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**EAD 340503-00-1106**

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European Assessment Document for

# Prefabricated fire-resistant building units



CE

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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

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# 1 SCOPE OF THE EAD

## 1.1 Description of the construction product

Prefabricated Fire-Resistant Building Units (hereafter Units or Unit) designed as box-like single units without aggregation or connection in height (see Figure 1.1.1). The maximum dimensions of the Units are 11 m (length), 4 m (depth) and 5 m (height). The Units are not part of a modular system and they are installed in a permanent manner to the works to generate a fire protected room.

The Units consist of the following components:

- a. Structural frame providing the structural capacity of the Unit, consisting of:
  - A double frame (inner frame, see Figure 1.1.2, and outer frame, see Figure 1.1.3) made of steel profiles (beams and columns) in accordance with EN 1090-2<sup>1</sup>, rigidly connected to each other with blind rivets. The inner and outer frame are coupled by screws.
  - A base consisting of a sump made of bended steel sheets. A steel grid is placed on top of the sump as the Unit's floor (for support of the Unit's contents and the sporadic pedestrian access). The base is connected to the structural concrete slab by means of anchors which are not part of the Units (see Figure 1.1.4 and clause 1.2.1 for fixing means).

The minimum data for the structural frame definition are: the geometrical data (nominal value and tolerance) of the steel elements (beams, columns, base sump and base grid), such as the thickness, cross-section dimensions and cross-section modulus; the maximum span between the profiles; the mechanical resistance of the steel by reference to the steel type and grade according to EN 10025-2 or EN 10346; the coating (organic or inorganic) applied on the steel elements, if any; the type (including dimensions and material), number and spacing of blind rivets and screws connecting the elements.

- b. The enclosure (walls and roof) is made of self-supporting sandwich panels with a mineral wool insulation core and two galvanised steel sheet facings in accordance with EN 14509. The panels are assembled within the inner and outer steel frame. See Figure 1.1.3.

The minimum data for the sandwich panels definition are the type and thickness of sheets, the type, thickness and density of the core material, the panel dimensions, and the connexion between the panels.

- c. Fire resistant doors (see Figure 1.1.3) in accordance with EN 16034 and EN 14351-1 or EN 13241, installed in a frame made of steel elements that form an encasement filled with concrete, resulting in a rigid support for the door.

The minimum data for the fire resistant doors definition are the type, material and dimensions.

- d. Fire penetration seals (optional) according to EAD 350454-00-1104 and fire dampers (optional) according to EN 15650 to keep the resistance to fire performance of the Unit's enclosure where it is penetrated by technical services (see clause 1.2.1 on additional equipment).

The minimum data for the fire penetration seals definition are the type of product, dimensions and service protected. For defining the fire dampers, the minimum data are the generic type and dimensions.

The Units are fully prefabricated and assembled at the factory, and transported to site in three-dimensional format. The sole operation needed on site is to lay the Unit and fix it to a flat concrete slab for its permanent incorporation (see Figure 1.1.4 and clause 1.2.1 for fixing means).

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<sup>1</sup> All undated references to standards in this EAD are to be understood as references to the dated versions listed in chapter 4.

