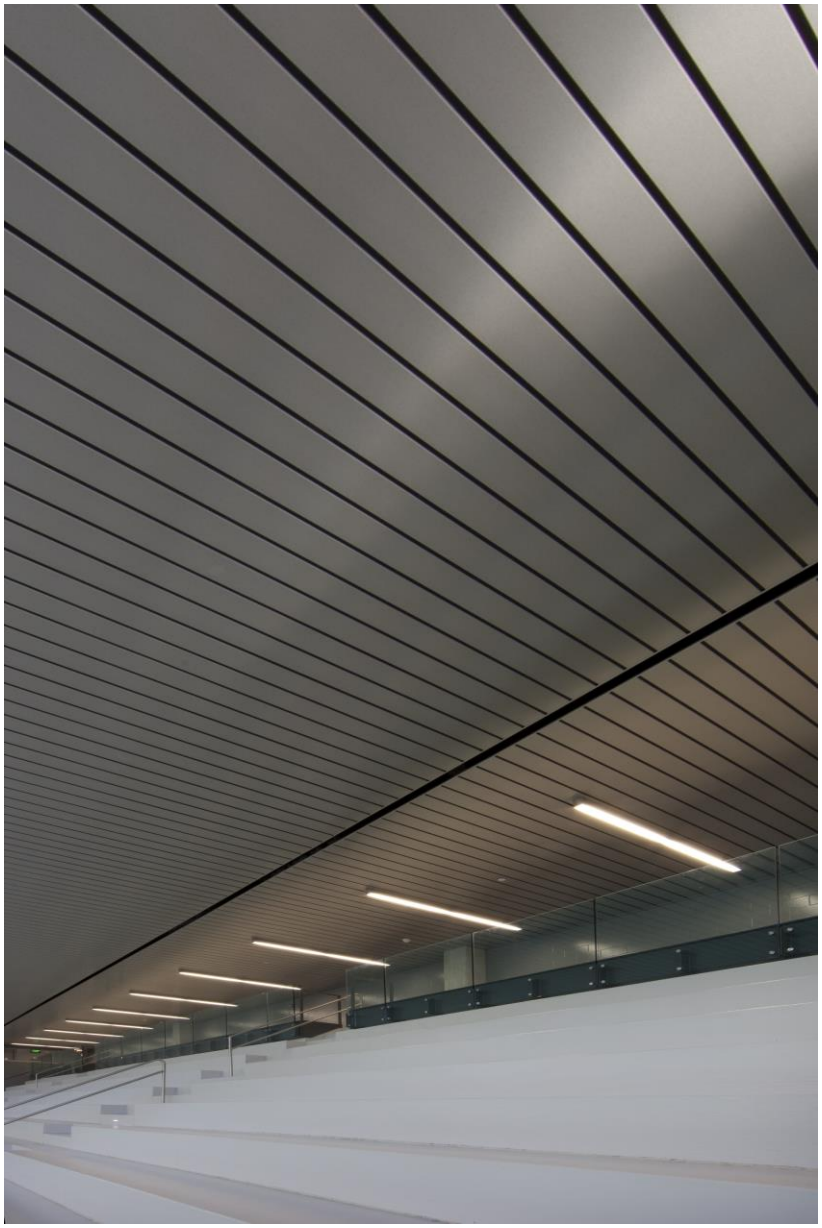
ENVIRONMENTAL PRODUCT DECLARATION

ALUMINUM SPECIALTY PRODUCTS

AN INDUSTRY-AVERAGE ENVIRONMENTAL PROFILE



Aluminum specialty products include ceiling and wall systems, trims, column covers and associated suspension elements.

CISCA
Ceilings & Interior Systems Construction Association

Increasing attention is paid to the environmental impact and sustainability of raw material sourcing, production, usage, and disposal of building products.

The Ceilings & Interior Construction Association (CISCA) is the industry leading organization for metal specialty companies in the manufacture of aluminum and steel ceilings, walls, and associated specialty products in the building products segment.

In an effort to support and inform the market, CISCA pulled together its leading metal specialty building product member companies to provide the first industry-average EPDs covering metal specialty materials sold and installed in North America.

