ENVIRONMENTAL PRODUCT DECLARATION

STEEL PIPE AND FIRE SPRINKLER PIPE

WHEATLAND TUBE

Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Wheatland Tube has been setting the standard in the pipe and sprinkler industry for years. Wheatland Tube is the only domestic, full-line producer of continuous weld (CW) and electric resistance weld (ERW) 1/2-18 NPS pipe today. Engineers and contractors across the continent depend on us for steel fire sprinkler pipe and standard pipe that are always in stock and ready to deliver.

For more information, please visit: www.wheatlandtube.com

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION ULCOM/EPD

Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Wheatland Tube
Steel Pipe and Fire Sprinkler Pipe

According to ISO 14025 and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL PROVIDED
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	UL Provided
ASSOCIATION NAME AND ADDRESS	Wheatland Tube | 1 Council Avenue, P.O. Box 608, Wheatland, PA 16161
DECLARATION NUMBER	UL Provided
DECLARED PRODUCT & DECLARED UNIT	Standard Pipe and Fire Sprinkler Pipe (Black and Galvanized), 1 metric ton
REFERENCE PCR AND VERSION NUMBER	Part A: Calculation Rules for the LCA and Requirements Project Report, (IBU/UL Environment, V3.2, 12.12.2018) and Part B: Designated Steel Construction Product EPD Requirements (UL Environment, V2.0, 08.26.2020).
DESCRIPTION OF PRODUCT APPLICATION/USE	Standard Pipe (Black and Galvanized) – continuous weld (CW) and electric resistance weld (ERW) used for mechanical and pressure applications, and for ordinary uses in steam, water, gas and air lines. Fire Sprinkler Pipe (Black and Galvanized) – Schedule 10 and Schedule 40, Mega-Flow, Mega-Thread, GL Galvanized, Light Wall, Threadable pipe. Applications: Typically used for wet, dry, preaction and deluge systems.
MARKETS OF APPLICABILITY	North America
DATE OF ISSUE	UL Provided
PERIOD OF VALIDITY	5 years
EPD TYPE	Product specific
EPD SCOPE	Cradle to gate
YEAR(S) OF REPORTED PRIMARY DATA	2019-2020
LCA SOFTWARE & VERSION NUMBER	GaBi v10
LCI DATABASE(S) & VERSION NUMBER	GaBi 2021 (CUP 2021.2)
LCIA METHODOLOGY & VERSION NUMBER	IPCC AR5 + TRACI 2.1

The sub-category PCR review was conducted by:	UL Provided UL Provided UL Provided
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report,", v3.2 (December 2018), in conformance with ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017) ☐ INTERNAL ☒EXTERNAL	UL Provided
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	UL Provided
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	UL Provided

LIMITATIONS

The environmental impact results of steel 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 steel 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. Please refer to the results section for additional EPD comparability guidelines.

Environmental declarations from different programs (ISO 14025) may not be comparable.

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General Information

Description of Organization

Wheatland Standard Pipe facilities have quality systems in place and are registered to ISO 9001:2015 Quality Management Systems at a minimum.

Wheatland cares about bringing manufacturing back to America, but we also care about keeping the country clean for future generations. That's why we work continuously to find new ways to recycle and improve manufacturing efficiency.

Product Description

This environmental product declaration (EPD) represents standard pipe products 1/2 through 18 NPS, SureThread (Continuous Weld) – Trade Sizes ½ - 4. Fire Sprinkler products (Schedule 10 and Schedule 40, Mega-Flow, Mega-Thread, GL Galvanized). Products are produced by Wheatland Tube in Warren, OH and Wheatland, PA.

Product Specification

Wheatland Tube manufactures the most complete line of steel standard pipe in the industry, in large sizes and small.

