



European Technical Assessment

ETA 14/0413
of 20.11.2014



General part

| | |
|--|---|
| Trade name of the construction product | DEKTON® |
| Product family to which the construction product belongs | External wall claddings in ventilated façade |
| Manufacturer | COSENTINO SA Ctra. A 334 km 59 ES-04850 Cantoria (Almería) Spain |
| Manufacturing plant(s) | Ctra. A 334 km 59 ES-04850 Cantoria (Almería) Spain |
| This European Technical Assessment contains | 22 pages including 4 Annexes which form an integral part of this assessment. |
| This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of | ETAG 034, <i>Kits for external wall claddings. Part 1: ventilated cladding kits comprising cladding, components and associated fixings</i> , edition April 2012, used as European Assessment Document (EAD) |

General comments

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es)).

Specific parts of the European Technical Assessment

1 Technical description of the product

The assessed product is the dry-pressed ceramic panels DEKTON®:

- with undercut drill holes on the rear side (fixing method according to family B of ETAG 034)
- with grooves (fixing method according to family C of ETAG 034)

Detailed information and data of DEKTON® cladding element are given in Annex 1 of this ETA.

2 Specification of the intended use(s) in accordance with the applicable EAD

DEKTON® is intended to be used in ventilated external wall claddings¹ mechanically fastened to a subframe which is fixed on external walls of new or existing buildings (renovation).

DEKTON® is intended to be used with the following types of cladding fixings²:

- Type 1: Specific anchor made of stainless steel to be placed in the undercut drill holes of the DEKTON® cladding element. At least four anchors are needed to support one cladding element (fixing method according to family B of ETAG 034).
- Type 2: Horizontal profiles made of aluminium alloy, to be placed in the grooves of the DEKTON® cladding element. Two horizontal profiles are needed to support one cladding element (fixing method according to family C of ETAG 034).
- Type 3: Horizontal rails made of stainless steel, to be placed in the grooves of the DEKTON® cladding element. At least four rails are needed to support one cladding element (fixing method according to family C of ETAG 034).

Detailed information and data of the cladding fixings are given in Annex 2.

The provisions made in this European Technical Assessment are based on an assumed working life of at least 25 years for the DEKTON® product. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

The claddings are non load-bearing elements. They do not contribute to the stability of the wall on which they are installed. The claddings will normally contribute to the durability of the works by providing enhanced protection from the effect of weathering. They are not intended to ensure airtightness of the building.

Some use categories have been adopted to correspond to the degree of exposure to impact in use (see section 3.6).

Detailed information and data regarding design, installation, maintenance and repair criteria are given in Annex 4.

¹ According to ETAG 034, ventilated external wall claddings must fulfil the following criteria:

- The distance between the cladding elements and the insulation layer or the substrate accordingly (ventilation air space) amounts to at least 20 mm. This air space may be reduced locally to 5 to 10 mm depending on the cladding and the subframe, provided that it is verified that it does not affect the draining and/or ventilation function,
- Ventilation openings are envisaged, as a minimum, at the building base point and at the roof edge with cross-sections of at least 50 cm² per linear metre.

² Not manufactured or supplied by COSENTINO SA.

3 Performance of the product and reference to the methods used for its assessment

The assessment of DEKTON[®] products for the intended use was performed following ETAG 034 *Kits for external wall claddings Part 1: Ventilated cladding kits comprising cladding components and associated fixings*, used as EAD.

Table 3.1: Performances of DEKTON[®].

| Product: DEKTON [®] | | Intended use: Ventilated external wall claddings | | | | |
|--|-------------------------------------|--|-----------------------------|------------------------------|---------------------|----------|
| Basic Works Requirement | ETA section | Essential characteristic | | Performance | | |
| BWR 2 Safety in case of fire | 3.1 | Reaction to fire | | A1 | | |
| BWR 3 Hygiene, health and the environment | 3.2 | Watertightness of joints | | Not watertight (open joints) | | |
| | 3.3 | Drainability | | See figures in Annex 3 | | |
| | --- | Content and/or release of dangerous substances | | Not assessed | | |
| BWR 4 Safety and accessibility in use | 3.4 | Family B | DEKTON [®] ≥ 12 mm | with cladding fixing type 1 | 3000 Pa | |
| | | | DEKTON [®] ≥ 12 mm | with cladding fixing type 2 | 2000 Pa | |
| | | Family C | DEKTON [®] ≥ 20 mm | with cladding fixing type 3 | 1400 Pa | |
| | | | DEKTON [®] ≥ 20 mm | with cladding fixing type 3 | 2000 Pa | |
| | 3.5.1 | Bending strength of DEKTON [®] | | ≥ 50 N/mm ² | | |
| | 3.5.2 | Resistance to axial tension | | Centre | Family B | ≥ 900 N |
| | | | | Border | | ≥ 650 N |
| | | | | Corner | | ≥ 2500 N |
| | 3.5.3 | Resistance to shear load | | ≥ 2500 N | | |
| | 3.5.4 | Resistance to combined tension and shear load | | ≥ 1400 N | | |
| | 3.5.5 | Resistance of the DEKTON [®] grooves | | Family C | ≥ 670 N | |
| | 3.5.6 | Resistance to vertical load | | Family C | < 0,15 mm after 4 h | |
| | 3.5.7 | Resistance of cladding fixing | Family C | cladding fixing type 1 | ≥ 4500 N | |
| | | | | cladding fixing type 2 | ≥ 3500 N | |
| 3.6 | Impact resistance | | See section 3.6 | | | |
| 3.7 | Resistance to horizontal point load | | See section 3.7 | | | |
| --- | Resistance to seismic actions | | Not assessed | | | |
| --- | Fatigue (pulsating load) | | Family B | Not assessed | | |
| General aspects relating to the performance of the product | 3.8 | Dimensional stability of DEKTON [®] | | by humidity | 0,05 mm/m | |
| | | | | by temperature | 0,007 mm/m.°C | |
| | 3.9 | Water absorption of DEKTON [®] | | < 0,5% (Group BIa) | | |
| | 3.10 | Freeze-thaw of DEKTON [®] | | No defects | | |
| 3.11 | Corrosion of DEKTON [®] | | See materials in Annex 2. | | | |

Complementary information:

- Requirements with respect to the mechanical resistance and stability of non load-bearing parts of the works are not included in the Basic Works Requirement *Mechanical resistance and stability* (BWR 1) but are treated under the Basic Works Requirement *Safety and accessibility in use* (BWR 4).
- The fire resistance requirement is applicable to the wall itself (made of masonry, concrete, timber or metal frame) and not on the external wall claddings for ventilated façades. The external wall claddings for ventilated façades alone do not meet any fire resistance requirements.
- The following performances are not relevant for the external wall claddings for ventilated façades (with ventilated air space): water permeability, water vapour permeability, airborne sound insulation and thermal resistance.
- The following performances are not relevant for the dry-pressed ceramic products: hygrothermal behaviour, chemical and biological resistance and UV radiation.

3.1 Reaction to fire

The reaction to fire of DEKTON[®] according to EN 13501-1, is class A1 without need of testing according to Decision 96/603/EC as amended.