UL CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

Aluminum Specialty Products
An industry-weighted environmental profile

According to ISO 14025

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. 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, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. 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. EPDs from different programs may not be comparable.

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	CISCA
DECLARATION NUMBER	4786340416.101.1
DECLARED PRODUCT	CISCA Aluminum Specialty Products
REFERENCE PCR	Institute Construction and Environment e.V. (IBU), 2014. PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Metal Ceilings, Version 1.6, 2014. UL Environment Addendum- Product Category Rules for preparing an environmental product declaration (EPD) for PCR: IBU Product Category Rules, Part B: Requirements on the EPD for Metal Ceilings, October 2013. Version 1, 2014.
DATE OF ISSUE	December 18, 2014
PERIOD OF VALIDITY	5 Years
CONTENTS OF THE DECLARATION	Product definition Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	The Independent Expert Committee (SVA)
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Thomas Gloria, Industrial Ecology Consultants
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Wade Stout, UL Environment

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Product

Product Description

This declaration covers an industry average of aluminum specialty products, sold and installed in North America by CISCA members. These specialty products include ceiling and wall systems, extruded trims, brake-formed shapes, column covers, and their suspension carriers, or runners and attachments. The declared unit for this declaration is based upon an industry-weighted average from the CISCA companies listed to the right.

Aluminum specialty products are manufactured from metal coil or sheet, and are perforated and bent as needed for the customer's specifications. Depending on the application, the aluminum may be coated or laminated with additional materials. For the purposes of this declaration, aluminum specialty product manufacturing also includes the suspension carriers, or runners and attachments. This study does not include the manufacturing of ceiling grid, regardless of product use or panel material type.

Participating CISCA Members

The following CISCA members provided primary manufacturing information for the creation of this declaration:

- Accent Ceilings & Walls
- Armstrong World Industries
- Gordon Inc.
- Hunter Douglas
- Lindner
- Rockfon
- Steel Ceilings, Inc.
- USG

Application

The specialty products included in this declaration have a wide variety of applications. Common uses for metal specialty products include ceiling panels, wall coverings, and column coverings. Metal specialty products may be chosen for both durability and aesthetic reasons.

Technical Data

Typical standards to which metal specialty products conform are listed below.

- **ASCE 7-10:** Minimum Design Loads for Buildings and Other Structures
- **ASTM B209:** Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- **ASTM C423:** Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- **ASTM C635:** Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- **ASTM C636:** Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
- **ASTM D1002:** Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)
- **ASTM E1264:** Standard Classification for Acoustical Ceiling Products
- **ASTM E1477:** Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
- **ASTM E488:** Standard Test Methods for Strength of Anchors in Concrete Elements
- **ASTM E580:** Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in

Panels in Areas Subject to Earthquake Ground Motions

- **ASTM E84:** Standard Test Method for Surface Burning Characteristics of Building Materials
- **CISCA Metal Ceilings Technical Guidelines**

Ranges for construction data are provided detailed in Table 1. Other standards are either not applicable (e.g. those for radiant ceilings) or targeted at the European market. Additional details for specific products are available directly from the participating manufacturers.

Table 1: Common panel sizes for steel specialty products

	Value
Noise reduction coefficient (ASTM C423)	0.65 to 0.95
Average weight	1.4 to 13 kg/m^2

Placing on the Market / Application Rules

Market placement is not included in this EPD due to the wide range of metal specialty products and product variation among manufacturers.

Delivery Status

Due to the range of products covered by this declaration, it is not meaningful to declare a single dimensional or quantitative delivery status for aluminum specialty products. Common panel dimensions are provided in Table 2.

Table 2: Common panel sizes for aluminum specialty products

	Panel Sizes
Common thicknesses (in.)	0.020, 0.032, 0.040, 0.063, 0.090, 0.125, 0.188
Common dimensions (in.)	2, 4, 6, 8, 12-in. wide × 144-in. length 12 to 48-in. wide × 24 to 120-in. length

Material Content

The material content of aluminum specialty products is based upon the material type and usage as reported by the CISCA member companies. Therefore, the materials listed in Table 3 do not represent any specific product, whether real or hypothetical, but rather an industry average material composition across all aluminum specialty products covered by the declaration. The composition in Table 3 is specified by weight percentage.

