National Technical Approval

National technical approval / general construction technique permission

Date: 15/11/2018
Reference: I 75.1.10.3-796/1

Number: Z-10.3.796

Applicant:
TONALITY GmbH
In der Mark 100
56414 Weroth
Germany

Period of validity
from: 15 November 2018
to: 15 November 2023

Subject matter of this notification:
“TONALITY cladding tileor use with suspended back-ventilated cladding for external walls

The subject of the regulations named above is herewith granted approval and is released for a national technical approval.
This notification consists of ten pages and 17 attachments.
This object received national technical approval for the first time on 7th May 2002,
under number No. Z-33.1-567
I GENERAL PROVISIONS

1 The usability and suitability of the subject matter of this regulation has been proven in the spirit of the Building Codes of the Laender (Landesbauordnung).

2 This notification does not replace the statutory approvals, permissions and certificates specified for construction projects.

3 This notification is issued irrespective of the rights of third parties, in particular of private intellectual property rights.

4 The user or the party applying the subject of this regulation must also be provided with copies of this notification, irrespective of further reaching regulations, regulations in the "Special Provisions". In addition the user or the party applying the subject matter of this approval must be informed that this notification must be present at the place of use or application. The authorities involved must likewise be provided with copies on request.

5 This notification may only be reproduced in full. Publishing extracts requires approval by the Deutsches Institut für Bautechnik. Text and drawings in advertising materials may not contradict this notification, Translations must include the reference “Translation of the German original edition not checked by the Deutsches Institut für Bautechnik”.

6 This notification has been granted until further notice. This approval can be added to and changed at a later date, in particular if new technical discoveries require this.

7 This notification refers to the details given by the applicant and the documents presented. A change to these fundamentals is not covered by this notification and the Deutsches Institut für Bautechnik must be informed of this immediately.

8 The construction technique permission covered by this notification is valid at the same time as a national technical approval for this type of construction.
II SPECIAL PROVISIONS

1 The subject matter of the approval and the field of use and application

1.1 Subject Matter of the Approval

The national technical approval applies to the “TONALITY” cladding tiles profiled on the reverse and to support profiles made of aluminium:

- “Classic profile (CLS)”
- “Adaptive profile (ADS)”
- “Base clinch rail profile (BAS)” or
- “BAS-Flex-holder profile (BAS Flex)”

as well as to the joint profiles made of aluminium or neoprene which are a part of the system.

The cladding tiles as well as the holder and aluminium joint profiles are non-combustible.

The neoprene joint profiles are normally flammable.

The subject matter of the general construction technique permission is the cladding system made up of the construction products named above including connection of same.

The cladding system is non-flammable.

The stability of the sub-structure including anchoring it to the construction is not included in the subject matter of this notification.

1.2 Field of Use and Application

The “TONALITY” facade cladding system may be used for back-ventilated external wall cladding according to DIN 18516. Depending on the holder profiles used, the panel fixing systems are classified as the “Classic system (CLS)”, the “Adaptive system (ADS)”, the “base clinch rail system (BAS)” or the “BAS-Flex-holding system (BAS Flex)”. The holder profiles are secured to the aluminium sub-structure’s support profiles.

The cladding tiles may also be used as ceiling cladding (overhead installation) when used with the “Adaptive system (ADS)” or the “base clinch rail system (BAS)”. The permitted height of a building for using the façade cladding system is the result of a proof of stability, provided lower heights are not specified by the Federal State Fire Prevention Regulations which apply in each case.

Any thermal insulation which may be present must be fixed directly to the building, independent of the sub-structure.

2 Provisions for Building Products

2.1 Properties and Composition

2.1.1 Cladding tiles

“TONALITY” cladding tiles according to Annexes 3 to 8 must be tiles which are profiled on the reverse with dimensions according to Table 1.

<table>
<thead>
<tr>
<th>Façade tile</th>
<th>150 Tile</th>
<th>175 Tile</th>
<th>200 Tile</th>
<th>225 Tile</th>
<th>250 Tile3</th>
<th>300 Tile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height [mm]</td>
<td>&lt;1200 +1</td>
<td>&lt;1200 +1</td>
<td>&lt;1200 +1</td>
<td>&lt;1200 +1</td>
<td>&lt;1200 +1</td>
<td>&lt;1200 +1</td>
</tr>
<tr>
<td>Length [mm]</td>
<td>d_1 * 22</td>
<td>+0.75 -0.5</td>
<td>22</td>
<td>+0.75 -0.5</td>
<td>22</td>
<td>+0.75 -0.5</td>
</tr>
<tr>
<td>Thickness [mm]</td>
<td>d_2 * 9.25</td>
<td>+1.0 -0.25</td>
<td>9.25</td>
<td>+1.0 -0.25</td>
<td>9.25</td>
<td>+1.0 -0.25</td>
</tr>
</tbody>
</table>

*d_1 = Thickness in the region of the profiles; d_2 = Thickness between the profiles;
With regard to the geometry of the profiles on the reverse side of the façade tiles, the specifications according to Annexes 3 to 8 must be followed.

The façade tiles must display the following characteristics:

- Mass per unit area (mean value): \(30 \pm 2\) kg/m\(^2\)
- The façade tiles must achieve Performance Level 1 for frost resistance according to DIN EN 539-2\(^2\).
- The values of the breaking loads according to Table 2 must be achieved (5% fractile value with a 75% confidence coefficient) in the test according to Annex 15 (three-point bending test and following DIN EN 100).