Since other components of the external wall claddings with DEKTON[®] for ventilated façades (cladding fixings and subframe) are metallic components, the reaction to fire of the whole external wall cladding, according to EN 13501-1, can be class A1 without need of testing according to Decision 96/603/EC as amended, provided that the insulation layer placed behind the cladding elements is made of a non combustible material (e.g. mineral wool) or if the layer behind the cladding elements is a mineral substrate like masonry or concrete (class A1 or A2-s1,d0).

For other end use conditions (for example with insulation layer made of EPS, XPS, PUR, PF), the reaction to fire of the external wall claddings for ventilated façades will be the reaction to fire of the insulation material to be used in the external wall claddings for ventilated façades (defined in the corresponding CE marking) or class F (not assessed).

Note: A European reference fire scenario has not been laid down for façades. In some Member States, the classification of external wall claddings according to EN 13501-1 might not be sufficient for the use in façades. An additional assessment of external wall claddings according to national provisions (e.g. on the basis of a large scale test) might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

3.2 Watertightness of joints (protection against driving rain)

Joints in the external wall claddings for ventilated façades with DEKTON[®] are open, therefore they are not watertight.

3.3 Drainability

On the basis of the construction details (see Annex 3), the available technical knowledge and experience and the installation criteria, it is considered that the water which penetrates into the air space or the condensation water can be drained out from the cladding without accumulation or moisture damage or leakage into the substrate.

3.4 Wind load resistance

Table 3.2: Wind load resistance.

| Family | Cladding element | Cladding fixing | Maximum load Q (Pa) |
|----------|---------------------------|-----------------------------|---------------------|
| Family B | DEKTON [®] 12 mm | with cladding fixing type 1 | 3000 |
| | | with cladding fixing type 2 | 2000 |
| Family C | DEKTON [®] 12 mm | with cladding fixing type 3 | 1400 |
| | DEKTON [®] 20 mm | | 2000 |

3.5 Mechanical resistance

3.5.1 Bending strength and modulus of rupture of the cladding element

Table 3.3: Bending strength and modulus of rupture of the cladding element.

| Cladding element | Breaking load (N) | | Breaking strength (N) | | Bending strength (N/mm ²) | |
|------------------|-------------------|-------------------|-----------------------|-------------------|---------------------------------------|----------------|
| | F _{bl,m} | F _{bl,c} | F _{bs,m} | F _{bs,c} | R _m | R _c |
| DEKTON® 12 mm | 898 | 855 | 5280 | 5027 | 55 | 53 |
| DEKTON® 20 mm | 2406 | 2149 | 14114 | 12606 | 62 | 54 |

Where: R_m = mean values; R_c = characteristic values giving 75% confidence that 95% of test results will be higher than this value.

See also Annex 1.

3.5.2 Resistance to axial tension for family B

Table 3.4: Axial tension.

| Cladding element | Fixing position | Ring diameter | Failure load (N) | |
|------------------|-------------------|-------------------|------------------|----------------|
| | | | F _m | F _c |
| DEKTON® 12 mm | Centre | Ø 50 mm | 1643 | 1125 |
| | | Ø 550 mm | 1463 | 945 |
| | | Ø 1000 mm | 1919 | 1590 |
| | Border (≤ 100 mm) | Ø 50 mm | 1579 | 1378 |
| | | Ø 1000 mm | 1379 | 1015 |
| | | Corner (≤ 100 mm) | Ø 50 mm | 1467 |
| | | Ø 1000 mm | 812 | 670 |

Where: F_m = mean values; F_c = characteristic values giving 75% confidence that 95% of results will be higher than this value.

3.5.3 Resistance to shear load for family B

Table 3.5: Resistance to shear load.

| Cladding element | Failure load (N) | |
|------------------|------------------|------------------|
| | F _{m,u} | F _{c,u} |
| DEKTON® 12 mm | 2898 | 2658 |

Where: F_m = mean values; F_c = characteristic values giving 75% confidence that 95% of results will be higher than this value.

3.5.4 Resistance to combined tension and shear load for family B

Table 3.6: Resistance to combined tension and shear load.

| Cladding element | Fixing position | Ring diameter | Failure load (N) | | |
|------------------|-----------------|---------------|------------------|------------------|------|
| | | | F _{m,u} | F _{c,u} | |
| DEKTON® 12 mm | Angle 30° | Centre | Ø 50 mm | 2735 | 2102 |
| | | | Ø 550 mm | 2185 | 1569 |
| | | | Ø 1000 mm | 2043 | 1474 |
| | Angle 60° | Centre | Ø 50 mm | 2747 | 2415 |
| | | | Ø 550 mm | 2409 | 1747 |
| | | | Ø 1000 mm | 2297 | 1661 |

Where: F_m = mean values; F_c = characteristic values giving 75% confidence that 95% of results will be higher than this value.

3.5.5 Resistance of grooved cladding element for family C

Table 3.7: Resistance of DEKTON[®] groove.

| Cladding element groove | Failure load (N) | |
|---------------------------|------------------|----------------|
| | F _m | F _c |
| DEKTON [®] 12 mm | 986 | 671 |

Where: F_m = mean values; F_c = characteristic values giving 75% confidence that 95% of test results will be higher than this value.

3.5.6 Resistance to vertical load for family C

The deflection of the cladding fixings has been less than 0,15 mm after 4 hour.

3.5.7 Resistance of cladding fixing for family C

3.5.7.1 Pull-through resistance of fixings from profiles (cladding fixing type 2)

The minimum value of pull-through resistance has been calculated taking into account the maximum load (2000 Pa) obtained in the wind suction test and the most critical case configuration of external wall cladding with this type of cladding fixing.

Minimum value has been indicated in the table 3.1.

3.5.7.2 Resistance of cladding fixing type 3

Table 3.8: Resistance of cladding fixing type 3.

| Cladding fixing | Failure load (N) | |
|-----------------|------------------|----------------|
| | F _m | F _c |
| Type 3 | 4360 | 3594 |

Where: F_m = mean values; F_c = characteristic values giving 75% confidence that 95% of results will be higher than this value.

3.6 Impact resistance

Table 3.9: Impact resistance.

| Test specimen | | | Impact resistance | Degree of exposure in use (*) |
|---------------|---------------------------|-----------------|--|-------------------------------|
| Family | Cladding element | Cladding fixing | | |
| Family B | DEKTON [®] 12 mm | Type 1 | <ul style="list-style-type: none"> ▪ Hard body (0,5 kg) impacts of 1 joule ▪ Soft body (3,0 kg) impacts of 10 joules | Category IV |
| | | Type 2 | | |
| | | Type 3 | | |
| Family C | DEKTON [®] 20 mm | Type 3 | <ul style="list-style-type: none"> ▪ Hard body (0,5 kg) impacts of 3 joules ▪ Soft body (3,0 kg) impacts of 10 joules ▪ Soft body (3,0 kg) impacts of 60 joules ▪ Soft body (50,0 kg) impact of 400 joules | Category III |

(*) Category III: This category means that the degree of exposure in use should be a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
 Category IV: This category means that the degree of exposure in use should be a zone out of reach from ground level.

3.7 Resistance to horizontal point loads

According to the bending strength tests, the cladding elements can support the horizontal static load (500 N) applied through two squares of 25 x 25 x 5 mm spaced apart 440 mm (ladder bearing against the surface of the cladding), without any damage or deformation.

3.8 Dimensional stability of cladding element

The maximum moisture expansion of DEKTON[®] is 0,05 mm/m.