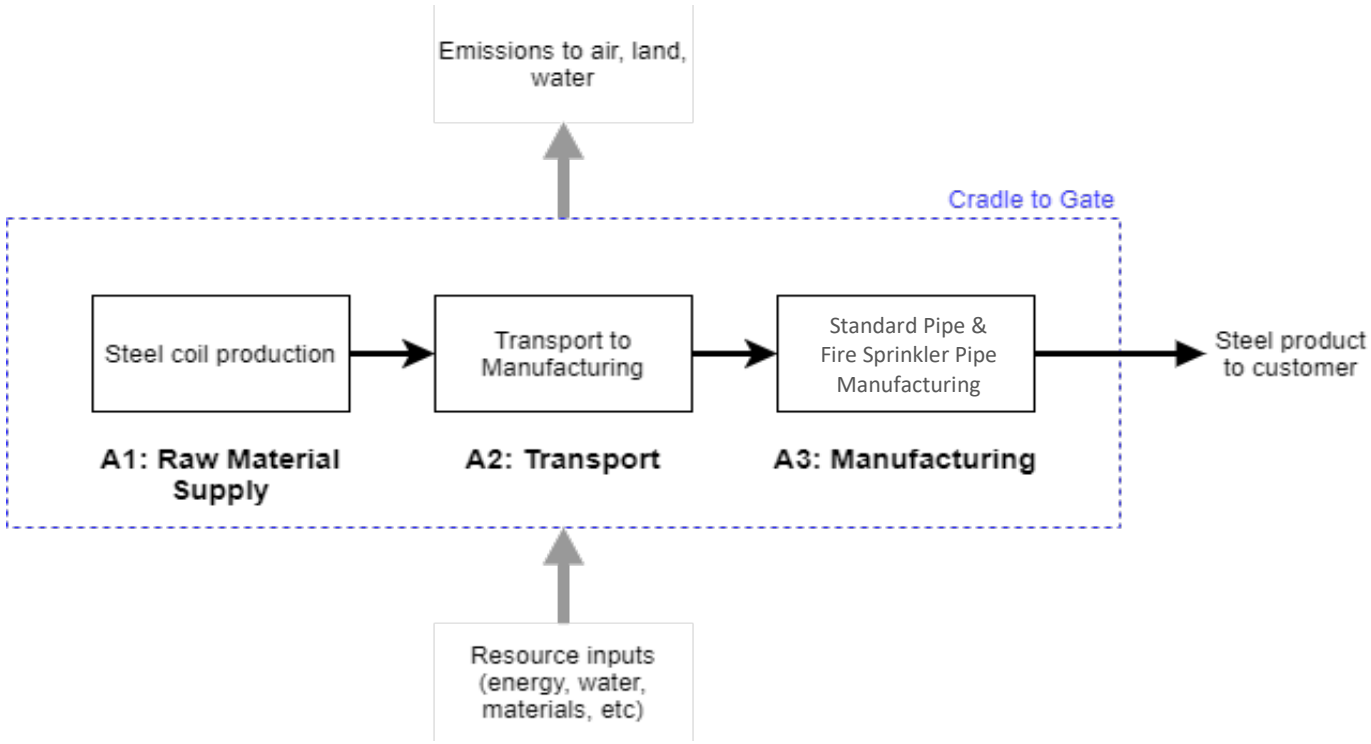
Wheatland's Steel Pipe and Fire Sprinkler Pipe meet the following ASTM standards:

- **ASTM A53** – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- **ASTM A135** – Standard Specification for Electric-Resistance-Welded Steel Pipe
- **ASTM A795** – Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use

Wheatland Tube
Steel Pipe and Fire Sprinkler Pipe

According to ISO 14025 and ISO 21930:2017

Flow Diagram



Product Average

The 2019 and 2020 production data used in this EPD considers pipe produced by Wheatland during the year. The products are manufactured in the the US. Results are weighted according to production totals at all locations based on the data. Facility-specific global warming potential results are provided in a separate table.

Application

Wheatland Tube's steel pipe is intended for mechanical and pressure applications, and for ordinary uses in steam, water, gas and air lines. Applications also include use in fire protection systems.

Material Composition

Steel pipe and fire sprinkler products are made of carbon steel with a small percentage of alloy elements and protective coatings included. For a full product breakdown, please request a safety data sheet (SDS).