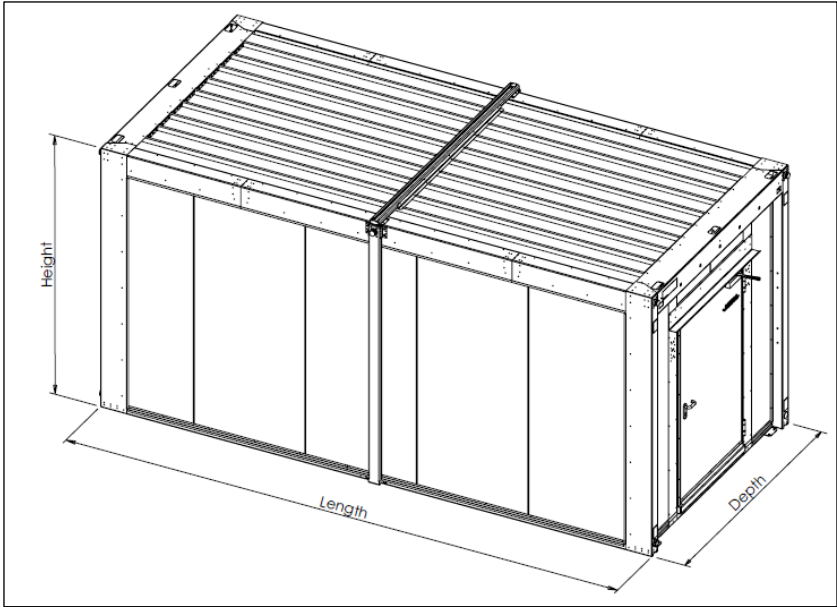


Figure 1.1.1 General view of the Unit

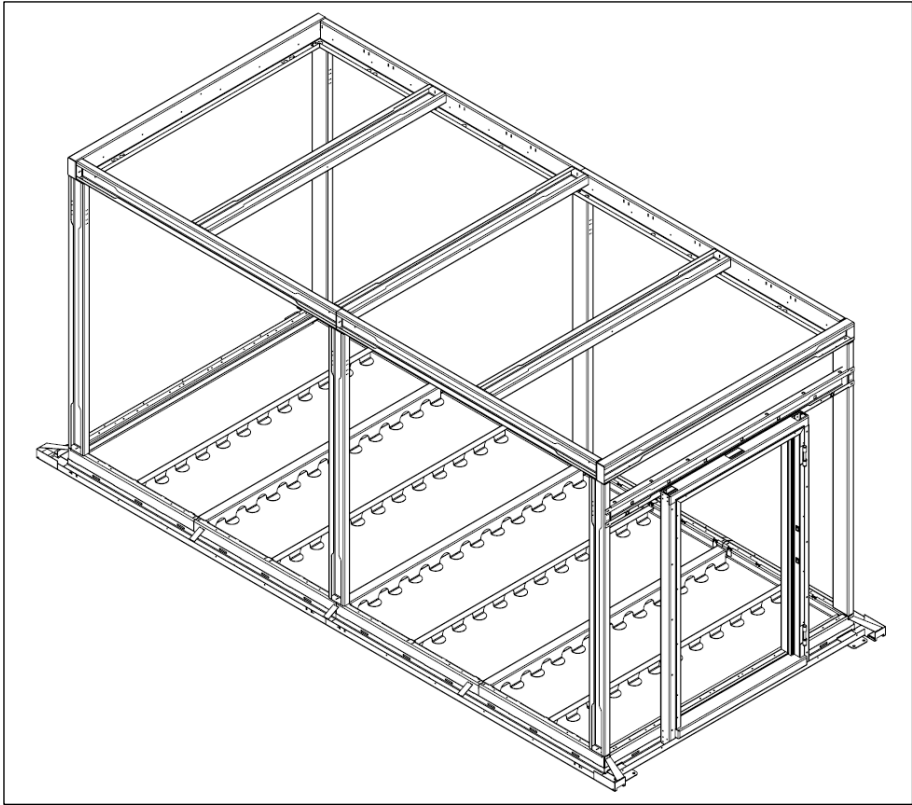
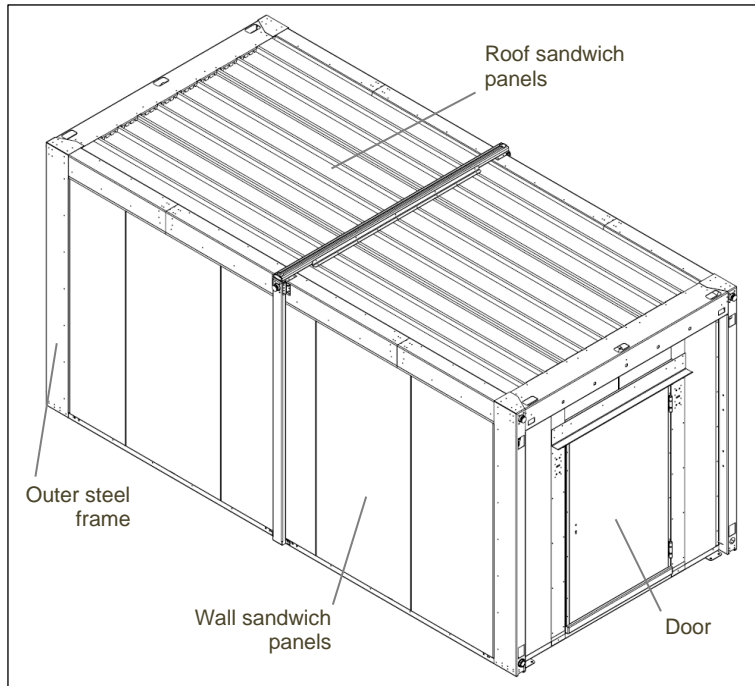
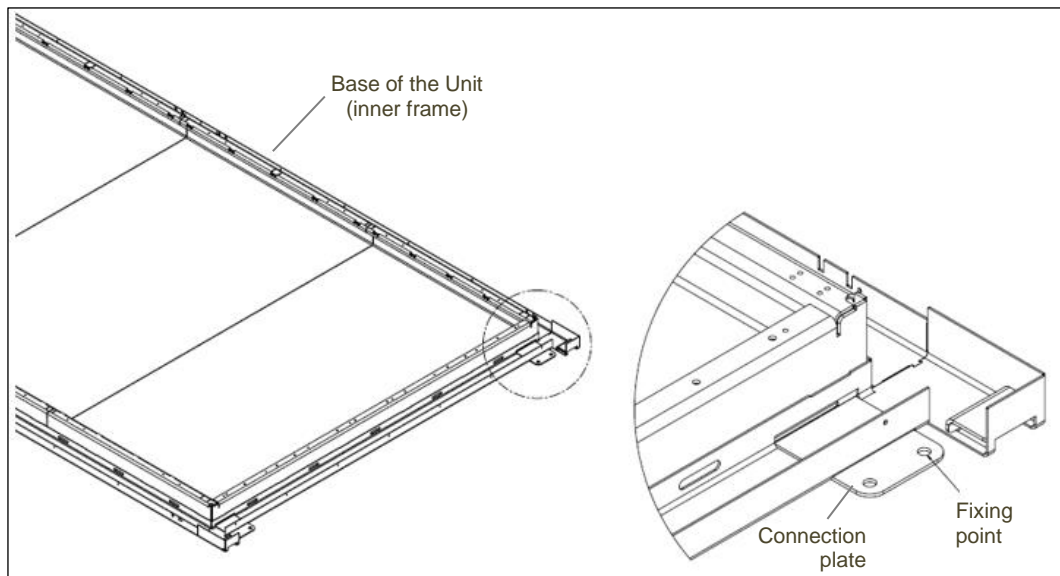


