

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

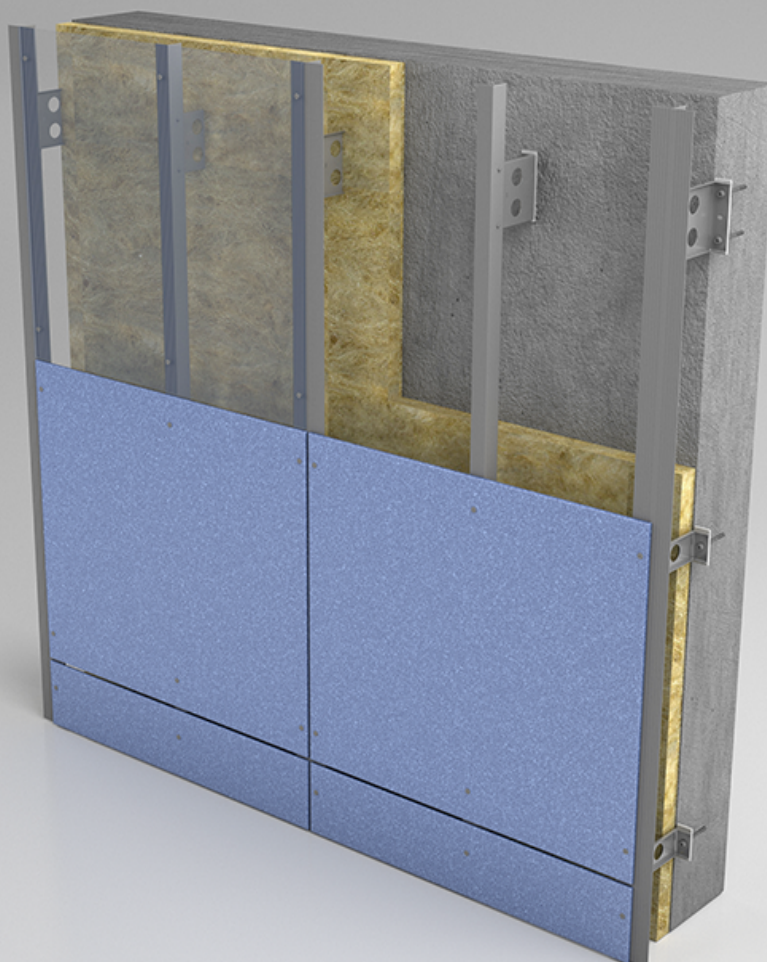
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## ALWI-S

Profile system for visible fixing of large-format cladding panels

Systema GmbH

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EPD  
VERIFIED

## General Information

### Systema GmbH

#### Programme holder

IBU – Institut Bauen und Umwelt e.V.  
Hegelplatz 1  
10117 Berlin  
Germany

#### Declaration number

EPD-SYS-20220089-CBA1-EN

#### This declaration is based on the product category rules:

Thin walled profiles and profiled panels of metal, 01.2019  
(PCR checked and approved by the SVR)

#### Issue date

24.05.2022

#### Valid to

23.05.2027



Dipl. Ing. Hans Peters  
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Dr. Alexander Röder  
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### ALWI-S

Profile system for visible fixing of large-format cladding panels

#### Owner of the declaration

**Systema GmbH**  
Margarete-Steiff-Str. 6  
D-24558 Henstedt-Ulzburg  
Germany

#### Declared product / declared unit

1 m<sup>2</sup> **ALWI-S** profile system for visible fixing of large-format cladding panels.

#### Scope:

This declaration applies to the ALWI-S profile system, consisting of wall brackets, fasteners, carrier profiles and thermal separators, which is manufactured at the Henstedt-Ulzburg plant in Germany. The declaration covers the lifecycle assessment data of the ALWI-S system with a mass per unit area of 1.85 kg/m<sup>2</sup>.

The data of the individual components made from different materials are indicated in kg in an appendix. The data can be used to calculate all specific product combinations and variants, as well as extensions.

This lifecycle assessment is based on average production data from the business year 2020. This was provided by Systema GmbH.

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.

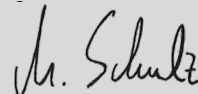
The EPD was created according to the specifications of *EN 15804+A2*. In the following, the standard will be simplified as *EN 15804*.