Methodological Framework

Declared unit

The declared unit for this EPD is one metric ton of steel construction products. Note that comparison of EPD results on a mass basis alone is insufficient and should consider the technical performance of the product.

Table 1 Declared unit

NAME	VALUE	UNIT
Declared unit	1	metric ton
Density (typical)	7,850	kg/m^3

System Boundary

This EPD is “cradle-to-gate” in scope. The life cycle stages included in the assessment represent the product stage (modules A1-A3).

PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
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
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

* X = module included, MND = module not declared

Allocation

No multi-output allocation was required in the foreground system of the study.

Allocation of background data (energy and materials) taken from the GaBi 2021 databases is documented online at http://www.gabi-software.com/america/support/gabi/. Background data for steelmaking from AISI use the system expansion allocation method for co-products from the steelmaking process.

Since the EPD does not cover the end-of-life of the products, end-of-life allocation is outside the scope of the study. Metal scrap from manufacturing (module A3) was balanced with the scrap demand of the raw materials module (A1) in

order to calculate the net scrap input to module A1.

Under a cradle-to-gate system boundary, scrap inputs to the system are not associated with any upstream burden, and scrap produced during manufacturing is assumed to be at least the same quality as scrap inputs into steelmaking. Remelting of scrap to produce structural steel and other raw materials is accounted for within module A1 using upstream datasets.

Cut-off Rules

In lieu of arbitrary cut-off criteria, all available energy and material flow data were included in the model for processes within the system boundary.

In cases where no matching life cycle inventories were available to represent a flow, proxy data were applied based on conservative assumptions regarding environmental impacts.

Data Sources

The LCA model was created using the GaBi 10 software system for life cycle engineering, developed by Sphera (Sphera, 2021). Background life cycle inventory data for raw materials and processes were obtained from the GaBi 2021 database (CUP 2021.1). Primary manufacturing data were provided by Wheatland tube.

Data Quality

A variery of tests and checks were performed by the LCA practitioner throughout the project to ensure high quality of the completed LCA. Checks included an extensive internal review of the project-specific LCA models developed as well as the background data used. A full data quality assessment is documented in the background report.

Period Under Review

Primary data were collected for steel pipe and fire sprinkler pipe production during the year 2019 and 2020. Background data for steel coil production was taken from AISI and represents steel production during 2017. This analysis is intended to represent production in 2020.

Estimates and Assumptions

The underlying study was conducted in accordance with the PCR. While this EPD has been developed by industry experts to best represent the product system, real life environmental impacts of steel pipe and fire sprinkler pipe products may extend beyond those defined in this document.

All of the raw materials and energy inputs have been modeled using processes and flows that closely follow actual production data on raw materials and processes. All of the reported material and energy flows have been accounted for. The steel pipe and fire sprinkler pipe inventory data was collected as part of the STI industry-average EPD. Where inbound transportation data was incomplete, a distance of 500 miles by truck was used.

Proxy data were applied to some materials where no matching life cycle inventories were available, as documented in the background report.

Technical Information and Scenarios

Manufacturing

Wheatland produces and stocks pipe of 1/2-18 nominal sizes in a variety of ASTM standards. SureThread (ASTM A53) and ERW are used for mechanical and pressure applications, and for ordinary uses in steam, water, gas and air lines. More than 350 different combinations of finishes, end treatments and lengths are available on standard pipe. The continuous weld process creates a uniform grain structure to make bending, cutting and threading easier.

Inbound Transportation

Inbound transportation distances and modes for steel and process materials were collected from each site.

Transportation

Transportation to the customer or construction site is outside the scope of this EPD.

Product Installation

Installation is outside the scope of this EPD.

Use

Product use is outside the scope of this EPD.

Reuse, Recycling, and Energy Recovery

Product reuse, recycling, and incineration for energy recovery is outside the scope of this EPD.

Disposal

Product disposal is outside the scope of this EPD.

Environmental Indicators Derived from LCA

North American life cycle impact assessment (LCIA) results are declared using TRACI 2.1 (Bare, 2012; EPA, 2012) methodology, with the exception of GWP which is reported using the IPCC AR5 (IPCC, 2013) methodology, excluding biogenic carbon. Primary energy use represents the lower heating value (LHV) a.k.a. net calorific value (NCV).