Figure 1.1.2 Inner frame of steel elements



**Figure 1.1.3 Outer frame with the enclosure of sandwich panels**



**Figure 1.1.4 Unit's connexion plates and fixing points in the base of the inner frame**

The product is not covered by a harmonised European standard (hEN).

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA.

## 1.2 Information on the intended use(s) of the construction product

### 1.2.1 Intended use(s)

The Units are intended to create a fire protected room (fire-resistant compartment). The Units are used to host services and/or store goods in safe conditions in case of fire, both because:

- a fire initiated outside the Unit should not affect the contents inside the Unit (fire from outside)
- a fire initiated inside the Unit should not spread and affect the outside of the Unit (fire from inside).

The Units are not intended to be used as a permanent workplace.

The Units are intended for indoor or outdoor uses.

The Units for indoor use are not intended to support additional loads except their own self-weight in accordance with clause 2.1 of EN 1991-1-1, and the weight of the store goods (variable imposed load in accordance with clause 2.2 of EN 1991-1-1).

The Units for outdoor use are intended to support, in addition to loads applicable to indoor use, other relevant variable imposed actions in accordance with clause 4.1 of EN 1990.

The structural frame of the Units is intended to be calculated in accordance with EN 1993-1-3 or EN 1993-1-1.

The Units are intended to be permanently fixed to a structural concrete slab, both for internal and external installation, using with two different types of fixings: mechanical fasteners for use in concrete, in accordance with EAD 330232-01-0601, or bonded fasteners for use in concrete, in accordance with EAD 330499-01-0601.

