

European Technical Assessment

ETA 14/0413
of 18.01.2022



General part

Technical Assessment Body issuing the ETA: ITeC	
ITeC has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)	
Trade name of the construction product	DEKTON®
Product family to which the construction product belongs	Kits for external wall claddings
Manufacturer	COSENTINO SAU 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 and Annex N, which contains updated extra information regarding DEKTON® colours and textures covered by this ETA.
This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of	EAD 090062-00-0404 <i>Kits for external wall claddings mechanically fixed.</i>
This version replaces	ETA 14/0413 issued on 20.07.2020.

General comments

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts of the European Technical Assessment

1 Technical description of the product

This ETA refers to the dry-pressed ultracompact ceramic panels DEKTON® for external wall cladding in ventilated façades.

Table 1.1 gives information on the specific cladding fixings to be considered for the assessment of DEKTON®.

Detailed information and data of all the components are given in the annexes of this ETA.

Table 1.1: System components.

N.	Generic component	System			Technical description
		family B	family C		
		DKT1	DKT2	DKT3	
1	Cladding element	DEKTON® with undercut drill holes on the rear side	DEKTON® with grooves		Annex 1
2	Cladding fixing	Stainless steel undercut anchors	Aluminium alloy horizontal rail profiles	Aluminium alloy small rails	Annex 2

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

DEKTON® is intended to be used as external wall claddings in ventilated façades (rainscreens). The walls are made of masonry (clay, concrete or stone), concrete (cast on site or as prefabricated panels), timber or metal frame in new or existing buildings (retrofit).

The characteristics of the walls shall be verified prior to use of DEKTON®, especially regarding conditions for reaction to fire classification and for mechanical fixing of DEKTON®.

DEKTON® is intended to be used with the following types of cladding fixings¹:

- **Type 1:** Specific undercut 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 EAD 090062-00-0404). System trade name DKT1.
- **Type 2:** Horizontal rail 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 EAD 090062-00-0404). System trade name DKT2.
- **Type 3:** Small rails made of aluminium alloy, 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 EAD 090062-00-0404). System trade name DKT3.

The provisions made in this European Technical Assessment are based on an assumed working life of at least 25 years for DEKTON®. 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.

¹ Not manufactured or supplied by COSENTINO SAU.

DEKTON® is a non-load bearing construction product. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to its durability by providing enhanced protection from the effect of weathering.

DEKTON® is not intended to ensure the airtightness of the building envelope.

Detailed information and data regarding design, installation, maintenance and repair criteria are given in Annexes 3 and 4.

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

The assessment of DEKTON® kit for the intended use was performed following the EAD 090062-00-0404 *Kits for external wall claddings mechanically fixed* (former ETAG 034).

Table 3.1: Summary of DEKTON® performance (see also detailed performance in relevant sections).

Product:	DEKTON®		Intended use:	External wall claddings in ventilated façades (rainscreens).		
Basic Works Requirement	ETA section	Essential characteristic		Performance		
				DKT1 (undercut anchor)	DKT2 (horizontal rail profile)	DKT3 (small rail)
BWR 2 Safety in case of fire	3.1	Reaction to fire	DEKTON® without ancillary mesh	A1		
			DEKTON® with ancillary mesh (see Annex 1)	A2-s1, d0		
	---	Façade fire performance		Not assessed		
	---	Propensity to undergo continuous smouldering		Not relevant		
BWR 3 Hygiene, health and the environment	3.2	Watertightness of joints (protection against driving rain)		Not watertight (open joints)		
	---	Water absorption		Not relevant		
	---	Water vapour permeability		Not relevant		
	3.3	Drainability		See figures in Annex 2		
	---	Content, emission and/or release of dangerous substances		Not assessed		
BWR 4 Safety and accessibility in use	3.4	Wind load resistance	DEKTON® 12 mm	see clause 3.4		
			DEKTON® 20 mm			
	---	Resistance to horizontal point loads		Not assessed		
	3.5	Impact resistance	DEKTON® 12 mm	Category IV (see table 3.3)	Not assessed	Not assessed
			DEKTON® 20 mm			
	3.6	Bending strength of cladding element		≥ 45 N/mm ²		
	3.7.1	Resistance to axial tension	DEKTON® 12 mm	see table 3.5	Not relevant	
			DEKTON® 20 mm			
	3.7.2	Resistance to shear load	DEKTON® 12 mm	see table 3.6	Not relevant	
			DEKTON® 20 mm			
	3.7.3	Resistance to combined tension and shear load	DEKTON® 12 mm	see table 3.7	Not relevant	
DEKTON® 20 mm						
3.8.1	Resistance of grooved cladding element	DEKTON® 12 mm	Not relevant	≥ 530 N (in suction action)		
		DEKTON® 20 mm		≥ 680 N (in pressure action)		
3.8.1	Resistance of grooved cladding element	DEKTON® 12 mm	Not relevant	≥ 1000 N (in suction action)		
		DEKTON® 20 mm		≥ 3800 N (in pressure action)		
3.8.2	Resistance to vertical load		Not relevant	< 0,15 mm after 4 h		
3.8.3	Pull-through resistance of fixings from profiles		Not relevant	≥ 3200 N	Not relevant	
3.8.4	Resistance of metal clip		Not relevant	Not relevant	≥ 2100 N	

Table 3.1: Summary of DEKTON® performance (see also detailed performance in relevant sections).

