purchased on the secondary market that may or may not match exact specifications needed but can be roll reduced and coated to meet desired specifications.
  - Steel coil production took place at either a domestic or foreign steel mill located in United States (77.5%), Canada (8.6%), Mexico (5.7%), India (3.1%), China (2.9%), or Italy (2.2%).

Process for Prime Steel
Prime Steel Coils are received into the warehouse from external suppliers. The Prime Steel Coils are slit into appropriate widths in a continuous slitting process. Then the slit coils are loaded into the roll forming machinery where continuous roll formers 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.

Process for Secondary Steel
Secondary Steel Coils are received into the warehouse. Where necessary secondary steel coils are cold reduced to the appropriate thickness. The Secondary Steel Coils are slit into narrow coils, then the narrow coils are loaded into the roll forming machinery where they are roll formed 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.
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.
LCA CALCULATION RULES

Declared Unit
The declared unit of calculation is one metric ton of steel construction product (1000 kg).

<table>
<thead>
<tr>
<th>Name</th>
<th>Required Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared Unit</td>
<td>Metric Ton</td>
<td>1</td>
</tr>
<tr>
<td>Density</td>
<td>kg/m³</td>
<td>7,850</td>
</tr>
</tbody>
</table>

System Boundary
The declared system boundary is cradle-to-gate. Cradle-to-gate includes the PCR life cycle modules A1, A2, and A3. The declared system boundaries are shown below:

Reference Service Life
Due to a cradle-to-gate declaration, a reference service life for steel products is not declared.

Scope
Temporal
All primary data were collected specific to the US. Where country / region specific secondary data were unavailable, proxy data were used but this is more an exception than the norm. Geographical representativeness is thus considered to be good.

Geographic
All primary data were collected for the year 2013. All secondary data come from the GaBi 2013 databases and are representative of the years 2009-2013. As the study intended to compare the product systems for the reference year 2013, temporal representativeness is good.

Data Quality Assessment
To ensure consistency, all primary data were collected with the same level of detail, while all background data were sourced from the GaBi databases. Allocation and other methodological choices were made consistently throughout the model.
Background Data
Most of the necessary life cycle inventories for the basic materials are available in the GaBi database. The last update of the database was 2013. Further LCIs for materials of the supply chain of the basic materials are approximated with LCIs of similar materials or estimated by the combination of available LCIs as documented in the background report. All datasets used in the major unit processes are provided in later sections of this report along with the description of the individual unit processes.

There is limited regional background data for steel that is specific to the US. There we have used the “NA: Steel hot dip galvanized” from worldsteel as the best available dataset for steel inputs. It must be noted that, the worldsteel data set does not report waste and net water consumption flows as required by the PCR. However, as the worldsteel methodology is in line with ISO 14044 allocation rules and is the best publicly available dataset for US steel, the use of this data set is justified. **Water and waste indicators shall not be reported as explained in the background report.**

Foreground Data
The foreground data collected by the manufacturer are based on yearly production amounts and extrapolations of measurements on specific machines and plants. The production data refer to an average of the year 2013.

Primary data for the production of cold-formed steel products were collected by ClarkDietrich using a specifically developed spreadsheet provided by thinkstep. Cross-checks concerning the plausibility of mass and energy flows were carried out by thinkstep on the data received via email, telephone consultation and teleconferencing.

Statement of Comparability
Any comparison of EPDs shall be subject to the requirements of ISO 21930. For comparison of EPDs which report different module scopes, such that one EPD includes Module D and the other does not, the comparison shall only be made on the basis of Modules A1, A2, and A3. Additionally, when Module D is included in the EPDs being compared, all EPDs must use the same methodology for calculation of Module D values.

Declaration of Environmental Impact Derived from LCA
**Disclaimer:** This Environmental Product Declaration (EPD) conforms to ISO 14025, ISO 14040, ISO 14044, and ISO 21930.

**Scope of Results Reported:** The PCR requires the reporting of a limited set of LCA metrics; therefore, there may be relevant environmental impacts beyond those disclosed by this EPD. The EPD does not indicate that any environmental or social performance benchmarks are met nor thresholds exceeded.

**Accuracy of Results:** This EPD has been developed in accordance with the PCR applicable for the identified product following the principles, requirements and guidelines of the ISO 14040, ISO 14044, ISO 14025 and ISO 21930 standards. The results in this EPD are estimations of potential impacts. The accuracy of results in different EPDs may vary as a result of value choices, background data assumptions and quality of data collected.

**Comparability:** EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate, and could lead to the erroneous selection of materials or products which are higher - impact, at least in some impact categories. Any comparison of EPDs shall be subject to the requirements of ISO 21930. For comparison of EPDs which report different module scopes, such that one EPD includes Module D and the other does not, the comparison shall only be made on the basis of Modules A1, A2, and A3. Additionally, when Module D is included in the EPDs being compared, all EPDs must use the same methodology for calculation of Module D values.
Parameters Describing Environmental Impacts
In accordance to the guiding PCR, the characterization method will be based on TRACI March 2012 v2.1 and CML 2012 v4.1. Environmental impact: 1 metric ton of Cold-Formed Steel product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>LCIA Method</th>
<th>A1 – A3</th>
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<tr>
<td>GWP</td>
<td>[metric ton CO₂-eq.]</td>
<td>TRACI (version 2.1)</td>
<td>2.33</td>
</tr>
<tr>
<td>ODP</td>
<td>[metric ton CFC11-eq.]</td>
<td>TRACI (version 2.1)</td>
<td>5.07E-08</td>
</tr>
<tr>
<td>AP</td>
<td>[metric ton SO₂-eq.]</td>
<td>TRACI (version 2.1)</td>
<td>0.0134</td>
</tr>
<tr>
<td>EP</td>
<td>[metric ton N eq.]</td>
<td>TRACI (version 2.1)</td>
<td>5.55E-04</td>
</tr>
<tr>
<td>POCP</td>
<td>[metric ton O₃ eq.]</td>
<td>TRACI (version 2.1)</td>
<td>0.185</td>
</tr>
<tr>
<td>ADPE*</td>
<td>[metric ton Sb eq.]</td>
<td>CML Baseline Method, Version 4.1 (October 2012)</td>
<td>4.58E-5</td>
</tr>
</tbody>
</table>

Caption
GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

*This indicator is based on assumptions regarding current reserves estimates. Although this impact category is required for those EPD’s meant to be in compliance with EN 15804:2012, users should use caution when interpreting results because there is insufficient information on which indicator is best for assessing the depletion on abiotic resources.

Parameters Describing Resource Use
Resource use: 1 metric ton of Cold-Formed Steel product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1 – A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERE</td>
<td>[MJ]</td>
<td>1800</td>
</tr>
<tr>
<td>PERM</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>PERT</td>
<td>[MJ]</td>
<td>1800</td>
</tr>
<tr>
<td>PENRE</td>
<td>[MJ]</td>
<td>2950</td>
</tr>
<tr>
<td>PENRM</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>PENRT</td>
<td>[MJ]</td>
<td>2950</td>
</tr>
<tr>
<td>SM</td>
<td>[metric ton]</td>
<td>0.447</td>
</tr>
<tr>
<td>RSF</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>NRSF</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>FW</td>
<td>[M³]</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

Caption
PERE = Use of renewable primary energy as raw materials; PERM = Use of renewable primary energy as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy as raw materials; PENRM = Use of non-renewable primary energy d as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water
### Parameters Describing Waste Categories and Output Flows

Output flows and waste categories: 1 metric ton of Cold-Formed Steel product

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<tr>
<th>Parameter</th>
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<th>A1- A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>HWD</td>
<td>[metric ton]</td>
<td>Not reported</td>
</tr>
<tr>
<td>NHWD</td>
<td>[metric ton]</td>
<td>Not reported</td>
</tr>
<tr>
<td>RWD</td>
<td>[metric ton]</td>
<td>Not reported</td>
</tr>
<tr>
<td>CRU</td>
<td>[metric ton]</td>
<td>0</td>
</tr>
<tr>
<td>MFR</td>
<td>[metric ton]</td>
<td>0.056</td>
</tr>
<tr>
<td>MER</td>
<td>[metric ton]</td>
<td>0</td>
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<tr>
<td>EEE</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>EET</td>
<td>[MJ]</td>
<td>0</td>
</tr>
</tbody>
</table>

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

FW, HWD, NHWD and RWD flows have not been reported as the worldsteel dataset used does report on waste and net water consumption flows in sufficient detail. The dataset is otherwise representative of the technology and conforms to ISO 14044.