The Units are produced on demand and customised, depending on the project requirements, by the installation of additional equipment, such as shelves and insert trays for storage, door hold-open devices, technical ventilation, lighting, wiring, electrical control systems, signal devices, cooling/heating systems, earthing rails or access ramps, etc. This equipment is autonomous and not connected with the building installations or structure (the only connexion of the Unit to the works is the fixing to the base concrete slab for a permanent incorporation in the works). This equipment is only considered in this EAD as far as it may affect the performance of the essential characteristics related to the intended use of the Unit, i.e., maintenance of the Unit's resistance to fire performance where it is penetrated by technical services.

### 1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the Units for the intended use of 10 years<sup>2</sup> when installed in the works. These provisions are based upon the current state of the art and the available knowledge and experience.

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<sup>2</sup> The working life of the Units has been established based on the shortest working life of the integrated components in accordance with the provisions given in the relevant harmonised technical specification as given in clause 1.1 (i.e., working life of 10 years for fire penetration seals according to EAD 350454-00-1104).

When assessing the product, the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works<sup>3</sup>.

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

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<sup>3</sup> The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.



## 2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

### 2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of Unit is assessed in relation to the essential characteristics.

**Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics**

No	Essential characteristic	Assessment method	Type of expression of product performance
<b>Basic Works Requirement 2: Safety in case of fire</b>			
1	Reaction to fire	2.2.1	Class
2	Resistance to fire	2.2.2	Class
3	Propensity to undergo continuous smouldering	2.2.3	Description
4	External fire performance of roofs	2.2.4	Class
<b>Basic Works Requirement 3: Hygiene, health and the environment</b>			
5	Water permeability	2.2.5	Level
6	Air permeability	2.2.6	Level
7	Water vapour resistance	2.2.7	Level
<b>Basic Works Requirement 5: Protection against noise</b>			
8	Airborne sound insulation	2.2.8	Level
<b>Basic Works Requirement 6: Energy economy and heat retention</b>			
9	Thermal transmittance	2.2.9	Level
<b>Aspects of durability</b>			
10	Corrosion resistance	2.2.10	Description
11	Reduction of tensile strength with time as a consequence of ageing (durability)	2.2.11	Description
12	Durability of the ability to release	2.2.12	Level
13	Durability of self-closing against degradation (cycling testing)	2.2.13	Description
14	Durability of self-closing against ageing (corrosion)	2.2.14	Description
15	Durability of response delay	2.2.15	Description
16	Durability of operational reliability	2.2.16	Description
17	Durability in relation to the environmental use category	2.2.17	Description

## **2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product**

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

If for any components assembled into the Units, covered by harmonised standards or European Technical Assessments, the manufacturer of the component has included the performance regarding the relevant characteristic in the Declaration of Performance, retesting of that component for issuing the ETA under the current EAD is not required.

The Unit shall be described in the ETA in accordance with the minimum data for each component as indicated in clause 1.1.

### **2.2.1 Reaction to fire**

The reaction to fire of the Unit is assessed by means of the reaction to fire of its components which are representative of the Unit performance.

The components of the Unit shall be tested using the method(s) relevant for the corresponding reaction to fire class according to EN 13501-1. The components of the Unit shall be classified according to the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

If the steel elements of the Unit's frame are uncoated or coated with an inorganic layer, they are considered to satisfy the requirements for performance class A1 of the characteristic reaction to fire in accordance with the Commission Decision 96/603/EC, as amended by 2000/605/EC and 2003/424/EC, without the need for testing on the basis of it fulfilling the conditions set out in that Decision and its intended use being covered by that Decision. In the case that an organic coating applied on the steel elements does not allow to meet the conditions established in the Decision, the component shall be tested using the method(s) relevant for the corresponding reaction to fire class according to EN 13501-1.

The reaction to fire class of the Unit's components shall be stated in the ETA.

### **2.2.2 Resistance to fire**

The resistance to fire of the Unit is assessed by means of the resistance to fire of constructive elements that form the Unit, which are representative of the Unit performance. The resistance to fire of the Unit will be the lower class obtained for the assembled constructive elements, as follows.

