

General approval by the building inspectorate

GERMAN INSTITUTE OF CONSTRUCTION ENGINEERING
Construction Testing Agency

A public institution jointly supported by the federal state and lands
Member of EOTA, UEAtc and WFTAO

Date: 14.04.2014

Ref.: II 17-1.33.2-632/5

Approval number:

Z-33.2-632

Period of validity:

From: **14th April 2014**

To: **14th April 2019**

Applicant:

DAW SE

Geschäftsbereich Lithodecor

Rossdörfer Strasse 50

D-64372 Ober-Ramstadt

Product approved:

External ventilated curtain wall cladding and façade soffit

“Airtec Stone”

The above-mentioned product is herewith awarded general building inspectorate approval. This general building inspectorate approval document consists of ten pages and sixteen pages of appendices.

I. GENERAL TERMS AND CONDITIONS

- 1 The general building inspectorate approval confirms the suitability or applicability of the approved product as defined by the regional building regulations.
- 2 In so far as the general building inspectorate approval demands special technical knowledge and experience from the persons contracted to manufacture the construction products and carry out the types of construction in accordance with the regional regulations that correspond to section 17 subsection 5 of the German model building regulations, it is to be noted that this technical knowledge and experience may also be verified by equivalent documents issued by other member states of the European Union. This also applies to equivalent documentation submitted as verification within the scope of the treaty establishing the European Economic Area (EEA) or other bilateral conventions.
- 3 The general building inspectorate approval does not replace the approvals, permits and certification required by law for the execution of construction projects.
- 4 The general building inspectorate approval is issued without prejudice to the rights of third parties, in particular private property rights or patents.
- 5 The manufacturer and distributor of the approved product are required, without prejudice to other provisions in the "Special terms and conditions", to provide the user or applicator of the approved product with copies of the general building inspectorate approval and to point out that the general building inspectorate approval must be available at the point of use or application. The authorities involved must be provided with copies of the general building inspectorate approval on request.
- 6 The general building inspectorate approval may only be copied in its entirety. Extracts may only be published with the approval of the German Institute of Construction Engineering. Texts and drawings in advertising material must not contradict the general building inspectorate approval. Translations of the general building inspectorate approval must be marked "Translation of the German original not checked by the German Institute of Construction Engineering".
- 7 The general building inspectorate approval is revocable. The terms and conditions of the general building inspectorate approval may be supplemented or amended at a later date, particularly if new technical insights make this necessary.

II. SPECIAL TERMS AND CONDITIONS

1 Approved product and scope of application

1.1 Approved product

The general building inspectorate approval covers the external ventilated curtain wall cladding and façade soffit (external overhead area) with the designation of “Airtec Stone”, where the Façade Panels [Fassadenplatten] N are fixed to the aluminium frame with the aid of special clips (agraffes).

Façade Panels N are off-site cast composite panels consisting of a Carrier Panel [Trägerplatte] N made of lightweight concrete, with glass-fibre reinforced lamination on both sides and a stone facing slab fully bonded to the visible face. Fixings consisting of prefabricated ceramic elements are inserted into the Carrier Panel N and fixed in position with adhesive at the factory.

Façade Panels N are flame-resistant.

Any existing thermal insulation must consist of non-combustible mineral-fibre insulation materials to DIN EN 13162¹ and must be fixed directly to the building, independently of the base frame for the cladding.

The maximum permissible construction height for the installation of “Airtec Stone” ventilated external wall cladding is to be based on the stability check, unless the applicable regional fire regulations stipulate lower heights.

The stability check relating to the cladding frame is not covered by the general building inspectorate approval.

2 Regulations for the construction products

2.1 General information

The product that is the subject of this approval and the components thereof must comply with the special terms and conditions and the appendices of this general building inspectorate approval, as well as the information registered with the German Institute of Construction Engineering.

2.2 Properties and composition

2.2.1 Façade Panels N

Façade Panels N as detailed in appendix 1.1 must consist of the construction products specified in sections 2.2.1.1 to 2.2.1.8 and may have an overall nominal thickness of 25 mm to 29 mm. The thickness tolerance is ± 1 mm. The dimensions and number of fixing points for Façade Panels N must correspond to those specified in tables 2 to 4 in section 3.1.3.

The following minimum values for the maximum bending moment must be achieved when testing the flexural strength of Façade Panels N:

Mean value ≥ 740 Nm/m

Minimum value ≥ 680 Nm/m

2.2.1.1 Lightweight concrete panel

The lightweight concrete panel (Carrier Panel N) must be made of expanded clay bound with CEM I 42.5 R cement to DIN EN 197-1 and be laminated on both sides as follows:

¹ Please refer to building regulations list B, part 1, item no. 1.5.1 with regard to reaction to fire.

- The front lamination between the Carrier Panel and the natural stone must be made of Mesh [Gewebe] N as specified in section 2.2.1.2, a single layer of which must be fully embedded in the adhesive specified in section 2.2.1.3.
- The rear lamination must consist of Mesh N as specified in section 2.2.1.2, a single layer of which must be fully embedded in the reinforcement compound specified in section 2.2.1.4.

The unlaminated Carrier Panel N must have a thickness of 15.5 mm ± 1 mm, a dry density of 0.64 to 0.90 g/cm³ and water absorption ≤ 30 % by weight (after 7 days immersion in water at 20 °C).

The formulation for Carrier Panel N must correspond to the information registered with the German Institute of Construction Engineering.

2.2.1.2 Reinforcement mesh

Mesh N must consist of a coated textile-glass mesh and possess the properties set out in table 1.

Table 1: Properties of Mesh N reinforcement mesh

Properties	Textile-glass mesh Mesh N
Weight per unit area	160 – 170 g/m ²
Mesh size	4 mm x 4 mm
Tear strength as supplied, tested to DIN 53857-1	≥ 2.0 kN / 5 cm
Residual tear strength after 6 hours ageing at 80 °C in an alkaline solution pH 12.5	≥ 1.7 kN / 5 cm

2.2.1.3 Adhesive for the front lamination of Carrier Panel N

Adhesive [Kleber] N is to be used for the front lamination of the Carrier Panel as specified in section 2.2.1.1 (consumption: approx. 1 kg/m²).

The formulation of the adhesive must correspond to the information registered with the German Institute of Construction Engineering.

2.2.1.4 Reinforcement compound for the rear lamination of Carrier Panel N

The one-component, cement-bound Surfacel [Spachtel] N is to be used for the rear lamination of the Carrier Panel as specified in section 2.2.1.1 (consumption: approx. 3 kg/m²).

The formulation of the reinforcement compound must correspond to the information registered with the German Institute of Construction Engineering.

2.2.1.5 Ceramic fixings

The prefabricated ceramic fixing elements must be made of steatite C221 to DIN EN 60672-3 (DIN VDE 0335) and comply with the dimensions stipulated in appendix 2. At the factory a central, stepped hole must be drilled through each fixing element to accommodate rivets, or they must have an internal thread or a threaded aluminium insert to accommodate screws as set out in appendix 2.

2.2.1.6 Adhesive to attach the ceramic fixings

Adhesive [Befestigungskleber] N must be used to attach the ceramic fixings specified in section 2.2.1.5 in the holes machine-drilled into the lightweight concrete panel as specified in section 2.2.1.1.