**Interpretation – Cold-Formed Steel**

Module A1 dominates across all impact categories, contributing to over 90% of impacts except for primary energy from renewable resources (PERT), where the contribution is lower at about 65%. Apart from PERT, contributions from A3 range from about -1.06 – 1.2% across the impact categories/indicators.

GWP shows a negative value for Module A3 impacts because of the wood and paper packaging material included in this module. Wood and paper products are made from plant fibers which themselves are made carbon extracted from atmospheric carbon dioxide. Hence production of these materials reduces net carbon dioxide emissions and results in negative GWP figures (this sequestered carbon may well be re-emitted at end of life but this is not assessed in this EPD).

As a whole, module A2 also contributes very little. It impacts across the categories with a maximum of about 2.7% in the case of Eutrophication potential (EP).
ENVIRONMENTAL PRODUCT DECLARATION
PROSTUD® WITH DIAMONDPLUS™ COATING

Certification is specific to ClarkDietrich Building Systems due to the declared system boundary of data collection. It is not applicable to the same or similar products produced by other manufacturers.
## ENVIRONMENTAL PRODUCT DECLARATION VERIFICATION

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**Product**

<table>
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<tr>
<th>ProSTUD® with DiamondPlus™ Coating</th>
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**Approved**

<table>
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<th>June 30, 2015</th>
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**Valid Until**

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<th>June 30, 2020</th>
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</thead>
</table>

**Declaration #**

<table>
<thead>
<tr>
<th>EPD10057</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Lori Bestervelt  
Bestervelt@nsf.org

This life cycle assessment was independently verified by in accordance with ISO 14044 and the reference PCR:

Jack Geibig  
jgeibig@ecoform.com

### LCA INFORMATION

**Basis LCA**

ProSTUD® Drywall Framing System & Cold-Formed Steel Products, May 15, 2015

**LCA Preparer**

thinkstep  
Takuma Ono  
takuma.ono@thinkstep.com

This life cycle assessment was critically reviewed in accordance with ISO 14044 by:

| Jack Geibig  
jgeibig@ecoform.com |

### PCR INFORMATION

**Program Operator**

SCS Global Services

**Reference PCR**

Designated Steel Construction Products

**Date of Issue**

May 5, 2015

**PCR review was conducted by:**

| Dr. Thomas Gloria, Ph. D. (Chair)  
Industrial Ecology Consultants  
t.gloria@industrial-ecology.com |
ABOUT US

ClarkDietrich Building Systems offers a comprehensive lineup of steel construction products and services across the United States and abroad. Using cold-formed steel, we manufacture innovative products for interior framing, interior finishing, exterior framing and floor framing, as well as clips, connectors, metal lath and accessories.

Within our facilities we actively recycle 100% of steel waste from all aspects of our processing, beginning with the slitting of the master coil and continuing through to the final roll-forming of our product. Every day at every plant. Steel is fully recyclable and we have always been diligent in this effort.

Product development is focused on labor savings systems, which incorporates optimal utilization of all raw materials. From concept to launch, our product offering consciously engages optimal use of material as well as ease of construction.

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.

ClarkDietrich Building Systems
9100 Centre Pointe Dr., Ste. 210
West Chester, OH 45069
p. 513-870-1100
www.clarkdietrich.com

Manufacturing Sites:
Baltimore, MD
Baytown, TX
Bristol, CT
Dade City, FL
Dallas, TX
Kapolei, HI
McDonough, GA
Riverside, CA
Rochelle, IL
Sacramento, CA
Warren, OH East
Warren, OH West

PRODUCT

Product Description and Application
This declaration covers ProSTUD® Drywall Framing with DiamondPlus™ Coating. ClarkDietrich offers ProSTUD with DiamondPlus coating—the next generation of high-performance, code-compliant steel framing systems. The corrosion resistance of DiamondPlus Coating is superior to that of G40 Hot Dipped Galvanized. DiamondPlus Coating isn’t a paint, barrier or mere surface treatment. It attaches to the base substrate of the steel through a chemical reaction. The result? A permanently bonded coating that provides unparalleled corrosion protection. ProSTUD with DiamondPlus coating doesn’t just meet code, it surpasses it. DiamondPlus coated steel products have bare steel thicknesses in the range of 0.0150 inches to 0.0329 inches.

Common interior framing applications of the ProSTUD Drywall Framing system with DiamondPlus Coating:
- Fire Rated Partitions - Nonstructural
- Non Fire Rated Partitions - Nonstructural
- Ceilings
- Soffits
- Bulkheads
Technical Data
The following table lists metal thicknesses and strengths for ProSTUD Drywall Framing system with DiamondPlus Coating products.

<table>
<thead>
<tr>
<th>Product</th>
<th>Gauge</th>
<th>Mils</th>
<th>Bare Steel Thickness (inches)</th>
<th>Design Thickness (inches)</th>
<th>Yield Strength (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProSTUD</td>
<td>25 to 20</td>
<td>15 to 33</td>
<td>0.0150 to 0.0329</td>
<td>0.0158 to 0.0346</td>
<td>33 to 65</td>
</tr>
<tr>
<td>ProTRAK</td>
<td>25 to 20</td>
<td>15 to 33</td>
<td>0.0150 to 0.0329</td>
<td>0.0158 to 0.0346</td>
<td>33 to 50</td>
</tr>
</tbody>
</table>

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

Constructional Data
Placing on the market / Application rules
Most commonly used and referred to codes in the steel framing industry. List is not intended to be all-inclusive or comprehensive.

Manufacturing Codes
- ASTM C645, Specification for Nonstructural Steel Framing Members
  - Interior Framing – Nonstructural

Construction and Building Codes
- International Building Code (IBC)
  - Chapter 25, Section 2506, Gypsum Board and Gypsum Panel Product Materials
- International Residential Code (IRC)
  - Section R603: Cold-Formed Steel Wall Framing

American Iron and Steel Institute (AISI) Standards
- AISI S220: North American Standard for Cold-Formed Steel Framing – Nonstructural Members

Delivery status / Packaging
ProSTUD Drywall Framing with DiamondPlus Coating is packaged and shipped in skids. Products are generally nested together in pairs, then stacked with other sets of nested pairs and are held together using banding and wood dunnage (See Figure 1).
ENVIRONMENTAL PRODUCT DECLARATION
PROSTUD® WITH DIAMONDPLUS™ COATING

Base Materials / Ancillary Materials
DiamondPlus Coating treatment bonds chemically to the steel substrate, forming a superior anti-corrosion protection compared to an industry standard G40 grade steel. Primary product components as follows:

<table>
<thead>
<tr>
<th>Component Name</th>
<th>Mass by % of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Metal</td>
<td>&gt; 98.0 %</td>
</tr>
<tr>
<td>Metallic Coating</td>
<td>&lt; 1.9 %</td>
</tr>
<tr>
<td>DiamondPlus Coating</td>
<td>&lt; 0.1 %</td>
</tr>
</tbody>
</table>

Manufacture
Definitions:
- Secondary Steel Coils
  - Steel coils that are purchased on the secondary market that may or may not match exact specifications needed but can be roll reduced and coated to meet desired specifications.
  - Steel coil production took place at either a domestic or foreign steel mill located in United States (77.5%), Canada (8.6%), Mexico (5.7%), India (3.1%), China (2.9%), or Italy (2.2%).

