

# 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)
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Valid to	06/03/2021

## Integra® Aluminum Ceiling Systems

[www.bau-umwelt.com](http://www.bau-umwelt.com) / <https://epd-online.com>



## General Information

### ASPEN Yapı ve Zemin

#### Programme holder

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

#### Declaration number

EPD-ASP-20150304-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  
(Managing Director IBU)

### Integra® Aluminum Ceiling Systems

#### Owner of the Declaration

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34387 Mecidiyeköy, İstanbul  
Turkey

#### Declared product / Declared unit

Metal Ceiling System / 1m<sup>2</sup>

#### Scope:

This Environmental Product Declaration (EPD) covers the life cycle analysis study results of Integra Aluminium 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® aluminum 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® aluminum ceiling systems are easily removable, so it is easy to access mechanical and electrical equipment above the ceiling panel. Integra® aluminum 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 auxiliaries for suspending the metal ceiling. In this LCA study, the auxiliaries 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 ( $\alpha_w$ ) values are between 0.60 and 1 in accordance with / TS EN ISO 11654/.

Name	Value	Unit
Sound absorption coefficient acc. to EN ISO 354 and TS EN ISO 11654	60 - 100	%

### Base materials / Ancillary materials

ASPEN Integra® Aluminium Ceiling Systems are primarily made of aluminium, coating powder and acoustic tissue. Main raw materials as mass percentage are;

Name	Value	Unit
Aluminium	91.34	%
Coating Powder*	6.91	%
Acoustic Tissue	1.70	%
Auxillary Substances	0.05	%

(\* = 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 1m<sup>2</sup> Integra® aluminium ceiling panel produced in ASPEN Eskişehir manufacturing plant. The average mass of the product is 1.88 kg/m<sup>2</sup>.

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	1.88	kg/m <sup>2</sup>
Conversion factor to 1 kg	0.53	-

The calculations were done based on average annual data available in the company. Average breakdown was done by considering Integra aluminum ceiling system total area per year production. According to this, the total raw materials, energy and water used to produce Aspen Integra aluminum 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 m<sup>2</sup> ceiling panel

Parameter	Unit	A1-A3
Global warming potential	[kg CO <sub>2</sub> -Eq.]	2.03E+1
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.31E-8
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	1.23E-1
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	1.19E-2
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	7.04E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	9.07E-6
Abiotic depletion potential for fossil resources	[MJ]	2.19E+2

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> ceiling panel

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	7.73E+1
Renewable primary energy resources as material utilization	[MJ]	-
Total use of renewable primary energy resources	[MJ]	7.73E+1
Non-renewable primary energy as energy carrier	[MJ]	2.67E+2
Non-renewable primary energy as material utilization	[MJ]	-
Total use of non-renewable primary energy resources	[MJ]	2.67E+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 <sup>3</sup> ]	1.48E+1

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> ceiling panel

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	4.42E-3
Non-hazardous waste disposed	[kg]	3.03E+0
Radioactive waste disposed	[kg]	1.92E-2
Components for re-use	[kg]	-
Materials for recycling	[kg]	1.70E-1
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](http://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

### **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

### **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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