Table 2: Breaking load on loading the front side and the reverse

<table>
<thead>
<tr>
<th>Façade Tile</th>
<th>150</th>
<th>175</th>
<th>200</th>
<th>225</th>
<th>250</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking load [kN]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- on loading the front side</td>
<td>≥ 1.05</td>
<td>≥ 0.50</td>
<td>≥ 0.50</td>
<td>≥ 1.28</td>
<td>≥ 1.76</td>
<td>≥ 1.88</td>
</tr>
<tr>
<td>- on loading the reverse side</td>
<td>≥ 1.75</td>
<td>≥ 0.91</td>
<td>≥ 0.91</td>
<td>≥ 1.61</td>
<td>≥ 3.49</td>
<td>≥ 3.69</td>
</tr>
</tbody>
</table>

2.1.2 Support profiles

The geometry of the cross-section must correspond to the specifications of Annexes 9 to 14.

2.1.2.1 Classic profile (CLS)

“Classic profiles (CLS)” according to Annex 9 must be made of aluminium alloy EN AW 6060 according to DIN EN 755-2\(^3\), material condition T66.

2.1.2.2 Adaptive profile (CLS)

“Adaptive profiles (ADS)” according to Annexes 10 and 11 must be made from aluminium alloy EN AW 5754 according to DIN EN 755-2.

2.1.2.3 “Base clinch rail profile (BAS)” and Strengthening Profile

“Base clinch rail profiles (BAS)” according to Annexes 12 and 13 must represent composite profiles in each case consisting of a “basic profile” made of aluminium alloy and a joint profile in each case made of aluminium alloy EN AW 5754 according to DIN EN 755-2.

The base clinch rail profile must be connected with the joint profile at separation distances of \(≤ 250\) mm (see Annex 13) via 2 adjoining connecting points. These interlocking connections must be effected using the Tog-L-Loc sheet metal clinching system in accordance with the details deposited with the DIBt.

In the event of shortening a profile, a structural connection of the two partial profiles must be completed using symmetrically arranged screws at a distance of 50mm from the end of the new profile. In this case self-drilling screws JT9-4-4.8 x 19 according to ETA 10/0200 made of stainless steel, material no. 1.4401 must be used. Each base clinch rail profile must be mechanically fastened onto a vertical symmetrical carrier profile made of aluminium (reinforcement profile), with a profile flange at least 70 mm wide as a supporting surface, a minimum profile thickness of 2 mm and minimum moments of inertia of \(I_p \geq 5.41\) cm\(^4\) and \(I_z \geq 5.72\) cm\(^4\) (e.g. T-profile: 70 x 50 x 2 mm made of aluminium alloy EN AW 6060 T66 according to DIN EN 755-2). The aforementioned self-drilling screws JT9-4-4.8 x 19 must be used as the means of connection.

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2. DIN EN 539-2:2013-08 Clay roofing tiles for discontinuous laying - Determination of physical characteristics - Part 2: Test for frost resistance
3. DIN EN 755-2:2016-10 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties
In each case the vertical separation distance between connection points in each case must be twice the nominal tile height, and two screws must be arranged next to one another per connection point.

2.1.2.4 BAS Flex holder profiles (BAS Flex) and Reinforcement Profiles

BAS Flex holder profiles according to Annex 14 must be made of aluminium alloy EN AW 5083 H24 according to DIN EN 755-2.

Each BAS flex holder profile must be mechanically fastened onto a vertical symmetrical carrier profile made of aluminium (reinforcement profile), with a profile flange at least 70 mm wide as a supporting surface, a minimum profile thickness of 2 mm and a minimum moment of inertia of \( I_y \geq 5.41 \text{ cm}^4 \) and \( I_z \geq 5.72 \text{ cm}^4 \) (e.g. T-profile: 70 x 50 x 2 mm) made of aluminium alloy EN AW 6060 T66 according to DIN EN 755-2. Self-drilling screws according to Section 2.1.2.3 or “TONALITY 4.8 x 10 x K9.5” blind rivets according to Annex 16 must be used as the means of fixing or fastening. In each case two screws or blind rivets per connection point must be sited next to one another.

2.1.3 Joint Profiles

Joint profiles for the “Classic system (CLS)’’ must be made of neoprene and they must fulfil the requirements of normally flammable building materials.

Joint profiles for the “Adaptive system (ALS)”, the “Base clinch rail system (BAS)” and the “BAS Flex holder (BAS Flex)” must be made of aluminium.

2.2 Manufacture, Packaging, Transportation, Storage and Marking

2.2.1 Manufacture

The construction products according to Section 2.1 must be produced by the manufacturer.

2.2.2 Packaging, Transportation, Storage

The construction products according to Section 2.1 must be stored according to manufacturer’s specifications and must be protected against damages.

2.2.3 Marking

The building products according to section 2.1., their packaging, packing manifest or delivery note must be marked by the manufacturer with a conformity mark (Ü mark) according to the regulation concerning the mark of conformity in the German Laender (federal states). Marking may only be carried out if the preconditions of Section 2.3 have been met.

2.3 Attestation of Conformity

2.3.1 Attestation of Conformity for the Cladding Tiles

The attestation of conformity for the “TONALITY” cladding tiles according to Section 2.1.1. with the specifications of the national technical approval covered by this notification must be carried out for each production plant with a manufacturer’s declaration of conformity on the basis of an internal factory production control and of a certificate of conformity from a certification body acknowledged for this as well as regular third party inspections by a recognised monitoring body according to the extent of the following regulations.

The manufacturer of the cladding tiles must appoint a certification body recognised for this to grant the certificate of conformity, and for the third party inspection, including the product test to be carried out as part of it.