The constructive elements (walls, roof, doors, penetration seals and fire dampers) shall be tested using the relevant test method for the corresponding fire resistance class, in order to be classified in accordance with EN 13501-2:

- Walls according to EN 1364-1.
- Roof according to EN 1365-2.
- Doors according to EN 1634-1.
- Penetration seals according to EN 1366-3.
- Fire dampers according to EN 1366-2.

The test specimens, according to the relevant test standard as given above, shall be fully representative of the constructive element as assembled in the Unit considering the intended use given in clause 1.2.1.

The resistance to fire shall be assessed both considering the fire from outside and from inside the Unit.

In the case of fire from outside the Unit only the inner frame shall provide support and, in the case of fire from inside, only the outer frame shall provide support. Thermal protection of the structural frame at the side not exposed to fire, provided by the insulation of the mineral wool sandwich panels, shall be tested using the relevant test method (EN 1364-1 for walls and EN 1365-2 for roofs) including the screws of connexion between outer and inner frames to assess the effect of thermal bridges.

The resistance to fire class of the Unit shall be stated in the ETA.

### **2.2.3 Propensity to undergo continuous smouldering**

The propensity to undergo continuous smouldering of the Unit is assessed by means of the propensity to undergo continuous smouldering of the mineral wool sandwich panels which are representative of the Unit.

The performance of the mineral wool sandwich panels' propensity to undergo continuous smouldering shall be tested and assessed in accordance with EN 16733.

The conditions and parameters which shall be taken into account in the test as well as the rules for the application of the test results are specified in Annex A.

In accordance with EN 16733, clause 11, the ETA shall specify the following information, depending on the outcome of the assessment:

- “The product does not show propensity to undergo continuous smouldering”,
- “The product shows propensity to undergo continuous smouldering”, or
- "Assessment of the propensity to undergo continuous smouldering is not possible".

### **2.2.4 External fire performance of roofs**

The external fire performance of the Unit's roof is assessed by means of the external fire performance of the mineral wool sandwich panels installed in the roof which are representative of the Unit.

The roof (including the complete roof covering) in which the mineral wool sandwich panels are intended to be incorporated is considered to satisfy the requirements for performance class B<sub>ROOF</sub> of the characteristic external fire performance in accordance with the Decision 2006/600/EC without the need for further testing on the basis of it fulfilling the conditions set out in that Decision and its intended use being covered by that Decision.

If the conditions established in the Decision 2006/600/EC are not met, the roof (including the complete roof covering) in which the mineral wool sandwich panels are intended to be incorporated shall be tested according to the test method referred to in EN 13501-5 and relevant for the corresponding external fire performance roof class, in order to be classified according to Commission Decision 2001/671/EC amended by Commission Decision 2005/823/EC.

The external fire performance class of the Unit's roof, including the test method used according to EN 13501-5, clause 5, shall be stated in the ETA.

### **2.2.5 Water permeability**

The water permeability of the Unit is assessed by means of the performance of the representative component, i.e., the sandwich panels.

The characteristic shall be assessed and stated in the ETA in accordance with EN 14509, clause 5.2.6.

### **2.2.6 Air permeability**

The air permeability of the Unit is assessed by means of the performance of the representative component, i.e., the sandwich panels.

The characteristic shall be assessed and stated in the ETA in accordance with EN 14509, clause 5.2.7.

### **2.2.7 Water vapour resistance**

The water vapour resistance of the Unit is assessed by means of the performance of the representative component, i.e., the sandwich panels.

The characteristic shall be assessed and stated in the ETA in accordance with EN 14509, clause 5.2.8.

### **2.2.8 Airborne sound insulation**

The airborne sound insulation of the Unit is assessed by means of the performance of the representative component, i.e., the sandwich panels.

The characteristic shall be assessed and stated in the ETA in accordance with EN 14509, clause 5.2.9.

### **2.2.9 Thermal transmittance**

The thermal transmittance of the Unit is assessed by means of the performance of the representative component, i.e., the sandwich panels.

The characteristic shall be assessed and stated in the ETA in accordance with EN 14509, clause 5.2.2.

### **2.2.10 Corrosion resistance**

The corrosion resistance of the Unit is assessed by means of the performance of the representative component, i.e., the structural steel elements.

