ENVIRONMENTAL PRODUCT DECLARATION

TRU-SPEC

J.M. HUBER CORPORATION

Industry Best Performance Characteristics for Structural Composite Lumber Panels & Components.

HUBER ENGINEERED WOODS

Huber Engineered Woods LLC continually strives to create innovative products that suit their customers' needs. Each one delivers outstanding performance, easy installation and greater strength in single family, multifamily and light commercial projects. Tru-spec® is a precision engineered wood product designed specifically for the millwork industry. Each product is manufactured by thermally fusing cross-oriented wood strands with a water-resistant adhesive offering a stronger, flatter, more stable product versus competing alternatives. Tru-spec is FSC and SFI Certified and available in a wide range of custom sizes and thicknesses to meet your customer's demands.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

Tru-spec
J.M. Huber Corporation

According to ISO 14025,
EN 15804, and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road Northbrook, IL 60611	https://www.ul.com/ https://spot.ul.com/
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.4 July 2018	
MANUFACTURER NAME AND ADDRESS	Huber Engineered Woods, 10925 David Taylor Drive, Suite 300 Charlotte, NC 28262	
DECLARATION NUMBER	4789103593.103.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Tru-spec J.M Huber Corporation Engineered Wood Products; 1 cubic meter	
REFERENCE PCR AND VERSION NUMBER	Product Category Rules Guidance for Building-Related Products and Services Part B: Structural and Architectural Wood Products EPD Requirements, UL, First Edition, October 21, 2019	
DESCRIPTION OF PRODUCT APPLICATION/USE	Oriented Strand Board Roof and Wall Sheathing	
PRODUCT RSL DESCRIPTION (IF APPL.)	75 years	
MARKETS OF APPLICABILITY	Residential, Multi-Family, Commercial	
DATE OF ISSUE	July 1, 2020	
PERIOD OF VALIDITY	5 Years	
EPD TYPE	Product-Specific	
RANGE OF DATASET VARIABILITY	N/A	
EPD SCOPE	Cradle to gate with options (A4, A5, C2, and C4)	
YEAR(S) OF REPORTED PRIMARY DATA	July 2018 to June 2019	
LCA SOFTWARE & VERSION NUMBER	SimaPro v9	
LCI DATABASE(S) & VERSION NUMBER	ecoinvent v3.5	
LCIA METHODOLOGY & VERSION NUMBER	TRACI	

This PCR Review was conducted by:	UL Environment PCR Review Panel epd@ulenvironment.com
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	Grant R. Martin Grant R. Martin, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria Thomas P. Gloria, Industrial Ecology Consultants

LIMITATIONS

Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

Product Definition and Information

Product Description

Huber Engineered Wood Tru-spec® is a family of engineered wood products made especially for the millwork industry. Each product is manufactured by fusing a network of wood strands together with a water-resistant adhesive. The result is a strong, solid and stable part that is moisture resistant, easy to machine and 100% usable. By carefully engineering the mix of resins, the wood and other components, Huber can tailor the product to meet customer's product design and manufacturing needs.

Recognized by the WDMA (Window and Door Manufacturers Association) as a Structural Composite Lumber (SCL), Huber's Tru–spec offers enhanced properties and performance.Tru-spec has exhibited excellent strength and screw holding capability, low dimensional responsiveness, product stability and superior performance to a variety of wood and composite products.

Figure 1: Photograph of Tru-spec Cross Section

Product Styles

This EPD covers the complete Tru-spec product line which is produced in 28 different thicknesses, measured in inches, ranging from 0.625" to 2.26". The results presented in the following tables reflect one cubic meter of product. The environmental impacts can be multiplied by the scaling factor in Table 2 to obtain the total environmental impacts per square meter for each product.

Table 1: Tru-spec Declared Unit

	Tru-spec
Declared Unit	1 m^3
Mass per Declared Unit (kg)	640
Thickness to Achieve Declared Unit	0.01588 m (5/8 in)
Density (kg/m^3)	640
Moisture Content	3.5%
Number of Square Meters to Achieve Declared Unit at Smallest Thickness	63