#### Verification

The standard *EN 15804* serves as the core PCR

Independent verification of the declaration and data according to *ISO 14025:2011*

internally  externally



Matthias Schulz  
(Independent verifier)

## Product

### Product description/Product definition

ALWI-S is a substructure system for non-bearing, rear-ventilated façades and rear-ventilated ceiling claddings.

An ALWI-S based substructure system consists of vertical L and T aluminium carrier profiles, wall brackets, and optional accessories. The wall brackets are made of stainless steel or, alternatively, of aluminium, depending on thermal requirements. The stainless-steel wall brackets are generally design

approved and Passivhaus certified. By using stainless-steel wall brackets, the system's thermal transmittance values can be minimised, allowing for structures with no thermal bridges.

The system is composed of the following constituent parts:

- Stainless-steel wall brackets (standard protrusion up to 400 mm)
- Alternatively aluminium wall brackets
- Thermostop elements for thermal separation

- Aluminium carrier profiles
- Alternatively powder-coated aluminium carrier profiles
- Fasteners
- Optional accessories

An ALWI-S based substructure system can be used for single-layer and multi-layer, horizontal and vertical superstructures and extended with additional profiles.

EU regulation no. 305/2011/ (CPR) applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a declaration of performance based on *DIN EN 1090-1:2012-02, Execution of steel structures and aluminium structures – Part 1: Requirements for conformity assessment of structural components* and the CE label.

The respective national regulations apply to its use.

### Application

The system, its variants and individual components covered by this declaration are primarily used as substructure system for non-bearing, rear-ventilated façades and rear-ventilated ceiling claddings on different substrates

### Technical Data

Technical data according to the declaration of performance:

#### 1. Product description:

Stainless-steel substructure systems and aluminium substructure systems

**2. Designation of component:** Brackets (also referred to as wall brackets), retainers, extruded profiles, hanger clips

**3. Instruction for use:** Substructure non-bearing, rear-ventilated façades

**4. Year of manufacture:** 2020

**5. Execution standard:** *EN 1090-2* and *EN 1090-3*

**6. Geometric tolerances:** according to *EN 1090-2 / Manufacturing Class II* and according to *EN 1090-3 / Manufacturing Class II*;

**7. Fracture toughness:** Not required for stainless steel and aluminium

**8. Weldability:** VA-1.4404; VA-1.4571; VA-1.4301; VA-1.4162 and EN AW 6063 T66; EN AW 6060 T66; EN AW 5754 H22/32 according to *EN 1011-4* and *EN 1999-1-1*

**9. Fire behaviour:** Material categorised as Class A1

**10. Release of cadmium:** NPD

**11. Release of radioactive radiation:** NPD

**12. Durability:** Untreated or powder-coated in accordance with *EN 12206-1* or anodised in accordance with *ISO 7599*

**13. Design:** According to *EN 1999*; refer to Design Requirements and External Calculations

**14. Manufacturing:** According to component specification and *EN 1090-2* and *EN 1090-3*

**15. Design class:** EXC 2

**16. Assembly:** NPD

### Constructional data

The constructional data are representative of all variants that are based on the ALWI-S substructure system or its individual components.

Name	Value	Unit
Thickness of stainless-steel wall bracket	1.7	mm
Thickness of aluminium wall bracket (alternative)	≥ 3	mm
Mass per unit area with stainless-steel brackets	1,84	kg/m <sup>2</sup>
Mass per unit area with aluminium wall bracket (alternative)	1,59	kg/m <sup>2</sup>
Height of wall brackets	≥ 70	mm
Thickness of carrier profiles	≥ 2	mm

The performance values of the product correspond to the declaration of performance in relation to the main features in accordance with *DIN EN 1090-1:2012-2 Execution of steel structures and aluminium structures – Part 1: Requirements for conformity assessment of structural components*

### Base materials/Ancillary materials

The main base materials and pre-products are:

- 40–60% stainless steel
- 40–60% aluminium
- 1–3% plastic
- < 1% colourants

The percentages may vary, subject to the substructure, protrusion and static requirements.

