

# General construction technique permit

Public-law institution jointly founded by the  
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**Technical authority granting approvals  
and permits for construction products  
and construction techniques**

Date: 19 Dec 2022      Reference number:  
I 75-1.10.3-905/1

**Number:**  
**Z-10.3-905**

**Applicant:**  
**Pfleiderer Leutkirch GmbH**  
Wurzacher Strasse 32  
88299 Leutkirch  
Germany

**Validity**  
from: **19 December 2022**  
to: **19 December 2027**

**Subject of decision:**

'Duropal XTerior compact F' HPL panels for use in ventilated external wall cladding and ceiling soffits

The subject named above is herewith granted a general construction technique permit (*allgemeine Bauartgenehmigung*).

This decision contains seven pages and three annexes.

**Translation authorised by DIBt**

DIBt

## I GENERAL PROVISIONS

- 1 The general construction technique permit confirms the fitness for application of the subject concerned within the meaning of the Building Codes of the federal states (*Landesbauordnungen*).
- 2 This decision does not replace the permits, approvals and certificates required by law for carrying out construction projects.
- 3 This decision is granted without prejudice to the rights of third parties, in particular private property rights.
- 4 Notwithstanding further provisions in the 'Special Provisions', copies of this decision shall be made available to the installer of the subject concerned. Furthermore, the installer of the subject concerned shall be made aware of the fact that this decision must be made available at the place of application. Upon request, copies of the decision shall be provided to the authorities involved.
- 5 This decision shall be reproduced in full only. Partial publication requires the consent of DIBt. Texts and drawings in promotional material shall not contradict this decision. In the event of a discrepancy between the German original and this authorised translation, the German version shall prevail.
- 6 This decision may be revoked. The provisions contained herein may subsequently be supplemented and amended, in particular, if this is required by new technical findings.
- 7 This decision is based on the information and documents provided by the applicant on the subject concerned during the permit procedure. Alterations to the information on which this general construction technique permit was based are not covered by this decision and shall be notified to DIBt without delay.

## II SPECIAL PROVISIONS

### 1 Subject concerned and field of application

#### 1.1 Subject concerned

The subject of the permit is the planning, design and application of 'Duropal XTerior compact F' rear-ventilated external wall claddings (façade system) with 8 mm thick high-pressure decorative laminate (HPL) panels in accordance with DIN EN 438-7<sup>1</sup> designated 'Duropal XTerior compact F' as façade panels and their fasteners.

The façade panels are fastened to an aluminium substructure with blind rivets.

Depending on the design, the façade system is rated either as not easily flammable (*schwerentflammbar*) or as flammable (*normalentflammbar*).

#### 1.2 Field of application

The field of application is specified as follows:

- static and quasi-static loads from wind and self-weight,
- ventilated external wall claddings in accordance with DIN 18516-1<sup>2</sup> and
- ceiling soffits (overhead area) in outdoor areas.

### 2 Provisions for planning, design and execution

Unless specified otherwise below, the external wall cladding, including its fixing to a substructure, shall be planned, designed and executed on an object-specific basis and in line with good engineering practice in accordance with the Technical Building Rules<sup>3</sup>.

#### 2.1 Planning

The façade panels shall be fastened to the aluminium support profiles free of constraint using fixed points and sliding points. For this purpose, each panel shall have a fixed point as close as possible to the centre of the panel while all other fastening points shall be designed as sliding points.