Table 2: Tru-spec Scaling Factors

Thickness (in/m^2)	Scaling Factors to Obtain 1 Square Meter of Desired Thickness (in/m^2) from Declared Unit	Number of Square Meters for $1m^3$ at Specified Thickness
0.625"	0.01588	62.99
0.725"	0.01842	54.30
0.75"	0.01905	52.49
0.79"	0.02007	49.84
0.875"	0.02223	44.99
1.0625"	0.02699	37.05
1.125"	0.02858	35.00
1.19"	0.03023	33.08
1.25"	0.03175	31.50
1.312"	0.03332	30.01
1.375"	0.03493	28.63
1.445"	0.03670	27.25
1.5"	0.03810	26.25
1.525"	0.03874	25.82
1.54"	0.03912	25.56
1.55"	0.03937	25.40
1.575"	0.04001	25.00
1.59"	0.04039	24.76
1.61"	0.04089	24.45
1.625"	0.04128	24.23
1.65"	0.04191	23.86
1.688"	0.04288	23.32
1.69"	0.04293	23.30
1.71"	0.04343	23.02
1.75"	0.04445	22.50
1.81"	0.04597	21.75
2"	0.05080	19.69
2.19"	0.05563	17.98
2.25"	0.05715	17.50
2.26"	0.05740	17.42

Range of Application

Huber's Tru-spec is designed to meet a wide range of product application needs. Whether producing doors, frames, windows, skylights, furniture, cabinets, or other millwork products, Tru-spec can provide a product that is right for customer's specific needs.

Product Specification

- Standard for Fire Tests of Door Assemblies (UL 10B)
- Standard for Positive Pressure Fire Test of Door Assemblies (UL 10C)

Material Composition

Functional Unit

The functional unit utilized for this study is one cubic meter (1 m^3) with a service life of 75 years, including end-of-life disposition.

Product Material Composition

Wood strands represent the largest Tru-spec formulation component. Resins used to bind the Tru-spec wood strands are the second largest formulation component. The Tru-spec formulation components are displayed in the following table.

Table 3: Tru-spec Product Recipe

Product Recipe	Tru-spec
Wood	90-95%
Core resin	1-6%
Surface resin	1-6%
Wax	1-4%
Release Agent	< 0.5%
Ink	<0.1%
Edge Seal	<0.1%

Packaging Material Composition

Tru-spec panels are stacked on top of each other onto 3 wood strips to enable loading and unloading via fork truck. The stacks are protected with vertical cardboard side covers and banded together with the wood strips with plastic banding.

Table 4: Tru-spec Packaging Materials (per cubic meter)

Packaging Material	Mass
Wood	5.6 lbs (2.54 kg)
Plastic Strapping	0.2 lbs (0.1 kg)

Technical Requirements

The standards that can be applied for Tru-spec® products are as follows:

- Standard for Fire Tests of Door Assemblies (UL 10B)
- Standard for Positive Pressure Fire Test of Door Assemblies (UL 10C)

Properties of Declared Product As Delivered

The product is delivered in the following status:

	Tru-spec
Length	8 ft (2.4 m)
Width	4 ft (1.2 m)
Height	2.7 ft – 3 ft (0.82 – 0.91 m)
Total Weight	3,450 – 3,750 lbs (1,565 kg – 1,700 kg)
Panels Per Unit	15 panels (2.26” thickness) to 55 panels (5/8” thickness)

Life Cycle Stages

EPD Scope

The life cycle analysis performed for this EPD is characterized as a “cradle-to-gate with options” study, examining the Tru-spec product from raw material extraction through final disposal excluding the use phase.

Table 5: Tru-spec System Boundary

Product Stage			Construction Process Stage		Use Stage							End of Life Stage*				Benefits and Loads Beyond the System Boundaries
Raw material supply	Transport	Manufacturing	Transport from gate to the site	Construction/ installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction /demolition	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	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	MND	X	MND

Time Boundary

Data for this LCA was collected from July 2018 through June 2019.

Cut-off Criteria

Processes with a cumulative mass or energy of the system flows/model less than 1% may be excluded, provided its environmental relevance is minor. Processes that meet that criteria but contribute at least 2% to the selected impact categories shall be included in the system boundary. In no case shall less than 95% of mass or environmental impact be included in the system boundary.

All hazardous or toxic substances shall be included in the system boundary.

This LCA is in compliance with the cut-off criteria since no known processes were neglected or excluded from this analysis.

Data Sources

Primary data were collected directly from the facilities for ever yproces in the product system under the control of J.M. Huber Corporation. SimaPro v9 software was utilized for modeling the complete cradle-to-gate with options inventory. The ecoinvent v3.5 life cycle inventory database was the primary sources of secondary data utilized for this study. Supplemental secondary data was used from the US LCI database.

System Boundaries

This project considers the life cycle activities from resource extraction through product use for a 75 year service life.