Product:	DEKTON®		Intended use:	External wall claddings in ventilated façades (rainscreens).		
Basic Works Requirement	ETA section	Essential characteristic	Performance			
			DKT1 (undercut anchor)	DKT2 (horizontal rail profile)	DKT3 (small rail)	
	---	Resistance of profiles	Not relevant			
	---	Pull-out resistance of subframe fixings	Not relevant			
	---	Shear load resistance of subframe fixings	Not relevant			
	---	Bracket resistance (horizontal and vertical load)	Not relevant			
BWR 5 Protection against noise	---	Airborne sound insulation	Not relevant			
BWR 6 Energy economy and heat retention	---	Thermal resistance of the kit	Not relevant			
	---	Thermal resistance of thermal insulation product	Not relevant			
Durability aspects	---	Hygrothermal behaviour	Not relevant			
	---	Behaviour after pulsating load	Not assessed			
	3.9	Freeze-thaw resistance	No defects			
	---	Behaviour after immersion in water	Not assessed			
	3.10	Dimensional stability of the cladding elements	by temperature	6,5 µm/m·°C		
			by humidity	0,05 mm/m		
	---	Chemical and biological resistance of the cladding elements	Not relevant			
	---	UV radiation resistance of the cladding elements	Not relevant			
3.11	Corrosion of metal components	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 (made of masonry, concrete, timber or metal frame) and not to the DEKTON® itself.

3.1 Reaction to fire

The reaction to fire of DEKTON® according to Commission Delegated Regulation (EU) 2016/364 and EN 13501-1, is:

- For DEKTON® without the ancillary mesh (see Annex 1) on the underneath surface (rear side):
 - class A1 without need of testing according to Decision 96/603/EC as amended.
- For DEKTON® with the ancillary mesh (see Annex 1) on the underneath surface (rear side):
 - class A2,s1-d0. It is based on the relevant tests according to EN 13501-1.

These classes are valid provided that the insulation layer placed behind the cladding elements is made of non-combustible materials (e.g. mineral wool) or that 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 or PF), the reaction to fire of the external wall claddings for ventilated façades will be the reaction to fire of the insulation material.

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, 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

Wind load resistance has been determined considering the wind resistance tests and the mechanical resistance of components (see sections 3.6 to 3.8).

The most critical cases for each cladding element thickness have been tested (maximum area and maximum distance between cladding fixings). Test results are given in table 3.2.

For other assembled systems, wind load resistance obtained by calculation based on the mechanical resistance of the kit components should not be higher than the maximum load obtained in the tests.

Table 3.2: Wind suction load resistance test results.

Cladding kit family	Cladding element	Cladding fixing					Maximum load Q (Pa)
		Type	Min. number (row x column)	Distance row-edge / column-edge (mm)	Column distance (mm)	Row distance (mm)	
Family B	DEKTON® 12 mm	DKT1.1	3 x 3	200 / 100	≤ 700	≤ 620	8200
		DKT1.2	3 x 3	200 / 100	≤ 700	≤ 620	6300
	DEKTON® 20 mm	DKT1.1	3 x 3	200 / 100	≤ 700	≤ 620	9500
		DKT1.2	3 x 3	200 / 100	≤ 700	≤ 620	8200
Family C	DEKTON® 12 mm	DKT2.2	2	---	Not relevant		2000
		DKT3 (*)	2 x 2	---	≤ 450	≤ 1440	
	DEKTON® 20 mm	DKT3 (*)	2 x 2	---	≤ 450	≤ 1440	2800 (**)

(*) Values also applicable to DKT2.1 cladding fixing.

(**) This configuration was also tested to pressure load and it reached 10000 Pa without failure.

3.5 Impact resistance

Impact resistance has been tested on the assembled system given in table 3.3. For other assembled systems, the impact resistance has not been assessed.

Table 3.3: Impact resistance.

Cladding element	Cladding fixing			Impact resistance passed	Degree of exposure in use (*)
	Min. number	Column distance (mm)	Row distance (mm)		
DEKTON® 12 mm & 20 mm	≥ 4 DKT1 (type 1)	≤ 700	≤ 1000	Hard body (0,5 kg) 3 impacts of 1 J Soft body (3,0 kg) 3 impacts of 10 J	Category IV
(*) Category I: This category means that the degree of exposure in use should be a zone readily accessible to the public at ground level and vulnerable to hard body impacts but not subjected to abnormally rough use.					
Category II: This category means that the degree of exposure in use should be a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.					
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.					

3.6 Bending strength of the cladding element

DEKTON® bending strength has been tested according to EN ISO 10545-4.

Mean values and characteristic values of the breaking load, breaking strength and bending strength are given in table 3.4.

Table 3.4: Bending strength and modulus of rupture of the cladding element.

Cladding element (*)	Breaking load (N)		Breaking strength (N)		Bending strength (N/mm ²)	
	F _m	F _c	F _m	F _c	F _m	F _c
DEKTON® 12 mm	2730	2527	4906	4551	52	48
DEKTON® 20 mm	8074	7071	14514	12711	55	48

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

(*) Test specimen dimensions = 200 mm x 100 mm.

3.7 Mechanical resistance in the case of family B

3.7.1 Resistance to axial tension

Resistance to axial tension has been tested. Mean and characteristic values are given in table 3.5.

Table 3.5: Axial tension.

Cladding element	Cladding fixing type	Fixing position	Ring diameter	Failure load (N)	
				F _m	F _c
	DKT1.1	Centre	Ø 700 mm	1816	1531

Table 3.5: Axial tension.

Cladding element	Cladding fixing type	Fixing position	Ring diameter	Failure load (N)			
				F _m	F _c		
DEKTON® 12 mm	DKT1.2	Border (100 mm)	Ø 350 mm	1984	1650		
			Ø 50 mm	4027	3434		
		Corner (100 mm)	Ø 700 mm (*)	1420	1035		
			Ø 700 mm (*)	1417	1077		
		Centre	Ø 700 mm	1764	1584		
			Ø 350 mm	2054	1581		
			Ø 50 mm	3084	1238		
			Ø 700 mm (*)	1518	1322		
		DEKTON® 20 mm	DKT1.1	Centre	Ø 700 mm	2870	1952
					Ø 350 mm	3621	2930
Ø 50 mm	3488				2504		
Border (100 mm)	Ø 700 mm (*)			2977	2487		
Corner (100 mm)	Ø 700 mm (*)			2655	2082		
DKT1.2	Centre		Ø 700 mm	4122	3468		
			Ø 350 mm	4213	3677		
			Ø 50 mm	5082	3314		
	Border (100 mm)		Ø 700 mm (*)	2858	2725		
	Corner (100 mm)		Ø 700 mm (*)	2814	2241		

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

(*) Tests using the ring diameter for the minimum mean value of the resistance in the case of centre position.