- The fixed points shall be made by means of a drill hole  $\varnothing$  5.1 mm in the façade panel.
- The sliding points shall be executed as a drill hole  $\varnothing$  8.5 mm in the façade panel.
- Alternatively, if at each fixed point the blind rivet is set with the corresponding fixed-point sleeve in accordance with Section 2.1.2.3, all holes for the blind rivets with head diameter  $\varnothing$  14 mm may be executed with  $\varnothing$  8.5 mm and for blind rivets with head diameter  $\varnothing$  16 mm with  $\varnothing$  10 mm.
- When using blind rivets with head diameter 16 mm, sliding points horizontally adjacent to the fixed point may be executed with a sliding-point sleeve in accordance with Section 2.1.2.4.
- A rivet jig shall be used at all fixing points to ensure a distance from the rivet head to the panel surface of  $\geq$  0.3 mm.
- The corner points shall be executed with a distance of 20 mm to both edges.
- The drill holes in the aluminium support profiles shall be  $\varnothing$  5.1 mm.

The construction products specified Sections 2.1.1 to 2.1.3 shall be used for the external wall cladding.

The substructure shall be executed free of constraint.

1	DIN EN 438-7:2005-04	High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called laminates) - Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes
2	DIN 18516-1:2010-06	Cladding for external walls, ventilated at rear - Part 1: Requirements, principles of testing
3	See <a href="http://www.dibt.de">www.dibt.de</a>	

Special loads (such as lamp loads) shall be introduced into the load-bearing substrate independently of the façade panels.

The joints between the façade panels may either remain unfilled or be lined with joint profiles in a constraint-free manner.

Any existing thermal insulation shall, in accordance with DIN 18516-1, be directly attached to the substrate independently of the substructure.

The provisions in accordance with DIN 18516-1, regarding factors such as the required width of the rear ventilation gap shall be observed, unless a larger air gap width is required for fire protection reasons (see Section 2.2.2).

### 2.1.1 'Duropal XTerior compact F' façade panels

The 'Duropal XTerior compact F' façade panels shall be high-pressure decorative laminate panels (compact laminate panels) in accordance with DIN EN 438-7, comply with the specifications given in Annex 1 and fulfil the requirements for compact laminate panels for external wall cladding type EDF in accordance with DIN EN 438-6<sup>4</sup>.

The façade panels shall consist of cellulose sheets impregnated with thermosetting synthetic resins and laminated using a high-pressure process. The core of the panels shall have integrated fire-protective features and decorative layers on both sides. The visible side shall be provided with transparent weather protection. On the visible side, this protection may consist of an acrylic paint coating.

The façade panels shall have the following physical characteristics pursuant to the CE marking / declaration of performance:

- Flexural strength in transverse direction:  $\geq 100$  MPa (in accordance with DIN EN 438-6, Table 3)
- Flexural modulus in transverse direction (mean value):  $\geq 9.000$  MPa
- Density (mean value):  $\geq 1.35$  g/cm<sup>3</sup>
- Reaction-to-fire: Class B-s1,d0 in accordance with DIN EN 13501-1<sup>5</sup>

### 2.1.2 Fasteners

#### 2.1.2.1 Blind rivet

For fastening the 'Duropal XTerior compact F' façade panels to the support profiles of the aluminium substructure, 'MBE-FN-AI5-5 × 18 K14' or 'MBE-FN-AI5-5 × 18 K16' blind rivets in accordance with national technical approval Z-10.3-698 or 'ECORIV AL/E 5 × 16' blind rivets in accordance with national technical approval Z-14.4-851 shall be used.

#### 2.1.2.3 Fixed-point sleeves

The fixing holes of the façade panels can be drilled with the same diameter in accordance with Section 2.1 c), depending on the head diameter of the fasteners, if fixed-point sleeves in accordance with Annex 2 are used.

#### 2.1.2.4 Sliding-point sleeves

For executing the sliding points located horizontally adjacent to the fixed point, sliding-point sleeves in accordance with Annex 2 may be used in accordance with Section 2.1 d).