The formulation of the adhesive must correspond to the information registered with the German Institute of Construction Engineering.

2.2.1.7 Stone facing slabs

Only stone slabs with a minimum thickness of 5 mm and a maximum thickness of 10 mm may be used. Their bending strength, tested in accordance with DIN EN 12372 must be at least 4.5 N/mm² after 48 frost-thaw cycles and their frost resistance in accordance with DIN EN 12371, section 6.7.2 (test B), must have been demonstrated after 48 cycles.

2.2.1.8 Adhesive for bonding the stone facing slab to Carrier Panel N

The natural stone facing slab must be fully bonded to the Carrier Panel using the adhesive specified in section 2.2.1.3.

The bond strength between the stone facing slabs and the Carrier Panel must correspond to the transverse tensile strength of the Carrier Panel, but be at least 0.5 N/mm².

2.2.2 Fixing accessories

2.2.2.1 Screws and rivets

The following may be used to fix the clips as specified in section 2.2.2.2 to the ceramic fixings as specified in section 2.2.1.5:

- M6 screws (for screw length see appendix 2) to DIN EN ISO 4017 made of A4 stainless steel to the specifications set out in DIN 18516-1², section 7.2.3.1 for inaccessible structures or
- 5.0 x 20 K14 rivets in accordance with general building inspectorate approval no. Z-14-1-4, appendix 2.3 (Rivet [Niet] N)

2.2.2.2 Clips

The clips must be made of an aluminium alloy EN AW 6060 T66 or EN AW 6063 T66 to DIN EN 755-2.

The clips must be at least 35 mm wide.

The wall thickness of the clips for must be $t \geq 3$ mm.

The moments of inertia about the centre lines must be $I_{XS} \geq 17$ cm⁴ and $I_{YS} \geq 1.9$ cm⁴ (see appendix 3).

2.2.3 Base frame

The horizontal and vertical supporting profiles of the frame must be made of aluminium alloy EN AW 6060 or EN AW 6063 T66 to DIN EN 755-2.

The moments of inertia about the centre lines that must be complied with are as follows:

- For the horizontal profiles (rails): $I_{XS} \geq 14.3$ cm⁴ and $I_{YS} \geq 1.4$ cm⁴
- For the vertical profiles (rails): $I_{XS} \geq 5.4$ cm⁴ and $I_{YS} \geq 5.7$ cm⁴

2.3 Manufacture, packaging, transport, storage and labelling

2.3.1 Manufacture

The construction products set out in sections 2.2.1 to 2.2.3 must be produced off-site in the factory. The positioning of the fixings in the panels must comply with appendix 1.1 or 1.2.

2.3.2 Packaging, transport and storage

Façade Panels N must be packaged, transported and stored in accordance with the manufacturer's instructions.

2.3.3 Labelling

Façade Panels N as specified in section 2.2.1 or their packaging or delivery note, as well as the packaging of fixing accessories as specified in section 2.2.2 must be labelled by the manufacturer with the conformity mark (C [Ü] mark) in accordance with regional/national conformity mark regulations. The products may only be labelled in this way if the conditions of section 2.4 have been fulfilled.

² DIN 18516-1:2010-06 External wall cladding, ventilated – part 1: Requirements and principles of testing

The following information must also be shown on the packaging of the construction products:

- Designation of the construction product
- Building materials class B1 to DIN 4102-1: Flame-resistant

2.4 Proof of conformity

2.4.1 Proof of conformity by means of a certificate of conformity

Confirmation of the conformity of Façade Panels N to the regulations of this general building inspectorate approval must be established for each manufacturing plant in the form of a certificate of conformity based on internal production control and regular external monitoring (inspection), including an initial test of the construction products in accordance with the regulations set out below.

A certifying authority as well as a recognised monitoring authority must be engaged by the manufacturer of Façade Panels N for the purpose of issuing a certificate of conformity and carrying out external monitoring, including the product tests required for this. If the manufacturer of the “Airtec Stone” external wall cladding is not also the manufacturer of Façade Panels N, he must contractually ensure that the Façade Panels N are subject to internal production control and external monitoring, both in keeping with this approval document.

The declaration that a certificate of conformity has been issued must be given by the manufacturer by marking or labelling the building products with the conformity mark (C [Ü] mark), with reference to the intended purpose.

The certifying authority is required to send the German Institute of Construction Engineering a copy of the certificate of conformity for information.

The German Institute of Construction Engineering must also be sent a copy of the initial test report for information.

2.4.2 Proof of conformity by manufacturer’s declaration

The confirmation of conformity of the screws and clips as specified in section 2.2.2.1 and 2.2.2.2 to the regulations of this general building inspectorate approval must be provided for each manufacturing plant by means of a manufacturer’s declaration of conformity based on internal production control and an initial test of the construction products carried out by an appropriate and recognised test laboratory.

2.4.3 Internal production control

An internal production control unit must be set up and the relevant inspections carried out in each manufacturing plant. Internal production control is deemed to be the continuous monitoring of the production process to be carried out by the manufacturer, which allows the manufacturer to ensure that the construction products manufactured by him comply with the requirements of this general building inspectorate approval.

The tests as set out in appendix 4 must be carried out within the scope of internal production control; in addition the flame resistance of Façade Panels N must be verified. As regards the reaction to fire of Façade Panels N the “Guidelines for proof of conformity of flame-resistant building materials (building materials class DIN 4102-B1) in accordance with general building inspectorate approval”³ must be complied with.

The results of the internal production control must be recorded and analysed. The records must contain at least the following information:

- Designation of the construction product or of the primary/raw material and the components
- Nature of the control or tests (inspection)
- Date of manufacture and testing (inspection) of the construction product or the primary/raw material or components

³ Published in the information sheets (“Mitteilungen”) of the German Institute of Construction Engineering

- Results of the controls and tests (inspection) and, if applicable, a comparison with the requirements
- Signature of the person responsible for internal production control

The records must be kept for at least five years and submitted to the monitoring authority instructed to carry out the external monitoring.

They must be submitted to the German Institute of Construction Engineering and the appropriate supreme building inspectorate on demand.

If the test result is not satisfactory, the manufacturer is required to take immediate measures to remedy the defect. Construction products that do not comply with the requirements must be handled in such a way that they cannot be mistaken for those products that do comply with the requirements. Once the defect has been remedied – in so far as this is technically possible and required for proof of the defect having been remedied – the relevant test must be repeated without delay.

2.4.4 External monitoring

For Façade Panels N the internal production control must be checked regularly, and at least twice a year, in each manufacturing plant by means of an external monitoring procedure.

An initial test of the construction product must be carried out within the scope of external monitoring. The sampling procedure and tests (inspections) have to be carried out by the relevant recognised monitoring authority. At least those tests set out in appendix 4 must be carried out on random samples; in addition the flame resistance of Façade Panels N must be verified. As regards the reaction to fire the “Guidelines for proof of conformity of flame-resistant building materials (building materials class DIN 4102-B1) in accordance with general building inspectorate approval”³ and the principles for approval for evidence of the flame resistance of building materials (building materials class DIN 4102-B1) apply to the external monitoring of Façade Panels N.

The results of certification and external monitoring must be kept for at least five years. They must be submitted to the German Institute of Construction Engineering by the certifying or monitoring authority on demand.