- 1) Does the product or at least one part product contain materials from the ECHA candidate list of Substances of Very High Concern – SVHC (Date 31/01/2022) above a mass percentage of 0.1: **no**.
- 2) Does the product or at least one part product contain further CMR Category 1A or 1B substances which are not on the candidate list in doses above 0.1 mass percent in at least one part product: **no**.
- 3) Were biocidal products added to this building product or was it treated with biocidal products (is it therefore a processed product in terms of the EU Biocide Product Directive no. 528/2012): **no**.

### Reference service life

The period of use of the ALWI-S profile system must at least be equal to the period of use of the cladding attached to it. It is safe to assume that the lifecycle is significantly longer than this, and is at least 70 years. Due to the materials used, it can be assumed that a substructure which is based on the ALWI-S system is a maintenance-free system which can easily be dismantled and disassembled into its individual components at the end of its lifecycle.

## LCA: Calculation rules

### Declared Unit

The declared unit (worst case) is 1 m<sup>2</sup> **ALWI-S** (profile system for visible fixing of large-format cladding panels) with a mass per unit area (stainless-steel wall bracket and fasteners, powder-coated aluminium profile and PVC thermal separator) of 1.85 kg/m<sup>2</sup>.

The data of the individual components made from different materials are indicated in kg in an appendix. The data can be used to calculate all specific product combinations and variants, as well as extensions.

### Declared unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Mass per unit area, stainless steel variant	1,85	kg/m <sup>2</sup>

The data given in the appendix can be used to calculate systems with a different structure which have other masses per unit area due to differing system depths or additional horizontal or vertical carrier profiles.

### System boundary

The EPD covers the lifecycle assessment data from the cradle to the factory gate – with options, modules C1–C4, and module D (A1–A3, C and D).

The following modules are declared:

### Product stage (A1–A3)

- Provision and transport of the pre-products and manufacture of the individual components, packaging

### Construction process stage (A4–A5)

- 457 km transport (A4) to building site and in A5 (only disposal of packaging)

### End-of-life stage (C1–C4)

- Manual deconstruction
- Transport to disposal site (50 km)
- Work done for thermal recycling of plastic parts and energy recovery with an R1 factor of > 0.6 in C3
- no work in C4

### Potential benefits and charges beyond the system boundary (D)

Work to be done for disposal (recycling for (stainless) steel and aluminium components), potentials for re-use, recovery or recycling as net streams and credits or charges for steel/stainless steel and energy recovery from the thermal recycling of the plastic parts.

The individual components (wall brackets and fasteners, carrier profile and thermal separator) of the declared system "ALWI-S" are delivered packed by the corresponding manufacturer. The packaging will not be considered under the **cut-off criteria**.

### 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

### Characteristic product properties Information on biogenic Carbon

The product itself contains no biogenic carbon.

The following technical information is the basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment if no modules are declared (MND).

### Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.0166	l/100km
Transport distance	457	km
Capacity utilisation (including empty runs)	61	%
Flächengewicht des transportierten Produkts	1,85	kg/m <sup>2</sup>

This only applies to the use of aluminium wall brackets.

Name	Value	Unit
Pallets (wood)	0,00167	kg/m <sup>2</sup>
Cardboard	0,00110	kg/m <sup>2</sup>
PE foil	0,00003	kg/m <sup>2</sup>

### End-of-life (C1–C4)

Name	Value	Unit
Recycling (stainless steel, steel, aluminium)	1.817	kg
Energy recovery (plastic parts)	0.031	kg

The potential use beyond the system boundary of electricity and thermal energy generated by the combustion of the plastic components are set off against European data sets

### Installation into the building (A5)

## LCA: Results

All declared life stages are marked with an X in Table 1. Description of the system boundary and all those which are not declared are marked with MND (Modules B3, B4 and B5 are set to MRN – Module Not Relevant – by default).

### DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

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	X	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m<sup>2</sup> ALWI-S with 1.85 kg/m<sup>2</sup> mass per unit area

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> -Eq.]	7.97E+0	5.13E-2	0.00E+0	0.00E+0	5.61E-3	8.03E-2	0.00E+0	-4.54E+0
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	7.96E+0	5.07E-2	0.00E+0	0.00E+0	5.55E-3	8.03E-2	0.00E+0	-4.53E+0
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	9.14E-3	1.48E-4	0.00E+0	0.00E+0	1.62E-5	1.62E-5	0.00E+0	-3.14E-3
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	6.31E-3	4.16E-4	0.00E+0	0.00E+0	4.55E-5	1.80E-5	0.00E+0	-3.33E-3
ODP	[kg CFC11-Eq.]	5.45E-12	6.49E-18	0.00E+0	0.00E+0	7.10E-19	1.29E-16	0.00E+0	8.12E-13
AP	[mol H <sup>+</sup> -Eq.]	3.97E-2	4.81E-5	0.00E+0	0.00E+0	5.26E-6	2.18E-5	0.00E+0	-2.21E-2
EP-freshwater	[kg P-Eq.]	1.05E-5	1.51E-7	0.00E+0	0.00E+0	1.65E-8	1.98E-8	0.00E+0	-2.25E-6
EP-marine	[kg N-Eq.]	5.14E-3	1.48E-5	0.00E+0	0.00E+0	1.62E-6	7.27E-6	0.00E+0	-2.94E-3
EP-terrestrial	[mol N-Eq.]	5.60E-2	1.78E-4	0.00E+0	0.00E+0	1.95E-5	8.97E-5	0.00E+0	-3.20E-2
POCP	[kg NMVOC-Eq.]	1.67E-2	4.14E-5	0.00E+0	0.00E+0	4.53E-6	2.11E-5	0.00E+0	-9.04E-3
ADPE	[kg Sb-Eq.]	1.24E-4	3.87E-9	0.00E+0	0.00E+0	4.23E-10	1.84E-9	0.00E+0	-3.43E-5
ADPF	[MJ]	1.04E+2	6.76E-1	0.00E+0	0.00E+0	7.40E-2	1.49E-1	0.00E+0	-5.61E+1
WDP	[m <sup>3</sup> world-Eq deprived]	1.07E+0	4.41E-4	0.00E+0	0.00E+0	4.83E-5	6.20E-3	0.00E+0	-9.70E-1

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m<sup>2</sup> ALWI-S with 1.85 kg/m<sup>2</sup> mass per unit area

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3.43E+1	3.77E-2	0.00E+0	0.00E+0	4.13E-3	3.32E-2	0.00E+0	-2.26E+1
PERM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	3.43E+1	3.77E-2	0.00E+0	0.00E+0	4.13E-3	3.32E-2	0.00E+0	-2.26E+1
PENRE	[MJ]	1.04E+2	6.77E-1	0.00E+0	0.00E+0	7.41E-2	7.69E-1	0.00E+0	-5.61E+1
PENRM	[MJ]	6.20E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-6.20E-1	0.00E+0	0.00E+0
PENRT	[MJ]	1.04E+2	6.77E-1	0.00E+0	0.00E+0	7.41E-2	1.49E-1	0.00E+0	-5.61E+1
SM	[kg]	1.18E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.16E-1
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m <sup>3</sup> ]	7.48E-2	4.32E-5	0.00E+0	0.00E+0	4.73E-6	1.62E-4	0.00E+0	-6.83E-2

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m<sup>2</sup> ALWI-S with 1.85 kg/m<sup>2</sup> mass per unit area

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	5.06E-8	3.41E-11	0.00E+0	0.00E+0	3.73E-12	2.66E-11	0.00E+0	-3.97E-9
NHWD	[kg]	1.55E+0	1.01E-4	0.00E+0	0.00E+0	1.10E-5	4.93E-2	0.00E+0	-1.12E+0
RWD	[kg]	4.59E-3	8.19E-7	0.00E+0	0.00E+0	8.96E-8	4.38E-6	0.00E+0	-2.63E-3
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.81E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.10E-2	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.48E-1	0.00E+0	0.00E+0

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:  
1 m<sup>2</sup> ALWI-S with 1.85 kg/m<sup>2</sup> mass per unit area**