3.7.2 Resistance to shear load

Resistance to shear load has been tested. Mean and characteristic values are given in table 3.6.

Table 3.6: Resistance to shear load.

Cladding element	Cladding fixing type	Failure load (N)	
		F _m	F _c
DEKTON® 12 mm	DKT1.1	5097	3942
	DKT1.2	8136	6996
DEKTON® 20 mm	DKT1.1	6231	4949
	DKT1.2	8383	6367

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

3.7.3 Resistance to combined tension and shear load

Resistance to shear load has been tested. Mean and characteristic values are given in table 3.7.

Table 3.7: Resistance to combined tension and shear load.

Cladding element	Cladding fixing type	Fixing position	Ring diameter	Failure load (N)	
				F _m	F _c
DEKTON® 12 mm	DKT1.1	Angle 60° (centre)	Ø 700 mm (*)	1249	904
		Angle 30° (centre)	Ø 700 mm (*)	1191	995
	DKT1.2	Angle 60° (centre)	Ø 700 mm (*)	1960	1006
		Angle 30° (centre)	Ø 700 mm (*)	751	599
DEKTON® 20 mm	DKT1.1	Angle 60° (centre)	Ø 700 mm (*)	1479	1169
		Angle 30° (centre)	Ø 700 mm (*)	1035	927
	DKT1.2	Angle 60° (centre)	Ø 700 mm (*)	1994	1455
		Angle 30° (centre)	Ø 700 mm (*)	1602	1168

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

(*) Tests using the ring diameter for the minimum mean value of the resistance in the case of centre position.

3.8 Mechanical resistance in the case of family C

3.8.1 Resistance of grooved cladding elements

Resistance to shear load has been tested. Mean and characteristic values are given in table 3.8.

Table 3.8: Resistance of grooved cladding elements.

Cladding element	Cladding fixing type	Resistance (N)			
		In suction action (internal tongue)		In pressure action (external tongue)	
		F _m	F _c	F _m	F _c
DEKTON® 12 mm	DKT2.1 & DKT3	654	539	949	688
	DKT2.2			654	539
DEKTON® 20 mm	DKT2.1 & DKT3	1365	1035	4604	3882
	DKT2.2			1365	1035

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

(*) Test specimen width = 100 mm.

3.8.2 Resistance to vertical load of cladding fixing

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

3.8.3 Pull-through resistance of fixings from profiles

Resistance to pull-through load has been tested. Mean and characteristic values are given in table 3.9.

Table 3.9: Pull-through resistance of fixings from horizontal rail profiles for family C (cladding fixing DKT2).

Specimen	Failure load (N)	
	F _m	F _c
DKT2 middle horizontal rail profile + stainless steel A2 screw 5,5 diameter and washer 16,0 mm diameter	4235	3829
DKT2 upper/lower horizontal rail profile + stainless steel A2 screw 5,5 diameter and washer 16,0 mm diameter	4023	3286

Table 3.9: Pull-through resistance of fixings from horizontal rail profiles for family C (cladding fixing DKT2).

Specimen	Failure load (N)	
	F _m	F _c
Where: F _m = mean values; F _c = characteristic values giving 75% confidence that 95% of test results will be higher than this value.		

3.8.4 Resistance of metal clip

Resistance of metal clips has been tested. Mean and characteristic values are given in table 3.10.

Table 3.10: Resistance of metal clip for family C (cladding fixing DKT3). Horizontal force.

Cladding fixing	Load (N) for 1 mm permanent deformation		Failure load (N)	
	F _m	F _c	F _m	F _c
DKT3 middle small rail	3637	3266	4077	3797
DKT3 upper/lower small rail	2407	2131	2933	2584
Where: F _i = individual values; F _m = mean values; F _c = characteristic values giving 75% confidence that 95% of test results will be higher than this value.				

3.9 Freeze-thaw resistance of the cladding element

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

3.10 Dimensional stability of the cladding elements

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

Linear thermal expansion of DEKTON® is 6,5 µm/m·°C (see Annex 1).

3.11 Corrosion of metal components

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

The cladding fixings type 1 (DKT1) are made of stainless steel 1.4401, 1.4404 or 1.4578 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 (DKT2) and type 3 (DKT3) 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 (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 2003/640/EC, as amended of the European Commission², 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 apply.

Table 4.1: Applicable AVPC system.

Product	Intended use	Level or class	System
	External finishes of walls	Any	2+
Exterior wall claddings	For uses subject to regulations on reaction to fire	A1 (*)	4
		A2,s1-d0 (**)	3

(*) Class A1 according to Commission Decision 96/603/EC, as amended for DEKTON® without the ancillary mesh (see Annex 1) on the underneath surface (rear side).

(**) Class A2,s1-d0 for DEKTON® with the ancillary mesh (see Annex 1) on the underneath surface (rear side).

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 ITeC³, with which the factory production control shall be in accordance.

Issued in Barcelona on 18 January 2022

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart
 Technical Director, ITeC

² 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.

³ 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 ultracompact ceramic panel. The main characteristics are given in table A1.1.

DEKTON® cladding element is further classified by the manufacturer in four technical families (Families I, II, III & IV). The list of colours and textures of each DEKTON® technical family which are covered by this ETA, is indicated in a separate Annex N. This Annex N is kept conveniently updated by ITeC.

DEKTON® cladding element is delivered with an ancillary glass fibre mesh bonded onto the underneath surface (rear side) by means of an epoxy adhesive (Protek⁴). The function of the mesh is solely to provide the panel with extra safety properties after a possible breakage (e.g. due to impacts). This mesh is not meant to improve the mechanical performance of DEKTON®.

Table A1.1: DEKTON® cladding element characteristics.