Allocation

Allocation of multi-output processes was performed following the requirements and guidance of ISO 14044:2006, clause 4.3.4, and was based on mass. Any co-products were less than 10x the economic value of the main products and were not included in the allocation.

Treatment of Biogenic Carbon

Biogenic carbon was considered neutral throughout this study. Separate carbon uptake and emissions from bio-derived sources are reported separately in the “Output Flows and Waste Categories” for both product and packaging biogenic carbon.

Data Quality

For consistency in the model, specific, primary data from the manufacturing process was provided by the relevant facilities. Upstream and downstream raw materials and other data were modeled using secondary data obtained from relevant databases as documented in the LCA Report. Thse databases are from nationally accepted and publicly available databases, ensuring reproducibility. This study is representative only of Huber Tru-spec.

Estimates and Key Assumptions

For installation, packaging waste was modeled as landfilled. Any required energy of this product to be installed into door and other millwork products was not included, as this energy would be included in the EPD of the subsequent product as manufacturing impacts.

Production of Tru-spec OSB Products

Production Process

The incoming logs are delivered by truck to the scale house. The logs are stripped of bark and fed into a strander which slices the material into small pieces (strands). The strands then enter a drying process and are dried down to a low moisture content. The strands are then sent through a cyclone where they are separated from the dryer airstream and into a screening process where any unusable strands are removed. These newly screened strands are sent to dry bins for storage. From there, the strands are blended with resins, waxes, and other binders to hold them together. A forming machine lays down the strands into a mat on a forming belt. During this forming process, the strands are oriented in alternating directions as they are conveyed, resulting in a more structurally consistent panel. The mats are trimmed into the desired lengths, and heat and pressure are applied to activate the resin and bond the strands into a solid panel. The panel edges are trimmed and cut to length and width. Panels are sanded and labeled. Finished panels are stacked, packaged, and shipped to customers.

Tru-spec® products are produced at Huber's Broken Bow, Oklahoma and Spring City, Tennessee facilities. Detailed operational and production data were collected in collaboration with process experts.

Construction

Transportation and Delivery

Final products were modeled as being shipped by truck and rail. Records of customer sales were used to generate the average distances.

Table 6: Transport to the Building Site (A4)

Name	Quantity	Unit
Fuel Type	Diesel	
Liters of fuel	38	l/100km
Vehicle type	5% by rail 95% by truck	
Average Transport Distance	1,360	km
Capacity Utilization	90	% by mass
Weight of products transported	640	kg
Volume of products transported	1	m^3
Capacity utilization volume factor	1	

Installation

Huber products are designed for superior durability and installation ease. Since Tru-spec is used in a number of millwork applications, nails are not generally required for installation. No other inventory items were identified for installation. 5% of product loss was assumed as scrap loss.

Table 7: Installation into the Building (A5)

Name	Quantity	Unit
Ancillary materials	n/a	kg
Net freshwater consumption specified by water source and fate	n/a	m^3
Other resources type	n/a	Kg
Electricity consumption	n/a	kWh
Other energy carriers	n/a	MJ
Product loss per functional unit	33.5	kg
Waste materials at the construction site	34.1	kg
Output materials (landfill)	34.1	kg
Mass of packaging waste specified by type	2.5 (wood) 0.10 (plastic)	kg
Biogenic carbon contained in packaging	0.73	kg CO_2
Direct emissions to ambient air, soil and water	n/a	kg
VOC emissions	unk	µg/m^3

Waste

During installation, saw dust, wood scrap, and packaging waste are generated. A 5% product scrap rate was assumed based on product installation expertise.

Use Stage

Product Service Life

The Tru-spec products are weather and moisture resistant and can withstand a long duration when exposed to the elements during the construction process. Once properly installed in a finished Code complying building, this study assumes that these products can last the duration of an average building, that is, at least 75 years.

Table 8: Reference Service Life

Name	Quantity	Unit
Reference Service Life (RSL)	75	years
Declared Product Properties	Please visit huberwood.com for more information.	
Design Application Parameters		
Quality of Work		
Outdoor Environment	n/a	
Indoor Environment	Please visit huberwood.com for more information.	
Use conditions		
Estimated Building Life	75	years
Number of Replacements	0	number
Maintenance	n/a	n/a

Use Stage Assumptions

During the use stage, the product is integrated into the permanent structure of the building. Tru-spec products use no energy or water during the use stage. Tru-spec products require no maintenance, repair, replacement, or reburbishment during their service life.