The corrosion protection of the steel elements shall be considered in accordance with:

- For continuously hot-dip coated steels: EN 10346, clause 7.3.
- For coated steels according to EN 10025-2: EN ISO 12944-1, clause 5.

The associated category of corrosivity of atmospheres shall be assessed and stated in the ETA according to EN ISO 9223.

### **2.2.11 Reduction of tensile strength with time as a consequence of ageing (durability)**

The reduction of tensile strength with time as a consequence of ageing of the Unit is assessed by means of the performance of the representative component, i.e., the self-supporting sandwich panels.

The characteristic shall be assessed and stated in the ETA in accordance with EN 14509, clause 5.2.3.1.

### **2.2.12 Durability of the ability to release**

The durability of the ability to release of the Unit is assessed by means of the performance of the representative component, i.e., the fire resistant doors.

The characteristic is relevant for doors provided with hold-open devices and shall be assessed and stated in the ETA in accordance with EN 16034, clause 4.5.1.

### **2.2.13 Durability of self-closing against degradation (cycling testing)**

The durability of self-closing against degradation (cycling testing) of the Unit is assessed by means of the performance of the representative component, i.e., the fire resistant doors.

The characteristic shall be assessed and stated the in ETA in accordance with EN 16034, clause 4.5.2.1.

#### **2.2.14 Durability of self-closing against ageing (corrosion)**

The durability of self-closing against ageing (corrosion) of the Unit is assessed by means of the performance of the representative component, i.e., the fire resistant doors.

The characteristic shall be assessed and stated in the ETA in accordance with EN 16034, clause 4.5.2.2.

#### **2.2.15 Durability of response delay**

The durability of response delay of the Unit is assessed by means of the performance of the representative component, i.e., the fire damper.

The characteristic is relevant for Units that incorporate technical ventilation, as additional equipment, penetrating the Unit enclosure and, therefore, requiring a fire damper to keep the resistance to fire performance of the Unit.

The characteristic shall be assessed and stated in the ETA in accordance with EN 15650, clause 4.3.3.1.

#### **2.2.16 Durability of operational reliability**

The durability of operational reliability of the Unit is assessed by means of the performance of the representative component, i.e., the fire damper.

The characteristic is relevant for Units that incorporate technical ventilation, as additional equipment, penetrating the Unit enclosure and, therefore, requiring a fire damper to keep the resistance to fire performance of the Unit.

The characteristic shall be assessed and stated in the ETA in accordance with EN 15650, clause 4.3.3.2.

#### **2.2.17 Durability in relation to the environmental use category**

The durability in relation to the environmental use category of the Unit is assessed by means of the performance of the representative component, i.e., the fire penetration seal.

The characteristic is relevant for Units that incorporate technical services, as additional equipment, penetrating the Unit enclosure and, therefore, requiring a fire penetration seal to keep the resistance to fire performance of the Unit.

The characteristic shall be assessed and stated in the ETA in accordance with EAD 350454-00-1104, clause 2.2.9.

### **3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE**

#### **3.1 System(s) of assessment and verification of constancy of performance to be applied**

For the products covered by this EAD the applicable European legal act is Commission Decision 2003/728/EC.

The system is 1.

### 3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

The manufacturer (regarding the components he buys from the market with DoP to be assembled into the Unit at the factory) shall take into account the Declaration of Performance issued by the manufacturer of that component. No retesting is necessary.