Characteristic	Reference	Value	Tolerance
Thickness		12 mm 20 mm	± 5,0% (± 0,5 mm)
Nominal Length (*) of manufactured format		3200 mm	± 0,6% (± 2,0 mm)
Nominal Width (*) of manufactured format		1440 mm	
Straightness of sides	EN ISO 10545-2	---	± 0,5% (± 1,5 mm)
Rectangularity		---	
Central curvature		---	± 0,5% (± 2,0 mm)
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 characteristic value (**)	EN ISO 10545-4	≥ 52 N/mm ² ≥ 55 N/mm ² ≥ 48 N/mm ² ≥ 48 N/mm ²
Hard body impact resistance (coefficient of restitution)	EN ISO 10545-5	0,85	---
Linear thermal expansion coefficient	EN ISO 10545-8	< 6,5 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	---
Heat of combustion, PCS-value	DEKTON® (***) Ancillary glass-fibre mesh and epoxy adhesive (***)	EN ISO 1716	≤ 0,34 MJ/kg ≤ 11,6 MJ/kg

(*) 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.

(***) Value including Protek⁴.

⁴ Protek refers to the gluing process, carried out at COSENTINO SAU factory, by which the fiberglass mesh (300 g/m²) is glued with epoxy resin (313 g/m² - 360 g/m²) onto the rear side (underneath) of DEKTON® panel.

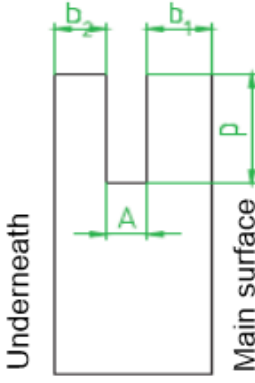
	Cladding fixing	Dekton® thickness (mm)	Geometry of the grooves			
			b1 (mm)	b2 (mm)	A (mm)	P (mm)
	Type 2 (DKT2.1)	12,0	4,0 (+0,0 ; -1,0)	5,0 (+0,0 ; -1,0)	3,0 ± 0,5	10,0 (+0,0 ; -1,0)
		20,0	12,0 (+0,0 ; -1,0)	5,0 (+0,0 ; -1,0)	3,0 ± 0,5	10,0 (+0,0 ; -1,0)
	Type 2 (DKT2.2)	12,0	4,0 (+0,4 ; -0,0)	4,0 (+0,4 ; -0,0)	4,0 (+0,0 ; -0,8)	10,0 (+0,0 ; -1,0)
		20,0	8,0 (+0,4 ; -0,0)	8,0 (+0,4 ; -0,0)	4,0 (+0,0 ; -0,8)	10,0 (+0,0 ; -1,0)
	Type 3 (DKT3.1)	12,0	4,0 (+0,0 ; -1,0)	5,0 (+0,0 ; -1,0)	3,0 ± 0,5	10,0 (+0,0 ; -1,0)
		20,0	12,0 (+0,0 ; -1,0)	5,0 (+0,0 ; -1,0)	3,0 ± 0,5	10,0 (+0,0 ; -1,0)

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. System trade name DKT1

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 (DKT1).				
Characteristic		Reference	Value	
System		---	DKT1.1	DKT1.2
Type of specific anchor		---	Undercut anchor	
Trade name		---	KEIL	FISCHER
			KH 8,5	FZP II 11x8 M6/T/PA
				FZP II 11x10 M6/T/PA
For use in DEKTON® thickness (mm)		---	12-20	12 20
Form and dimensions			See figure A2.1a	See figure A2.1b
Anchor installation	Anchorage depth, h_s (mm)		8,5	8,0 = (a = 10,5) - 2,5 10,0 = (a = 12,5) - 2,5
	Panel thickness, h (mm)	ETA 03/0055	$\geq 11,0$	$\geq 10,0$ $\geq 20,0$
	Diameter of drill hole, d_o (mm)	ETA 06/0253	7,0	11,0
	Diameter of undercut, d_1 (mm)	ETA 11/0465	9,0	13,5
	Screw length, c		See note (1)	---
	Thread diameter		M6	M6
	Installation torque moment, T_{inst} (N·m)		$2,5 \leq T_{inst} \leq 4,0$	$T_{inst} \leq 5,0$
	Distance anchor - panel edge (mm)	---	$100 \leq b \leq 200$	$100 \leq b \leq 200$
	Maximum distance anchor - anchor	---	≤ 700 (between columns) ≤ 620 (between rows)	≤ 700 (between columns) ≤ 620 (between rows)
	Material properties	Anchor sleeve	EN 10088-1	See note (2)
Screw		EN 10088-2	See note (3)	---
Cone bolt		EN 10088-1		
Expansion part		EN 10088-2 EN 10088-3	---	Stainless steel
Shim washer		---	---	Poliamide 6.6
	Hexagona l nut	EN 755 EN 10088	---	Aluminium, optional A4 stainless steel

(1) Without washer: $h_s + 3 \text{ mm} + t_{fix}$; with washer: $h_s + 7,5 \text{ mm} + t_{fix}$ (with washer).

(2) Stainless steel 1.4404 (X2CrNiMo17-12-2).

(3) Stainless steel: 1.4401 (X5CrNiMo17-12-2), 1.4404 (X2CrNiMo17-12-2) or 1.4578 (X3CrNiCuMo 17-11-3-2).