Process for Secondary Steel
Secondary Steel Coils are received into the warehouse. Where necessary secondary steel coils are cold reduced to the appropriate thickness. When the Secondary Steel Coils are cold reduced, then they have an additional anti-corrosion coating added called DiamondPlus. The Secondary Steel Coils are slit into narrow coils, then the narrow coils are loaded into the roll forming machinery where they are roll formed 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.

The diagram below shows the flow of ProSTUD with DiamondPlus Coating products through major processes. The arrows between processes indicate transportation of intermediate products. Material input flow has associated inbound transportation.
LCA CALCULATION RULES

Declared Unit
The declared unit of calculation is one metric ton of steel construction product (1000 kg).

<table>
<thead>
<tr>
<th>Name</th>
<th>Required Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared Unit</td>
<td>Metric Ton</td>
<td>1</td>
</tr>
<tr>
<td>Density</td>
<td>kg/m³</td>
<td>7,850</td>
</tr>
</tbody>
</table>

System Boundary
The declared system boundary is cradle-to-gate. Cradle-to-gate includes the PCR life cycle modules A1, A2, and A3. The declared system boundaries are shown below:

<table>
<thead>
<tr>
<th>Production</th>
<th>Installation</th>
<th>Use Stage</th>
<th>End-Of-Life</th>
<th>Next Product System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material supply (extraction, processing, recycled material)</td>
<td>Transport to manufacturer</td>
<td>Transport to building site</td>
<td>Installation into building</td>
<td>Use / application</td>
</tr>
<tr>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
<td>A5</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MND</td>
<td>MND</td>
</tr>
</tbody>
</table>

Reference Service Life
Due to a cradle-to-gate declaration, a reference service life for steel products is not declared.

Scope
Temporal
All primary data were collected specific to the US. Where country / region specific secondary data were unavailable, proxy data were used but this is more an exception than the norm. Geographical representativeness is thus considered to be good.

Geographic
All primary data were collected for the year 2013. All secondary data come from the GaBi 2013 databases and are representative of the years 2009-2013. As the study intended to compare the product systems for the reference year 2013, temporal representativeness is good.
Data Quality Assessment
To ensure consistency, all primary data were collected with the same level of detail, while all background data were sourced from the GaBi databases. Allocation and other methodological choices were made consistently throughout the model.

Background Data
Most of the necessary life cycle inventories for the basic materials are available in the GaBi database. The last update of the database was 2013. Further LCIs for materials of the supply chain of the basic materials are approximated with LCIs of similar materials or estimated by the combination of available LCIs as documented in the background report. All datasets used in the major unit processes are provided in later sections of this report along with the description of the individual unit processes.

There is limited regional background data for steel that is specific to the US. We have there used the “NA: Steel hot dip galvanized” from worldsteel as the best available dataset for steel inputs. It must be noted that the worldsteel data set does not report waste and net water consumption flows as required by PCR. However, as the worldsteel methodology is in line with ISO 14044 allocation rules and is the best publicly available dataset for US steel, the use of this data set is justified. Water and waste indicators shall not be reported as explained in the background report.

Foreground Data
The foreground data collected by the manufacturer are based on yearly production amounts and extrapolations of measurements on specific machines and plants. The production data refer to an average of the year 2013.

Primary data for the production of DiamondPlus Coated products were collected by ClarkDietrich using a specifically developed spreadsheet provided by thinkstep. Cross-checks concerning the plausibility of mass and energy flows were carried out by thinkstep on the data received via email, telephone consultation and teleconferencing.

Statement of Comparability
Any comparison of EPD’s shall be subject to the requirements of ISO 21930. For comparison of EPD’s which report different module scopes, such that one EPD includes Module D and the other does not, the comparison shall only be made on the basis of Modules A1, A2, and A3. Additionally, when Module D is included in the EPD’s being compared, all EPD’s must use the same methodology for calculation of Module D values.

Declaration of Environmental Impact Derived from LCA
Disclaimer: This Environmental Product Declaration (EPD) conforms to ISO 14025, ISO 14040, ISO 14044, and ISO 21930.

Scope of Results Reported: The PCR requires the reporting of a limited set of LCA metrics; therefore, there may be relevant environmental impacts beyond those disclosed by this EPD. The EPD does not indicate that any environmental or social performance benchmarks are met nor thresholds exceeded.

Accuracy of Results: This EPD has been developed in accordance with the PCR applicable for the identified product following the principles, requirements and guidelines of the ISO 14040, ISO 14044, ISO 14025 and ISO 21930 standards. The results in this EPD are estimations of potential impacts. The accuracy of results in different EPD’s may vary as a result of value choices, background data assumptions and quality of data collected.

Comparability: EPD’s are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate, and could lead to the erroneous selection of materials or products which are higher - impact, at least in some impact categories. Any comparison of EPD’s shall be subject to the requirements of ISO 21930. For comparison of EPD’s which report different
module scopes, such that one EPD includes Module D and the other does not, the comparison shall only be made on the basis of Modules A1, A2, and A3. Additionally, when Module D is included in the EPD’s being compared, all EPD’s must use the same methodology for calculation of Module D values.

Parameters Describing Environmental Impacts
In accordance to the guiding PCR, the characterization method will be based on TRACI March 2012 v2.1 and CML 2012 v4.1.

Environmental impact: 1 metric ton of DiamondPlus coated product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>LCIA Method</th>
<th>A1 – A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>GWP</td>
<td>[metric ton CO₂-eq.]</td>
<td>TRACI (version 2.1)</td>
<td>2.69</td>
</tr>
<tr>
<td>ODP</td>
<td>[metric ton CFC11-eq.]</td>
<td>TRACI (version 2.1)</td>
<td>1.18E-07</td>
</tr>
<tr>
<td>AP</td>
<td>[metric ton SO₂-eq.]</td>
<td>TRACI (version 2.1)</td>
<td>0.0156</td>
</tr>
<tr>
<td>EP</td>
<td>[metric ton PO₄³⁻- eq.]</td>
<td>TRACI (version 2.1)</td>
<td>6.45E-04</td>
</tr>
<tr>
<td>Smog</td>
<td>[metric ton O₃ eq.]</td>
<td>TRACI (version 2.1)</td>
<td>0.215</td>
</tr>
<tr>
<td>ADPE*</td>
<td>[metric ton Sb eq.]</td>
<td>CML Baseline Method, Version 4.1 (October 2012)</td>
<td>4.84E-05</td>
</tr>
</tbody>
</table>

* This indicator is based on assumptions regarding current reserves estimates. Although this impact category is required for those EPD meant to be in compliance with the PCR, users should use caution when interpreting results because there is insufficient information on which indicator is best for assessing the depletion on abiotic resources.