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

Table 2. LCIA results, per 1 metric ton

PARAMETER	UNIT	TOTAL	A1	A2	A3
GWP 100	kg CO_2 eq.	**2.14E+03**	1.70E+03	1.20E+01	4.31E+02
ODP*	kg CFC 11 eq.	**-2.11E-12**	-2.47E-12	2.44E-15	3.50E-13
AP	kg SO_2 eq.	**4.34E+00**	3.72E+00	6.32E-02	5.59E-01
EP	kg N eq.	**2.27E-01**	1.79E-01	5.52E-03	4.24E-02
SFP	kg O_3 eq.	**7.74E+01**	6.09E+01	1.78E+00	1.47E+01
ADP_{fossil}	MJ surplus	**2.29E+03**	1.43E+03	2.31E+01	8.38E+02

* ODP has limited relevance due to the absence of ozone-depleting emissions in the LCI, in both the background and foreground data.

Comparability: Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product 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. 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 comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Table 3. Resource use results, per 1 metric ton

PARAMETER	UNIT	TOTAL	A1	A2	A3
RPR_E	MJ LHV	**1.06E+03**	8.37E+02	6.74E+00	2.17E+02
RPR_M	MJ LHV	**-**	-	-	-
$NRPR_E$	MJ LHV	**2.90E+04**	2.15E+04	1.74E+02	7.39E+03
$NRPR_M$	MJ LHV	**8.38E-01**	-	-	8.38E-01
SM	kg	**5.07E+02**	5.07E+02	-	3.87E-02
RSF	MJ LHV	**-**	-	-	-
NRSF	MJ LHV	**-**	-	-	-
RE	MJ LHV	**-**	-	-	-
FW	m^3	**9.71E+00**	8.17E+00	2.87E-02	1.51E+00

Table 4. Output flows and waste categories results, per 1 metric ton

Parameter	Unit	Total	A1	A2	A3
HWD	kg	**4.58E-01**	-	-	4.58E-01
NHWD	kg	**1.05E+01**	-	-	1.05E+01
HLRW	kg	**1.08E-03**	7.62E-04	5.84E-07	3.16E-04
ILLRW	kg	**9.02E-01**	6.37E-01	4.92E-04	2.64E-01
CRU	kg	-	-	-	-
MR	kg	**9.60E+01**	-	-	9.60E+01
MER	kg	**-**	-	-	-
EE	MJ LHV	**-**	-	-	-

To align with the PCR, "product specific EPDs which include averaging shall report the range of results for all IPCC AR5 and TRACI indicators for products included in the average." The min and max results presented in Table 5 represent the facilities with the lowest (best) and highest (worst) impacts, respectively. Min and max facilities are determined for each impact category separately. The mean and median do not take production volumes across facilities into account (i.e., it is a calculation based on each individual facility as a data point), while the weighted average presented in Table 2 through Table 4 is calculated via production volume weightings reported by each participating facility.

Table 5. Statistical distribution of LCIA results, per 1 metric ton

Parameter	Unit	Min (A1-A3)	Max (A1-A3)	Max/Min Ratio (A1-A3)	Mean (A1-A3)	Median (A1-A3)
GWP 100	kg CO_2 eq.	1.94E+03	2.97E+03	1.53E+00	2.45E+03	2.45E+03
ODP	kg CFC 11 eq.	-2.56E-12	-1.79E-12	6.99E-01	-2.18E-12	-2.18E-12
AP	kg SO_2 eq.	4.24E+00	5.47E+00	1.29E+00	4.86E+00	4.86E+00
EP	kg N eq.	2.15E-01	2.98E-01	1.38E+00	2.56E-01	2.56E-01
SFP	kg O_3 eq.	7.23E+01	1.03E+02	1.43E+00	8.79E+01	8.79E+01
ADP_{fossil}	MJ surplus	1.64E+03	3.93E+03	2.39E+00	2.79E+03	2.79E+03

Wheatland 's steel pipe and fire sprinkler pipe products are manufactured at 2 different facilities. The results presented above represent a production-weighted average of these facilities. To understand how the GWP may vary between sites, facility-specific GWP100 results are presented below.