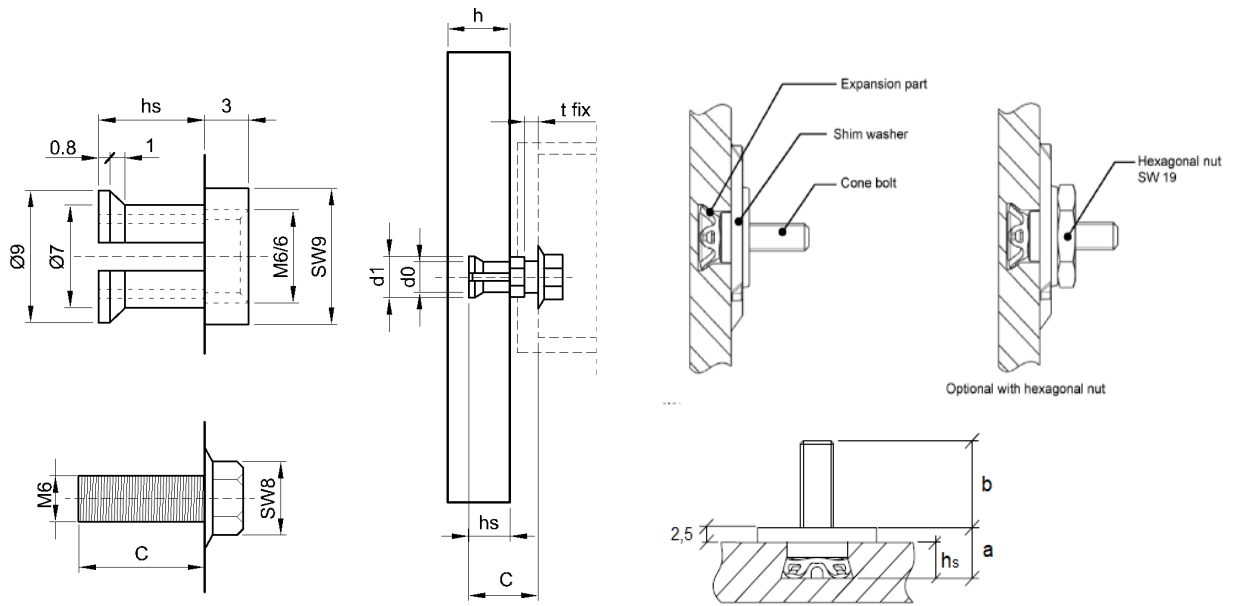


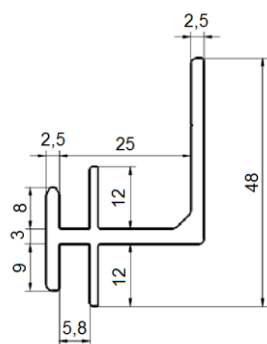
Figure A2.1a: KEIL KH undercut anchor. Anchor sleeve and hexagonal screw (DKT1.1).

Figure A2.1b: FISCHER FZP II undercut anchor (DKT1.2).

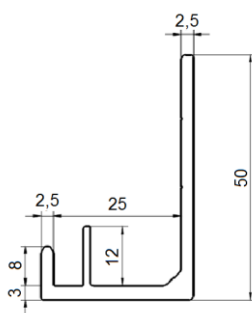
A2.2 Cladding fixings type 2 - Horizontal rail profiles made of aluminium alloy. System trade name DKT2

Geometric characteristics and material properties of the horizontal rail profiles (middle profile and lower/upper profile) considered for the assessment of DEKTON® are given in the table A2.2. Two models are considered, DKT2.1 and DKT2.2.

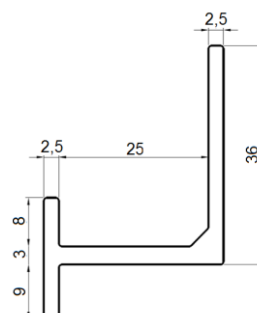
Table A2.2: Characteristics of cladding fixings type 2.			Reference		Value	
Characteristic			DKT2.1 & DKT3	DKT2.2		
	Geometric characteristics	System		See figures A2.2a	See figures A2.2b	
Form and dimensions		0,725 kg/m	0,678 kg/m			
Weight per linear metre		6,0 m				
Standard length		---	268,0 mm ²			
Cross section			Middle profile	250,9 mm ²		
		Lower/upper profile	2,03 cm ⁴			
Inertia of profile section		I _{xx}	Middle profile	1,78 cm ⁴		
		I _{yy}	Lower/upper profile	2,89 cm ⁴		
		Middle profile	2,49 cm ⁴			
		Lower/upper profile				
Material properties	Type of material		Aluminium alloy AW 6063 T66	Aluminium alloy AW 6063 T5		
	Durability class		B			
	Specific gravity (unit mass)		2700 kg/m ³			
	Elastic limit R _{p0,2}		EN 1999-1-1	≥ 200 N/mm ²	≥ 130 N/mm ²	
	Elongation		EN 755-2	≥ 8%		
	Tensile strength R _m		≥ 245 N/mm 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 µm/m·°C				



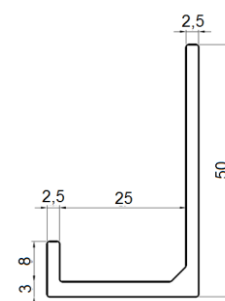
Middle profile



Lower/upper profile



Middle profile



Lower/upper profile

Figure A2.2a: Cross-section. DKT2.1 and DKT3.

Figure A2.2b: Cross-section. DKT2.2.

A2.3 Cladding fixings type 3 - Small rails made of aluminium alloy. System trade name DKT3

Cladding fixings type 3 considered for the assessment of DEKTON® are small rails which have the same cross-section (see figures A2.2a) and the same material properties (see table A2.2) that the cladding fixings type 2 DKT2.1 system.

Specific form and dimensions of the small rails are given in figures A2.3.

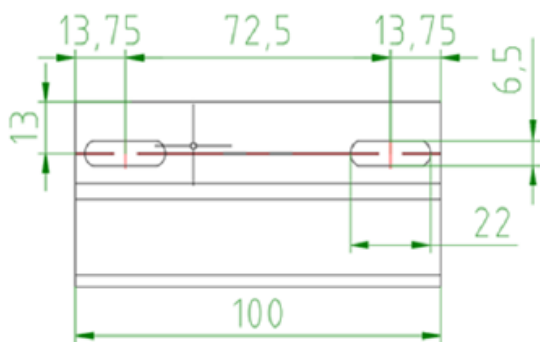


Figure A2.3a: Middle small rail with oblong holes. Frontal view.