Parameters Describing Resource Use
Resource use: 1 metric of DiamondPlus coated product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1 – A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERE</td>
<td>[MJ]</td>
<td>1990</td>
</tr>
<tr>
<td>PERM</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>PERT</td>
<td>[MJ]</td>
<td>1990</td>
</tr>
<tr>
<td>PENRE</td>
<td>[MJ]</td>
<td>3490</td>
</tr>
<tr>
<td>PENRM</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>PENRT</td>
<td>[MJ]</td>
<td>3490</td>
</tr>
<tr>
<td>SM</td>
<td>[metric ton]</td>
<td>0.464</td>
</tr>
<tr>
<td>RSF</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>NRSF</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>FW</td>
<td>[M³]</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

* PERE = Use of renewable primary energy as raw materials; PERM = Use of renewable primary energy as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy as raw materials; PENRM = Use of non-renewable primary energy d as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Date of Issue: June 30, 2015
Period of Validity: 5 years
Declaration#: EPD10057
Parameters Describing Waste Categories and Output Flows

Output flows and waste categories: 1 metric ton of DiamondPlus coated product

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1- A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>HWD</td>
<td>[metric ton]</td>
<td>Not reported</td>
</tr>
<tr>
<td>NHWD</td>
<td>[metric ton]</td>
<td>Not reported</td>
</tr>
<tr>
<td>RWD</td>
<td>[metric ton]</td>
<td>Not reported</td>
</tr>
<tr>
<td>CRU</td>
<td>[metric ton]</td>
<td>0</td>
</tr>
<tr>
<td>MFR</td>
<td>[metric ton]</td>
<td>0.0665</td>
</tr>
<tr>
<td>MER</td>
<td>[metric ton]</td>
<td>0</td>
</tr>
<tr>
<td>EEE</td>
<td>[MJ]</td>
<td>0</td>
</tr>
<tr>
<td>EET</td>
<td>[MJ]</td>
<td>0</td>
</tr>
</tbody>
</table>

Caption: HWD = Hazardous waste disposed; NHWD = Non–hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

FW, HWD, NHWD and RWD flows have not been reported as the worldsteel dataset used does report on waste and net water consumption flows in sufficient detail. The dataset is otherwise representative of the technology and conforms to ISO 14044.

Interpretation – DiamondPlus Coated

Module A1 dominates across all impact categories, contributing at least 90% of impacts in every category except for primary energy from renewable resources (PERT), where the contribution is lower at about 67%. For PERT, the higher A3 impacts come from the paper, corrugate and wood used in packaging, where the materials themselves embody renewable primary energy. With the exception of PERT, contributions from A3 range from 0–5% across the impact categories/indicators. As a whole, module A2 contributes very little, exhibiting a maximum contribution of about 2% in the case of Eutrophication potential (EP).
CLASSIFICATION: 05 40 00 - Cold-Formed Steel Framing

PRODUCT DESCRIPTION: To obtain cold-formed steel framing products with Residuals Disclosure levels of 1,000 ppm you must request mill certified steel when you place your order. If this request is made after manufacturing we cannot guarantee the desired Residuals Disclosure levels of 1,000 ppm. Base Metal: Steel. Base Metal Coating: Galvanized with Passivation (if applicable). Product ID - HPD covers Interior Framing Products, Interior Finishing Products, Exterior Framing Products, Floor Framing Products, Clips & Connectors, and Plaster Stucco & Veneer Products made of Cold-Formed Steel Framing. This includes, but is not limited to the following brand name products and systems, RedHeader PRO™ Rough Opening System, ProSTUD® Drywall Framing System, HDS®, MaxTrak®. Additional MasterSpecs: 09 22 16.00 Finishes:Non-Structural Metal Framing, 09 24 00 Finishes: Cement Plastering, 09 21 16.23 Finishes: Gypsum Board Shaft Wall Assemblies.

SAFETY: Occupational Exposure Limits (OELs): Cold-Formed Steel Product as sold and shipped in its physical form does not present an inhalation, ingestion or contact hazard. However, operations such as burning, welding (high temperature), sawing, brazing, machining, grinding, etc. may produce fumes and/or particulates. Please refer to the ClarkDietrich Safety Data Sheet (SDS) for more information.

Section 1: Summary

CONTENT INVENTORY

<table>
<thead>
<tr>
<th>Inventory Reporting Format</th>
<th>Threshold Disclosed Per</th>
<th>Threshold level</th>
<th>Residuals/Impurities</th>
<th>Are All Substances Above the Threshold Indicated:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nested Materials Method</td>
<td>Material</td>
<td>100 ppm</td>
<td>Residuals/Impurities</td>
<td>Characterized: Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000 ppm</td>
<td>Considered in 0 of 3 Materials</td>
<td>No</td>
</tr>
<tr>
<td>Basic Method</td>
<td>Product</td>
<td>Per GHS SDS</td>
<td>Explanation(s) provided for Residuals/Impurities?</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Per OSHA MSDS</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to its chemical substances or any health risk. Refer to Section 2 for further details.

MATERIAL | SUBSTANCE | RESIDUAL OR IMPURITY | GREENSCREEN SCORE | HAZARD TYPE
---|---|---|---|---
STEEL | IRON | LT-P1 | END | MANGANESE | LT-P1 | END | MUL | REP | PHOSPHORUS | BM-2 | PHY | MAM | COPPER | LT-UNK | NICKEL | LT-1 | CAN | RES | SKI | MAM | MUL | CHROMIUM | LT-P1 | RES | END | SKI | MOLYBDENUM | LT-UNK | CARBON | LT-UNK | VANADIUM | LT-1 | MUL | CAN | GEN | NIOBIUM | LT-UNK | TITANIUM | LT-UNK | SULFUR | LT-UNK | SKI | GALVANIZATION | (COATING) | ZINC | LT-P1 | AQU | PHY | END | MUL | ALUMINUM | LT-P1 | RES | PHY | END | PASSIVATION | COATING | PHOSPHORIC | ACID | LT-P1 | SKI | CHROMIUM | (III) | CHROMATE | LT-1 | CAN | DEL | REP | AQU | PHY | SKI | MUL | GEN | CHROMIUM | (VI) | OXIDE | LT-1 | RES | CAN | DEL | REP | GEN | AQU | PHY | MAM | SKI | MUL | PHOSPHORIC | ACID | CHROMIUM | (3+) | SALT | (1:1) | LT-P1 | SKI | CHROMIUM | FLUORIDE | (C2F5) | LT-P1 | SKI | HYDROFLUORIC | ACID | BM-2 | MAM | SKI | MUL | PHY | CHROMIUM | NITRATE | LT-P1 | SKI | MANGANESE | BIS-(D-GLUCONATO-O1,O2)- | (T-4) | LT-UNK | MANGANESE | CITRATE | NOGS | SILICA | AMORPHOUS | LT-P1 | CAN | NITRIC | ACID | LT-P1 | PHY | SKI | MAM | CHROMIUM | (III) | OXIDE | LT-P1 | SKI |

VOLATILE ORGANIC COMPOUND (VOC) CONTENT

CERTIFICATIONS AND COMPLIANCE

VOC emissions: Inherently non-emitting source per LEED®

CONSISTENCY WITH OTHER PROGRAMS

See Section 3 for additional listings.
No pre-checks completed or disclosed.
# Section 2: Content in Descending Order of Quantity

This section lists contents in a product based on specific threshold(s) and reports detailed health information including hazards. This HPD uses the inventory method indicated above, which is one of three possible methods:

- Basic Inventory method with Product-level threshold.
- Nested Material Inventory method with Product-level threshold
- Nested Material Inventory method with individual Material-level thresholds

Definitions and requirements for the three inventory methods and requirements for each data field can be found in the HPD Open Standard version 2.1, available on the HPDC website at: [www.hpd-collaborative.org/hpd-2-1-standard](http://www.hpd-collaborative.org/hpd-2-1-standard)

## STEEL

<table>
<thead>
<tr>
<th>%: 90.8200 - 99.6400</th>
<th>HPD URL:</th>
</tr>
</thead>
</table>

**PRODUCT THRESHOLD:** 1000 ppm  
**RESIDUALS AND IMPURITIES CONSIDERED:** No

**RESIDUALS AND IMPURITIES NOTES:** All commercial steel products contain small amounts of various elements in addition to those listed. These small quantities are frequently referred to as “trace” or “residual” elements that generally originate in the raw materials used. Steel products may contain the following trace or residual elements including typical percentages for the elements identified: aluminum (0.01-0.5), boron (≤0.005 max, typically 0.001%), calcium (≤ 0.005 max, typically 0.0003%), nitrogen (≤ 0.01 max, typically 0.006%), silicon (≤ 0.03 max, typically 0.002%), and tin (≤ 0.03 max, typically 0.002%). Other trace elements not frequently identified, may include antimony, arsenic, cadmium, cobalt, lead, and zirconium.