The maximum linear thermal expansion of DEKTON[®] is 0,007 mm/m.°C (see Annex 1).

3.9 Immersion in water of cladding element

The maximum water absorption of DEKTON[®] is 0,5%. Therefore DEKTON[®] is classified in the Group Bla according to EN 14411 (see Annex 1).

3.10 Freeze-thaw resistance of cladding element

DEKTON[®] does not show any defects after 100 cycles of freeze-thaw (see Annex 1).

3.11 Corrosion of cladding fixings

The specifications and corrosion protection of the cladding fixings are given in the relevant sections of Annex 2.

The cladding fixings type 1 are made of stainless steel 1.4401, 1.4404 or 1.4578 according to EN 10088 and the cladding fixings type 3 are made of stainless steel 1.4301 according to EN 10088. Therefore, these components may be used in dry internal conditions or exposure in permanent damp internal conditions and also in external atmospheric exposure with high category of corrosivity of the atmosphere (included industrial and marine environment, C4 as defined in ISO 9223), provided no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent or alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

The cladding fixings type 2 are made of aluminium alloy AW 6063 T5 according to EN 573, EN 1999 and EN 755. The durability is class B and the minimum thickness is 2,0 mm. Therefore, these components may be used in the following external atmospheric exposure: rural environment, moderate industrial/urban environment, but excluding industrial marine environment. These components may be used in other external atmospheric conditions exposure if the components are protected as indicated in EN 1999-1-1.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to the decision 2003/640/EC of the European Commission³ the systems of AVCP (see EC delegated regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in the following table applies.

Table 4.1: Applicable AVPC system.

| Product | Intended use | Level or class | System |
|-------------------------|--|----------------|--------|
| Exterior wall claddings | external finishes of walls | Any | 2+ |
| | for uses subjects to regulations on reaction to fire | A1 (*) | 4 |

(*) Class A1 according to Commission Decision 96/603/EC, as amended.

³ 2003/640/EC – Commission Decision of date 4 September 2003, published in the Official Journal of the European Union (OJEU) L226/21 of 10/09/2003.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC⁴, with which the factory production control shall be in accordance.

Issued in Barcelona on 20 November 2014

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart
Technical Director, ITeC

⁴ The *Control Plan* is a confidential part of the ETA and is only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

ANNEX 1: DEKTON[®] cladding element

DEKTON[®] cladding element is a dry-pressed ceramic panel according to EN 14411. The main characteristics are given in the table A1.1.

DEKTON[®] cladding element is further classified by the manufacturer in three families regarding the colour and surface texture (see table A1.2).

Table A1.1: DEKTON[®] cladding element characteristics.

| Characteristic | Reference | Value | | Tolerance | |
|---|-----------------|---------------------------|------------------------|-------------------------|-----|
| Thickness | | 12 mm | 20 mm | ± 5,0% (± 0,5 mm) | |
| Length (*) of manufactured format | | 3200 mm | | ± 0,6% (± 2,0 mm) | |
| Width (*) of manufactured format | | 1440 mm | | | |
| Straightness of sides | EN ISO 10545-2 | --- | | ± 0,5% (± 1,5 mm) | |
| Rectangularity | | --- | | ± 0,5% (± 2,0 mm) | |
| Central curvature | | --- | | | |
| Lateral curvature | | --- | | | |
| Warping | | --- | | | |
| Surface appearance | | 100% undamaged tiles | | --- | |
| Density | | 2540 kg/m ³ | | ± 100 kg/m ³ | |
| Water absorption (% weight) | EN ISO 10545-3 | < 0,5% (Group BIa) | | --- | |
| Porosity | | 0,2% | | --- | |
| Bending strength | | mean value | ≥ 55 N/mm ² | ≥ 62 N/mm ² | --- |
| | | characteristic value (**) | ≥ 53 N/mm ² | ≥ 54 N/mm ² | |
| Breaking strength | EN ISO 10545-4 | mean value | 5200 N | 14100 N | --- |
| | | characteristic value (**) | 5000 N | 12600 N | |
| Breaking load | | mean value | 890 N | 2400 N | --- |
| | | characteristic value (**) | 850 N | 2100 N | |
| Hard body impact resistance (coefficient of restitution) | EN ISO 10545-5 | 0,85 | | --- | |
| Linear thermal expansion coefficient | EN ISO 10545-8 | < 7,0 µm/m.°C | | --- | |
| Resistance to thermal shock | EN ISO 10545-9 | Pass | | --- | |
| Moisture expansion | EN ISO 10545-10 | 0,05 mm/m | | --- | |
| Frost resistance | EN ISO 10545-12 | No defects | | --- | |
| Chemical resistance | EN ISO 10545-13 | Pass | | --- | |
| Resistance to stains | EN ISO 10545-14 | Class 5 | | --- | |

(*) The manufactured cladding element can be cut (in the factory) in any prescribed dimension.

(**) Characteristic value giving 75% confidence that 95% of test results will be higher than this value.

Table A1.2: Classification of DEKTON® cladding element (as regards colour and texture).

| Cladding element families | Colour | Texture | Collection |
|---------------------------|----------|----------------|------------|
| Family I | SPECTRA | Polished | |
| | SIRIUS | Textured matte | SOLID |
| | ANANKÉ | | |
| | DOMOOS | Smooth matte | NATURAL |
| | SIROCCO | | |
| | STRATO | | |
| | KADUM | TECH | |
| | KERANIUM | | |
| Family II | ARIANE | Textured matte | SOLID |
| | ZENITH | Smooth matte | |
| | HALO | | |
| | AURA | Polished | NATURAL |
| | NAONE | | |
| Family III | DANAE | Smooth matte | NATURAL |

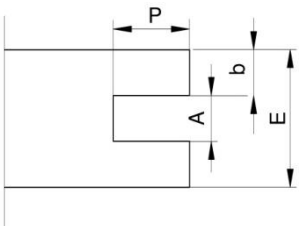
| | Cladding fixing | Dekton® thickness E, (mm) | Geometry of the grooves | | |
|---|-----------------|---------------------------|-------------------------|--------|--------|
| | | | b (mm) | A (mm) | P (mm) |
|  | Type 2 | 12,0 | 4,0 | 4,0 | 10,0 |
| | | 20,0 | 8,0 | 4,0 | 10,0 |
| | Type 3 | 12,0 | 4,0 | 4,0 | 15,0 |
| | | 20,0 | 8,0 | 4,0 | 15,0 |

Figure A1.1: Geometry of the grooves.

ANNEX 2: Cladding fixings

A2.1 Cladding fixings type 1 - Specific anchor made of stainless steel to be placed in an undercut drill hole

Geometric characteristics and material properties of the specific anchor that has been used in the tests for the assessment of DEKTON® are given in the table A2.1.