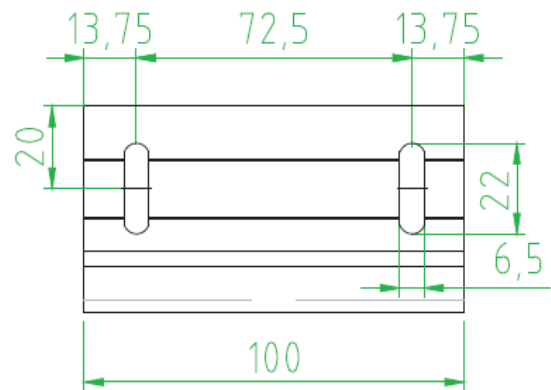


Figure A2.3b: Lower/upper small rail. Frontal view.

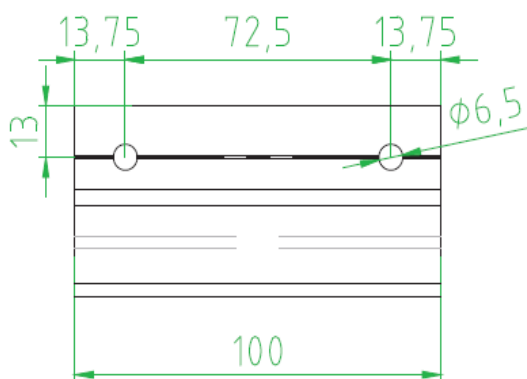


Figure A2.3c: Middle small rail with circular holes. Frontal view.

ANNEX 3: Construction details

A3.1 Construction details with cladding fixings type 1 - DKT1.1

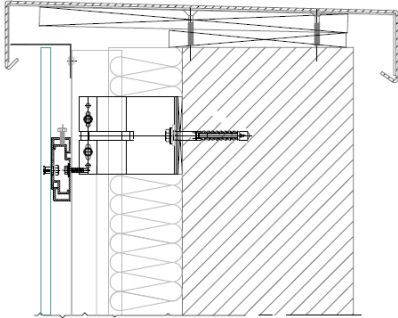


Figure A3.1a: Roof edge. DKT1.1.

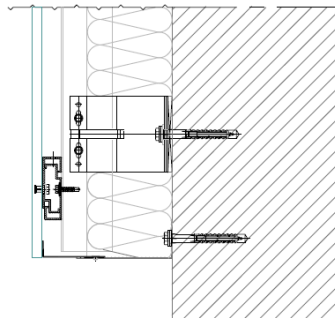


Figure A3.1b: Base edge. DKT1.1.

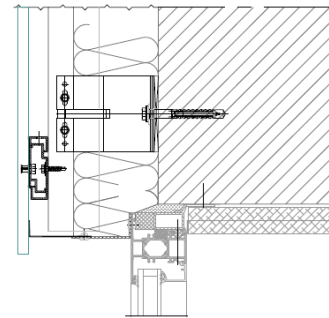


Figure A3.1c: Lintel. DKT1.1.

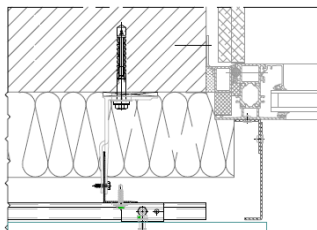


Figure A3.1d: Jamb. DKT1.1.

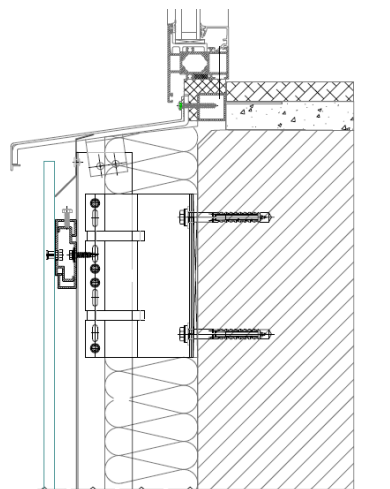


Figure A3.1e: Sill. DKT1.1.

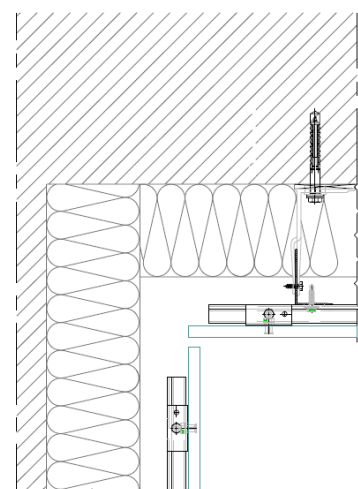


Figure A3.1f: Internal corner. DKT1.1.

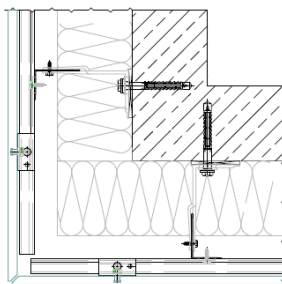


Figure A3.1g: External corner mitered edge. DKT1.1.

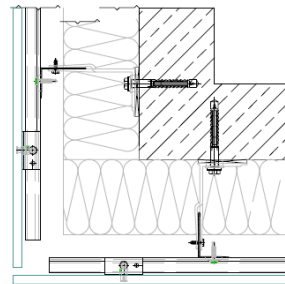


Figure A3.1h: External corner. DKT1.1.

A3.2 Construction details with cladding fixings type 1 - DKT1.2

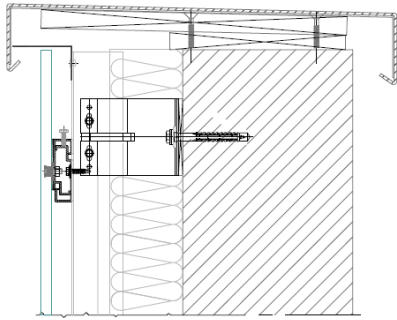


Figure A3.2a: Roof edge. DKT1.2.