4	DIN EN 438-6:2016-06	High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called laminates) - Part 6: Classification and specifications for Exterior-grade compact laminates of thickness 2 mm and greater
5	DIN EN 13501-1:2010-01	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests;

### 2.1.3 Substructure

The substructure profiles shall be extruded aluminium profiles, have a thickness of 1.8–3.0 mm and a tensile strength of  $R_m \geq 215 \text{ N/mm}^2$  as well as a yield strength  $R_{p0.2} \geq 195 \text{ N/mm}^2$  (e.g. EN AW-6060 T66 or EN AW 6063 T6 in accordance with DIN EN 755-2<sup>6</sup>). Thicker profiles can also be used, provided that a longer rivet of the same type is used and the thicknesses of the materials to be joined recommended by the rivet manufacturer are observed.

## 2.2 Design

### 2.2.1 Stability

2.2.1.1 Unless otherwise specified below, the façade system shall be designed in compliance with the Technical Building Rules.

The loading of the façade panels and the fasteners shall be determined taking into account the yielding of the substructure<sup>7</sup>, the pointwise support of the façade panels and the possible changes in the support conditions due to temperature, swelling and/or shrinkage (when absorbing the self-weight).

Additional loads from eccentricities in asymmetrical substructures shall be taken into account.

Constraint forces from temperature, swelling and shrinkage do not need to be considered when complying with the drill hole clearance in accordance with Section 2.1 and a maximum fixing distance of 850 mm.

When applied as a ceiling soffit in outdoor areas, the self-weight of the façade panels shall be multiplied by the increase factor  $\alpha_G = 2.5$ .

2.2.1.2 Design resistance values  $R_d$

The design resistance values of the façade panels for flexural stress under wind load action shall be  $\sigma_{Rd} = 29 \text{ N/mm}^2$ .

The design resistance values of the blind rivets for tensile loading under wind action  $F_{Z,Rd}$  and for shear loading of the blind rivets under self-weight  $F_{Q,Rd}$  shall be taken from Table 1.

Table 1: Design value for rivet fastening

Rivet head $\emptyset$	Tension $F_{Z,Rd,Corner}$	Tension $F_{Z,Rd,Edge}$	Tension $F_{Z,Rd,Middle}$	Shear tension $F_{Q,Rd}$
14 mm	540 N	540 N	660 N	1100 N
16 mm	620 N	620 N	610 N	1180 N

2.2.1.3 Verification

The stability of the 'Duropal XTerior compact F' façade panels and the fastenings shall be verified for the ultimate limit state with

$$E_d \leq R_d$$

$E_d$ : design value of the action ( $\sigma_{Ed}$ ;  $F_{Z,Ed}$ ;  $F_{Q,Ed}$ )

$R_d$ : design resistance value ( $\sigma_{Rd}$ ;  $F_{Z,Rd}$ ;  $F_{Q,Rd}$ )

When tensile and shear forces (from wind suction [ $F_{Z,Ed}$ ] and self-weight [ $F_{Q,Ed}$ ]) occur simultaneously, the following shall be observed:  $\frac{F_{Z,Ed}}{F_{Z,Rd}} + \frac{F_{Q,Ed}}{F_{Q,Rd}} \leq 1,0$

Verification of the absorption of the transverse and axial force in the façade panels is not required.

<sup>6</sup> DIN EN 755-2:2016-10 Aluminium and aluminium alloys – Extruded rod / bar, tube and profiles – Part 2: Mechanical properties

<sup>7</sup> e.g. in accordance with E. Zuber: Einfluss nachgiebiger Fassadenunterkonstruktionen auf Bekleidungen und Befestigungen published in the Official Bulletin (*Mitteilungen*) of DIBt 1979, issue 2, p. 45-50

## 2.2.2 Fire protection

The façade system using 'Duropal XTerior compact F' façade panels, composed as described in Section 1.1 and in conjunction with an aluminium substructure is fit for application where the regulatory requirements of not easily flammable (*schwerentflammbar*) or flammable (*normalentflammbar*) for external wall claddings apply.