Table A2.1: Characteristics of cladding fixings type 1.

| Characteristic | | Reference | Value |
|---------------------------|--|---|---|
| Geometric characteristics | Type of specific anchor | | KEIL KH 7,0 undercut anchor |
| | Form and dimensions | | See figure A2.1 |
| Anchor installation | Anchorage depth, h_s | ETA 03/0055 | 7,0 mm |
| | Panel thickness, h | | $\geq 9,5$ mm |
| | Diameter of drill hole, d_0 | | 7,0 mm |
| | Diameter of undercut, d_1 | | 9,0 mm |
| | Screw length, c | | $h_s + 3$ mm + t_{fix} |
| | Installation torque moment, T_{inst} | | $2,5$ N·m $\leq T_{inst} \leq 4,0$ N·m |
| Material properties | Type of material | Anchor sleeve EN 10088-1 EN 10088-2 | Stainless steel 1.4404 (X2CrNiMo17-12-2) |
| | | Screw EN 10088-1 EN 10088-2 EN 10088-3 | Stainless steel: 1.4401 (X5CrNiMo17-12-2), 1.4404 (X2CrNiMo17-12-2) or 1.4578 (X3CrNiCuMo 17-11-3-2) |

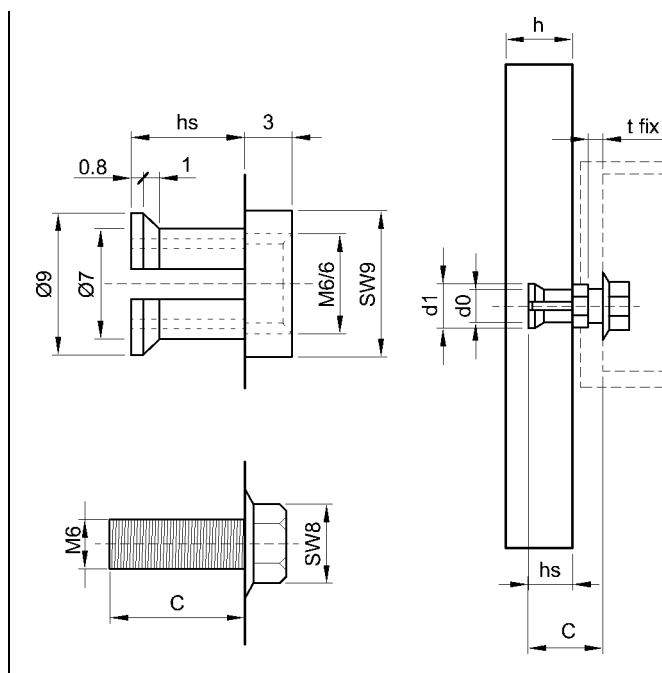


Figure A2.1: KEIL KH undercut anchor. Anchor sleeve and hexagonal screw.

A2.2 Cladding fixings type 2 - Horizontal profiles made of aluminium alloy

Geometric characteristics and material properties of the horizontal profiles (intermediate profile and termination profile) that have been used in the tests for the assessment of DEKTON[®] are given in the table A2.2.

Table A2.2: Characteristics of cladding fixings type 2.

| Characteristic | | Reference | Value | |
|--|----------------------------------|---|--|--|
| Geometric characteristics | Type of profile | | Intermediate profile | Edge profile |
| | Form and dimensions | | See figure A2.2a | See figure A2.2b |
| | Weight per linear metre | | 0,725 kg/m | 0,678 kg/m |
| | Standard length | --- | 6,0 m | |
| | Cross section | | 268,0 mm ² | 250,9 mm ² |
| | Inertia of profile section | I_{xx} I_{yy} | 2,03 cm ⁴ 2,89 cm ⁴ | 1,78 cm ⁴ 2,49 cm ⁴ |
| Material properties | Type of material | | Aluminium alloy AW 6063 T5 | |
| | Durability class | | B | |
| | Specific gravity (unit mass) | | 2700 kg/m ³ | |
| | Elastic limit $R_{p0,2}$ | | ≥ 130 N/mm ² | |
| | Elongation | EN 1999-1-1 | $\geq 8\%$ | |
| | Tensile strength R_m | EN 755-2 | ≥ 175 N/mm ² | |
| | Modulus of elasticity (at 20 °C) | | 70000 N/mm ² | |
| | Poisson coefficient | | 0,3 | |
| Thermal expansion coefficient between 50 °C and 100 °C | | 23,0 $\mu\text{m}/\text{m}\cdot\text{°C}$ | | |

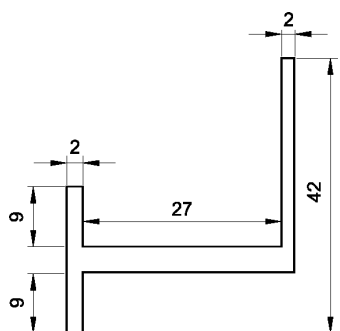


Figure A2.2a: Intermediate profile.

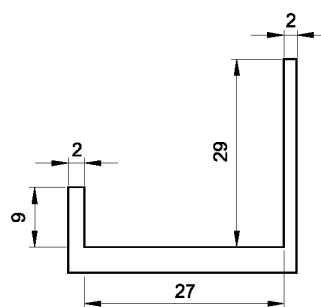


Figure A2.2b: Edge profile.

A2.3 Cladding fixings type 3 - Horizontal rails made of stainless steel

Geometric characteristics and material properties of the horizontal rails and ancillary components that have been used in the tests for the assessment of DEKTON® are given in the tables A2.3.

Table A2.3a: Characteristics of cladding fixings type 3.

| Characteristic | | Reference | Value | |
|---------------------------|---|------------|--------------------------------------|-----------------------------|
| Geometric characteristics | Type of profile | --- | Intermediate horizontal rail | Edge horizontal rail |
| | Form and dimensions | | See figure A2.3a | See figure A2.3b |
| Material properties | Type of material | | Stainless steel 1.4301 (X5CrNi18-10) | |
| | Intergranular corrosion resistance at delivery conditions | | Yes | |
| | Specific gravity (unit mass) | | 7900 kg/m ³ | |
| | Elastic limit R _{p0,2} | EN 10088-1 | ≥ 210 N/mm ² | |
| | Elongation | EN 10088-2 | ≥ 45% | |
| | Tensile strength R _m | | 520 – 720 N/mm ² | |
| | Modulus of elasticity (at 20 °C) | | 200000 N/mm ² | |
| | Poisson coefficient | | 0,3 | |
| | Thermal expansion coefficient between 50 °C and 100 °C | | 12,0 µm/m·°C | |

Table A2.3b: Characteristics of ancillary components.

| Characteristic | | Reference | Value |
|-----------------|---------------------|------------|--------------------------------------|
| Metallic spring | Form and dimensions | --- | See figure A2.3d |
| | Type of material | EN 10088-1 | Stainless steel 1.4310 (X10CrNi18-8) |
| Rail protector | Form and dimensions | --- | See figure A2.3e |
| | Type of material | | Polypropylene (PP) |

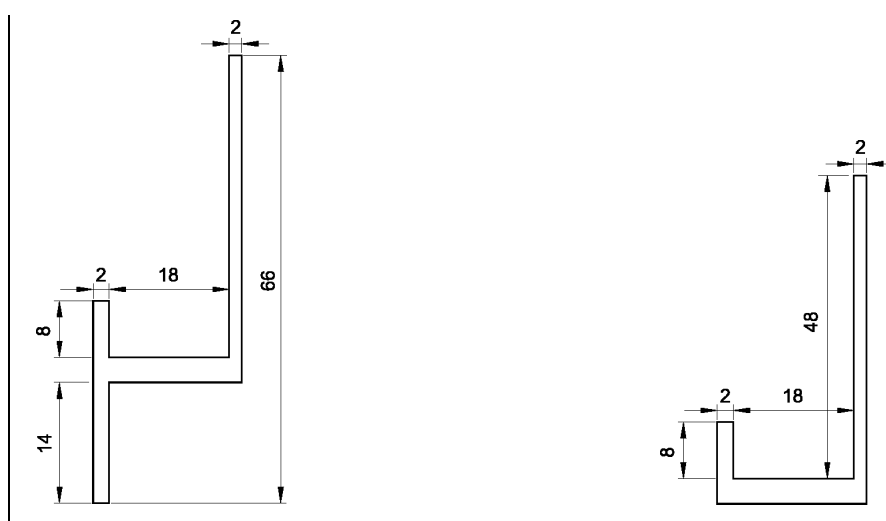


Figure A2.3a: Intermediate horizontal rail. Lateral view.