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Table 3: Industry-weighted, average material composition

Component Description	Material	Wt. %
Metal	Coated, Cold-Rolled Aluminum	50%
Metal	Extruded Aluminum	27%
Metal	Bare, Cold-Rolled Aluminum	17%
Metal	Anodized, Cold-Rolled Aluminum	3%
Metal	Laminated, Cold-Rolled Aluminum	<1%
Acoustic Fleece	Non-woven fabric	<1%
Insulation	Fiberglass	<1%

Manufacturing

There are two basic processes used by CISCA members for manufacturing metal specialty products, coil-coating and post-painting. The major difference is whether the metal coil is coated before the product is manufactured, or whether the product is painted after it is shaped. The two processes are depicted in Figure 1.

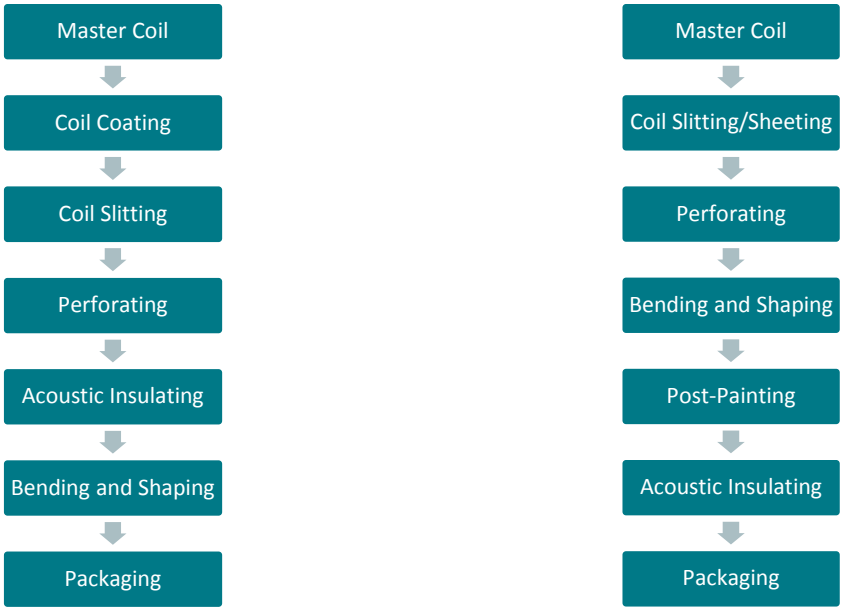

Figure 1: Typical aluminum specialty product manufacturing process, coil-coating (left) & post-paint (right)

As Figure 1 shows, manufacturers typically receive the metal for their products in the form of master coil or pre-slit master coil. In the case of coil-coating, as depicted on the left of Figure 1, the coil is sent directly to a third party for coil coating or is coated by the metal specialty product manufacturer. The coated coil is then cut to size and depending on the product, perforated and a non-woven, acoustic insulation fused to the back. Encapsulated fiberglass pads or recycled cotton pads may also be used instead of non-woven fabric. Then the metal panel may be roll-formed, bent, or shaped in other ways to match the product or customer specifications. Finally, the product is packaged for shipping.

The post-paint manufacturing process, shown on the right of Figure 1, has many of the same steps as the coil-coating process. The major difference is that the metal is coated after it is formed into a product rather than before.

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Environment and Health during Manufacturing

This represents an industry-average; therefore company-specific environmental and health practices are not included in this declaration.

Product Processing / Installation

Only packaging material disposal was considered for the Installation into the building module (A5). The products covered under this declaration vary. As such, no information on environmental impact mitigation measures during installation is provided here.

Packaging

Packaging materials are considered as part of this declaration. The specific packaging materials depend on the manufacturer, but in general cardboard, wooden crates, steel banding, plastic banding, and plastic film were included based upon the industry-weighted average usage. The packaging materials are conservatively assumed to be disposed of and the impacts of this disposal are reported in the Installation into the building module (A5).

Conditions of Use

Due to the wide range of applications for metal specialty products, the use stage (B1-B7) is not considered for this declaration. Therefore no conditions of use, environmental and health effects during use, and reference service life considerations have been made.