2.4.5 Initial testing

The properties of the screws and clips as specified in section 2.2.2 and appendices 2 and 3 must be tested within the scope of the initial tests.

3 Regulations for design and dimensioning

3.1 Structural strength and fitness for purpose

3.1.1 General information

Unless otherwise specified in the sections below, all the required static calculations must be carried out on the basis of the technical building specifications⁴ introduced by the building inspectorate.

The proof of static stability for the clips, the base-frame profiles and their connecting and anchoring components must be provided on a project-specific basis in accordance with the technical building specifications and the general building inspectorate approvals. The value to be assumed for the typical area load of Façade Panels N is 0.46 kN/m².

3.1.2 Design value for wind influence E_d

Please refer to the technical building specifications introduced by the building inspectorate for the typical values for the influence of exposure to wind w_e and the partial safety factor γ_F.

$$E_d = w_e \times \gamma_F$$

⁴ See www.dibt.de under the section >Geschäftsbereiche< (Business areas) and there under >Bauregellisten/Technische Baubestimmungen< (List of building regulations / Technical building specifications)

3.1.3 Design value for resistance of structural component R_d (when subjected to wind loads)

The design value for resistance of structural components R_d for Façade Panels N and their fixings is shown in tables 2 to 4 if the requirements of section 4 and appendices 1 to 4 are complied with.

Table 2: Design values for resistance of structural components $R_d = 2.40 \text{ kN/m}^2$, when installed as external wall cladding

Quantity of fixing points	Max. panel width [mm]	Max. panel length [mm]	Max. a_{s1} [mm]	Max. a_{s2} [mm]	System diagram no.	Appendix	R_d [kN/m ²]
2 x 2	1300	1300	1000	1000	1	1.2	2.40
2 x 3	1300	1900	1000	800	2	1.2	
2 x 4	1300	2700	1000	800	3	1.3	
2 x 5	1300	3500	1000	800	4	1.3	
2 x 6	1300	4300	1000	800	5	1.4	
3 x 2	1900	1300	800	1000	6	1.5	
3 x 4	1800	2700	750	800	7	1.5	
3 x 5	1800	3500	750	800	8	1.6	
3 x 6	1800	4300	750	800	9	1.6	

Table 3: Design values for resistance of structural components $R_d = 3.30 \text{ kN/m}^2$, when installed as external wall cladding

Quantity of fixing points	Max. panel width [mm]	Max. panel length [mm]	Max. a_{s1} [mm]	Max. a_{s2} [mm]	System diagram no.	Appendix	R_d [kN/m ²]
2 x 2	1300	1300	1000	1000	10	1.7	3.30
2 x 3	1300	1800	1000	750	11	1.7	
2 x 4	1300	2550	1000	750	12	1.8	
2 x 5	1300	3300	1000	750	13	1.8	
2 x 6	1300	4050	1000	750	14	1.9	
3 x 2	1800	1300	750	1000	15	1.10	
3 x 4	1800	2100	750	600	16	1.10	
3 x 5	1800	2700	750	600	17	1.11	
3 x 6	1800	3300	750	600	18	1.11	

Table 4: Design values for resistance of structural components $R_d = 1.88 \text{ kN/m}^2$, when installed in overhead areas

Quantity of fixing points	Max. panel width [mm]	Max. panel length [mm]	Max. a_{s1} [mm]	Max. a_{s2} [mm]	System diagram no.	Appendix	R_d [kN/m ²]
2 x 2	1000	800	700	500	19	1.12	1.88
2 x 3	1400	800	550	500	20	1.12	

3.1.4 Verification

The structural stability must be verified for the ultimate limit state of load-bearing capacity at

$$E_d \leq R_d.$$

E_d : Design value of influence (exposure)

R_d : Design value of resistance of structural component

Verification is carried out at the level of the exposure to wind loads.

3.2 Thermal protection and climate-related moisture protection

DIN 4108-2 applies with regard to proof of thermal protection.

For the purpose of calculating the thermal resistance (R value) to DIN EN ISO 6946 for the external wall construction, the air space (ventilation gap) and the Façade Panels must not be taken into account.

The proof of thermal protection provided by the insulation material used must be based on the design value for thermal conductivity in accordance with DIN V 4108-4⁵:2007-06, table 2, category I. A design value in accordance with category II applies to insulation boards where a threshold value of λ_{Limit} has been determined within the scope of a conformity certificate based on general building inspectorate approval.

The thermal bridges created by the base frame and its anchoring must be taken into account, as the layer of thermal insulation is penetrated or its thickness reduced.

DIN 4108-3 applies with regard to proof of climate-related moisture protection.

3.3 Fire protection

Façade Panels N are fire-resistant (building materials class B1 to DIN 4102-1).

The requirements contained in the list of technical building specifications to DIN 18516-1 (MLTB item no. 2.6.5) must be complied with.

3.4 Sound insulation

DIN 4109, including annex 1 to DIN 4109, applies to proof of sound insulation (protection against external noise).

4 Regulations concerning installation

4.1 Installation and assembly

The aluminium base frame must be installed with zero stress in accordance with DIN 18516-1. Only profiles as specified in section 2.2.3 may be used.

⁵ DIN V 4108-4:2007-06: Thermal protection and energy efficiency in buildings – part 4: Design values for thermal and moisture protection

The span length of the horizontal profiles (i.e. the distance between each of the vertical profiles) must be limited to the width of the façade panels and must not exceed 1250 mm. The span length of the vertical profiles (i.e. the vertical distance between the wall brackets) must not exceed $L = 1.25$ m.

The Façade Panels must be attached to the base frame using the ceramic fixings and fixing accessories as specified in section 2.2.2.1 and the clips as specified in section 2.2.2.2. For the number of required fixings please refer to tables 2 to 4 and appendices 1.1 or 1.12 should be referred to. The Façade Panels must be installed with zero stress. The Façade Panels may be installed with their long sides along the vertical or horizontal line.

The clips are hooked into the horizontal profiles of the base frame and secured to prevent them from slipping. They must be attached to the horizontal profiles of the base frame with zero stress (see appendix 1).

For installation as façade soffits (external overhead areas) the following must also be complied with:

Any mineral-wool insulation boards installed between the overhead Façade Panels and the load-bearing floor must not be fixed to the Façade Panels; an air gap of at least 20 mm must be maintained between the rear face of the façade and the layer underneath (either the thermal insulation or the solid mineral substrate).