**Table 3.2.1 Control plan for the manufacturer; cornerstones**

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
<b>Factory production control (FPC)</b> [including testing of samples taken at the factory in accordance with a prescribed test plan]					
Assembled Unit					
1	Structural connexions	Visual inspection	As defined in Control Plan	As defined in Control Plan	Every Unit
2	Panels mounting: dimensional tolerances	Visual inspection	As defined in Control Plan	As defined in Control Plan	Every Unit
3	Joints / joints sealing	Visual inspection	As defined in Control Plan	As defined in Control Plan	Every Unit
4	Doors operation and permitted gaps	Visual inspection	As defined in Control Plan	As defined in Control Plan	Every Unit
Steel structural elements					
5	Compliance with EN 1090-1	Check of supplier's documentation	As defined in Control Plan	According to EN 1090-1	Every component
6	Execution class according to EN 1090-2	EN 1090-2	Minimum EXC2	According to EN 1090-2	Every component
7	Steel composition	Check of certificate according to EN 10204	As defined in Control Plan <sup>4</sup>	According to EN 10204	Every delivery
8	Cutting	According to EN ISO 9013	As defined in Control Plan	According to EN ISO 9013	Every component
9	Welding	According to EN ISO 3834-1	As defined in Control Plan	According to EN ISO 3834-1	Every component
10	Welding tolerances	According to EN ISO 13920	As defined in Control Plan	According to EN ISO 13920	Every component
Concrete (doors metal-concrete frame)					
11	Raw materials	Check of supplier's documentation	As defined in Control Plan	As defined in Control Plan	Every delivery
12	Dosage	Check of process records	As defined in Control Plan	As defined in Control Plan	Every Unit

<sup>4</sup> Certificate type 2.2 (at least) according to EN 10204.

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
<b>Factory production control (FPC)</b> [including testing of samples taken at the factory in accordance with a prescribed test plan]					
13	Complete filling of frame	Visual inspection	As defined in Control Plan	As defined in Control Plan	Every Unit
Mineral wool sandwich panels					
14	Compliance with EN 14509	Check of supplier's documentation	As defined in Control Plan	As defined in Control Plan	Every delivery
Fire resisting doors					
15	Compliance with EN 16034 and EN 14351-1 / EN 13241	Check of supplier's documentation	As defined in Control Plan	As defined in Control Plan	Every delivery
Fire dampers					
16	Compliance with EN 15650	Check of supplier's documentation	As defined in Control Plan	As defined in Control Plan	Every delivery
Penetration seals					
17	Compliance with EAD 350454-00-1104	Check of supplier's documentation	As defined in Control Plan	As defined in Control Plan	Every delivery
Mechanical fixings					
18	Compliance with EN 1090-2	Check of supplier's documentation	As defined in Control Plan	As defined in Control Plan	Every delivery



### 3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance for the Units are laid down in Table 3.3.1.

**Table 3.3.1 Control plan for the notified body; cornerstones**

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
<b>Initial inspection of the manufacturing plant and of factory production control</b>					
1	The Notified Body will ascertain that the factory production control with the staff and equipment are suitable to ensure a continuous and orderly manufacturing of the Units.	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	According to Control plan	According to Control plan	When starting the production or a new line
<b>Continuous surveillance, assessment and evaluation of factory production control</b>					
2	The Notified Body will ascertain that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan.	Verification of the controls carried out by the manufacturer as described in the control plan agreed between the TAB and the manufacturer with reference to the raw materials, to the process and to the product as indicated in Table 3.2.1	According to Control plan	According to Control plan	2/year