**OTHER MATERIAL NOTES:** Final percentage concentration of steel in the finished product depends on the ratio of steel (base metal) to the corrosion resistant galvanized coating. For example, a G90 coating on a 15-mil steel product represents 9.2% of the overall product weight, while a G40 coating on a 97-mil steel product only represents 0.4% of the overall product weight. These percentages will vary depending on the product mix ordered.

## IRON

<table>
<thead>
<tr>
<th>%: 96.0600 - 97.8090</th>
<th>GS: LT-P1</th>
<th>RC: Both</th>
<th>NANO: No</th>
<th>ROLE: Base Metal</th>
</tr>
</thead>
</table>

**HAZARDS:**  
**AGENCY(IES) WITH WARNINGS:**

**ENDOCRINE**  
TEDX - Potential Endocrine Disruptors  
Potential Endocrine Disruptor

**SUBSTANCE NOTES:**

## MANGANESE

<table>
<thead>
<tr>
<th>%: 1.1500 - 1.6500</th>
<th>GS: LT-P1</th>
<th>RC: Both</th>
<th>NANO: No</th>
<th>ROLE: Alloying Metal</th>
</tr>
</thead>
</table>

**HAZARDS:**  
**AGENCY(IES) WITH WARNINGS:**

**ENDOCRINE**  
TEDX - Potential Endocrine Disruptors  
Potential Endocrine Disruptor

**MULTIPLE**  
German FEA - Substances Hazardous to Waters  
Class 2 - Hazard to Waters

**REPRODUCTIVE**  
Japan - GHS  
Toxic to reproduction - Category 1B

**SUBSTANCE NOTES:**
### PHOSPHORUS

**ID:** 7723-14-0  
**%:** 0.2000 - 0.2300  
**GS:** BM-2  
**RC:** Both  
**NANO:** No  
**ROLE:** Alloying Metal

**HAZARDS:**  
**AGENCY(IES) WITH WARNINGS:**

- **PHYSICAL HAZARD (REACTION):** EU - GHS (H-Statements)  
  - H228 - Flammable solid

- **MAMMALIAN:** US EPA - EPCRA Extremely Hazardous Substances  
  - Extremely Hazardous Substances

**SUBSTANCE NOTES:**

### COPPER

**ID:** 7440-50-8  
**%:** 0.2000 - 0.5000  
**GS:** LT-UNK  
**RC:** Both  
**NANO:** No  
**ROLE:** Alloying Metal

**HAZARDS:**  
**AGENCY(IES) WITH WARNINGS:**

- None Found
  - No warnings found on HPD Priority lists

**SUBSTANCE NOTES:**

### NICKEL

**ID:** 7440-02-0  
**%:** 0.2000 - 0.3000  
**GS:** LT-1  
**RC:** None  
**NANO:** No  
**ROLE:** Alloying Metal

**HAZARDS:**  
**AGENCY(IES) WITH WARNINGS:**

- **CANCER:** IARC  
  - Group 1 - Agent is Carcinogenic to humans

- **CANCER:** IARC  
  - Group 2b - Possibly carcinogenic to humans

- **CANCER:** CA EPA - Prop 65  
  - Carcinogen

- **CANCER:** US CDC - Occupational Carcinogens  
  - Occupational Carcinogen

- **CANCER:** US NIH - Report on Carcinogens  
  - Reasonably Anticipated to be Human Carcinogen

- **RESPIRATORY:** AOEC - Asthmagens  
  - Asthmagen (ARs) - sensitizer-induced - inhalable forms only

- **SKIN SENSITIZE:** EU - GHS (H-Statements)  
  - H317 - May cause an allergic skin reaction

- **CANCER:** EU - GHS (H-Statements)  
  - H351 - Suspected of causing cancer

- **ORGAN TOXICANT:** EU - GHS (H-Statements)  
  - H372 - Causes damage to organs through prolonged or repeated exposure

- **MULTIPLE:** German FEA - Substances Hazardous to Waters  
  - Class 2 - Hazard to Waters

- **CANCER:** MAK  
  - Carcinogen Group 1 - Substances that cause cancer in man

- **RESPIRATORY:** MAK  
  - Sensitizing Substance Sah - Danger of airway & skin sensitization
## CHROMIUM

<table>
<thead>
<tr>
<th>%</th>
<th>GS</th>
<th>RC</th>
<th>NANO</th>
<th>ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1500 - 0.3000</td>
<td>LT-P1</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
</tr>
</tbody>
</table>

**HAZARDS:**

- **RESPIRATORY**
  - AOEC - Asthmagens
  - Asthmagen (ARs) - sensitizer-induced - inhalable forms only
- **ENDOCRINE**
  - TEDX - Potential Endocrine Disruptors
  - Potential Endocrine Disruptor
- **SKIN SENSITIZE**
  - MAK
  - Sensitizing Substance Sh - Danger of skin sensitization

## MOLYBDENUM

<table>
<thead>
<tr>
<th>%</th>
<th>GS</th>
<th>RC</th>
<th>NANO</th>
<th>ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0600 - 0.1600</td>
<td>LT-UNK</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
</tr>
</tbody>
</table>

**HAZARDS:**

- None Found
- No warnings found on HPD Priority lists

## CARBON

<table>
<thead>
<tr>
<th>%</th>
<th>GS</th>
<th>RC</th>
<th>NANO</th>
<th>ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0300 - 0.2500</td>
<td>LT-UNK</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
</tr>
</tbody>
</table>

**HAZARDS:**

- None Found
- No warnings found on HPD Priority lists

## VANADIUM

<table>
<thead>
<tr>
<th>%</th>
<th>GS</th>
<th>RC</th>
<th>NANO</th>
<th>ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0080 - 0.2000</td>
<td>LT-1</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
</tr>
</tbody>
</table>

**HAZARDS:**

- **MULTIPLE**
  - German FEA - Substances Hazardous to Waters
  - Class 3 - Severe Hazard to Waters
- **CANCER**
  - MAK
  - Carcinogen Group 2 - Considered to be carcinogenic for man
- **GENE MUTATION**
  - MAK
  - Germ Cell Mutagen 2
<table>
<thead>
<tr>
<th>Substance</th>
<th>ID</th>
<th>%</th>
<th>GS</th>
<th>RC</th>
<th>NANO</th>
<th>ROLE</th>
<th>HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIOBIUM</td>
<td>7440-03-1</td>
<td>0.0080 - 0.1500</td>
<td>LT-UNK</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
<td>None Found</td>
</tr>
<tr>
<td>TITANIUM</td>
<td>7440-32-6</td>
<td>0.0080 - 0.2000</td>
<td>LT-UNK</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
<td>None Found</td>
</tr>
<tr>
<td>SULFUR</td>
<td>7704-34-9</td>
<td>0.0070 - 0.0400</td>
<td>LT-UNK</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
<td>SKIN IRRITATION</td>
</tr>
<tr>
<td>GALVANIZATION (COATING)</td>
<td>7440-66-6</td>
<td>0.3600 - 9.1800</td>
<td>LT-UNK</td>
<td>Both</td>
<td>No</td>
<td>Alloying Metal</td>
<td>All commercial galvanizing products contain small amounts of various elements in addition to those listed. These small quantities of impurities are frequently referred to as “trace” or “residual” elements that generally originate in the raw or recycled materials used. Galvanizing products may contain the following trace or residual elements including typical maximum percentages for the elements identified: lead (0.01%), iron (0.01%), cadmium (0.01%), copper (0.01%), other elements (0.01%) balance by difference. Other material notes: The minimum and maximum percentages vary based on the thickness of base steel ordered and the level or corrosion protection ordered. For example a G40 coating on 97-mil sheet steel would only be 0.36% of the total weight, while a G90 coating on 15-mil sheet steel would be 9.18% of the total weight. This will vary depending on customer order requirements.</td>
</tr>
</tbody>
</table>
### Aluminum