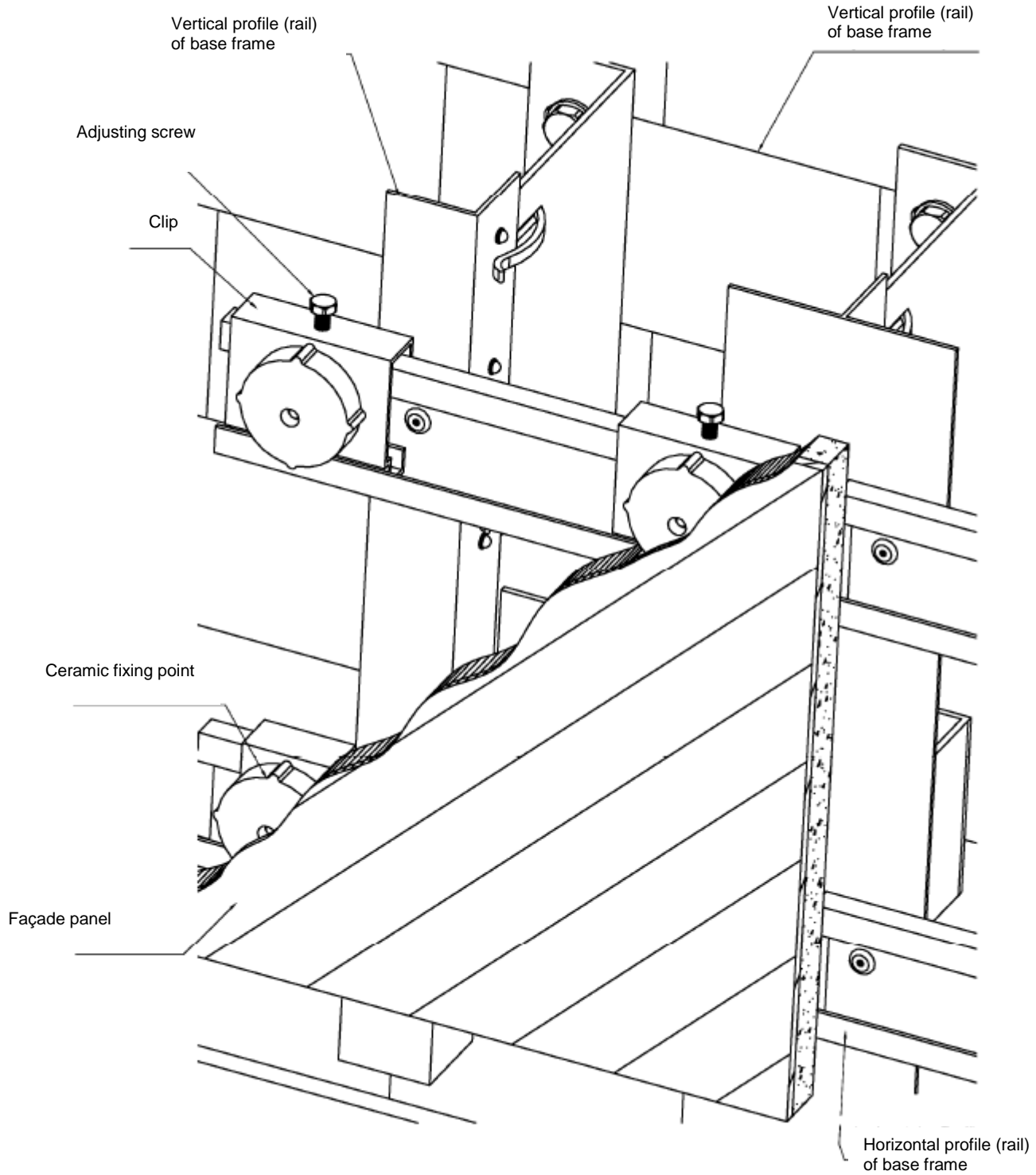
Special loads must be applied independently of the Façade Panels installed overhead.

Structural measures must be taken to prevent the clips from sliding out of the clip profile (rail); the structural securing measures must not result in any stress being applied to the façade fixings.

Damaged façade panels must not be installed.

Manfred Klein
Head of Department

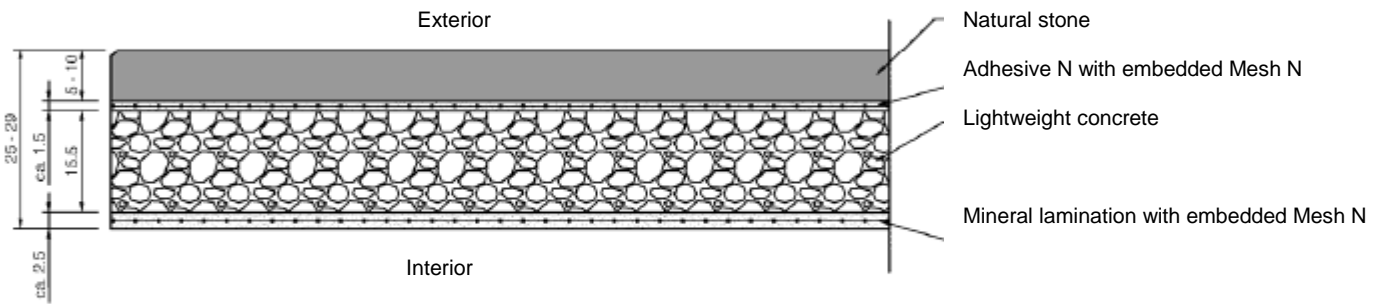
Certified



External ventilated curtain wall cladding and façade soffit "Airtec Stone"
System overview

Appendix 1

Build-up of Façade Panel N



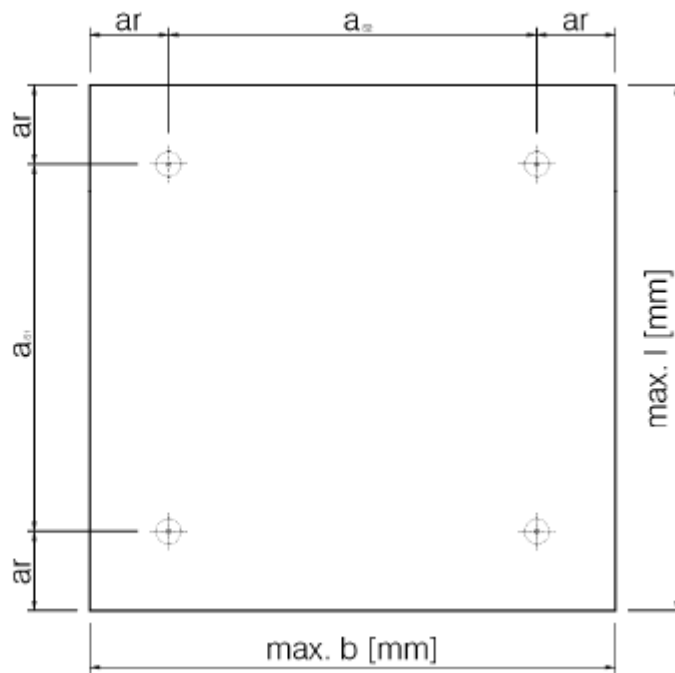
Thickness tolerance: ± 1.0 mm

All dimensions in [mm]

Edge spacing of fixings:

$150 \text{ mm} \leq ar \leq 200 \text{ mm}$

ar may be reduced to 100 mm for narrow panels with a side length of $b = 300$ mm to 400 mm



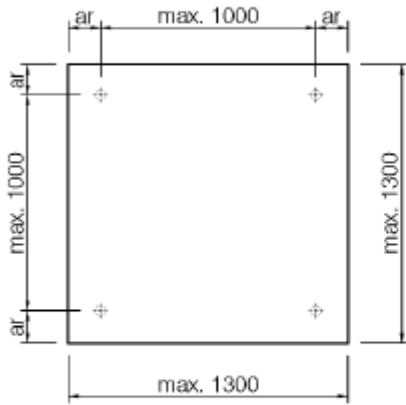
Tolerances:

