

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	ASPEN Yapı ve Zemin Sistemleri Sanayi ve Ticaret A.Ş.
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASP-20150303-IBC1-EN
Issue date	07/03/2016
Valid to	06/03/2021

Integra® Steel Ceiling Systems

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General Information

ASPEN Yapı ve Zemin

Programme holder

IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-ASP-20150303-IBC1-EN

This Declaration is based on the Product Category Rules:

Metal ceilings, 07.2014
(PCR tested and approved by the SVR)

Issue date

07/03/2016

Valid to

06/03/2021



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



Dr. Burkhard Lehmann
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Integra® Steel Ceiling Systems

Owner of the Declaration

ASPEN Yapı ve Zemin Sistemleri Sanayi ve Ticaret A.Ş.
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Turkey

Declared product / Declared unit

Metal Ceiling System / 1 m²

Scope:

This Environmental Product Declaration (EPD) covers the life cycle analysis study results of Integra Steel Ceiling Systems product group - manufactured at ASPEN Organized Industrial Zone plant in Eskişehir. The declaration type of this EPD is an average product from manufacturer's plant. The study was conducted for the operation activities in 2014.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The CEN Norm /EN 15804/ serves as the core PCR

Independent verification of the declaration
according to /ISO 14025/

internally externally



Prof. Dr. Birgit Grahl
(Independent verifier appointed by SVR)

Product

Product description

ASPEN Integra® steel suspended ceiling systems are a type of finish system that is hung below the ceiling structure within a space. They are mainly used to provide aesthetical view and acoustical quality in working environment. Besides, the interstitial space between the ceiling panel and deck can serve as an air plenum for ventilation. They can also be used to hide pipes, ducts and electrical wiring. Integra® steel ceiling systems are easily removable, so it is easy to access mechanical and electrical equipment above the ceiling panel. Integra® steel ceiling systems can be applied with different suspension heights and designs depend on project requirements.

They are comprised of membranes e.g. tile or plank panel ceilings and substructure for suspending the metal ceiling. In this LCA study, the substructures were not taken into account according to average breakdown approach.

Application

ASPEN Integra® Metal Ceiling Systems provide modern design alternatives to architects and freedom to use as cladding in the interior spaces. It comprises modular panels produced in desired dimensions according to project requirements that can easily respond to both acoustic and aesthetic needs.

Unlimited colour opportunities and light transmission feature provide convenience in obtaining aesthetic appearances.

Technical Data

Depend on the project requirements; ASPEN can supply metal ceiling panels with perforation diameters between 0.50 - 16.0 mm, which provides different acoustical qualities and sound absorption values as follows;

- Noise Reduction Coefficient (NRC) values are from 0.60 up to 0.95 in accordance with Standard Test Method for Sound Absorption and Sound Absorption Coefficients /ASTM C423 -09a/.
- The weighted sound absorption coefficient (α_w) values are between 0.60 and 1 in accordance with /TS EN ISO 11654/.

Name	Value	Unit
Sound absorption coefficient (EN ISO 354, TS EN ISO 11654)	60 - 100	%

Base materials / Ancillary materials

ASPEN Integra® Steel Ceiling Systems are primarily made of steel, acoustic tissue, coating powder, plaster and rock wool. Main raw materials as mass percentage are;

Name	Value	Unit
Steel	86.42	%
Plaster	6.71	%
Rock Wool	2.42	%
Coating Powder*	2.94	%
Acoustic Tissue	0.64	%
Auxillary Substances	0.79	%

(* = Coating powder includes zinc di(benzothiazol-2-yl) disulphide. It is in "Candidate List of Substances of

Very High Concern for Authorisation". The substance has been registered to ECHA and REACH Declaration exist.)

Reference service life

This Life Cycle Assessment study is based on *cradle-to-factory gate* without options, therefore no reference service life is required. The ceiling systems are manufactured by considering /TS EN 13964/, /TS EN ISO 9223/, and /TS EN ISO 9224/. The environmental conditions and durability requirements defined for projects were also taken into account while manufacturing the product.