The manufacturer must indicate that a certificate of conformity has been issued by marking the construction product with the mark of conformity (the Ü mark) whilst providing information on the designated use.
The Deutsches Institut für Bautechnik must be given a copy of the certificate of conformity issued by the certification body issuing it.
The Deutsches Institut für Bautechnik must be given a copy of the initial inspection report for information.

2.3.2 Attestation of Conformity for the Holder Profiles, Joint Profiles and Blind Rivets

The attestation of conformity for the holder profiles according to Sections 2.1.2.1 to 2.1.2.4, for the joint profiles according to Section 2.1.3 and of the blind rivets according to section 2.1.2.4 with the regulations of the national technical approval covered by this notification must be effected for every production plant by means of a manufacturer’s declaration of conformity on the basis of internal factory production control and an initial inspection of the construction product by an acknowledged testing body for this – in this case an acknowledged monitoring body for this with independent testing competence. The manufacturer must indicate that a declaration of conformity has been issued by marking the construction product with the conformity symbol (Ü mark) whilst providing information on the intended purpose for use.
The Deutsches Institut für Bautechnik must be given a copy of the initial inspection report for information.

2.3.3 Internal Factory Production Control

Internal factory production controls must be set up and carried out in each production plant. Internal factory production control is understood to be continuous monitoring of production by the manufacturer, in order to ensure that the construction products he manufactures correspond to the regulations of the national technical approval covered by this notification.
Internal factory production control should at least include the measure mentioned in Annex 15.
The results of the internal factory production control must be recorded and evaluated. The records must include the following details as a minimum:

- Description of the construction product or the starting material and its constituents
- The type of inspection or testing
- The date of manufacture and testing of the construction product or of the starting material or the constituents
- Results of the inspection and testing and, as far as applicable, comparison with the requirements
- Signature of the person responsible for the internal factory production control.

The records must be archived and kept for at least five years, and must be presented to the monitoring body appointed for the third party inspection. They must be presented to the Deutsches Institut für Bautechnik and to the highest building inspection authority with competence in this case, on request.

In the case of unsatisfactory test results, the manufacturer must immediately initiate the measures required to resolve the fault. Construction products which do not meet the requirements must be handled in such a way that confusing them with products which conform is ruled out. The respective test must be repeated immediately – as far as is technically possible and as far as this is necessary to prove that the fault has been resolved – after the fault has been resolved.

2.3.4 Third Party inspection

The internal factory production control must be inspected in each production plant for “TONALITY” cladding tiles by a third party inspection body regularly, however at least twice a year.
An initial inspection of the cladding tiles must be carried out in the context of the third party inspection. Samples may also be taken for random testing. Sampling and testing are also considered to be the responsibility of the acknowledged monitoring body in each case.
The cladding tiles must be tested according to Annex 15. The results of certification and third party inspections must be kept for a period of at least five years. On request, they must be presented to the Deutsches Institut für Bautechnik and to the highest building inspection authority with competence in this case.

2.3.5 Initial inspection by an acknowledged Inspection body
The dimensions and material characteristics must be tested according to Sections 2.1.2 and 2.1.3 as well as Annexes 9 to 14 and Annex 16 in the context of the initial inspection of the support profiles, joint profiles and blind rivets.

3 Provisions for design, dimensioning and Implementation

3.1 Design and Dimensioning
3.1.1 General
The “TONALITY” cladding system may only be composed of construction products according to Sections 2.1.1 to 2.1.3. The build-up of the façade cladding system must be taken from the overview of Annexes 1 and 2. The 150, 250 and 300 façade cladding tiles may only be fixed in place with the help of “Adaptive profiles (ADS)”, “Base clinch rail profiles (BAS)” or “BAS flex holder profiles (BAS Flex)”. Neoprene or aluminium joint profiles must be placed behind the vertical joints. Butt joints for cladding tiles must be at least 6 mm (see Annexes 3 to 8). Joints between the support profiles may not be spanned over and covered by cladding tiles. The maximum bearing distances for the façade cladding tiles dependent on the wind loads (positive or negative wind pressure), for the support profiles (Adaptive system “ADS”, Classic system “CLS”, Base clinch rail system “BAS” or BAS flex holder profiles “BAS Flex”) and nominal tile heights (150 to 300) are indicated in Tables 3, 4 and 5. The permitted bearing distance in each case is the smaller bearing distance from Tables 3 and 4 for the “ADS” and “CLS” systems and from Tables 3 and 5 for the “BAS” and “BAS Flex” systems.

Incident wind loads must be taken from the Technical Building Regulations already introduced by building supervisory authorities.

3.1.2 Proof of Stability
3.1.2.1 Proof of Stability for the Cladding Tiles
The proof of stability for “TONALITY” cladding tiles according to Section 2.2.1 and installation of same as single span supports by hanging them onto the aluminium support profiles according to Section 2.1.2 must be carried out following the provisions of Section 3.1 for each specific construction project. The maximum bearing distances for cladding tiles for design values of wind resistance for parts of the building are given in Tables 3 to 5. Linear interpolation between two adjacent values in the tables is permitted.
Table 3: Maximum bearing distances of cladding tiles for design values of resistance for part of the building to positive wind pressure loading for the systems “ADS”, “CLS”, “BAS” and “BAS-Flex”