In length: ± 1.0 mm

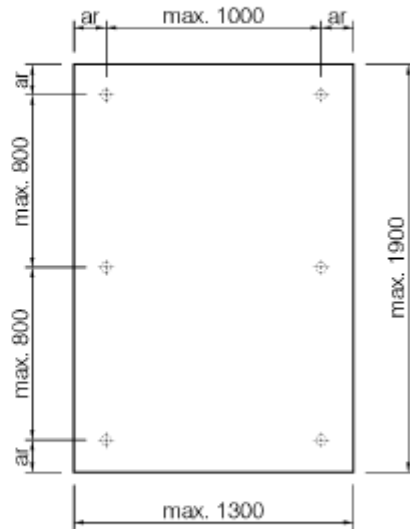
In width: ± 1.0 mm

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.1
Section drawing of Façade Panel N and view of edge spacings for fixings	

System diagram no. 1: 2 x 2 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



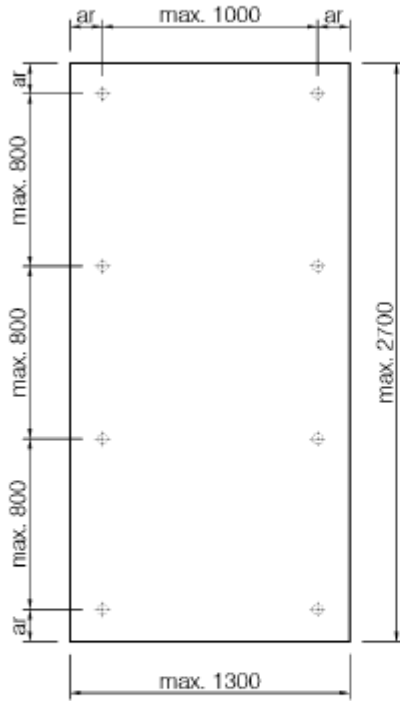
System diagram no. 2: 2 x 3 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



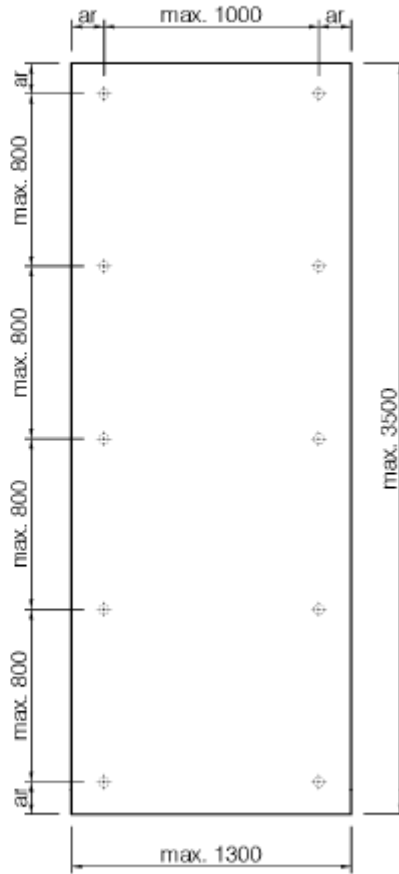
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.2
System diagrams 1 + 2, application as external wall cladding	

System diagram no. 3: 2 x 4 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



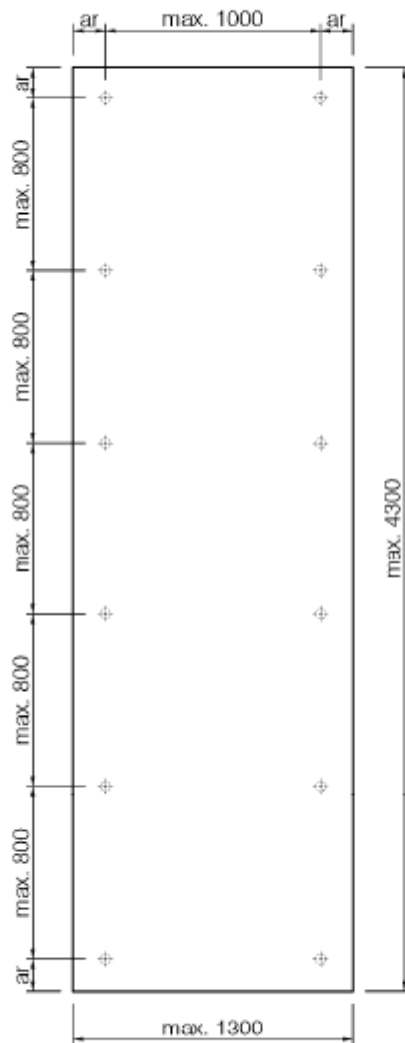
System diagram no. 4: 2 x 5 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.3
System diagrams 3 + 4, application as external wall cladding	

System diagram no. 5: 2 x 6 fixing points
 $R_d = 2.4 \text{ kN/m}^2$

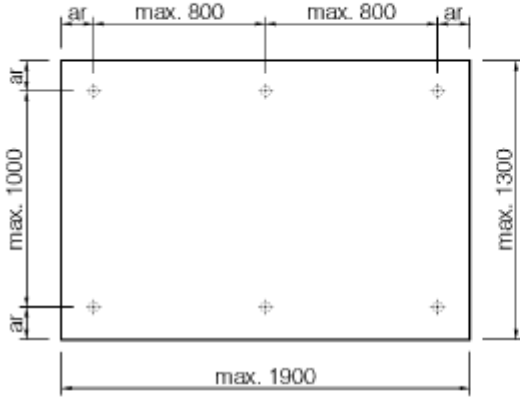


* All dimensions in [mm]

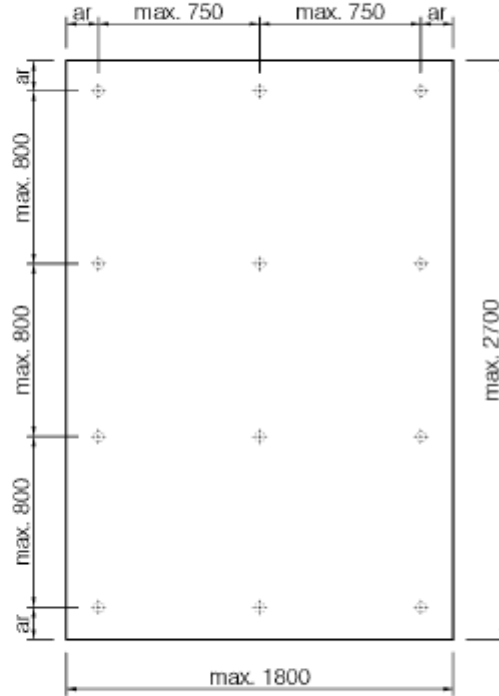
* For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.4
System diagram 5, application as external wall cladding	

System diagram no. 6: 3 x 2 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