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	5.42E-7	2.93E-10	0.00E+0	0.00E+0	3.21E-11	5.53E-10	0.00E+0	-2.80E-7
IRP	[kBq U235-Eq.]	7.87E-1	1.17E-4	0.00E+0	0.00E+0	1.28E-5	4.55E-4	0.00E+0	-5.46E-1
ETP-fw	[CTUe]	3.66E+1	4.89E-1	0.00E+0	0.00E+0	5.35E-2	1.22E-1	0.00E+0	-2.25E+1
HTP-c	[CTUh]	1.28E-6	9.86E-12	0.00E+0	0.00E+0	1.08E-12	4.89E-12	0.00E+0	-4.22E-9
HTP-nc	[CTUh]	1.12E-7	5.09E-10	0.00E+0	0.00E+0	5.57E-11	5.19E-10	0.00E+0	-4.77E-8
SQP	[-]	1.52E+1	2.32E-1	0.00E+0	0.00E+0	2.54E-2	3.27E-2	0.00E+0	-3.20E+0
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index								

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”.

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”.

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

## References

### Standards

#### PCR Part A

Product category rules for building-specific products and services in the Environmental Product Declarations programme of the Institut Bauen und Umwelt e.V. (IBU), Part A: Calculation rules for the LCA and requirements of the project report in accordance with *EN15804+A2: 2021*. Version 1.2, 11/2021, [www.ibu-epd.com](http://www.ibu-epd.com)

#### PCR: Thin-walled metal profiles and profile panels

Product Category Rules for Building-specific Products and Services. Part B: Requirements on EDP for Thin-walled metal profiles and profile panels, 2017; [www.ibu-epd.com](http://www.ibu-epd.com). Institut Bauen und Umwelt e.V. (Ed.), Version 1.7, 08/01/2019

#### GaBi ts

Software & Documentation Sphera Solutions GmbH, *GaBi* Software-System and Database for Life Cycle Engineering. Stuttgart, Leinfelden-Echterdingen, 1992-2020. CUP2021.1.2. *GaBi* data set documentation: <http://documentation.gabi--software.com/>

#### EN 15804

*EN 15804:2012+A2:2019 + AC:2021*, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

#### ISO 14025

*DIN EN ISO 14025:2011-10*, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures.

#### DIN 18516

*DIN 18516-1: 2010-06* Cladding for external walls, ventilated at rear – Part 1: Requirements, principles of testing.

#### EN 1090-1

*DIN EN 1090-1:2012-02*, Execution of steel structures and aluminium structures – Part 1: Requirements for conformity assessment of structural components.

#### EN 1090-2

*DIN EN 1090-2:2018-09*, Execution of steel structures and aluminium structures – Part 2: Technical requirements for steel structures.

#### EN 1090-3

*DIN EN 1090-3:2019-07*, Execution of steel structures and aluminium structures – Part 2: Technical requirements for the execution of steel structures – Part 3: Technical requirements for aluminium structures.

#### EN 1090-4

*DIN EN 1090-4:2020-06*, Execution of steel structures and aluminium structures – Part 4: Technical requirements for cold-formed structural steel elements and cold-formed structures for roof, ceiling, floor and wall applications.

#### EN 1011-4

*DIN EN 1011-4:2001-02*, Welding - Recommendations for welding of metallic materials – Part 4: Arc welding of aluminium and aluminium alloys.

#### EN ISO 3834-3

*DIN EN ISO 3834-3:2021-08*, Quality requirements for

fusion welding of metallic materials – Part 3: Standard quality requirements (ISO 3834-3:2021).

**EN ISO 3834-4**

*DIN EN ISO 3834-4:2021-08*, Quality requirements for fusion welding of metallic materials – Part 4: Elementary quality requirements (ISO 3834-4:2021).

**EN 10088-1**

*DIN EN 10088-1:2014-12*, Stainless steels – Part 1: List of stainless steels.

**EN 10088-2**

*DIN EN 10088-2:2014-12*, Stainless steels – Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes.

**EN 755-1**

*DIN EN 755-1:2016-10*, Aluminium and aluminium alloys – Extruded rod/bar, tube and profiles – Part 1: Technical conditions for inspection and delivery.

**EN 755-2**

*DIN EN 755-2:2016-10*, Aluminium and aluminium alloys – Extruded rods/bars, tubes and profiles – Part 2: Mechanical properties.

**EN ISO 7599**

*DIN EN ISO 7599:2018-05*, Anodizing of aluminium and its alloys – Method for specifying decorative and protective anodic oxidation coatings on aluminium. (ISO 7599:2018).

**EN 12206-1**

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