## 4 REFERENCE DOCUMENTS

EN 10025-2:2019	Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels.
EN 10204:2004	Metallic products - Types of inspection documents.
EN 10346:2015	Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions.
EN 1090-1:2009+A1:2011	Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components.
EN 1090-2:2018+A1:2024	Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures.
EN 13241:2003+A2:2016	Industrial, commercial, garage doors and gates - Product standard, performance characteristics.
EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.
EN 13501-2:2023	Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services.
EN 13501-5:2016	Fire classification of construction products and building elements - Part 5: Classification using data from external fire exposure to roofs tests.
EN 1364-1:2015	Fire resistance tests for non-loadbearing elements - Part 1: Walls.
EN 1365-2:2014	Fire resistance tests for loadbearing elements - Part 2: Floors and roofs.
EN 1366-2:2015	Fire resistance tests for service installations - Part 2: Fire dampers.
EN 1366-3:2021	Fire resistance tests for service installations - Part 3: Penetration seals.
EN 13820:2003	Thermal insulating materials for building applications - Determination of organic content.
EN 14351-1:2006+A2:2016	Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets.
EN 14509:2013	Self-supporting double skin metal faced insulating panels - Factory made products - Specifications.
EN 15650:2010	Ventilation for buildings - Fire dampers.
EN 16034:2014	Pedestrian doorsets, industrial, commercial, garage doors and openable windows - Product standard, performance characteristics - Fire resisting and/or smoke control characteristics.
EN 1634-1:2014+A1:2018	Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows.
EN 16733:2016	Reaction to fire tests for building products - Determination of a building product's propensity to undergo continuous smouldering.
EN 1990:2023	Eurocode - Basis of structural and geotechnical design.
EN 1991-1-1:2002/AC:2009	Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings.
EN 1993-1-1:2022	Eurocode 3 - Design of steel structures - Part 1-1: General rules and rules for buildings.
EN 1993-1-3:2024	Eurocode 3 - Design of steel structures - Part 1-3: Cold-formed members and sheeting
EN ISO 12944-1:2017	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 1: General introduction (ISO 12944-1:2017).
EN ISO 13920:2023	Welding - General tolerances for welded constructions - Dimensions for lengths and angles - Shape and position.
EN ISO 29466:2022	Thermal insulating products for building applications - Determination of thickness (ISO 29466:2022).
EN ISO 29470:2020	Thermal insulating products for building applications - Determination of the apparent density (ISO 29470:2020).
EN ISO 3834-1:2021	Quality requirements for fusion welding of metallic materials - Part 1: Criteria for the selection of the appropriate level of quality requirements (ISO 3834-1:2021).
EN ISO 9013:2017	Thermal cutting - Classification of thermal cuts - Geometrical product specification and quality tolerances.
EN ISO 9223:2012	Corrosion of metals and alloys - Corrosivity of atmospheres - Classification, determination and estimation (ISO 9223:2012).
EAD 350454-00-1104	Fire stopping and fire sealing products. Penetration seals.

## **ANNEX A: CONDITIONS AND PARAMETERS FOR THE DETERMINATION OF THE MINERAL WOOL PRODUCTS' PROPENSITY TO UNDERGO CONTINUOUS SMOULDERING**

### **A.1 Sampling and preparation of test specimens**

The following conditions and parameters shall be considered for the product sampling and the test specimens' preparation:

- the product variations of a product family (as defined by a certain combination of raw materials and other additives and produced in a certain production process)<sup>5</sup>;
- the product or product variant with the highest organic content (in percentage per mass), determined according to EN 13820; also, the product with the highest absolute organic content (kg/m<sup>3</sup>);
- the product or product variant with the highest density as well as a density of about 100 kg/m<sup>3</sup> (± 15%); if this range is lower than 115 kg/m<sup>3</sup>, then only the product or product variant with the highest density the product or product variant with the highest density. The density shall be determined in accordance with EN ISO 29470;
- the product or product variant with the highest thickness. If the highest thickness is greater than 100 mm, the test specimen thickness shall be reduced from the backside to the maximum testable thickness of 100 mm (see clause 6.2.3 of EN 16733). The thickness shall be determined in accordance with EN ISO 29466 on at least three specimens;
- each different produced fibre orientation, i.e., lengthwise and crosswise to the length direction of the test specimen, as well as perpendicular to the surface of the specimen front side;
- without any facing, coating (or similar). Existing facings or coatings shall be removed when preparing the test specimens.

The tests shall be done on free-hanging specimens without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions. No joints will be included in the test specimen, except if clause 6.2.5 of EN 16733 applies (dimensions of the product smaller than the required dimensions of the test specimen).

If the product is only available in a length lower than 800 mm, the test specimens shall be prepared by using two (or more) smaller pieces of the mineral wool, which shall be put together with a butt joint. This joint shall be positioned in the highest possible distance to the bottom edge of the test specimens. Connexion of the pieces of the test specimens shall be carried out in such a manner that a permanent and close contact is ensured between both pieces at the joint for the entire testing and monitoring time.

### **A.2 Field of application of test results**

The test results, considering the above-mentioned conditions and parameters, are also valid for products:

- of the same product family,
- with a lower organic content,
- with a lower density,
- with a lower thickness, and also with higher thickness when 100 mm thick specimens are tested,
- with any fibre orientation,
- with any facing or coating,
- for any end-use conditions.

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<sup>5</sup> In order to permit the TAB to apply rules for the extended application of test results within the assessment, it is recommended that the manufacturer should provide (but he is not obliged to do so) sufficient information (e.g., on the basis of the composition of the products in question), allowing the TAB to determine which products or product variants should be submitted to testing and so to reduce the number of tests required.