The following applies to the planning and design of the façade system as a not easily flammable external wall cladding:

- The Technical Building Rules on special fire protection measures for ventilated external wall claddings<sup>8</sup> shall be observed.
- The rating not easily flammable (*schwerentflammbar*) only applies when the ventilated external wall cladding is executed on walls with verified resistance to fire:
  - made of solid mineral building materials (masonry or concrete) or
  - made of wood with fire protective external cladding made of non-combustible boards of class K<sub>2</sub>60 in accordance with DIN EN 13501-2<sup>9</sup>
  - and if any existing thermal insulation consists of non-combustible thermal insulation materials (thickness ≥ 50 mm, density ≥ 35 kg/m<sup>3</sup>).
- The distance between the external wall cladding and the substrate or the thermal insulation shall be at least 20 mm.
- The joint width of the open joints shall not exceed 10 mm.

If the above conditions are not met, the façade system is only fit for application in areas where the regulatory requirement of flammable (*normalentflammbar*) applies for the external wall cladding.

The façade system with 'Duropal XTerior compact F' façade panels is fit for application as a ceiling cladding (façade soffit) where the regulatory requirement of flammable (*normalentflammbar*) applies for this area.

## 2.2.3 Thermal insulation and protection against moisture subject to climate conditions

DIN 4108-2<sup>10</sup> shall apply to the verification of thermal insulation.

For the calculation of the thermal resistance (R value) in accordance with DIN EN ISO 6946<sup>11</sup> of the external wall, the air layer (rear ventilation gap) and the façade panels shall not be taken into consideration.

For the thermal verification, the design thermal conductivity value given in DIN 4108-4<sup>12</sup> Table 2 shall be taken for the insulation material used.

Thermal bridges caused by the substructure and its anchorage because the insulation layer is penetrated or its thickness is reduced shall be taken into account.

DIN 4108-3<sup>13</sup> shall apply to the verification of protection against moisture subject to climate conditions.

<sup>8</sup> See Model Administrative Provisions – Technical Building Rules (MVV TB), Section A 2.2, no. A 2.2.1.6 (Annex 6), under [www.dibt.de](http://www.dibt.de) as implemented in the federal states.

<sup>9</sup> DIN EN 13501-2:2016-12 Fire classification of construction products and construction techniques – Part 2: Classification using data from fire resistance tests, excluding ventilation services

<sup>10</sup> DIN 4108-2:2013-02 Thermal protection and energy economy in buildings – Part 2: Minimum requirements to thermal insulation

<sup>11</sup> DIN EN ISO 6946:2018-03 Building components and building elements – Thermal resistance and thermal transmittance – Calculation methods; German version EN ISO 6946:2007

<sup>12</sup> DIN 4108-4:2020-11 Thermal insulation and energy economy in buildings – Part 4: Hygrothermal design values

<sup>13</sup> DIN 4108-3:2018-10 Thermal protection and energy economy in buildings – Part 3: Protection against moisture subject to climate conditions – Requirements and directions for design and construction

#### 2.2.4 Sound insulation

DIN 4109-1<sup>14</sup> and DIN 4109-2<sup>15</sup> shall apply to the verification of sound insulation (protection against outside noise).

### 2.3 Provisions for execution

#### 2.3.1 General

Damaged panels shall not be installed.

The executing company shall provide a declaration of conformity in accordance with Section 16a (5) in conjunction with Section 21 (2) of the Model Building Code, as implemented by the Building Codes of the federal states, to confirm the conformity of the construction technique with this general construction technique permit. A template for the declaration of conformity is given in Annex 3 to this decision. This decision shall be submitted to the building owner.

#### 2.3.2 Installation

The façade panels 'Duropal XTerior compact F' shall be fastened to the substructure free of constraint, using fixed points and sliding points.

The drill holes for the blind rivets in the façade panels and in the profiles of the substructure may be drilled on site using step drills. Otherwise, the drill holes in the support profiles of the substructure may be drilled using the already pre-drilled façade panels as a drill jig.

The fasteners shall be placed centrally in the panel holes.