End of Life

Disposal

The end-of-life scenario was modeled based on the 2011 US EPA solid waste and waste diversion statistics . The study assumes a 14.8% recycling rate with the remaining 85.2% being disposed as the average US municipal solid waste disposition. The average US disposition includes 82% landfill and 18% incineration. The cut-off methodology (also known as the recycled content method in the GHG Protocol for Products) was used for any materials that were sent to recycling such as scrap and the end of life disposition.

Table 9: End of Life (C1-C4)

Name		Subflooring	Unit
Assumptions for scenario development		Products are manually removed and disposed with construction and demolition (C&D) waste, and may be sorted and recycled, landfilled or incinerated..	
Collection process	Collected separately	n/a	kg
	Collected with mixed construction waste	640	kg
Recovery and Disposal	Reuse	0	kg
	Recycling	94.7	kg
	Landfill	447.1	kg
	Incineration	98.2	kg
	Incineration (with energy recovery)	0	kg
	Energy conversion	n/a	
Removals of biogenic carbon (excluding packaging)		296	kg

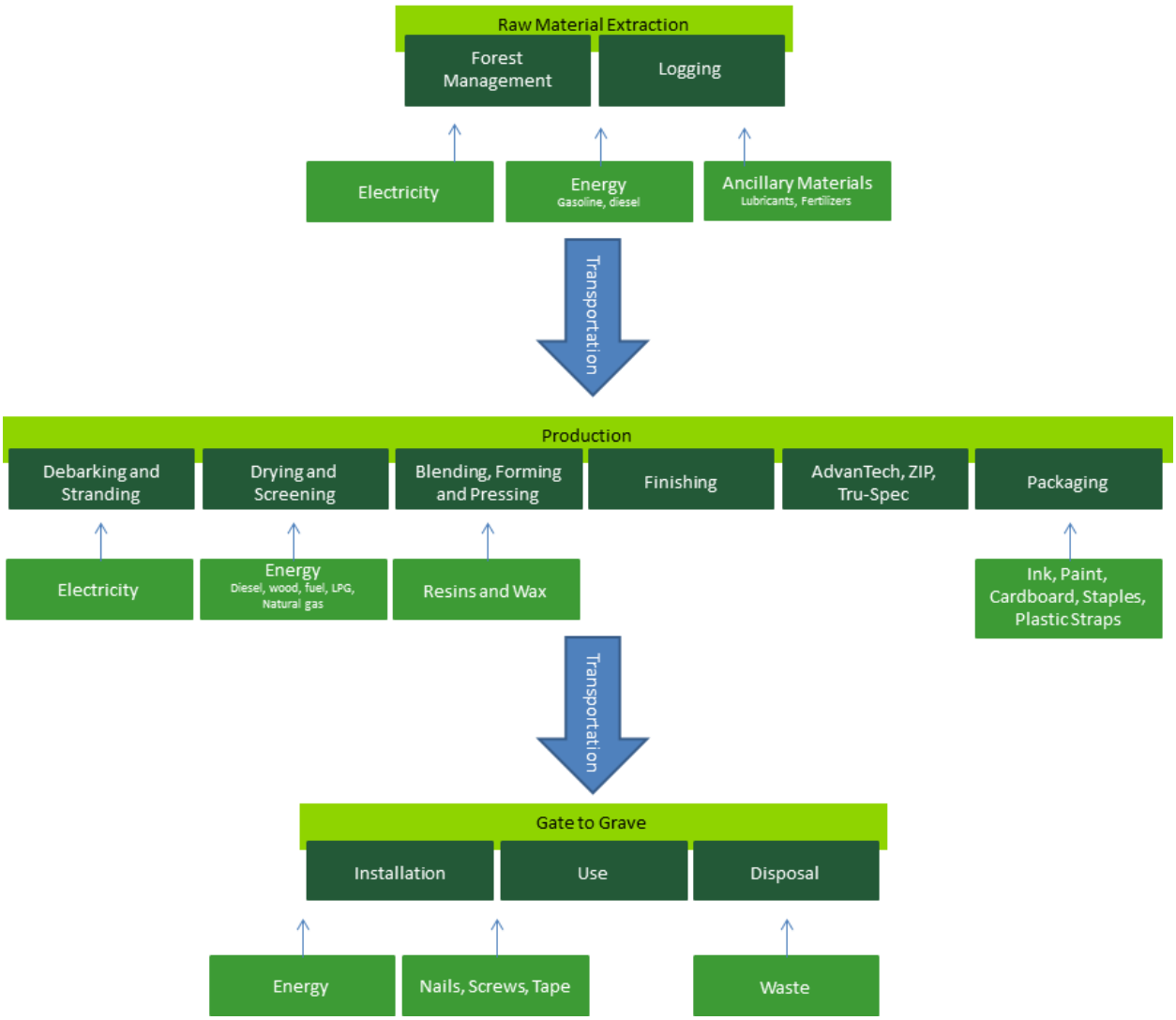

Figure 2: System Flow Diagram

Potential Environmental Impacts

Cradle-to-Gate with Options Potential Environmental Impacts

The tables below present the five selected categories of potential environmental impacts (global warming, acidification, eutrophication, smog creation, and ozone depletion) as well as primary energy consumption, material resources consumption, and waste generated for each cradle-to-grave life cycle stage for 1 cubic meter Tru-spec®. Refer to the scaling factors above to convert these results to other product thicknesses.

Table 10: Life Cycle Impact Assessment of 1m^3 Tru-spec

TRACI 2.1 Impact Assessment							
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**C2**	**C4**