<table>
<thead>
<tr>
<th>%: 0.2500 - 1.0000</th>
<th>GS: LT-P1</th>
<th>RC: Both</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
</tr>
</thead>
</table>

**HAZARDS:**

**RESPIRATORY**

- **AOEC - Asthmagens**
  - Asthmagen (ARs) - sensitizer-induced - inhalable forms only

**PHYSICAL HAZARD (REACTIVE)**

- **EU - GHS (H-Statements)**
  - H228 - Flammable solid

**PHYSICAL HAZARD (REACTIVE)**

- **EU - GHS (H-Statements)**
  - H250 - Catches fire spontaneously if exposed to air

**PHYSICAL HAZARD (REACTIVE)**

- **EU - GHS (H-Statements)**
  - H261 - In contact with water releases flammable gases which may ignite spontaneously

**ENDOCRINE**

- **TEDX - Potential Endocrine Disruptors**
  - Potential Endocrine Disruptor

**SUBSTANCE NOTES:** Corrosion Protection

### Passivation Coating

<table>
<thead>
<tr>
<th>%: 0.0080 - 0.0980</th>
<th>HPD URL:</th>
</tr>
</thead>
</table>

**PRODUCT THRESHOLD:** 1000 ppm

**RESIDUALS AND IMPURITIES CONSIDERED:** No

**RESIDUALS AND IMPURITIES NOTES:** These are highly controlled mixtures with no known impurities.

**OTHER MATERIAL NOTES:** Steel sheet coils are galvanized at the steel mill, and then as an industry standard an additional passivation coating, variations all commonly known as "chem treat", is applied. This is an additional corrosion protection that helps prevent the formation of zinc oxide otherwise known as "white rust". There are many variations of "chem treat" used across the industry, and due to difficulties in tracing which specific "chem treat" was used on each order all possible hazardous components are listed here.

### Phosphoric Acid

<table>
<thead>
<tr>
<th>%: 10.0000 - 30.0000</th>
<th>GS: LT-P1</th>
<th>RC: UNK</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
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</table>

**PHOSPHORIC ACID**

<table>
<thead>
<tr>
<th>%: 10.0000 - 30.0000</th>
<th>GS: LT-P1</th>
<th>RC: UNK</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
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</table>

**PHOSPHORIC ACID**

<table>
<thead>
<tr>
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<th>GS: LT-P1</th>
<th>RC: UNK</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
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</thead>
</table>

**PHOSPHORIC ACID**

<table>
<thead>
<tr>
<th>%: 10.0000 - 30.0000</th>
<th>GS: LT-P1</th>
<th>RC: UNK</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
</tr>
</thead>
</table>
SKIN IRRITATION

EU - GHS (H-Statements)

H314 - Causes severe skin burns and eye damage

SUBSTANCE NOTES: Corrosion Protection

CHROMIUM (III) CHROMATE

ID: 24613-89-6

%: 10.0000 - 20.0000

GS: LT-1
RC: UNK
NANO: No
ROLE: Corrosion Protection

HAZARDS:

AGENCY(IES) WITH WARNINGS:

CANCER

IARC

Group 1 - Agent is Carcinogenic to humans

CANCER

CA EPA - Prop 65

Carcinogen

DEVELOPMENTAL

CA EPA - Prop 65

Developmental toxicity

REPRODUCTIVE

CA EPA - Prop 65

Reproductive Toxicity - Female

REPRODUCTIVE

CA EPA - Prop 65

Reproductive Toxicity - Male

CANCER

US CDC - Occupational Carcinogens

Occupational Carcinogen

CANCER

EU - SVHC Authorisation List

Carcinogenic - Banned unless Authorised

ACUTE AQUATIC

EU - GHS (H-Statements)

H400 - Very toxic to aquatic life

CHRON AQUATIC

EU - GHS (H-Statements)

H410 - Very toxic to aquatic life with long lasting effects

PHYSICAL HAZARD (REACTIVE)

EU - GHS (H-Statements)

H271 - May cause fire or explosion; strong oxidiser

SKIN IRRITATION

EU - GHS (H-Statements)

H314 - Causes severe skin burns and eye damage

SKIN SENSITIZE

EU - GHS (H-Statements)

H317 - May cause an allergic skin reaction

CANCER

EU - GHS (H-Statements)

H350 - May cause cancer

CANCER

EU - GHS (H-Statements)

H350i - May cause cancer by inhalation

CANCER

EU - REACH Annex XVII CMRs

Carcinogen Category 2 - Substances which should be regarded as if they are Carcinogenic to man

MULTIPLE

ChemSec - SIN List

CMR - Carcinogen, Mutagen &/or Reproductive Toxicant

MULTIPLE

German FEA - Substances Hazardous to Waters

Class 3 - Severe Hazard to Waters

CANCER

MAK

Carcinogen Group 1 - Substances that cause cancer in man

SKIN SENSITIZE

MAK

Sensitizing Substance Sh - Danger of skin sensitization

CANCER

Korea - GHS

Carcinogenicity - Category 1 [H350 - May cause cancer]