The blind rivets shall be tightened at the fixed and sliding points using a rivet jig so that a gap of  $\geq 0.3$  mm remains between the underside of the rivet head and the surface of the façade panel.

Renée Kamanzi-Fechner  
Head of Section

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<sup>14</sup> DIN 4109-1:2018-01

Sound insulation in buildings – Part 1: Minimum requirements

<sup>15</sup> DIN 4109-2:2018-01

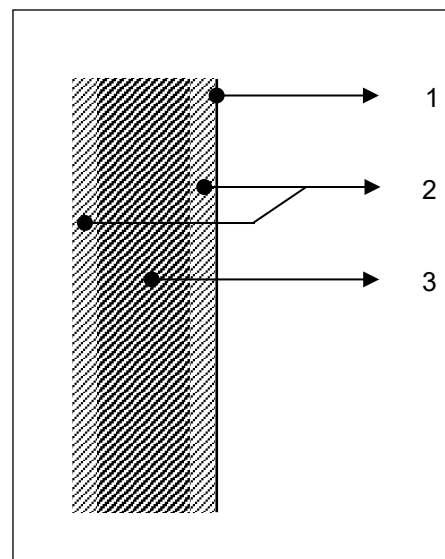
Sound insulation in buildings – Part 2: Verification of compliance with the requirements by calculation

**Layers from the outside to the inside:**

- 1 Weather protection layer
- 2 Melamine coating
- 3 Compact laminate sheet, black

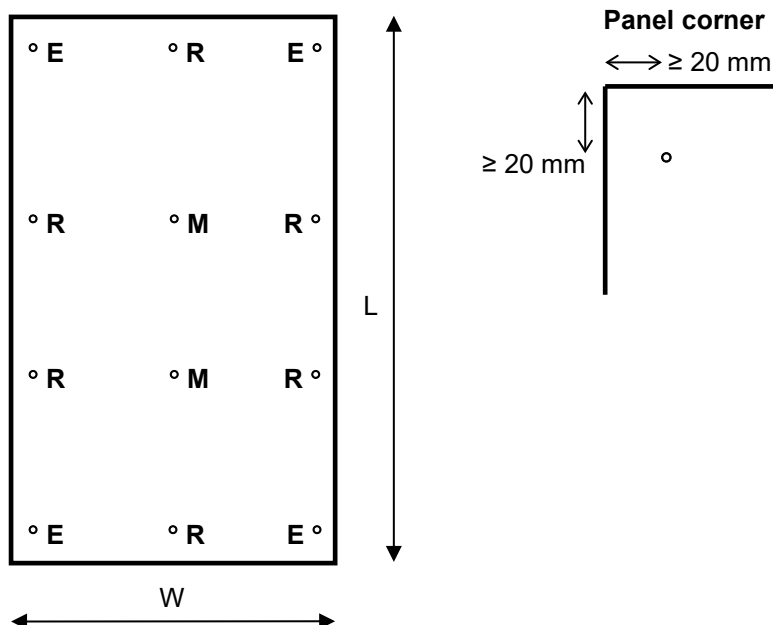
Maximum panel format Length (L) × Width (W)	Panel thickness
2800 mm × 2070 mm Tolerance: +2 mm	8 mm Tolerance: ±0.5 mm

L: measured in the panel's lengthwise direction (see below)  
W: measured in the panel's transverse direction (see below)



**Arrangement of the fastenings**

**Max. spacing between fastening points: 850 mm**



**M: Middle R: Edge E: Corner**

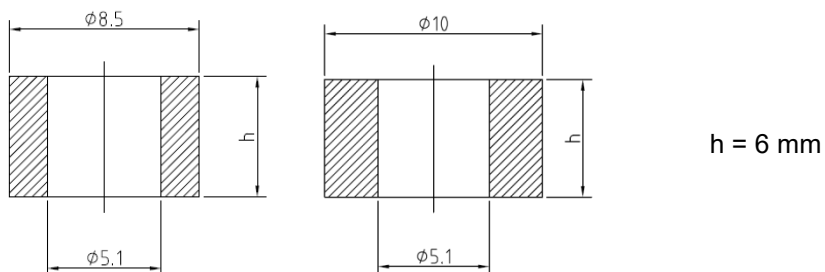
'Duropal XTerior compact F' HPL panels for use in ventilated external wall cladding and ceiling soffits