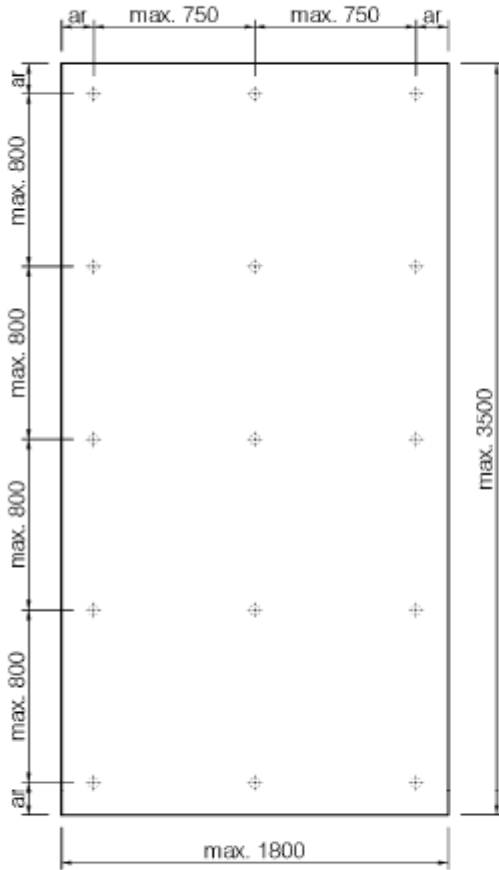
System diagram no. 7: 3 x 4 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



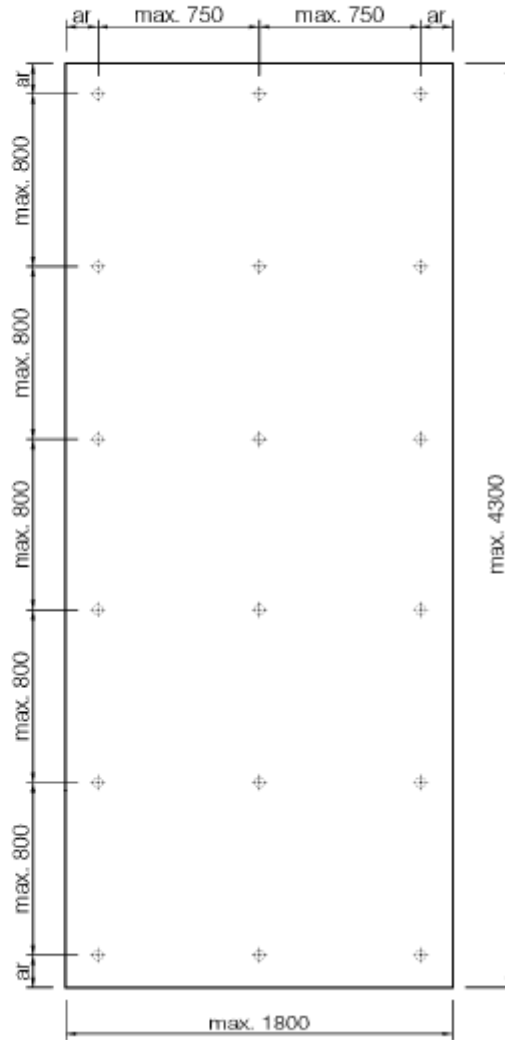
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.5
System diagrams 6 + 7, application as external wall cladding	

System diagram no. 8: 3 x 5 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



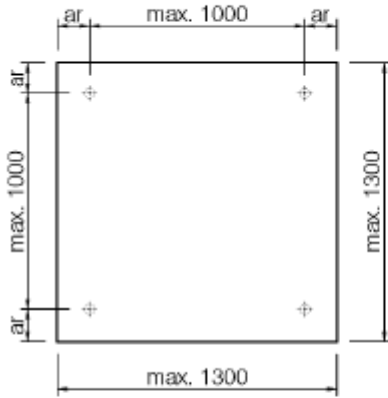
System diagram no. 9: 3 x 6 fixing points
 $R_d = 2.4 \text{ kN/m}^2$



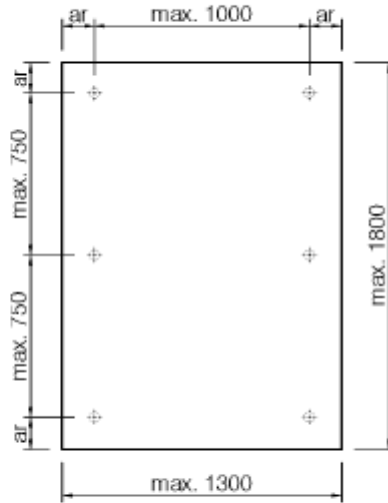
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone" System diagrams 8 + 9, application as external wall cladding	Appendix 1.6
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System diagram no. 10: 2 x 2 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



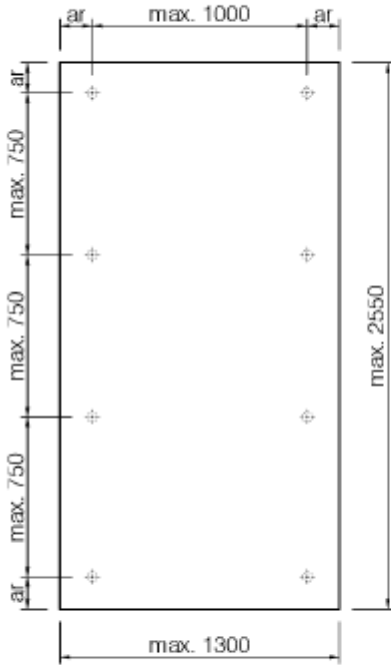
System diagram no. 11: 2 x 3 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



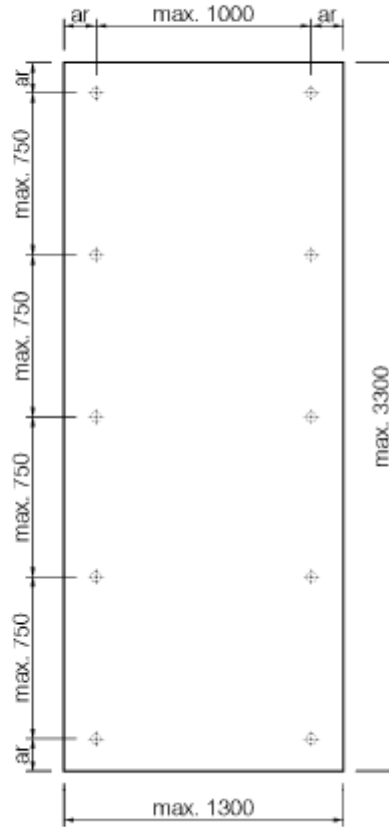
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.7
System diagrams 10 + 11, application as external wall cladding	

System diagram no. 12: 2 x 4 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



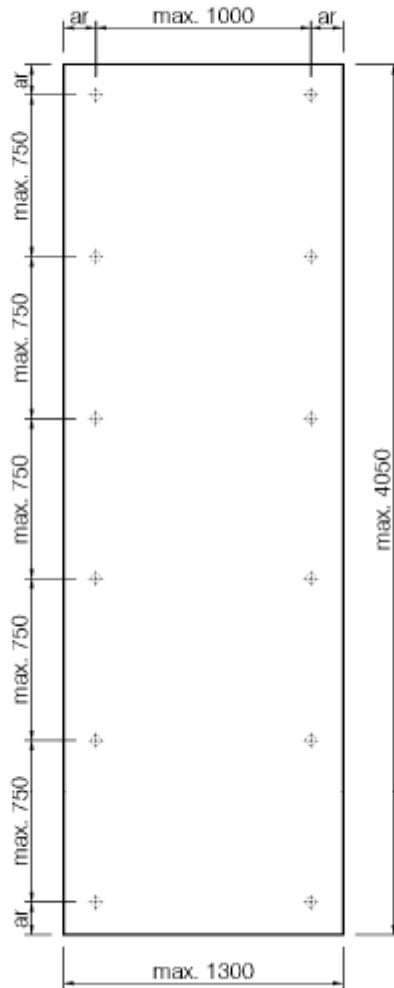
System diagram no. 13: 2 x 5 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