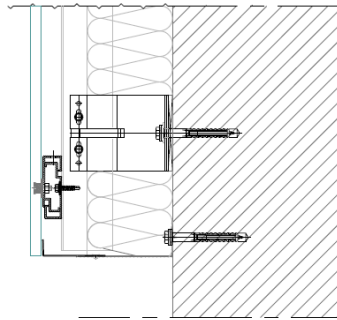


Figure A3.2b: Base edge. DKT1.2.

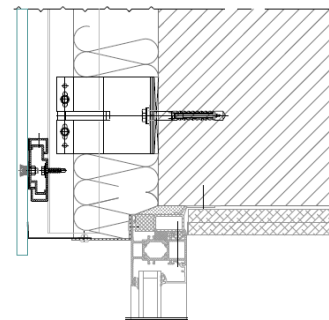


Figure A3.2c: Lintel. DKT1.2.

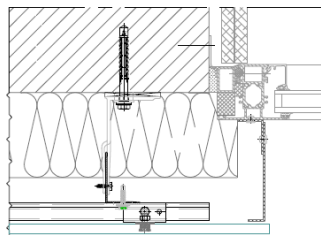


Figure A3.2d: Jamb. DKT1.2.

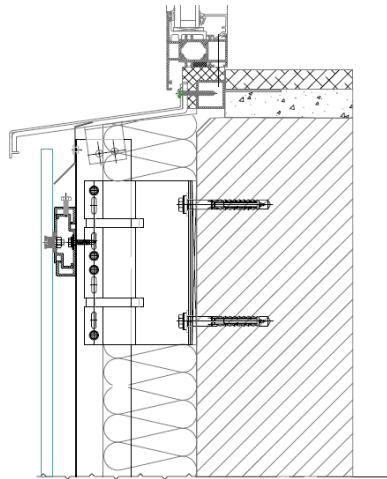


Figure A3.2e: Sill. DKT1.2.

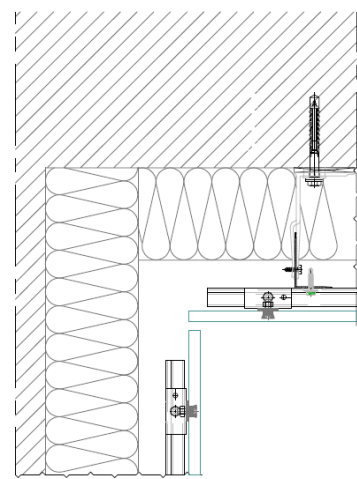


Figure A3.2f: Internal corner. DKT1.2.

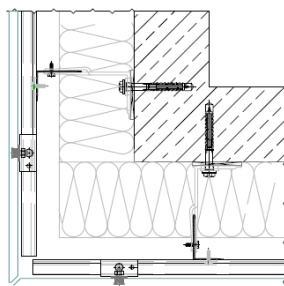


Figure A3.2g: External corner mitered edge. DKT1.2.

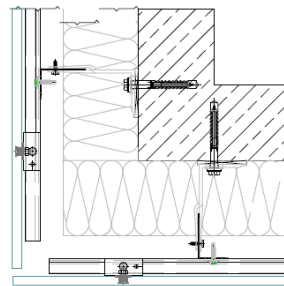


Figure A3.2g: External corner. DKT1.2.

A3.3 Construction details with cladding fixings type 2 – DKT2.1 & DKT2.2

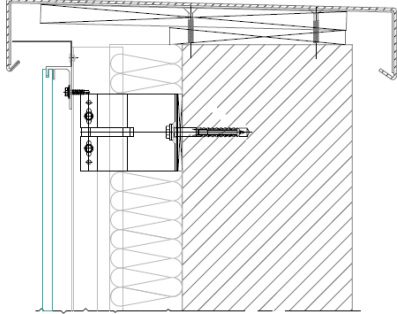


Figure A3.3a: Roof edge. DKT2.1 & DKT2.2.

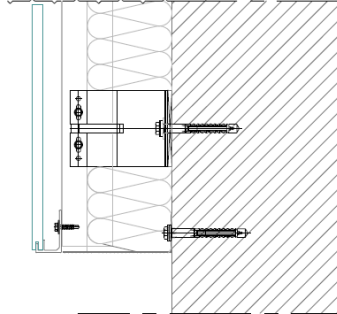


Figure A3.3b: Base edge. DKT2.1 & DKT2.2.

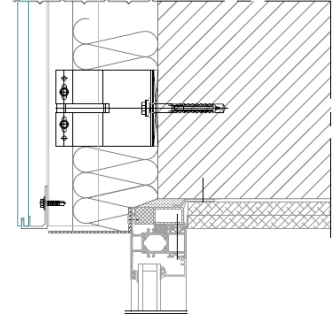


Figure A3.3c: Lintel. DKT2.1 & DKT2.2.

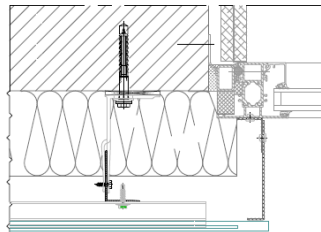


Figure A3.3d: Jamb. DKT2.1 & DKT2.2.

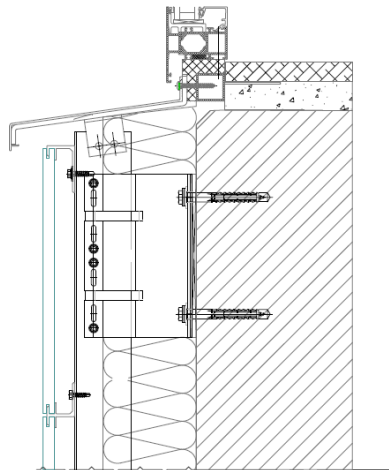


Figure A3.3e: Sill. DKT2.1 & DKT2.2.