Table 6. Facility-specific GWP100 results, per 1 metric ton

GWP 100 (kg CO_2 eq)	A1	A2	A3	Total	Cradle-to-Gate, Mill Product*
Warren, OH	1.94E+03	4.46E+01	9.67E+01	2.08E+03	1.79E+03
Wheatland, PA	2.97E+03	4.46E+01	9.67E+01	3.11E+03	2.75E+03

* Per 1 metric ton unfabricated product

Visualization of Life Cycle Impact Assessment

The relative contribution of each life cycle stage to the overall cradle-to-gate impact are presented in Figure 1, while the contribution of manufacturing components are presented in Figure 2.

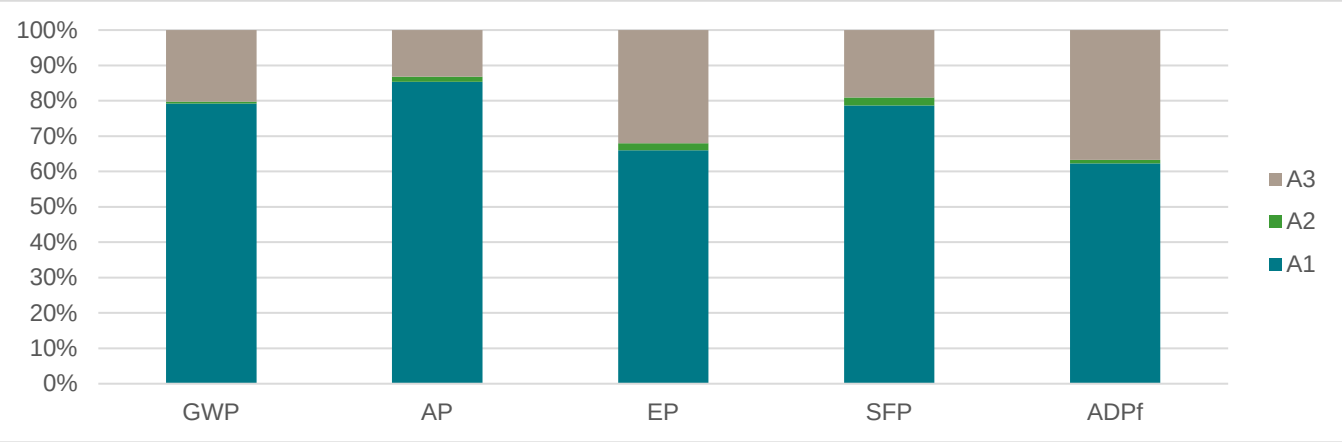


Figure 1: Relative contribution by life cycle stage for 1 metric ton of hollow structural sections

Figure 2: Relative contribution by manufacturing component for 1 metric ton of hollow structural sections

Interpretation

The cradle-to-gate potential environmental impacts of Wheatland 's steel pipe and fire sprinkler pipe products are driven by steel coil production (A1) and energy use during manufacturing (A3). Inbound transportation to manufacturing (A2)contributes to potential environmental impacts on a smaller order of magnitude.

Additional Environmental Information

Environment and Health During Manufacturing

For a full product breakdown, please request a safety data sheet (SDS) at https://www.wheatland.com/

Environmental Activities and Certifications

For full details of environmental activities and certifications please vist: https://www.wheatland.com/wp-content/uploads/2017/12/LEEDs_2021.pdf

Further Information

For further information please visit: https://www.wheatland.com

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Contact Information

Study Commissioner

Wheatland Tube, a division of Zekelman Industries
Corporate Office
227 West Monroe St, Suite 2600
Chicago, IL 60606
www.wheatland.com

LCA Practitioner

Sphera Solutions, Inc.
130 E Randolph St, #2900
Chicago, IL 60601
https://sphera.com/contact-us/
www.sphera.com