CANCER

EU - Annex VI CMRs

Carcinogen Category 1B - Presumed Carcinogen based on animal evidence

GENE MUTATION

MAK

Germ Cell Mutagen 2

GENE MUTATION

Australia - GHS

H340 - May cause genetic defects

CANCER

Australia - GHS

H350 - May cause cancer
## CHROMIUM (VI) OXIDE

**ID:** 1333-82-0  
**%:** 7.0000 - 13.0000  
**GS:** LT-1  
**RC:** UNK  
**NANO:** No  
**ROLE:** Corrosion Protection

### HAZARDS:

<table>
<thead>
<tr>
<th>Category</th>
<th>Agency(ies) with warnings</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESPIRATORY</strong></td>
<td>AOEC - Asthmagens</td>
<td>Asthmagen (Rs) - sensitizer-induced</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>IARC</td>
<td>Group 1 - Agent is Carcinogenic to humans</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>CA EPA - Prop 65</td>
<td>Carcinogen</td>
</tr>
<tr>
<td><strong>DEVELOPMENTAL</strong></td>
<td>CA EPA - Prop 65</td>
<td>Developmental toxicity</td>
</tr>
<tr>
<td><strong>REPRODUCTIVE</strong></td>
<td>CA EPA - Prop 65</td>
<td>Reproductive Toxicity - Female</td>
</tr>
<tr>
<td><strong>REPRODUCTIVE</strong></td>
<td>CA EPA - Prop 65</td>
<td>Reproductive Toxicity - Male</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>US CDC - Occupational Carcinogens</td>
<td>Occupational Carcinogen</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>US NIH - Report on Carcinogens</td>
<td>Known to be a human Carcinogen</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>EU - SVHC Authorisation List</td>
<td>Carcinogenic - Banned unless Authorised</td>
</tr>
<tr>
<td><strong>GENE MUTATION</strong></td>
<td>EU - SVHC Authorisation List</td>
<td>Mutagenic - Banned unless Authorised</td>
</tr>
<tr>
<td><strong>ACUTE AQUATIC</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H400 - Very toxic to aquatic life</td>
</tr>
<tr>
<td><strong>CHRON AQUATIC</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H410 - Very toxic to aquatic life with long lasting effects</td>
</tr>
<tr>
<td><strong>PHYSICAL HAZARD (REACTIVE)</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H271 - May cause fire or explosion; strong oxidiser</td>
</tr>
<tr>
<td><strong>MAMMALIAN</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H301 - Toxic if swallowed</td>
</tr>
<tr>
<td><strong>MAMMALIAN</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H311 - Toxic in contact with skin</td>
</tr>
<tr>
<td><strong>SKIN IRRITATION</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H314 - Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td><strong>SKIN SENSITIZE</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H317 - May cause an allergic skin reaction</td>
</tr>
<tr>
<td><strong>MAMMALIAN</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H330 - Fatal if inhaled</td>
</tr>
<tr>
<td><strong>RESPIRATORY</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled</td>
</tr>
<tr>
<td><strong>GENE MUTATION</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H340 - May cause genetic defects</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H350 - May cause cancer</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H350i - May cause cancer by inhalation</td>
</tr>
<tr>
<td><strong>REPRODUCTIVE</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H361f - Suspected of damaging fertility</td>
</tr>
<tr>
<td><strong>ORGAN TOXICANT</strong></td>
<td>EU - GHS (H-Statements)</td>
<td>H372 - Causes damage to organs through prolonged or repeated exposure</td>
</tr>
<tr>
<td><strong>CANCER</strong></td>
<td>EU - REACH Annex XVII CMRs</td>
<td>Carcinogen Category 1 - Substances known to be Carcinogenic to man</td>
</tr>
<tr>
<td><strong>GENE MUTATION</strong></td>
<td>EU - REACH Annex XVII CMRs</td>
<td>Mutagen Category 2 - Substances which should be regarded as if they are Mutagenic to man</td>
</tr>
<tr>
<td>MULTIPLE</td>
<td>ChemSec - SIN List</td>
<td>CMR - Carcinogen, Mutagen &amp;/or Reproductive Toxicant</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>MULTIPLE</td>
<td>German FEA - Substances Hazardous to Waters</td>
<td>Class 3 - Severe Hazard to Waters</td>
</tr>
<tr>
<td>CANCER</td>
<td>MAK</td>
<td>Carcinogen Group 1 - Substances that cause cancer in man</td>
</tr>
<tr>
<td>SKIN SENSITIZE</td>
<td>MAK</td>
<td>Sensitizing Substance Sh - Danger of skin sensitization</td>
</tr>
<tr>
<td>CANCER</td>
<td>Korea - GHS</td>
<td>Carcinogenicity - Category 1 [H350 - May cause cancer]</td>
</tr>
<tr>
<td>CANCER</td>
<td>EU - Annex VI CMRs</td>
<td>Carcinogen Category 1A - Known human Carcinogen based on human evidence</td>
</tr>
<tr>
<td>GENE MUTATION</td>
<td>EU - Annex VI CMRs</td>
<td>Mutagen - Category 1B</td>
</tr>
<tr>
<td>GENE MUTATION</td>
<td>New Zealand - GHS</td>
<td>6.6A - Known or presumed human mutagens</td>
</tr>
<tr>
<td>CANCER</td>
<td>New Zealand - GHS</td>
<td>6.7A - Known or presumed human carcinogens</td>
</tr>
<tr>
<td>REPRODUCTIVE</td>
<td>New Zealand - GHS</td>
<td>6.8A - Known or presumed human reproductive or developmental toxicants</td>
</tr>
<tr>
<td>CANCER</td>
<td>Japan - GHS</td>
<td>Carcinogenicity - Category 1A</td>
</tr>
<tr>
<td>GENE MUTATION</td>
<td>Japan - GHS</td>
<td>Germ cell mutagenicity - Category 1B</td>
</tr>
<tr>
<td>REPRODUCTIVE</td>
<td>Japan - GHS</td>
<td>Toxic to reproduction - Category 1B</td>
</tr>
<tr>
<td>GENE MUTATION</td>
<td>MAK</td>
<td>Germ Cell Mutagen 2</td>
</tr>
<tr>
<td>CANCER</td>
<td>Australia - GHS</td>
<td>H350 - May cause cancer</td>
</tr>
</tbody>
</table>

SUBSTANCE NOTES: Corrosion Protection

**PHOSPHORIC ACID, CHROMIUM(3++) SALT (1:1)**

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<th>RC: UNK</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
</tr>
</thead>
</table>

HAZARDS:

SKIN SENSITIZE MAK Sensitizing Substance Sh - Danger of skin sensitization

SUBSTANCE NOTES: Corrosion Protection

**CHROMIUM FLUORIDE (CRF3)**

<table>
<thead>
<tr>
<th>%: 1.0000 - 5.0000</th>
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<th>RC: UNK</th>
<th>NANO: No</th>
<th>ROLE: Corrosion Protection</th>
</tr>
</thead>
</table>

HAZARDS:

SKIN SENSITIZE MAK Sensitizing Substance Sh - Danger of skin sensitization

SUBSTANCE NOTES: Corrosion Protection
HYDROFLUORIC ACID

**ID:** 7664-39-3
**%:** 1.0000 - 5.0000
**GS:** BM-2
**RC:** UNK
**NANO:** No
**ROLE:** Corrosion Protection

**HAZARDS:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Agency(ies) with warnings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAMMALIAN</td>
<td>EU - GHS (H-Statements)</td>
<td>H300 - Fatal if swallowed</td>
</tr>
<tr>
<td>MAMMALIAN</td>
<td>EU - GHS (H-Statements)</td>
<td>H310 - Fatal in contact with skin</td>
</tr>
<tr>
<td>SKIN IRRITATION</td>
<td>EU - GHS (H-Statements)</td>
<td>H314 - Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>MAMMALIAN</td>
<td>EU - GHS (H-Statements)</td>
<td>H330 - Fatal if inhaled</td>
</tr>
<tr>
<td>MULTIPLE</td>
<td>German FEA - Substances Hazardous to Waters</td>
<td>Class 2 - Hazard to Waters</td>
</tr>
<tr>
<td>MAMMALIAN</td>
<td>US EPA - EPCRA Extremely Hazardous Substances</td>
<td>Extremely Hazardous Substances</td>
</tr>
<tr>
<td>PHYSICAL HAZARD (REACTIVE)</td>
<td>Korea - GHS</td>
<td>H290 - May be corrosive to metals</td>
</tr>
</tbody>
</table>

**SUBSTANCE NOTES:** Corrosion Protection

CHROMIUM NITRATE

**ID:** 13548-38-4
**%:** 1.0000 - 5.0000
**GS:** LT-P1
**RC:** UNK
**NANO:** No
**ROLE:** Corrosion Protection

**HAZARDS:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Agency(ies) with warnings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKIN SENSITIZE</td>
<td>MAK</td>
<td>Sensitizing Substance Sh - Danger of skin sensitization</td>
</tr>
</tbody>
</table>