Figure A2.3b: Edge horizontal rail. Lateral view.

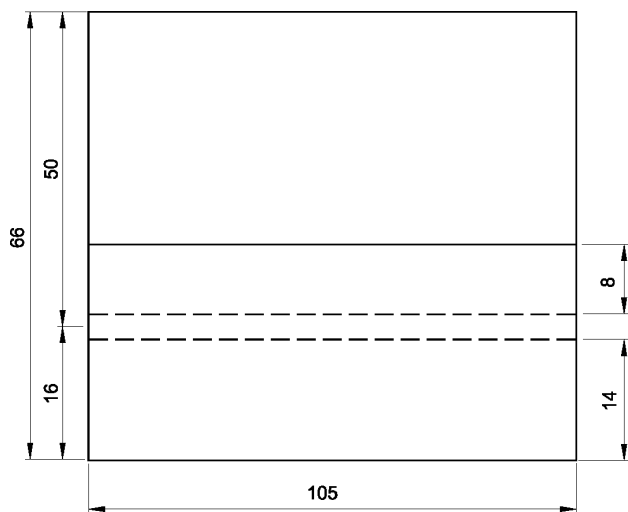


Figure A2.3c: Intermediate horizontal rail. Front view.

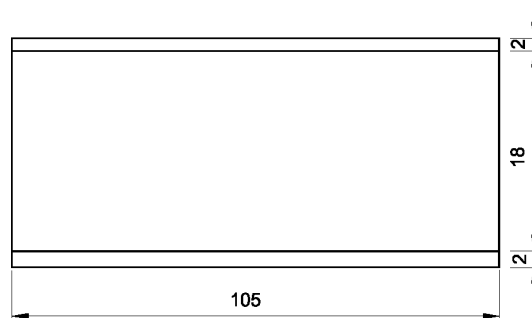


Figure A2.3d: Intermediate horizontal rail. Top view.

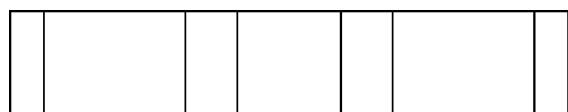


Figure A2.3e: Ancillary component. Metallic spring.

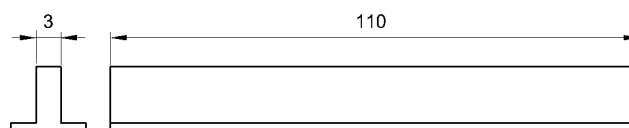
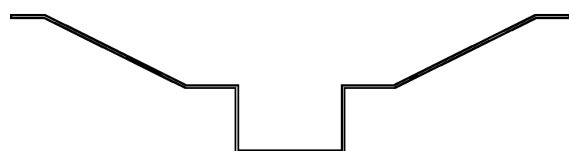


Figure A2.3f: Ancillary component. Rail protector.

ANNEX 3: Construction details

A3.1 Construction details with cladding fixings type 1

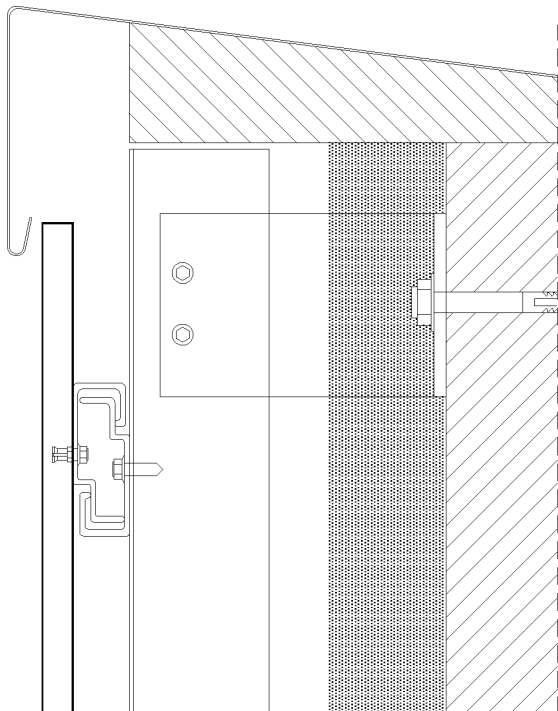


Figure A3.1a: Roof edge.

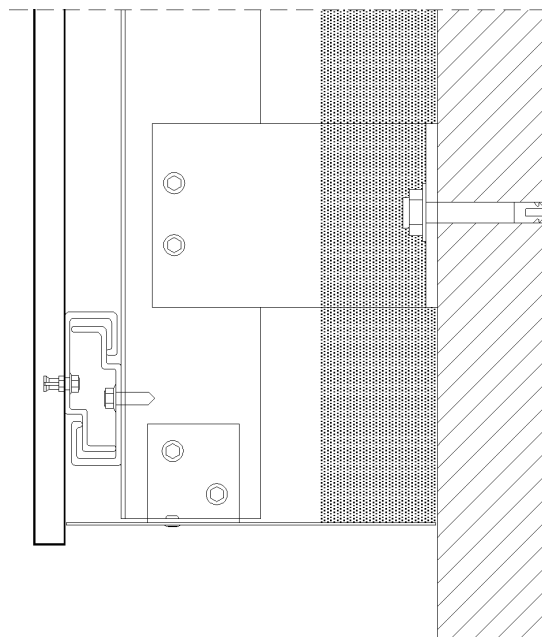


Figure A3.1b: Base edge.

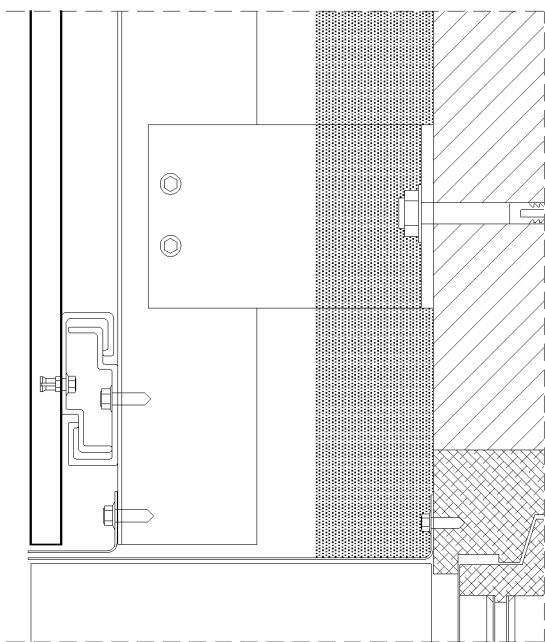


Figure A3.1c: Lintel.