Environment and Health during Use

The product use stage is not considered. However, there should be no release of harmful substances or emissions during the use of aluminum specialty products.

Reference Service Life

The product use stage is not considered. Therefore, this section is not relevant to this declaration.

Extraordinary Effects

Fire

Fire performance for aluminum specialty products is determined in accordance with UL 723, NFPA 255, ASTM E-84, or ICC's IBC 803.1.1 standards. Manufacturer-specific details are not provided here, but can be obtained from participating manufacturers.

Water

There are no known effects on the environment in the event of flooding or other water damage to the product.

Mechanical Destruction

There are no known effects on the environment in mechanical destruction.

Re-Use Phase

This declaration does not cover the end-of-life disposal or re-use of aluminum specialty products (C1-C4 & D). However, aluminum specialty products are mostly metal and can be recycled once they reach the end of their useful lifetime.

Disposal

The end-of-life disposal or re-use is not considered. Therefore, this section is not relevant to this declaration.

Life Cycle Assessment – Product System and Modeling

A “cradle-to-gate with options” life cycle assessment (LCA) was conducted for this EPD. The analysis was done according to IBU’s product category rule (PCR) for metal ceilings [IBU 2014] and UL’s adaption for products manufactured in North America [UL 2014, UL 2014a], and followed LCA principles, requirements, and guidelines laid out in the ISO 14040/14044 standards [ISO 14040, ISO 14044]. As such, EPDs of construction products may not be comparable if they do not comply with the same PCR or if they are from different programs.

While the intent of the PCR is to increase comparability, there may still be differences among EPDs that comply with the same PCR (e.g., due to differences in system boundaries, background data, etc.).

Declared Unit

The declared unit for this EPD is 1 kg of aluminum specialty product. Note that ceiling grid is not included in the definition of aluminum specialty product. Due to the participation of multiple manufacturers and the often-customized nature of the products, it is not meaningful to declare a reference panel that is accurate for all participating manufacturers. Therefore mass was chosen as the extensive property to normalize energy, materials, and impact assessment results.

The CISCA member companies were surveyed and a conversion from mass to area of sample panels of various thicknesses of aluminum is provided in Table 4. This is provided as a sample conversion, as the weight of aluminum specialty products can vary between 0.28 and 2.6 pounds per square foot.

Table 4: Example conversions from mass to area

Example Panel Thickness	Sheet weight per sq. ft.	Sheet weight per sq. m	Area per 1 kg of product
(in.)	(lbs./ft^2)	(kg/m^2)	(m^2)
0.020	0.28	1.4	0.73
0.032	0.45	2.2	0.46
0.040	0.56	2.7	0.36
0.063	0.88	4.3	0.23
0.090	1.3	6.2	0.16
0.125	1.8	8.6	0.12
0.188	2.6	13	0.078

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System Boundary

This EPD is based upon a "cradle-to-gate with options" life cycle assessment (LCA) study. Specifically the product stage (A1-A3) and construction stage (A5), explicitly the disposal of packaging to landfill, are included. These modules include the following information:

- **Raw material supply:** Raw material supply (including virgin and recycled materials), energy for manufacturing raw materials, emissions, and wastes
- **Transportation:** In-bound transportation of metal materials
- **Manufacturing:** Energy use, waste, and emissions for aluminum specialty product manufacturing
- **Assembly:** The disposal of packaging to landfill

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)																
PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement[1]	Refurbishment[1]	Operational energy use	Operational water use	De-construction 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	MND	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Estimates and Assumptions

The analysis uses the following assumptions:

- Aluminum specialty products are represented by 1 kg of an industry average material composition specified in Table 3.
- Metal scrap produced during aluminum specialty product manufacturing is produced at the same quality as scrap into the up-stream material processes and can be modeled as closed-loop recycling. All relevant recycling operations, such as remelting of scrap, are accounted for within the model.

Cut-off Criteria

Processes or activities that contribute no more than 1% of the total mass and 1% of the total energy, as well as less than 5% of total mass and energy usage per module, may be omitted under PCR cut-off criteria.