GWP	Global warming potential	kg CO_2-Eq.	4.7E+02	4.4E+01	7.4E+01	6.1E+00	4.4E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	5.2E-07	1.7E-09	1.6E-06	2.6E-10	1.2E-06
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	5.1E+00	2.8E-01	3.1E-01	8.1E-02	1.1E-01
EP	Eutrophication potential	kg N-Eq.	2.9E-01	1.6E-02	2.0E-01	4.9E-03	2.2E+00
SP	Smog formation potential	kg O_3-Eq.	6.6E+01	7.7E+00	2.4E+00	2.1E+00	3.3E+00
FFD	Fossil Fuel Depletion	MJ-surplus	1.9E+03	8.4E+01	2.7E+02	1.3E+01	1.5E+01
CML 3.05 Impact Assessment							
Parameter	**Parameter**		**A1-A3**	**A4**	**A5**	**C2**	**C4**
GWP	Global warming potential	kg CO_2-Eq.	4.8E+02	4.4E+01	7.6E+01	6.2E+00	4.5E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	4.1E-07	1.7E-09	1.3E-06	2.6E-10	9.4E-07
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	5.2E+00	2.3E-01	3.3E-01	6.2E-02	8.1E-02
EP	Eutrophication potential	kg $(PO_4)^3$-Eq.	3.9E-01	4.1E-02	9.0E-02	1.4E-02	8.7E-01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	3.4E-01	1.0E-02	2.0E-02	-1.3E-02	4.5E-03
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	2.0E-04	0.0E+00	2.9E-04	0.0E+00	2.4E-05
ADPF	Abiotic depletion potential for fossil resources	MJ	1.4E+04	5.7E+02	1.9E+03	8.8E+01	1.1E+02

Table 11: Use of Resources of 1m³ Tru-spec

Resource Use							
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**C2**	**C4**
PERE	Renewable primary energy as energy carrier	MJ	1.4E+04	0.0E+00	1.3E+01	0.0E+00	1.9E+00
PERM	Renewable primary energy resources as material utilization	MJ	1.4E+01	0.0E+00	5.3E+00	0.0E+00	7.9E-01
PENRE	Nonrenewable primary energy as energy carrier	MJ	1.4E+04	6.0E+02	2.0E+03	9.3E+01	1.3E+02
PENRM	Nonrenewable primary energy as material utilization	MJ	1.1E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF	Use of renewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RE	Use of recovered energy	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FW	Use of net fresh water	m3	1.3E+01	0.0E+00	1.6E-01	0.0E+00	-5.4E-02