LCA: Calculation rules

Declared Unit

The declared unit is 1m² Integra® steel ceiling panel produced in ASPEN Eskişehir manufacturing plant. The average mass of the product is 6.37 kg/m².

Name	Value	Unit
Conversion factor to 1 kg	0.157	-
Declared unit	1	m ²
Grammage	6.37	kg/m ²

The calculations were done based on average annual data available in the company. Average breakdown was done by considering Integra steel ceiling system total area per year production. According to this, the total raw materials, energy and water used to produce Aspen Integra steel ceiling system were divided by the total annual production amount in reference year -

2014.

System boundary

The type of this LCA study is *cradle to factory gate*. The system boundary includes A1 through A3 product stages that are accounted for;

- A1 raw material extraction and processing
- A2 transport to the manufacturer
- A3 manufacturing - including packaging

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

LCA: Scenarios and additional technical information

The modules A4, A5, B1- B7 and C1-C4 are neither considered nor declared in this study.

LCA: Results

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 from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² Integra Steel Ceiling Panel

Parameter	Unit	A1-A3
Global warming potential	[kg CO ₂ -Eq.]	1.72E+1
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.80E-7
Acidification potential of land and water	[kg SO ₂ -Eq.]	7.96E-2
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	1.24E-2
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	8.54E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.79E-4
Abiotic depletion potential for fossil resources	[MJ]	2.02E+2

RESULTS OF THE LCA - RESOURCE USE: 1 m² Integra Steel Ceiling Panel

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	1.58E+1
Renewable primary energy resources as material utilization	[MJ]	-
Total use of renewable primary energy resources	[MJ]	1.58E+1
Non-renewable primary energy as energy carrier	[MJ]	2.11E+2
Non-renewable primary energy as material utilization	[MJ]	-
Total use of non-renewable primary energy resources	[MJ]	2.11E+2
Use of secondary material	[kg]	-
Use of renewable secondary fuels	[MJ]	-
Use of non-renewable secondary fuels	[MJ]	-
Use of net fresh water	[m ³]	5.60E-1

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m² Integra Steel Ceiling Panel

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	1.69E-3
Non-hazardous waste disposed	[kg]	2.48E-1
Radioactive waste disposed	[kg]	3.04E-3
Components for re-use	[kg]	-
Materials for recycling	[kg]	1.02E+0
Materials for energy recovery	[kg]	-
Exported electrical energy	[MJ]	-
Exported thermal energy	[MJ]	-

References

Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V., Berlin(pub.):
Generation of Environmental Product Declarations (EPDs);

General principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04
www.bau-umwelt.de

ISO 14025

DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804

EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Product Category Rules for Building Products, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report (Version 1.2)

Product Category Rules for Building-Related Products and Services, Part B: Requirements on the EPD for Metal Ceilings (Version 1.6)

GaBi 6.3.1.14

Software and database for life cycle engineering. LBP,
University of Stuttgart and PE INTERNATIONAL AG,
Leinfelden-Echterdingen, 2013

World Steel Association

Life Cycle Assessment Methodology Report, Life Cycle
Inventory Study for Steel Products

ASTM C423 - 09a

Standard Test Method for Sound Absorption and
Sound Absorption Coefficients by the Reverberation
Room Method

TS EN ISO 11654:1997

Acoustics - Sound absorbers for use in buildings -
Rating of sound absorption

TS EN 13964:2014

Suspended ceilings - Requirements and test methods

TS EN ISO 9223:2012

Corrosion of metals and alloys - Corrosivity of
atmospheres - Classification, determination and
estimation

TS EN ISO 9224:2012

Corrosion of metals and alloys - Corrosivity of
atmospheres - Guiding values for the corrosivity
categories

ISO 14025

Environmental labels and declarations: Type 3
Environmental Declarations Principles and Procedures

EN ISO 354:2003

Acoustics -- Measurement of sound absorption in a
reverberation room

European Chemicals Agency

Candidate List of substances of very high concern for
Authorisation

<http://echa.europa.eu/candidate-list-table>

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