<table>
<thead>
<tr>
<th>Positive wind load pressure* [kN/m²]</th>
<th>+0.75</th>
<th>+1.20</th>
<th>+1.50</th>
<th>+2.25</th>
<th>+3.00</th>
<th>+3.75</th>
<th>+4.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum bearing distances [m]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.04</td>
<td>0.90</td>
<td>0.81</td>
<td>0.74</td>
</tr>
<tr>
<td>175 Tile</td>
<td>1.17</td>
<td>0.96</td>
<td>0.83</td>
<td>0.68</td>
<td>0.59</td>
<td>0.52</td>
<td>0.48</td>
</tr>
<tr>
<td>200 Tile</td>
<td>1.20</td>
<td>1.15</td>
<td>1.00</td>
<td>0.82</td>
<td>0.71</td>
<td>0.63</td>
<td>0.58</td>
</tr>
<tr>
<td>225 Tile</td>
<td>1.20</td>
<td>1.02</td>
<td>0.88</td>
<td>0.72</td>
<td>0.63</td>
<td>0.56</td>
<td>0.51</td>
</tr>
<tr>
<td>250 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.04</td>
<td>0.90</td>
<td>0.81</td>
<td>0.74</td>
</tr>
<tr>
<td>300 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>0.99</td>
<td>0.86</td>
<td>0.77</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Table 4: Maximum bearing distances of the cladding tiles for design values of resistance for part of the building to negative wind pressure loading (wind suction) for the systems “ADS”, “CLS” and “BAS Flex”

<table>
<thead>
<tr>
<th>Negative wind load pressure* [kN/m²]</th>
<th>-0.75</th>
<th>-1.20</th>
<th>-1.50</th>
<th>-2.25</th>
<th>-3.00</th>
<th>-3.75</th>
<th>-4.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum bearing distances [m]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.10</td>
<td>0.88</td>
<td>0.73</td>
</tr>
<tr>
<td>175 Tile</td>
<td>1.20</td>
<td>1.20</td>
<td>0.97</td>
<td>0.65</td>
<td>0.49</td>
<td>0.39</td>
<td>0.32</td>
</tr>
<tr>
<td>200 Tile</td>
<td>1.20</td>
<td>1.13</td>
<td>0.85</td>
<td>0.57</td>
<td>0.43</td>
<td>0.34</td>
<td>0.28</td>
</tr>
<tr>
<td>225 Tile</td>
<td>1.20</td>
<td>1.20</td>
<td>0.98</td>
<td>0.65</td>
<td>0.49</td>
<td>0.39</td>
<td>0.33</td>
</tr>
<tr>
<td>250 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>0.96</td>
<td>0.80</td>
</tr>
<tr>
<td>300 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.11</td>
<td>0.83</td>
<td>0.67</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Table 5: Maximum bearing distances of the cladding tiles for design values of resistance for part of the building to negative wind pressure loading (wind suction) for the “BAS” system

<table>
<thead>
<tr>
<th>Negative wind load pressure* [kN/m²]</th>
<th>-0.75</th>
<th>-1.20</th>
<th>-1.50</th>
<th>-2.25</th>
<th>-3.00</th>
<th>-3.75</th>
<th>-4.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum bearing distances [m]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 Tile**</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>1.10</td>
<td>0.88</td>
<td>0.73</td>
</tr>
<tr>
<td>175 Tile</td>
<td>1.20</td>
<td>1.20</td>
<td>0.97</td>
<td>0.65</td>
<td>0.49</td>
<td>0.39</td>
<td>0.32</td>
</tr>
<tr>
<td>200 Tile</td>
<td>1.20</td>
<td>1.13</td>
<td>0.85</td>
<td>0.57</td>
<td>0.43</td>
<td>0.34</td>
<td>0.28</td>
</tr>
<tr>
<td>225 Tile</td>
<td>1.20</td>
<td>1.20</td>
<td>0.98</td>
<td>0.65</td>
<td>0.49</td>
<td>0.39</td>
<td>0.33</td>
</tr>
<tr>
<td>250 Tile**</td>
<td>1.20</td>
<td>1.10</td>
<td>0.83</td>
<td>0.55</td>
<td>0.41</td>
<td>0.33</td>
<td>0.28</td>
</tr>
<tr>
<td>300 Tile**</td>
<td>1.20</td>
<td>0.86</td>
<td>0.64</td>
<td>0.43</td>
<td>0.32</td>
<td>0.26</td>
<td>0.21</td>
</tr>
</tbody>
</table>

*The partial stability coefficient γₘ has already been taken into consideration.

** The 150, 250 and 300 tiles may only be used with the “ADS”, “BAS” or “BAS Flex” systems.
3.1.2.2 Stability of Holder Profiles, Sub-structure Support Profiles and Anchoring

The stability of the holder profiles, the support profiles of the sub-structure and their anchoring onto the building must be proven specifically for the building according to Technical Building Regulations. Deflection and deformation bending of the sub-structure and the support profiles must be limited to L/200. The deflection and deformation of projecting components of sub-structures and support profiles must be limited to L/150.

The joint profiles do not have any load-bearing function.

The proof of stability for the “base clinch rail system (BAS)” as well as for the means of connection between the base clinch rail profile and reinforcement profile has been proven whilst keeping to the specifications of Section 2.1.2.3 as well as according to Annexes 12 and 13 of the approval procedure.

The proof of stability of the “base clinch rail system (BAS Flex)” as well as its connection by means of self-drilling screws or blind rivets according to the reinforcement profile has been proven whilst following the details according to Section 2.1.2.4 as well as according to Annex 14 of the approval procedure.

Different means of connection other than self-drilling screws or blind rivets named above may be used, if we are dealing with regular, controlled products and the proof of static stability has been proven specifically for the construction project. DIN 18516-1 must be followed with regards to corrosion protection.