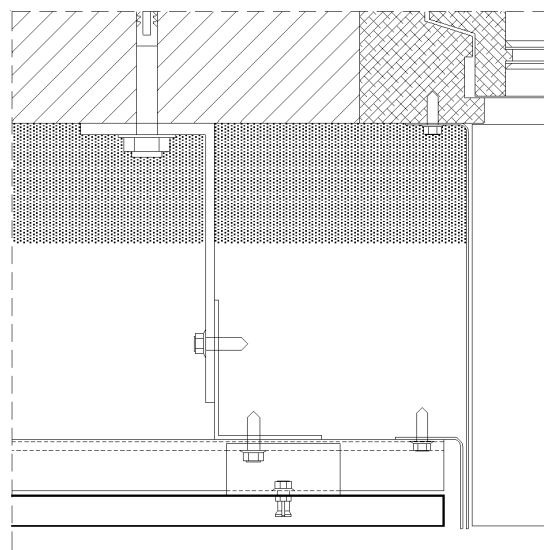


Figure A3.1d: Jamb.

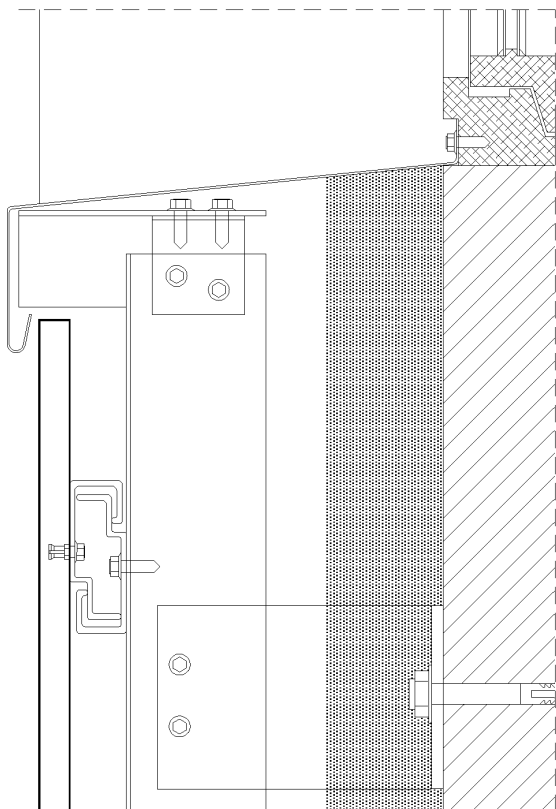


Figure A3.1e: Sill.

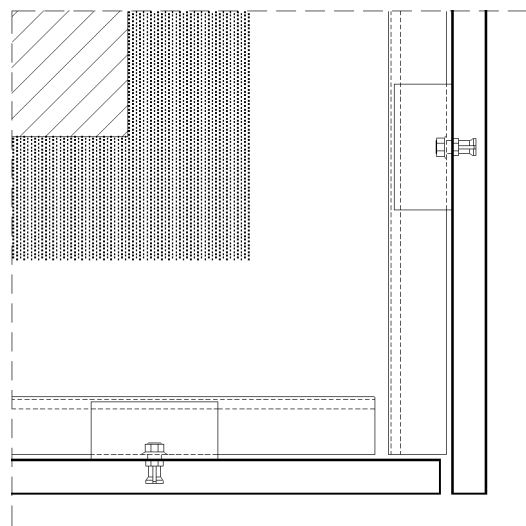


Figure A3.1f: External corner.

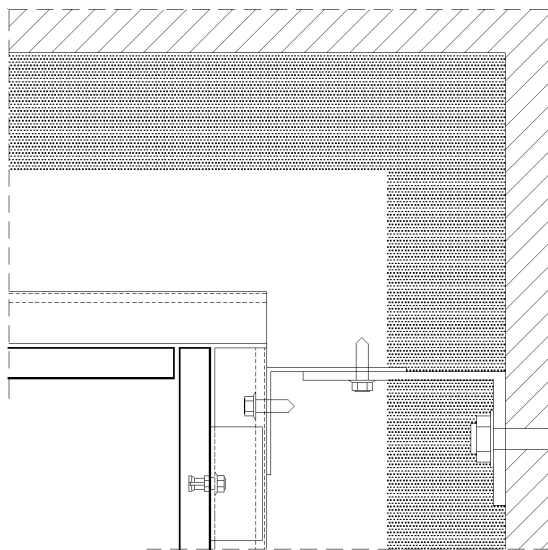


Figure A3.1g: Internal corner.

A3.2 Construction details with cladding fixings type 2

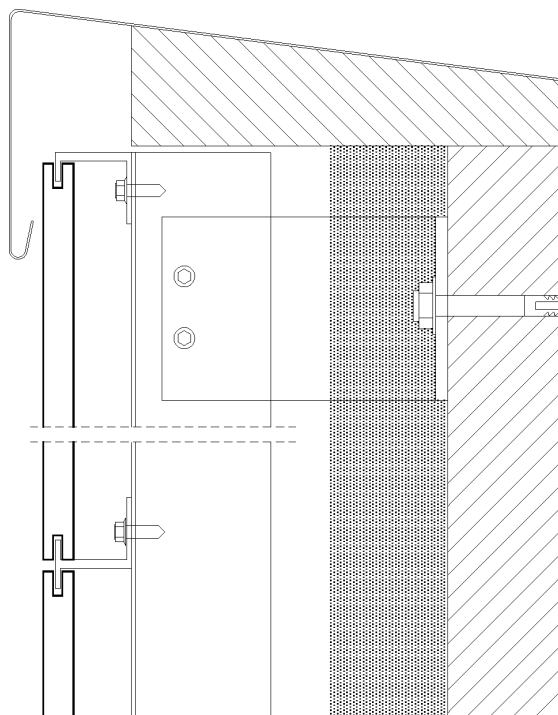


Figure A3.2a: Roof edge.

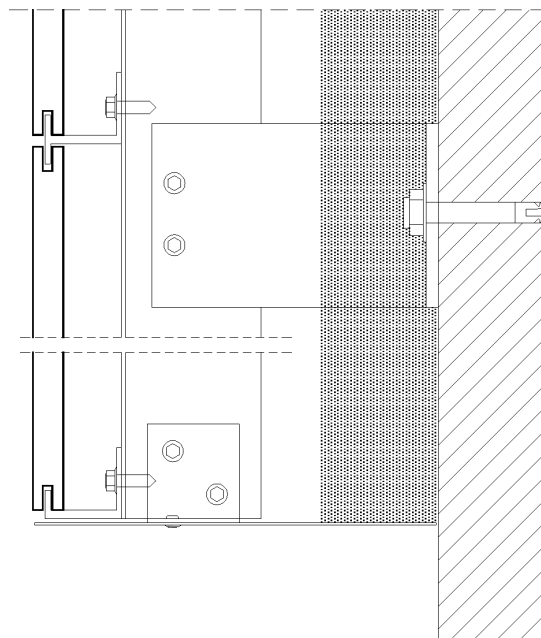


Figure A3.2b: Base edge.