* All dimensions in [mm]
* For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.8
System diagrams 12 + 13, application as external wall cladding	

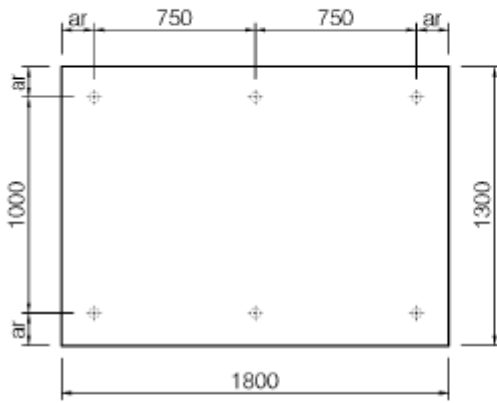
System diagram no. 14: 2 x 6 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



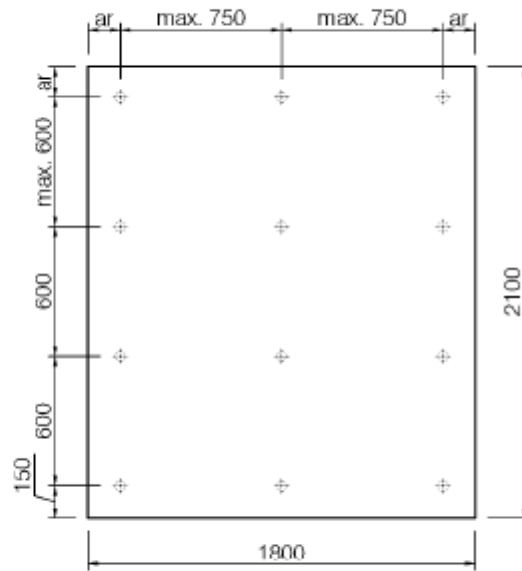
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.9
System diagram 14, application as external wall cladding	

System diagram no. 15: 3 x 2 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



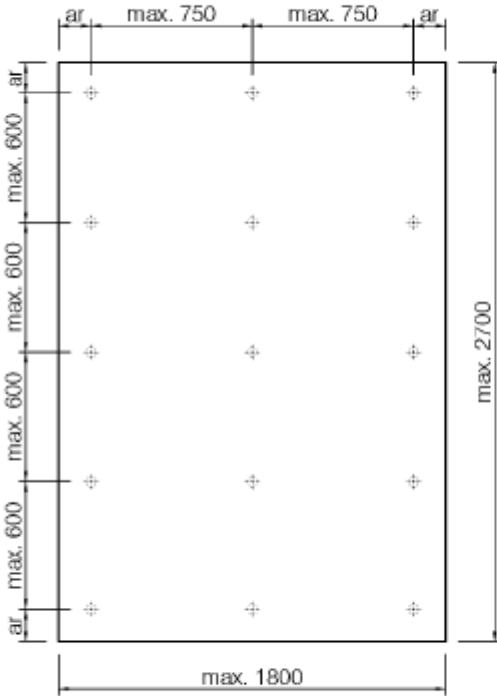
System diagram no. 16: 3 x 4 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



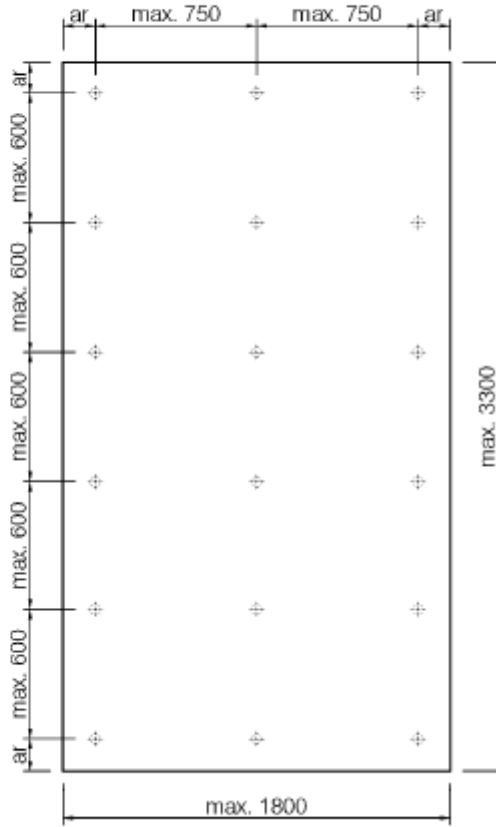
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.10
System diagrams 15 + 16, application as external wall cladding	

System diagram no. 17: 3 x 5 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



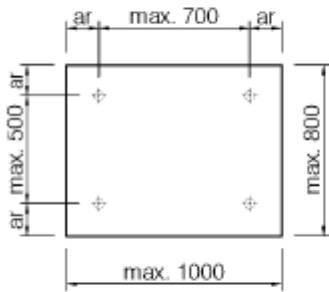
System diagram no. 18: 3 x 6 fixing points
 $R_d = 3.3 \text{ kN/m}^2$



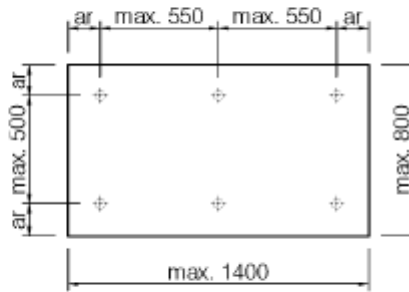
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.11
System diagrams 17 + 18, application as external wall cladding	

System diagram no. 19: 2 x 2 fixing points
 $R_d = 1.88 \text{ kN/m}^2$



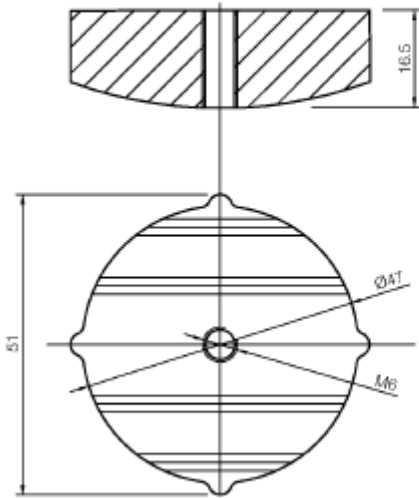
System diagram no. 20: 2 x 3 fixing points
 $R_d = 1.88 \text{ kN/m}^2$