Composite effects with the base clinch rail profile or with the BAS Flex holders may not be used for demonstrating the proof of stability of the reinforcement profile according to Sections 2.1.2.3 and 2.1.2.4.

When arranging layouts with several support profiles above one another, the maximum length of each profile as well as also the separation distance between fixed points for two successive support profiles may not exceed a maximum of 2.80 m.

3.1.3 Fire Protection

The “TONALITY” cladding system is non-combustible.

If any thermal insulation is present it must be made of non-combustible mineral fibre materials according to DIN EN 13162\(^4\) - otherwise the cladding system may only be used wherever building inspection authorities have set the requirement as normally flammable.

The Technical Building Regulations\(^5\) for DIN 18516-1 must be followed with regard to structural fire protection measures with the use as back-ventilated external wall cladding.

3.1.4 Thermal Insulation and Protection against Moisture Subject to Climate Conditions

DIN 4108-2\(^6\) applies for the proof of thermal insulation properties.

The air gap (back ventilation space) and the cladding tiles may not be taken into consideration when calculating the thermal insulation resistance (R value) according to DIN EN ISO 6946\(^7\) for external wall constructions.

The design value of thermal conductivity corresponding to DIN 4108-4\(^8\), Table 2 must be set for the proof of thermal insulation properties for the insulation material used.

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6. DIN 4108-4:2017-03 Thermal insulation and energy economy in buildings - Part 4: Hygrothermal design values
DIBt – National Technical Approval
No. Z-10.3-796

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Thermal bridging which occurs due to the sub-structure and its anchoring, because the thermal insulation layer has been penetrated or its thickness is reduced must be taken into consideration. DIN 4108-3\(^9\) applies for protection against moisture subject to climate conditions.

3.1.5 Sound Insulation

DIN 4109-1\(^10\) applies for the proof of sound insulation (protection against external noise).

3.2 Execution

3.2.1 Requirements of the Applicant and Company Executing the Installation

- Applicant
  The applicant is obliged to inform all persons entrusted with the design and installation of façade cladding systems of all the special provisions in this notification and about all the further individual details necessary for flawless execution of this type of construction.

– Contracting Company
  Façade cladding systems may only be installed by specialist operatives, who have been appropriately trained and whose suitability for performing the work has been certified by the applicant. The contracting company completing the work must confirm conformance of the type of construction with this notification in accordance with Annex 17, and this confirmation must be handed over to the client or owner of the building.

3.2.2 Checking Construction Products on Receipt

Marking and labelling of construction products according to Sections 2.1.1 to 2.1.3 must be checked on receipt on the building site in accordance with Section 2.2.3.

3.2.3 Installation

Construction products according to Sections 2.1 must be used for executing the construction of the facade system.

The sub-structure must be installed free from technical constraints. The specifications from the proofs of stability (see Section 3.1) must be observed.

Each cladding tile must be installed onto the support profiles through positive interlocking in accordance with the indications of Annexes 1 to 14 as a single span support.

Joint profiles according to Section 2.1.3 must be placed behind vertical joints between the cladding tiles as protection against driving rain and to secure their position structurally.

Damaged cladding tiles may not be installed.

Renée Kamanzi-Fechner
Head of Department

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\(9\) DIN 4108-3:2014-11 Thermal protection and energy economy in buildings - Part 3: Protection against moisture subject to climate conditions - Requirements and directions for design and construction

\(10\) DIN 4109-1:2016-07 Sound insulation in buildings - Part 1: Minimum requirements
"TONALITY®" cladding tile
2 “TONALITY®” support profile
3 “TONALITY®” joint profile
4 Sub-structure + wall bracket
5 Thermal insulation
6 Supporting substrate

Overview (Cladding system)
**Classic system (CLS)**
*Example of horizontal section through façade structure*

**Adaptive system (ADS)**
*Example of horizontal section through façade structure*

**Legend/key**
- Unterkonstruktion nach statischer Erfordernis
- Classic-Halteprofil (CLS)
- uneingeschränkte Hinterlüftung
- Adaptive-Halteprofil (ADS)
- Fassadenziegel
- Fugenprofil
- Systemtiefe
- Tiefe abhängig von Dämmungsdicke
- Achse

**Base clinch rail system (BAS)**
*Example of horizontal section through façade structure*

**BAS Flex system**
*Example of horizontal section through façade structure*

---

"TONALITY" cladding tile for use with suspended back-ventilated external wall cladding

**Horizontal sections**

---

All measurements in mm

Annex 2
Legend/key

Höhenraster  
oberer Einhängepunkt  
unterer Einhängepunkt  
Geometrie Ziegelstoß  
Geometrie Profilstoß  
Halteprofil z.B. ADS  
Ziegel  
Gleitpunkt  
Festpunkt  
Geometrie Nase Typ A  
Ziegeltoleranzen: Alle nicht bemessenen Linearmaße = ±0.25 mm  

Alle Maße in mm

"TONALITY" cladding tile for use with suspended back-ventilated external wall cladding  

Annex 3

Cladding tile 150
Legend/key

Höhenraster                      Tile height grid
oberer Einhängepunkt            upper hanging points
unterer Einhängepunkt           lower hanging points
Geometrie Ziegelstoß            geometry of tile joint
Geometrie Profilstoß            geometry of profile joint
Halteprofil z.B. ADS            Support profile e.g. ADS
Ziegel                          Tile
Gleitpunkt                      Sliding point
Festpunkt                       Fixed point
Geometrie Nase Typ A            Geometry of lobe Type A
Ziegeltoleranzen Alle nicht bemaßten Linearmaße = ±0.25 mm Tile tolerances All linear measures not assessed = ±0.25 mm