Layered structure of the façade panels and arrangement of the fastenings

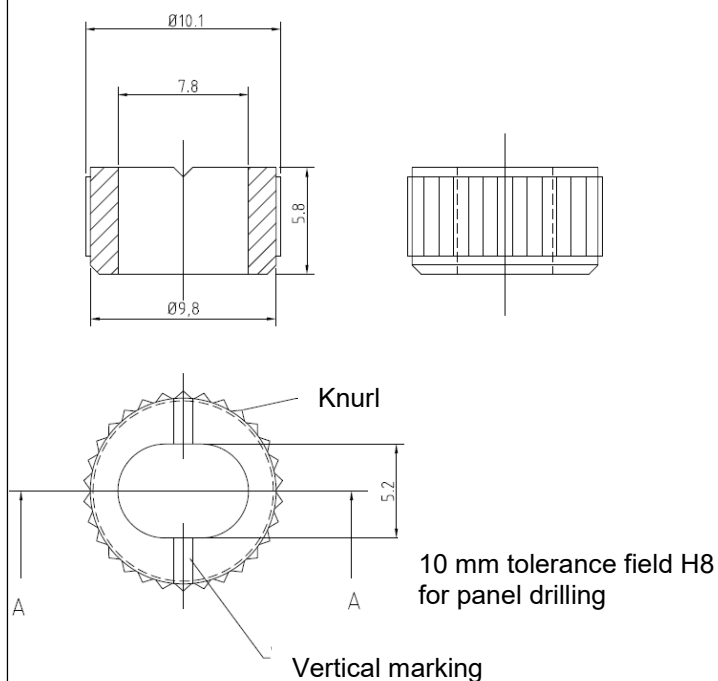
Annex 1



Fixed-point sleeves MBE from EN AW 2007 in accordance with DIN EN 755-2



Sliding-point sleeves MBE from EN AW 2007 in accordance with DIN EN 755-2



'Duropal XTerior compact F' HPL panels for use in ventilated external wall cladding and ceiling soffits

Fasteners: Fixed-point and sliding-point sleeves

Annex 2

This declaration shall be filled in by the executing company's qualified installer after completing the façade system on site and submitted to the client (building owner).

**Building address:**

Street / number: \_\_\_\_\_

Postal code / place: \_\_\_\_\_

**Description of installed façade system  
in accordance with general construction technique permit no. Z-10.3-905**

'Duropal XTerior compact F' HPL panels (in accordance with Section 2.1.1):

t = 8 mm

Fasteners used (in accordance with Section 2.1.2):

Blind rivet type: \_\_\_\_\_

Fixed-point / sliding-point sleeve type: \_\_\_\_\_

Substructure used (in accordance with Section 2.1.3):

Profile thickness: \_\_\_\_\_

Alloy: \_\_\_\_\_

Reaction to fire of façade system 'Duropal XTerior compact F' (in accordance with Section 2.2.2)

not easily flammable (*schwerentflammbar*)

flammable (*normalentflammbar*)

**Address of executing company:**

Company: \_\_\_\_\_

Street: \_\_\_\_\_

Postal code / place: \_\_\_\_\_

Country: \_\_\_\_\_

We hereby declare that we have installed the façade system as described above in accordance with the provisions of the above decision and the installation instructions provided by the manufacturer.

Date / signature of installer: \_\_\_\_\_

'Duropal XTerior compact F' HPL panels for use in ventilated external wall cladding and ceiling soffits

Declaration of conformity of the executing company for the building owner

Annex 3