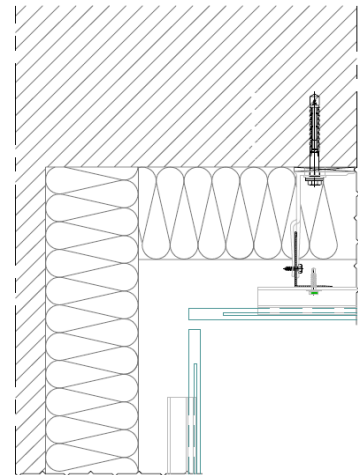


Figure A3.3f: Internal corner. DKT2.1 & DKT2.2.

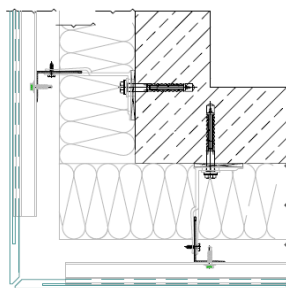


Figure A3.3g: External corner mitered edge. DKT2.1 & DKT2.2.

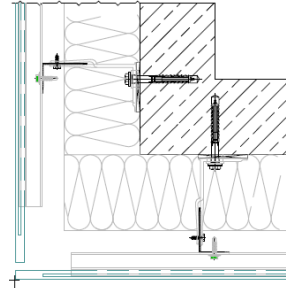


Figure A3.3h: External corner. DKT2.1 & DKT2.2.

A3.4 Construction details with cladding fixings type 3 – DKT3

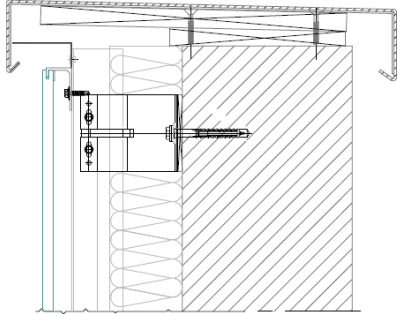


Figure A3.4a: Roof edge. DKT3.

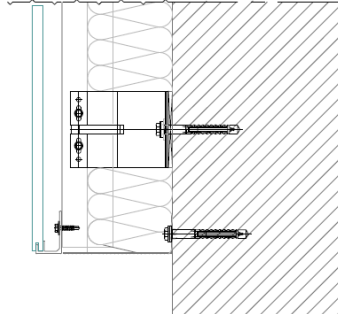


Figure A3.4b: Base edge. DKT3.

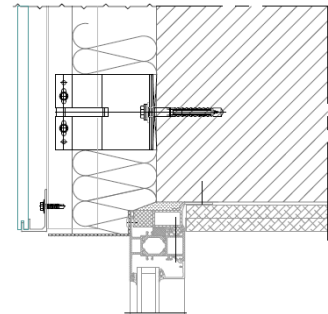


Figure A3.4c: Lintel. DKT3.

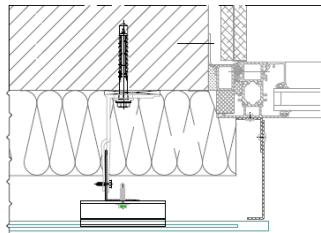


Figure A3.4d: Jamb. DKT3.

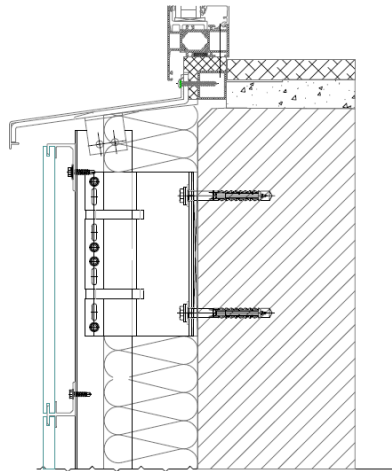


Figure A3.4e: Sill. DKT3.

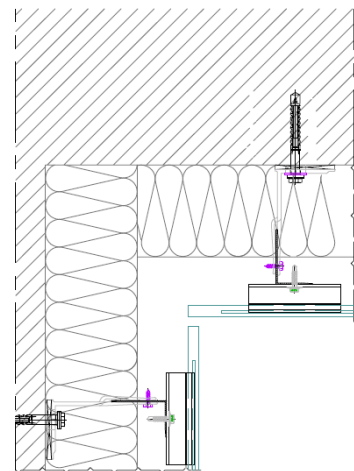


Figure A3.4f: Corner. DKT3.

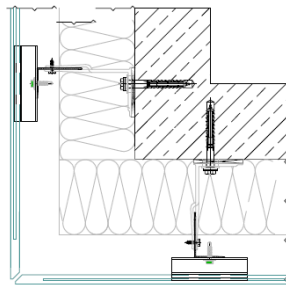


Figure A3.4g: External corner mitered edge. DKT3.

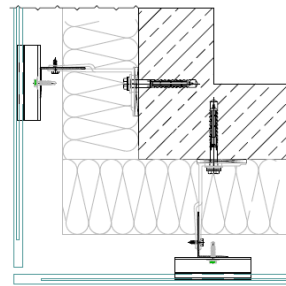


Figure A3.4h: External corner. DKT3.

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:

- It is assumed that the substrate wall meets the necessary requirements regarding the mechanical strength (resistance to static and dynamic loads) and the airtightness, as well as the relevant resistance regarding watertightness and water vapour.
- The verification of the designed system by means of calculation, taking into account the mechanical characteristic values of the system 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. Minimum safety factor recommended by the manufacturer = 1,50.
- The selection and verification of the anchors between the subframe components (e.g. brackets) and the external walls (substrate), taking into account the substrate material 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 of works (e.g. acc. ISO 9223).
- 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 a harmonized standard or an European technical assessment and taking into account the section 3.1 of this ETA.
- 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.

A3.2 Installation

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

- According to the specifications of the manufacturer and using the components specified in this ETA.
- In accordance with the design and drawings prepared for the specific works. The manufacturer 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.

A3.3 Maintenance and repair

Maintenance of the external wall claddings for ventilated façades using DEKTON® includes inspections on site, considering 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 localized damaged areas must be carried out with the same components and following the repair instructions given by the manufacturer.