All measurements in mm

“TONALITY Classic” cladding tile for use with suspended back-ventilated external wall cladding

Annex 4

Cladding tile 175
Legend/key

<table>
<thead>
<tr>
<th>Höhenraster</th>
<th>Tile height grid</th>
</tr>
</thead>
<tbody>
<tr>
<td>oberer Einhängepunkt</td>
<td>upper hanging points</td>
</tr>
<tr>
<td>unterer Einhängepunkt</td>
<td>lower hanging points</td>
</tr>
<tr>
<td>Geometrie Ziegelstoß</td>
<td>geometry of tile joint</td>
</tr>
<tr>
<td>Geometrie Profilstoß</td>
<td>geometry of profile joint</td>
</tr>
<tr>
<td>Halteprofil z.B. ADS</td>
<td>Support profile e.g. ADS</td>
</tr>
<tr>
<td>Ziegel</td>
<td>Tile</td>
</tr>
<tr>
<td>Gleitpunkt</td>
<td>Sliding point</td>
</tr>
<tr>
<td>Festpunkt</td>
<td>Fixed point</td>
</tr>
<tr>
<td>Geometrie Nase Typ A</td>
<td>geometry of lobe Type A</td>
</tr>
<tr>
<td>Ziegelelenzanten Alle nicht bemaßten Linearmaße = ±0.25 mm</td>
<td>Tile tolerances All linear measures not assessed = ±0.25 mm</td>
</tr>
</tbody>
</table>

All measurements in mm

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Cladding tile 200

Annex 5
**Legend/key**

- **Höhenraster**: Tile height grid
- **oberer Einhängepunkt**: Upper hanging points
- **unterer Einhängepunkt**: Lower hanging points
- **Geometrie Ziegelstoß**: Geometry of tile joint
- **Geometrie Profilstoß**: Geometry of profile joint
- **Halteprofil z.B. ADS**: Support profile e.g. ADS
- **Ziegel**: Tile
- **Gleitpunkt**: Sliding point
- **Festpunkt**: Fixed point
- **Geometrie Nase Typ A**: Geometry lobe Type A
- **Ziege ltoleranzen**: Tile tolerances
  - Alle nicht bemessenen Linearmaße = ±0.25 mm
  - All linear measures not assessed = ±0.25 mm

**All measurements in mm**

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Annex 6

Cladding tile 225
Legend/key

Höhenraster  Tile height grid
oberer Einhängepunkt  upper hanging points
unterer Einhängepunkt  lower hanging points
Geometrie Ziegelstoß  geometry of tile joint
Geometrie Profilstoß  geometry of profile joint
Halteprofil z.B. ADS  Support profile e.g. ADS
Ziegel  Tile
Gleitpunkt  Sliding point
Festpunkt  Fixed point
Geometrie Nase Typ A  geometry lobe Type A
Ziegel toleranzen Alle nicht bemäßten Linearmaße = ±0.25 mm  Tile tolerances All linear measures not assessed = ±0.25 mm

All measurements in mm

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Annex 7

Cladding tile 250
National Technical Approval
General Construction Technique Permission
No. Z-10.3-796 of 15 November 2018

Legend/key

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Tile height grid</td>
</tr>
<tr>
<td>o</td>
<td>upper hanging point</td>
</tr>
<tr>
<td>u</td>
<td>lower hanging point</td>
</tr>
<tr>
<td>G</td>
<td>geometry of tile joint</td>
</tr>
<tr>
<td>Gp</td>
<td>geometry of profile joint</td>
</tr>
<tr>
<td>Hp</td>
<td>Support profile e.g. ADS</td>
</tr>
<tr>
<td>Z</td>
<td>Tile</td>
</tr>
<tr>
<td>Gp</td>
<td>Sliding point</td>
</tr>
<tr>
<td>Fp</td>
<td>Fixed point</td>
</tr>
<tr>
<td>GnT</td>
<td>geometry lobe Type C</td>
</tr>
<tr>
<td>Zt</td>
<td>Tile tolerances All linear measures not assessed = ± 0.25 mm</td>
</tr>
</tbody>
</table>

All measurements in mm

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Cladding tile 300

Annex 8
Classifc Profile (CLS)
Cross-section

Legend/key:

Fugenprofilaufnahme Joint Profile take-up insertion

Geometry of the suspension hooks on the Classic Profile (CLS)

Profile length according to Section 3.1.2
Separation distance of suspension hooks (= distance X)
150 mm for fixing tiles of height 300 mm
150 / 100 mm (alternating) for fixing tiles of height 250 mm
100 / 125 mm (alternating) for fixing tiles of height 225 mm
100 mm for fixing tiles of height 200 mm
87.5 mm for fixing tiles of height 175 mm
87.5 / 62.5 mm (alternating) for fixing tiles of height 175 mm

Legend/key:

Länge (separation) distance

All measurements in mm

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Annex 9

Classic Profile (CLS)
Adaptive Profile Cross-Section (ADS) – different profile thicknesses

Profile cross-section
Adaptive profile for system thickness of 42 mm
with closed joint 20 mm (standard)