Low volume coatings, including wood-laminate materials were considered for inclusion in this study, but were determined to be below the cut-off criteria. Capital equipment production and maintenance were excluded under the

assumption that the impacts associated with these aspects are small enough to fall below cut-off criteria when scaled down to the declared unit. Production of packaging for inbound raw materials to CISCA member companies was also excluded; however, disposal of this packaging is included in waste reported by some manufacturers. Inbound transportation for many process materials (including packaging) is not included, except for inbound transportation of the metal, which represents the bulk of the product mass.

Background Data

The LCA model was created using the GaBi 6 software system for life cycle engineering, developed by PE INTERNATIONAL. The GaBi 2013 LCI databases provided the life cycle inventory data for upstream and downstream processes of the background system. Proxy data used in the LCA model were limited to background data for raw material production and coil coating. Background data specific to the manufacturer's location were used whenever possible, with other locations substituted as proxies when necessary.

Data Quality

Data quality and representativeness are considered to be good to high. Foreground data were collected from CISCA members' manufacturing facilities. The LCI data sets from the GaBi 2013 databases are widely distributed and used with the GaBi 6 Software. The datasets have been used in LCA models worldwide in industrial and scientific applications in internal, as well as in many critically reviewed and published studies. In the process of providing these datasets they are cross-checked with other databases and values from industry and science. All background data used in this model is based on information from 2009 or later, and is considered representative of current activities.

Period under Review

The majority of primary data from CISCA members represents 12 continuous months of production during the 2013 calendar year, with two exceptions. First, due to data availability, one manufacturer provided data for the first six months of 2014. Second, another manufacturer provided previously collected data representing 12 continuous months of production in calendar year 2011. The data from these two manufacturers were benchmarked against the other CISCA members and deemed to be consistent.

Allocation

Most of the manufacturers included in this declaration produce steel specialty products in addition to aluminum specialty products. Therefore, onsite energy, emissions, waste, and process materials were allocated by mass for module A3. The aluminum raw materials were not allocated, as these are tracked for aluminum specialty product manufacturing.

One manufacturer included also produces products that fall outside the scope of this study in the same facility and were not able to obtain the total production mass of these products. As a result, economic allocation based upon product sales price was used to allocate energy and packaging materials. The allocated data for this manufacturer was benchmarked against the mass-allocated data from the other manufacturers and was deemed to be consistent.

A combination of closed-loop recycling and cut-off allocation was used to treat manufacturing wastes and end-of-life treatment for packaging. Metal scrap produced during the production module (A3) is accounted for as materials for recycling and was looped back to the raw materials module (A1). Net scrap input to A1 is then calculated. All relevant recycling operations, such as remelting of scrap, are accounted for within the model.

The energy credits generated from the disposal of manufacturing waste (A3) and packaging waste (A5) are accounted for in exported energy, but were not taken into account for calculating energy demand.

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Comparability

This declaration does not constitute a comparative assertion. Comparisons should only be made with declarations for similar products subject to the same product category rules and verified by UL Environment. It is important to note that even declarations that follow the same PCR may be based upon different underlying assumptions and methodology.

LCA: Scenarios and Additional Technical Information

Modules A4, B1-B7, C1-C4, and D are not declared. Installation into the building (A5) is considered only as it relates to disposal of packaging. The production-weighted, average packaging amounts to approximately 180 g wood, 87 g paper/cardboard, 0.68 g metal, and 2.6 g plastic per 1 kg of aluminum specialty product.

Life Cycle Assessment Results

Environmental Impact

Life cycle impact assessment results for 1 kg of aluminum specialty product are presented in Table 5 and Figure 2. Results are based upon the US EPA TRACI 2.1 Tool for the Reduction and Assessment of Chemical and other environmental Impacts [TRACI]. In an effort to be consistent with declarations written in accordance with EN 15804, the CML 2001- April 2013 [Guinée 2011] impact assessment results are also provided in Table 6.