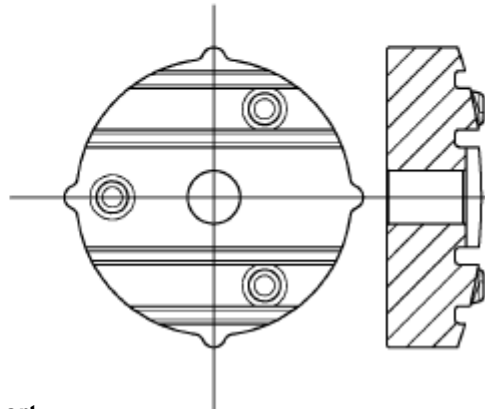
* All dimensions in [mm]
 * For information about dimension "ar" see appendix 1.1

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 1.12
System diagrams 19 + 20, application in overhead areas	

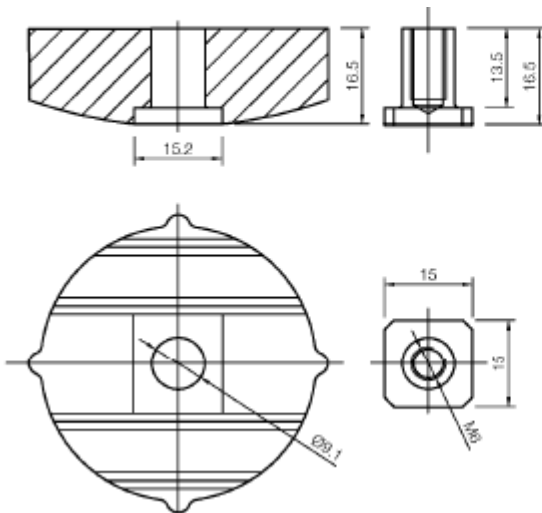
Screw fixing
 Internal screw thread



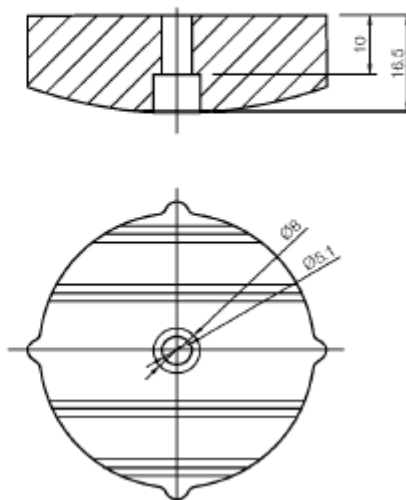
Design of base
 (Alternative to standard)



Screw fixing with aluminium threaded insert
 Square socket and bore Aluminium threaded insert



Rivet fixing
 Stepped bore



Required length of screws (screws as detailed in section 2.2.2.1):

Minimum depth of engagement in ceramic fixing elements with internal screw thread ≥ 12 mm

Minimum depth of engagement in ceramic fixing elements with aluminium threaded inserts ≥ 10 mm

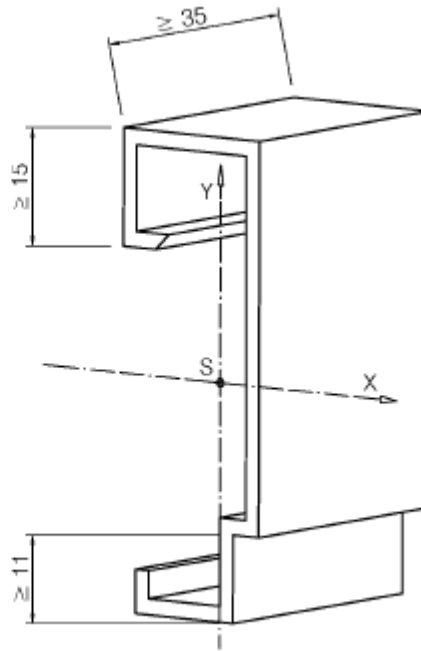
All dimensions in [mm]

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 2
Inserts for load transfer from "Airtec Stone" Façade Panels	

Clips – schematic drawing

Aluminium alloy:
EN AW 6060 T66 to DIN EN 755-2 or
EN AW 6063 T66 to DIN EN 755-2

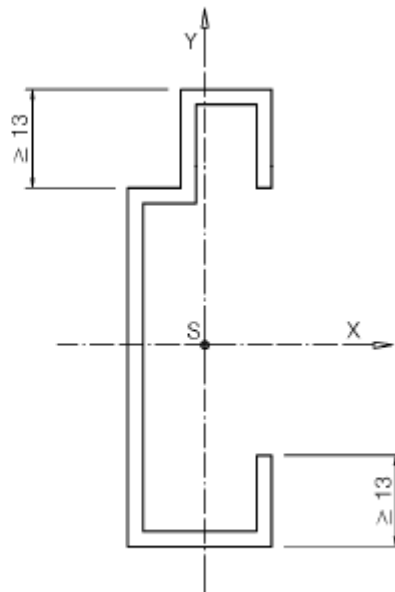
Thickness of material:
 $t \geq 3 \text{ mm}$
In area of screwed connection



S = Centre of gravity

Horizontal support rail – schematic drawing

Aluminium alloy:
EN AW 6060 T66 to DIN EN 755-2 or
EN AW 6063 T66 to DIN EN 755-2



S = Centre of gravity

External ventilated curtain wall cladding and façade soffit "Airtec Stone"
Clips and horizontal support rails in aluminium base frame

Appendix 3

Table 1: Incoming goods inspection, each consignment

Construction product	Properties and requirements	Certification by
Natural stone	See section 2.2.1.7	Works certificate "2.2" to DIN EN 10204
Reinforcement mesh	See table 1, section 2.2.1.2	
Ceramic fixings	Dimensions and materials in accordance with section 2.2.1.5 and appendix 2	
Adhesive N	See section 2.2.1.3	

Table 2: Internal production control

Construction product	Properties	Requirement	Scope and frequency
Lightweight concrete panel, unlaminated (Carrier Panel N)	Thickness	15.5 mm	Every 10 th panel
Façade Panel N	Thickness	25 mm to 29 mm	5 samples per order \geq 200 m ² ; but at least 5 samples per 2000 m ² produced
	Adhesive pull strength*	Mean value \geq 0.7 N/mm ² Minimum value \geq 0.5 N/mm ²	
	Breaking stress of fixings**	Mean value \geq 3.15 kN Minimum value \geq 2.95 kN	
	Maximum bending moment***	Mean value \geq 740 Nm/m Minimum value \geq 680 Nm/m	
Fixing accessories in accordance with section 2.2.2	A certificate of compliance in accordance with DIN EN 10204 is required to confirm that the materials, the dimensions and the load-carrying ability of the fixing accessories meet the requirements set out in this general building inspectorate approval document.		

* Determination of adhesive pull strength (testing the bond between natural stone and lightweight concrete):

- Dimensions of test specimens in mm: l/b/d = 60/60/d [d = thickness]

** Determination of the breaking stress of fixings under centric tensile load:

- Dimensions of test specimens in mm: l/b/d = 300/300/d [d = thickness]
- Inside diameter of bearing ring D_s = 250 mm

*** Flexural strength test using the three-point bending test:

- Dimensions of test specimen in mm: l/b/d = 500/100/d [d = thickness]
- Distance between supports l_s = 400 mm
- Natural stone slab located in the bending tension zone

External ventilated curtain wall cladding and façade soffit "Airtec Stone"	Appendix 4
Incoming goods control and internal production control	