Profile cross-section
Adaptive profile for system thickness of 66 mm

Profile cross-section
Adaptive profile for system thickness of 62 mm

End profile for termination
AlMg3 H22, t = 0.8 mm

Open joint profile
AlMg3 H22, t = 0.8 mm

Joint profile variations for adaptive profile (cross-section)
closed joint profile
8 x 28 mm (flush)
AlMg3 H22, t = 0.8 mm
closed joint profile
2 x 20 mm
AlMg3 H22, t = 0.8 mm
closed joint profile
2 x 28 mm (flush) with notchings
AlMg3 H22, t = 0.8 mm

All measurements in mm

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Adaptive Profile (ADS)
Cross-sections

Annex 10
Adaptive Profile side-view (ADS)

### Key/ Legend

- Seitenansicht ADS: Side view of ADS
- Maß L (Adaptiv-Vertikalprofil): Dimension L (adaptive vertical profile)
- Maß B oder C (alterierend): Dimension B or C (alternately)
- Zo: Ziegeleinhängung oben: Zo: top of tile suspension
- Zu: Ziegeleinhängung unten: Zu: bottom of tile suspension
- Profillänge = Anzahl der Raster minus 6 mm: Profile length = number of tile grids minus 6 mm
- Profillänge nach Abschritt 3.1.2: Profile length according to Section 3.1.2
- Raster: Tile grid height
- Anzahl der Raster minus 6 mm: Number of tile grids minus 6 mm
- Maß: Dimension
- Klammermaße entsprechen 300’er Raster: Bracket dimensions correspond to 300 tile grid height

### All measurements in mm

<table>
<thead>
<tr>
<th>Raster</th>
<th>Anzahl d. Raster</th>
<th>Maß L</th>
<th>Maß A</th>
<th>Maß B</th>
<th>Maß C</th>
<th>Maß E</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>18</td>
<td>2064</td>
<td>29</td>
<td>87.5</td>
<td>62.5</td>
<td>27.5</td>
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<td>175</td>
<td>16</td>
<td>2794</td>
<td>39</td>
<td>87.5</td>
<td>87.5</td>
<td>42.5</td>
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<tr>
<td>200</td>
<td>14</td>
<td>2794</td>
<td>41</td>
<td>100</td>
<td>100</td>
<td>55</td>
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<td>12</td>
<td>2694</td>
<td>93</td>
<td>100</td>
<td>125</td>
<td>26</td>
</tr>
<tr>
<td>250</td>
<td>11</td>
<td>2744</td>
<td>41</td>
<td>150</td>
<td>100</td>
<td>55</td>
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<td>08</td>
<td>2694</td>
<td>91</td>
<td>150</td>
<td>150</td>
<td>53</td>
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</table>

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Adaptive profile (ADS)
Side-view

Annex 11

Z23611.18
Cross-section of base clinch rail profile (BAS)

Key/Legend

ca. 4.2 Tox Point
approx. 4.2 Tox point

Representation of the suspension hooks

Key/Legend

Kl. 300'er Raster
Bracket dimensions correspond to 300 tile grid height

Cross-section of base clinch rail profile with different joint profiles

Cross-section of Base clinch rail profile in installed state

Support profile
e. g. T 70/50/2
in accordance with Section 2.1.2.3

Screws/fixings
in accordance with Section 2.1.2.3

Base clinch rail profile
t = 2mm

Clinch connection
(see Annex 13)

Joint profile t = 0.8 mm
(coated on both sides)

All measurements in mm

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

Annex 12

Base clinch rail profile (BAS)
Cross-section
Isometric view (lying flat)
shortened image of the product

Side view (lying flat)
shortened image of the product: repeat arrangement of Sections B, C

View from above (lying flat)
shortened image of the product: repeat arrangement of Sections F, L

Profile length according to Section 3.1.2

### BAS System

<table>
<thead>
<tr>
<th>Dimension, tolerance +/- 0.5 mm</th>
<th>Grid (tile height)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length of the base clinch rail profile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2694</td>
</tr>
</tbody>
</table>

### Suspensions (fixings for the tile to the base clinch rail profile)

<table>
<thead>
<tr>
<th>Vertical separation between suspensions</th>
<th>B</th>
<th>87,5</th>
<th>87,5</th>
<th>100</th>
<th>100</th>
<th>150</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>62,5</td>
<td>87,5</td>
<td>100</td>
<td>125</td>
<td>100</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Edge separation of suspensions</td>
<td>A</td>
<td>41,5</td>
<td>51</td>
<td>54</td>
<td>105</td>
<td>54</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>15</td>
<td>30,5</td>
<td>40</td>
<td>14</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

### Connections between the base clinch rail profiles and sub-structure carrier profiles

<table>
<thead>
<tr>
<th>Separation between the fixing points</th>
<th>F</th>
<th>150</th>
<th>150*</th>
<th>200</th>
<th>225*</th>
<th>250*</th>
<th>300</th>
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</thead>
<tbody>
<tr>
<td>G</td>
<td>87,5</td>
<td>87,5</td>
<td>100</td>
<td>100</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Edge separation</td>
<td>E</td>
<td>26,5</td>
<td>36</td>
<td>39</td>
<td>39</td>
<td>39</td>
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<td></td>
<td>H</td>
<td>30</td>
<td>45,5</td>
<td>55</td>
<td>29</td>
<td>55</td>
<td>56</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Separation distance between clinch points</th>
<th>I</th>
<th>15</th>
<th>20</th>
<th>70</th>
<th>20</th>
<th>80</th>
<th>15</th>
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<tr>
<td></td>
<td>K</td>
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<td>230</td>
<td>200</td>
<td>160</td>
<td>270</td>
<td>220</td>
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<tr>
<td></td>
<td>L</td>
<td>150/300</td>
<td>175/350</td>
<td>200</td>
<td>225</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>190</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>130</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>19</td>
<td>94</td>
<td>24</td>
<td>39</td>
<td>14</td>
<td>59</td>
</tr>
</tbody>
</table>