Table 12: Output Flows and Waste Categories of 1m³ Tru-spec

Output Flows and Waste Categories							
Parameter	**Parameter**	**Units**	**A1-A3**	**A4**	**A5**	**C2**	**C4**
HWD	Hazardous waste disposed	kg	1.2E-04	0.0E+00	2.9E-04	0.0E+00	2.2E-04
NHWD	Non-hazardous waste disposed	kg	2.1E+01	0.0E+00	1.5E+01	0.0E+00	5.4E+02
HLRW	High-level radioactive waste, conditioned, to final repository	kg	1.5E-04	0.0E+00	4.4E-04	0.0E+00	3.7E-04
ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CRU	Components for re-use	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MFR	Materials for recycling	kg	0.0E+00	0.0E+00	4.9E+00	0.0E+00	9.9E+01
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
EEE	Exported electrical energy	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ETE	Exported thermal energy	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Removals associated with biogenic carbon content of the bio-based product;		kg CO_2	8.5E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Emissions associated with biogenic carbon content of the bio-based product;		kg CO_2	0.0E+00	0.0E+00	4.2E+01	0.0E+00	8.5E+02
Emissions from calcination and removals from carbonation;		kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Removals associated with biogenic carbon content of the bio-based packaging		kg CO_2	2.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Emissions associated with biogenic carbon content of the bio-based packaging		kg CO_2	0.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00
Emissions from combustion of waste from renewable sources used in production processes;		kg CO_2	3.1E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Emissions from combustion of waste from non-renewable sources used in production processes.		kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Interpretation

The product stage is the main driver of results for Tru-spec.Installation and disposal are second and third primary drivers of the life cycle potential environmental impacts.

Please note: while this EPD does not address landscape level forest management impacts, potential impacts may be addressed through requirements put forth in regional regulatory frameworks, ASTM 7612-15 guidance, and ISO 21930 Section 7.2.11 including notes therein. These documents, combined with this EPD, may provide a more complete picture of environmental and social performance of wood products. While this EPD does not address all forest management activities that influence forest carbon, wildlife habitat, endangered species, and soil and water quality, these potential impacts may be addressed through other mechanisms such as regulatory frameworks and/or forest certification systems which, combined with this EPD, will give a more complete picture of environmental and social performance of wood products. EPDs can complement but cannot replace tools and certifications that are designed to address environmental impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, etc. National or regional life cycle averaged data for raw material extraction does not distinguish between extraction practices at specific sites and can greatly affect the resulting impacts.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any particular product line and reported impact when averaging data. Variability was estimated in this EPD by facility weighted averages over a year of data.

Additional Environmental Information

Environment and Health During Manufacture

Huber developed and implemented a Global Environmental, Health and Safety Management System between 2005 and 2007. The system is titled Huber Sustainability Management System (HSMS). A combined regulatory compliance and management system conformance audit program was implemented in 2008. All Huber sites are audited on a recurring schedule, and action plans are created to address audit findings to ensure continual improvement, providing results equivalent to, or surpassing, ISO standards.

Environment and Health During Installation

For sanding, sawing or machining of wood products, avoid creating dust, which can be a source of fire and explosion. Avoid breathing dust. Wood dusts should be wet down to reduce the likelihood of ignition or dispersion of dust in the air. Use NIOSH/OSHA approved respirator where ventilation is not possible and exposure limits could be exceeded. Refer to the AdvanTech Subflooring and Sheathing SDS for further information.

Extraordinary Effects

Fire
Tru-spec has been approved bu UL and ITS Fire tests for 20 minutes as a stile, rail and core material.

Water
There are no relevant data regarding water effects for this product.

Mechanical Destruction
There are no relevant data regarding mechanical destruction effects for this product.

Environmental Activities and Certifications

The following certificates are relevant certifications for Tru-spec products

- Forest Stewardship Council (license C089480)
- Sustainable Forestry Initiative (SFI 2015-2019), SFIS-4Z968-FS4
- UL Fire Door Construction Materials (GSRJ2.R20786)

References

- AdvanTech, ZIP System, and Tru-spec Life Cycle Assessment, Sustainable Solutions Corporation, December 2019
- Product Category Rules Guidance for Building-Related Products and Services Part B: Structural and Architectural Wood Products EPD Requirements, UL Environment, First Edition, October 21, 2019
- Product Category Rules: Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment, December 2018, version 3.2
- UL Environment General Program Rules Version 2.0, April 2018
- EN 15804:2012+A2:2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.
- ISO 14025 Environmental labels and declarations - Type III environmental declarations
- ISO 14040 Environmental management - Life cycle assessment – Principles and framework
- ISO 14044 Environmental management - Life cycle assessment – Requirements and guidelines
- ISO 21930 (2017) Sustainability in building construction – Environmental declaration of building products
- UL 10B Standard for Fire Tests of Door Assemblies
- UL 10C Standard for Positive Pressure Fire Test of Door Assemblies
- Sustainable Forestry Initiative 2014-2019 Standard
- EPA, Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI)
- SimaPro v9 Software
- Ecoinvent v3.5 Database for Life Cycle Engineering

LCA Development

This EPD and corresponding LCA were prepared by Sustainable Solutions Corporation of Royersford, Pennsylvania.