Table 5: Life cycle impact assessment results per kilogram of aluminum specialty product

Impact Category	Units	A1	A2	A3	A5	Total
Acidification Potential	kg SO_2-eq	4.17E-02	2.62E-04	5.32E-03	9.05E-04	**4.82E-02**
Eutrophication Potential	kg N-eq	1.67E-03	1.67E-05	5.53E-04	5.37E-04	**2.78E-03**
Global Warming Potential	kg CO_2-eq	7.45	0.0518	2.04	0.276	**9.82**
Ozone Depletion Potential	kg CFC 11-eq	1.62E-09	4.59E-13	4.55E-10	2.74E-13	**2.08E-09**
Smog Formation Potential	kg O_3-eq	3.50E-01	7.98E-03	6.93E-02	4.49E-03	**4.32E-01**

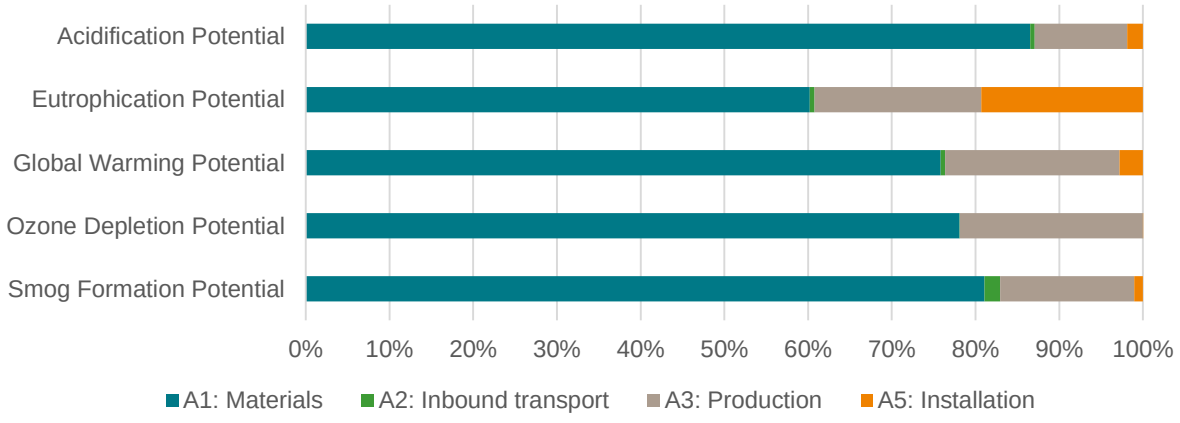

Figure 2: Life cycle impact assessment results for aluminum specialty product

Table 6: Life cycle impact assessment results for TRACI and CML

	TRACI 2.1		CML 2001 – April 2013	
Impact Category	**Impact**	**Units**	**Impact**	**Units**
Acidification potential	4.82E-02	kg SO_2-Equiv.	5.10E-02	kg SO_2-Equiv.
Eutrophication potential	2.78E-03	kg N-Equiv.	3.36E-03	kg PO_4^{3-}-Equiv.
Global warming potential	9.82	kg CO_2-Equiv.	9.82	kg CO_2-Equiv.
Ozone depletion potential	2.08E-09	kg CFC 11-Equiv.	1.93E-09	kg R11-Equiv.
Photochemical ozone creation potential	—	—	3.30E-03	kg C_2H4-Equiv.
Smog formation potential	4.32E-01	kg O_3-Equiv.	—	—
Abiotic depletion potential, elements	—	—	7.48E-06	kg Sb-Equiv.
Abiotic depletion potential, fossil	—	—	111	MJ

Resource Use

The resource use for the declared modules of 1 kg of aluminum specialty products are provided in Table 7 in accordance with the PCR requirements. Both fresh water consumption (as required by the PCR) and fresh water use (i.e. intake) are provided.