All measurements in mm

*Connection is carried out in accordance with Section 2.1.2.3 for tile grid height 150 - 250 mm at a separation distance of 2 x F (1 x F with grid height 300)

**TONALITY** cladding tile for use with suspended back-ventilated external wall cladding

Fixing Point separation distances:
Base clinch rail system (BAS)
Z23611.18

Annex 13

1.10.3-796/1
View of the BAS Flex Holder in 3 Planes

Cross-section of the BAS-Flex-joint profile

Cross-section of the Base clinch rail profile in installed state

Support profile
e.g. T 70/50/2
in accordance with Section 2.1.2.4

Fixing / fastener
in accordance with Section 2.1.2.4

BAS-Flex-holder profile
(t = 2 mm)

Flex-joint profile, t = 0.8mm
(coated on both sides)

All measurements in mm

“TONALITY” cladding tile for use with suspended
back-ventilated external wall cladding

Annex 14

BAS-Flex-Holder
Cross-section
Z23611.18

1.10.3-796/1
<table>
<thead>
<tr>
<th>Building Product</th>
<th>Type of Investigation</th>
<th>Test Standard / Test Procedure</th>
<th>Requirement</th>
<th>Frequency</th>
</tr>
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<tbody>
<tr>
<td>“TONALITY” cladding tile</td>
<td>Evenness</td>
<td>DIN EN 1024</td>
<td>0.7 % max.</td>
<td>At least once every working day</td>
</tr>
<tr>
<td></td>
<td>Tile length</td>
<td>DIN EN 1024</td>
<td>See Section 2.1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tile width (tile height)</td>
<td>DIN EN 1024</td>
<td>See Section 2.1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tile thickness</td>
<td></td>
<td>See Annexes 3 to 8</td>
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<tr>
<td></td>
<td>Profiles on the reverse side (suspensions)</td>
<td></td>
<td>See Section 2.1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass per unit area (dry)</td>
<td></td>
<td>See Section 2.1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flexural strength</td>
<td>Three point bending test *</td>
<td>See below*</td>
<td>See below*</td>
</tr>
<tr>
<td></td>
<td>Frost resistance</td>
<td>DIN EN 539-2</td>
<td>DIN EN 1304 Performance Level 1</td>
<td>every six months</td>
</tr>
<tr>
<td>Support profile Joint profiles Blind rivet</td>
<td>Dimensions Characteristic Material values</td>
<td></td>
<td>See Section 2.1.2 and 2.1.3 as well as Annexes 9 to 14 and Annex 16</td>
<td>Every delivery or Factory certificate 2.2 according to DIN EN 10204</td>
</tr>
</tbody>
</table>

*Three Point bending test*
The flexural strength of the cladding tile must be determined using a three-point bending test. At least 10 samples per batch must be tested with a test speed of 5-10 mm/M. The sample dimensions L x B must be 391 mm x tile height; and the bearing span must be 350 mm. The requirements according to Section 2.1.1 regarding breaking loads must be followed.

"TONALITY" cladding tile for use with suspended back-ventilated external wall cladding

Annex 15

Internal Factory production control
**“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding**

**Annex 16**

<table>
<thead>
<tr>
<th>Blind rivet</th>
<th>4.8 x 10 K9.5</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sleeve material:** Al Mg 3 (EN AW-5754)
**Tension pin material:** 1.4541 (DIN EN 10088)
**Surface:** bright, shiny
**Shaft length L:** 10 mm
**Minimum tensile breaking load:** 1950 N
**Minimum shear breaking load:** 1480 N
**Bracket length:** 4.5 – 6.5 mm

All dimensions in mm
This confirmation must be completed by the specialist contractors of the company carrying out the installation on the building site following completion of the cladding façade system and must be handed to the client (the owner of the building).

**Address of the building:**

Street/no.:  
Post code:

**Description of the Cladding System worked on according to the national technical approval / general to General Construction Technique Permission No. Z-10.3-796**

“TONALITY” cladding tiles used:

- Nominal height 150 mm
- Nominal height 175 mm
- Nominal height 200 mm
- Nominal height 225 mm
- Nominal height 250 mm
- Nominal height 300 mm

Holder profiles used:

- Classic profile (CLS)
- Adaptive profile (ADS)
- Base clinch rail profile (BAS)
- BAS-Flex-holder profile (BAS-Flex)

Joint profiles used:

- Neoprene joint profile for the Classic system CLS
- Aluminium joint profile for the Adaptive system (ADS)
- Neoprene joint profile for the base clinch rail system (BAS)
- Neoprene joint profile for the for the BAS-Flex-holder system (BAS-Flex)

**Behaviour of the cladding system under fire loading:**

See Section 3.1.3 of the notification named above

- Non-combustible cladding system
- Normally flammable cladding system

**Address of the company completing the installation**

Company:  
Street:  
Town / Post code:  
Country:  

We herewith declare that the cladding system described above has been installed in accordance with the regulations of the notification above and the manufacturer’s processing and handling instructions.

Date/Signature for the specialist installation company:  

“TONALITY” cladding tile for use with suspended back-ventilated external wall cladding

**Confirmation by the company completing the installation for the building owner or client**

Translation by Charles Rose, technical translator with many years’ experience as a technical German translator, for static engineers, federations and universities, contractors in Germany and Britain in the roofing, cladding and construction industries and for ventilated façade systems).