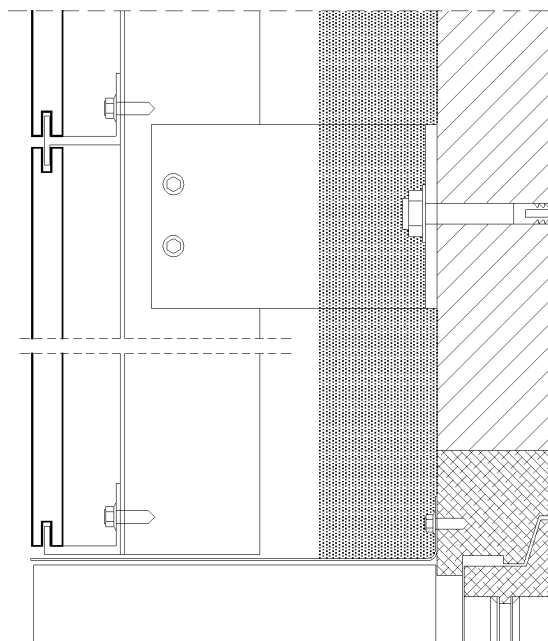


Figure A3.2c: Lintel.

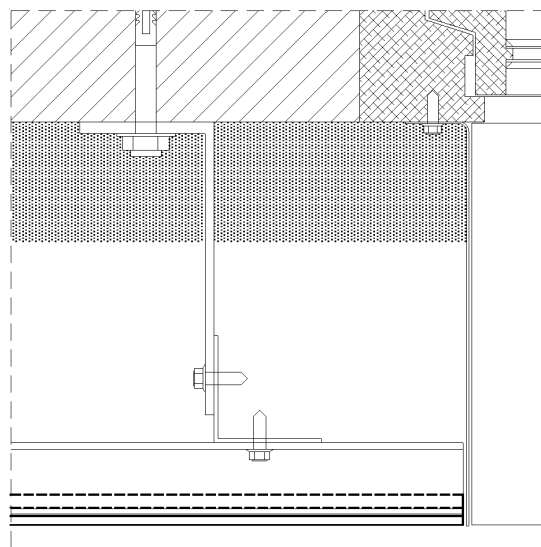


Figure A3.2d: Jamb.

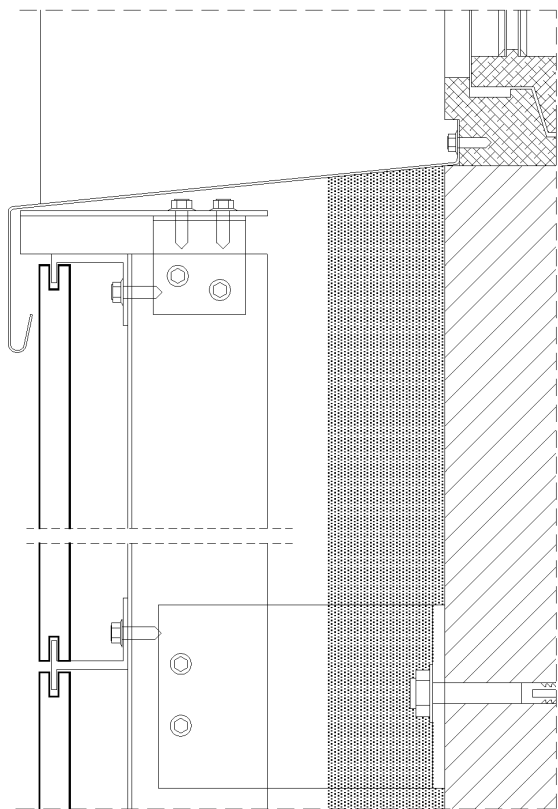


Figure A3.2e: Sill.

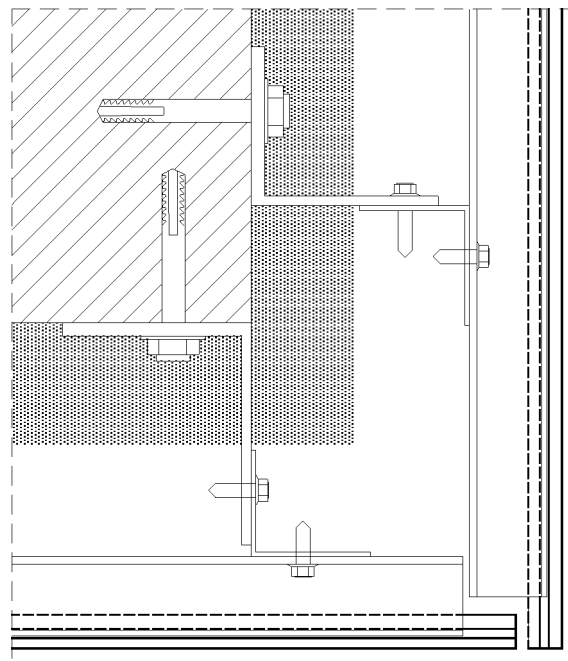


Figure A3.2f: Corners.

A3.3 Construction details with cladding fixings type 3

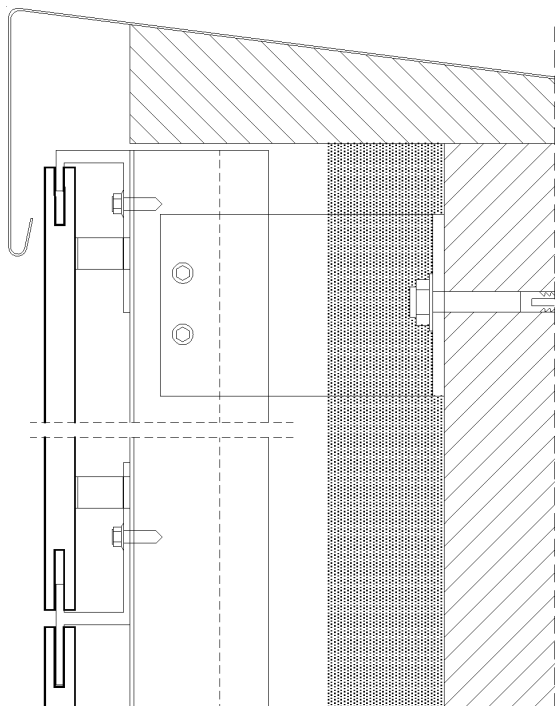


Figure A3.3a: Roof edge.

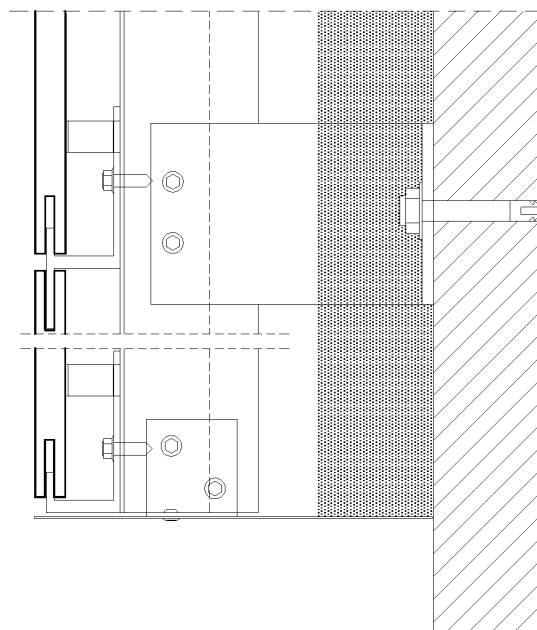


Figure A3.3b: Base edge.