**SUBSTANCE NOTES:** Corrosion Protection

MANGANESE, BIS(D-GLUCONATO-O1,O2)-, (T-4)-

**ID:** 6485-39-8
**%:** 1.0000 - 10.0000
**GS:** LT-UNK
**RC:** UNK
**NANO:** No
**ROLE:** Corrosion Protection

**HAZARDS:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Agency(ies) with warnings</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>None Found</td>
<td>No warnings found on HPD Priority lists</td>
<td></td>
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</tbody>
</table>

**SUBSTANCE NOTES:** Corrosion Protection

MANGANESE CITRATE

**ID:** 10024-66-5
**%:** 1.0000 - 5.0000
**GS:** NoGS
**RC:** UNK
**NANO:** No
**ROLE:** Corrosion Protection

**HAZARDS:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Agency(ies) with warnings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>None Found</td>
<td>No warnings found on HPD Priority lists</td>
<td></td>
</tr>
</tbody>
</table>

**SUBSTANCE NOTES:** Corrosion Protection
**SILICA, AMORPHOUS**

ID: 7631-86-9

| %: 1.0000 - 5.0000 | GS: LT-P1 | RC: UNK | NANO: No | ROLE: Corrosion Protection |

**HAZARDS:**

**AGENCY(IES) WITH WARNINGS:**

**CANCER**

Japan - GHS

Carcinogenicity - Category 1A

**SUBSTANCE NOTES:** Corrosion Protection

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**NITRIC ACID**

ID: 7697-37-2

| %: 1.0000 - 5.0000 | GS: LT-P1 | RC: UNK | NANO: No | ROLE: Corrosion Protection |

**HAZARDS:**

**AGENCY(IES) WITH WARNINGS:**

**PHYSICAL HAZARD (REACTIVE)**

EU - GHS (H-Statements)

H272 - May intensify fire; oxidiser

**SKIN IRRITATION**

EU - GHS (H-Statements)

H314 - Causes severe skin burns and eye damage

**MAMMALIAN**

US EPA - EPCRA Extremely Hazardous Substances

 Extremely Hazardous Substances

**PHYSICAL HAZARD (REACTIVE)**

Korea - GHS

H271 - May cause fire or explosion; strong oxidizer

**SUBSTANCE NOTES:** Corrosion Protection

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**CHROMIUM (III) OXIDE**

ID: 1308-38-9

| %: 0.1000 - 1.0000 | GS: LT-P1 | RC: UNK | NANO: No | ROLE: Corrosion Protection |

**HAZARDS:**

**AGENCY(IES) WITH WARNINGS:**

**SKIN SENSITIZE**

MAK

Sensitizing Substance Sh - Danger of skin sensitization

**SUBSTANCE NOTES:** Corrosion Protection
Section 3: Certifications and Compliance

This section lists applicable certification and standards compliance information for VOC emissions and VOC content. Other types of health or environmental performance testing or certifications completed for the product may be provided.

### VOC EMISSIONS

<table>
<thead>
<tr>
<th>CERTIFYING PARTY:</th>
<th>Self-declared</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERTIFICATE URL:</td>
<td></td>
</tr>
<tr>
<td>CERTIFICATION AND COMPLIANCE NOTES:</td>
<td>Cold-Formed Steel Framing is considered an inherently non-emitting source per LEED®</td>
</tr>
</tbody>
</table>

| ISSUE DATE: | 2018-07-11 |
| EXPIRY DATE: | |
| CERTIFIER OR LAB: | LEED |

Section 4: Accessories

This section lists related products or materials that the manufacturer requires or recommends for installation (such as adhesives or fasteners), maintenance, cleaning, or operations. For information relating to the contents of these related products, refer to their applicable Health Product Declarations, if available.

#### STEEL TAPPING SCREWS FOR COLD-FORMED STEEL FRAMING CONNECTIONS

HPD URL: **No HPD available**

**CONDITION WHEN RECOMMENDED OR REQUIRED AND/OR OTHER NOTES:**

Self-drilling and self-piercing screws (per ASTM C1513) are used to connect cold-formed steel framing members together in preparation to receive gypsum panel products.

Section 5: General Notes

ClarkDietrich Building Systems offers a comprehensive lineup of steel construction products and services across the United States and abroad. Using cold-formed steel, we manufacture innovative products for interior framing, interior finishing, exterior framing, floor and roof framing, as well as clips, connectors, metal lath, barrier mesh 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.
MANUFACTURER INFORMATION

MANUFACTURER: ClarkDietrich Building Systems
ADDRESS: 9050 Centre Pointe Drive #400
West Chester Ohio 45069, United States
WEBSITE: www.clarkdietrich.com

CONTACT NAME: Technical Services Department
TITLE: Technical Services
PHONE: (888) 437-3244
EMAIL: support@clarkdietrich.com

KEY

OSHA MSDS Occupational Safety and Health Administration Material Safety Data Sheet
GHS SDS Globally Harmonized System of Classification and Labeling of Chemicals Safety Data Sheet

Hazard Types

AQU Aquatic toxicity
CAN Cancer
DEV Developmental toxicity
END Endocrine activity
EYE Eye irritation/corrosivity
GEN Gene mutation
GLO Global warming
MAM Mammalian/systemic/organ toxicity
MUL Multiple hazards
NEU Neurotoxicity
OZO Ozone depletion
PB T Persistent Bioaccumulative Toxic
PHY Physical Hazard (reactive)
REP Reproductive toxicity
RES Respiratory sensitization
SKI Skin sensitization/irritation/corrosivity
LAN Land Toxicity
NF Not found on Priority Hazard Lists

GreenScreen (GS)

BM-4 Benchmark 4 (prefer-safer chemical)
BM-3 Benchmark 3 (use but still opportunity for improvement)
BM-2 Benchmark 2 (use but search for safer substitutes)
BM-1 Benchmark 1 (avoid - chemical of high concern)
BM-U Benchmark Unspecified (insufficient data to benchmark)
LT-P1 List Translator Possible Benchmark 1
LT-1 List Translator Likely Benchmark 1
LT-UNK List Translator Benchmark Unknown (insufficient information from List Translator lists to benchmark)
NoGS Unknown (no data on List Translator Lists)

Recycled Types

PreC Preconsumer (Post-Industrial)
PostC Postconsumer
Both Both Preconsumer and Postconsumer
Unk Inclusion of recycled content is unknown
None Does not include recycled content

Other Terms

Inventory Methods:

Nested Method / Material Threshold Substances listed within each material per threshold indicated per material
Nested Method / Product Threshold Substances listed within each material per threshold indicated per product
Basic Method / Product Threshold Substances listed individually per threshold indicated per product

Nano Composed of nano scale particles or nanotechnology
Third Party Verified Verification by independent certifier approved by HPDC
Preparer Third party preparer, if not self-prepared by manufacturer
Applicable facilities Manufacturing sites to which testing applies

The Health Product Declaration (HPD) Open Standard provides for the disclosure of product contents and potential associated human and environmental health hazards. Hazard associations are based on the HPD Priority Hazard Lists, the GreenScreen List Translator™, and when available, full GreenScreen® assessments. The HPD Open Standard v2.1 is not:

- a method for the assessment of exposure or risk associated with product handling or use,
- a method for assessing potential health impacts of: (i) substances used or created during the manufacturing process or (ii) substances created after the product is delivered for end use.

Information about life cycle, exposure and/or risk assessments performed on the product may be reported by the manufacturer in appropriate Notes sections, and/or, where applicable, in the Certifications section.

The HPD Open Standard was created and is supported by the Health Product Declaration Collaborative (the HPD Collaborative), a customer-led organization composed of stakeholders throughout the building industry that is committed to the continuous improvement of building products through transparency, openness, and innovation throughout the product supply chain.

The product manufacturer and any applicable independent verifier are solely responsible for the accuracy of statements and claims made in this HPD and for compliance with the HPD standard noted.