Table 7: Resource use results per kilogram of aluminum specialty product

		A1	A2	A3	A5	Total
Renewable Energy Demand	**Units**					
Primary energy resources used as raw materials	MJ	0	0	0	0	**0**
Primary energy excluding resources used as raw materials	MJ	32.8	0.00459	6.05	0.00887	**38.9**
Total primary energy resources	MJ	32.8	0.00459	6.05	0.00887	**38.9**
Non-Renewable Energy Demand	**Units**					
Primary energy resources used as raw materials	MJ	0	0	0	0	**0**
Primary energy excluding resources used as raw materials	MJ	85.8	0.737	32.3	0.200	**119**
Total primary energy resources	MJ	85.8	0.737	32.3	0.200	**119**
Use of Secondary Materials / Fuels	**Units**					
Use of secondary materials	kg	0.722	0	0	0	**0.722**
Use of renewable secondary fuels	MJ	7.55E-03	1.78E-05	6.25E-04	2.11E-04	**8.40E-03**
Use of non-renewable secondary fuels	MJ	7.36E-02	1.88E-04	6.46E-03	4.83E-04	**8.08E-02**
Fresh Water Usage	**Units**					
Fresh water consumption	L	141	0.0506	10.5	-0.539	**151**
Fresh water use (intake)	L	3.56E+04	1.45	1.14+E03	5.32	**3.67E+04**

Output Flows and Waste Categories

The output flows and wastes for the declared modules of 1 kg of aluminum specialty product are provided in Table 8 in accordance with PCR requirements.

Table 8: Waste and output flow results per kilogram of aluminum specialty product

		A1	A2	A3	A5	Total
Waste Flows	**Units**					
Hazardous waste disposed	kg	5.53E-03	7.32E-07	2.61E-04	4.76E-06	**5.80E-03**
Non-hazardous waste disposed	kg	1.91	1.64E-05	2.13E-02	1.51E-01	**2.08**
Radioactive waste disposed	kg	1.71E-03	1.52E-06	1.52E-03	2.39E-06	**3.23E-03**
Materials for Recovery	**Units**					
Materials for recycling	kg	0	0	0.240	0	**0.240**
Materials for energy recovery	kg	0	0	0	0	**0**
Exported Energy	**Units**					
Exported electrical energy	MJ	0	0	2.24E-03	0.109	**0.112**
Exported thermal energy	MJ	0	0	1.05E-03	5.15E-02	**5.26E-02**

LCA Interpretation

The raw material module (A1) is associated with the largest impact relative to the other modules across all assessment categories. Considering just the raw material module (A1), 95-100% of the impact, in almost all assessment categories, is due to the production of aluminum. The two exceptional impact categories are eutrophication and ozone depletion, to which acoustic fleece production and fiberglass production, respectively, represent relevant contributions. Inbound transportation (A2) is almost negligible across all impact categories except for smog formation, in which it accounts for almost 2% of the product impacts.

For the production module (A3), energy usage—specifically electricity usage and propane combustion—is the cause of much of the impact. Coil coating is associated with the second largest effect on eutrophication and smog. The polyester resin and solvent production are primary contributors to eutrophication from the coil coating process. Finally, the disposal of packaging is significant to eutrophication due to the leaching of ammonia from the landfilling of treated wood pallets. The freshwater usage is negative for the assembly (A5), explicitly the landfilling of the packaging, due to the modelling of rainwater accumulation and introduction of this water into the technosphere as wastewater from the landfill.

Requisite Evidence

No statements are declared regarding scope of the declaration or material composition that require requisite evidence.

References

GaBi 6 — GaBi 6 dataset documentation for the software-system and databases, LBP, University of Stuttgart and PE INTERNATIONAL GmbH, Leinfelden-Echterdingen, 2012 (http://documentation.gabi-software.com/)

Guinée 2011 — Guinée, J. B. (ed.): Handbook on life cycle assessment: Operational guide to the ISO-standards. Centre for Milieukunde (CML), Leiden 2001.

IBU 2014	Institute Construction and Environment e.V. (IBU), 2014. PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Metal Ceilings, Version 1.6, 2014.
ISO 14040	ISO 14040 Environmental Management – Life Cycle Assessment – Principles and Framework, 2006
ISO 14044	ISO 14044 Environmental management -- Life cycle assessment -- Requirements and guidelines, 2006
UL 2014	Product Category Rules for Building-Related Products and Services. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project report. UL Environment as adapted from the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Version 1.3, 2014.
TRACI	Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) – User's Manual. Environmental Protection Agency. Washington, DC.
UL 2014a	UL Environment Addendum- Product Category Rules for preparing an environmental product declaration (EPD) for PCR: IBU Product Category Rules, Part B: Requirements on the EPD for Metal Ceilings, October 2013. Version 1, 2014.

LCA and EPD Development

The EPD and background LCA were prepared with support from PE International, Inc.

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