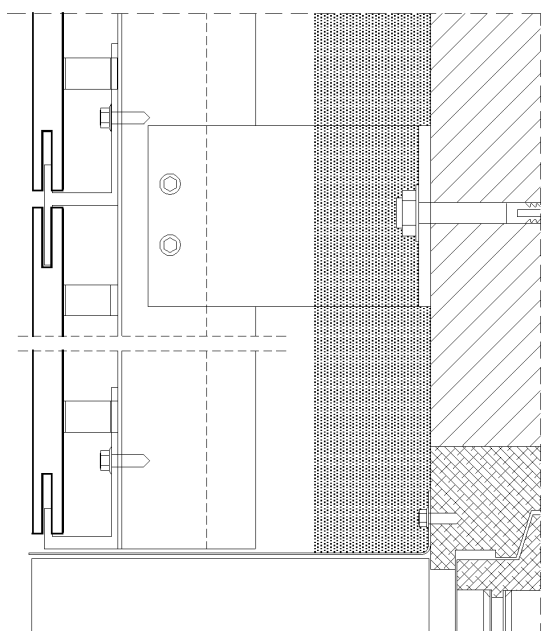


Figure A3.3c: Lintel.

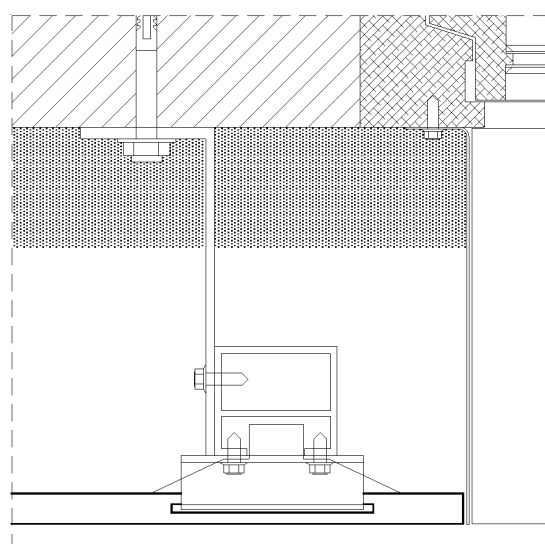


Figure A3.3d: Jamb.

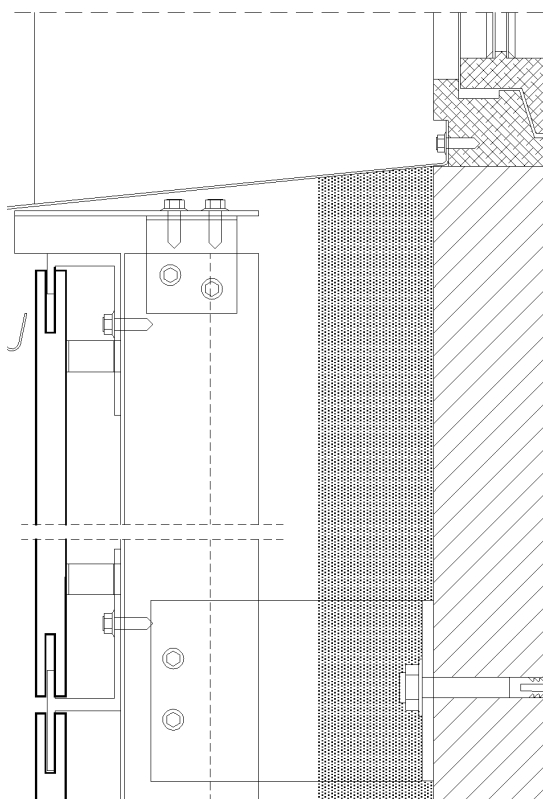


Figure A3.3e: Sill.

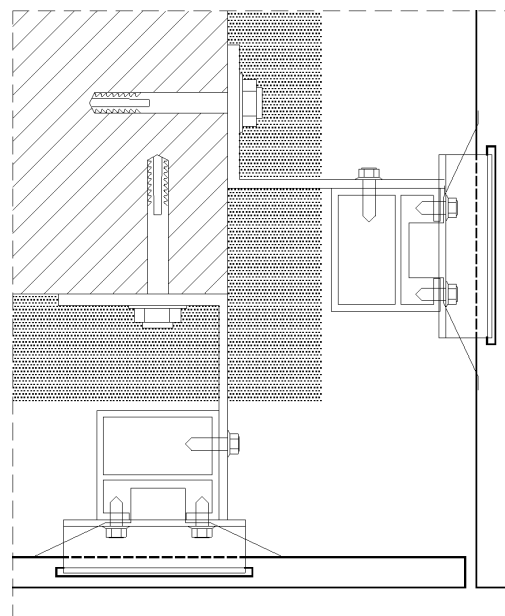


Figure A3.3f: Corners.

ANNEX 4: Design, installation, maintenance and repair criteria

A4.1 Design

The design of the external wall claddings for ventilated façades using DEKTON[®] should consider:

- The verification of the designed system by means of calculation, taking into account the mechanical characteristic values of the kit components (cladding element and cladding fixings) and the other components of the designed system (profiles, brackets, fixings, etc.) in order to resist the actions (dead loads, wind loads, etc.) applying on the specific works. National safety factors and other national provisions must be followed.
- The selection and verification of the fixings between the subframe components (e.g. brackets) and the external walls (substrate), taking into account the substrate material⁵ and the minimum resistance required (pull-out and shear resistance) according to the envisaged actions obtained from the mechanical calculation of the designed system.
- The accommodation of the designed system movements to the substrate or structural movements.
- The execution of singular parts of the façade; some examples of construction details are indicated in Annex 3.
- The corrosion protection of the designed system metallic components taking into account the category of corrosivity of the atmosphere (e.g. acc. ISO 9223) of works.
- The drainability of the ventilated air space between the cladding elements and the insulation layer or the external wall accordingly.
- An insulation layer is usually fixed on the external wall and should be defined in accordance with an harmonized standard or an European technical assessment.
- Because the joints are not watertight, the first layer behind ventilated air space (e.g. insulation layer) should be composed by materials with low water absorption.

A4.2 Installation

Installation of the external wall claddings for ventilated façades using DEKTON[®] should be carried out:

- According to the specifications of the ETA holder and using the components specified in this ETA, manufactured by the ETA holder or by suppliers recognized by the ETA holder.
- In accordance with the design and drawings prepared for the specific works. The ETA holder should ensure that the information on these provisions is given to those concerned.
- By appropriately qualified staff and under the supervision of the technical responsible of the specific works.

A4.3 Maintenance and repair

Maintenance of the external wall claddings for ventilated façades using DEKTON[®] includes inspections on site, taking into account the following aspects:

- Regarding the cladding elements: the appearance of any damage such as cracking, detachment, delamination, mould presence due to permanent moisture or permanent irreversible deformation.
- Regarding metallic components (cladding fixings and other components of the designed system as profiles, brackets and fixings): the presence of corrosion or presence of water accumulation.

When necessary, any repair to localised damaged areas must be carried out with the same components and following the repair instructions given by the ETA holder.

⁵ According to ETAG 034, the substrate can be made of masonry (clay, concrete or stone), concrete (cast in site or as prefabricated panels), timber and metal frame.