

Gentaş Exterior Compact laminates for façade cladding

REQUIRED PRODUCT CHARACTERISTICS

The statements in Chapter 4 of this quality statement for Gentaş Exterior decorative panels as application as cladding façades are only valid if the panels meet the conditions in Table 2.

Table 2: Conditions product characteristics Performance Building Decree

Properties	Standard	Requirement for the application
Fire class	NEN-EN 13501-1	EDS ≥ 10 mm: ≥ B-s1, d0 ¹⁾ EDF ≥ 6 mm: ≥ B-s1, d0 ¹⁾
Resistance to fixings	EN 438-7, 4.5	≥ 2000 N
Bending strength: - flexural strength transverse and longitudinal direction - flexural modules in transverse and longitudinal direction	EN 438-7, 4.8 EN-ISO 178 EN-ISO 178	≥ 80 MPa ≥ 9000 MPa
Resistance to climatic shock: - change in flexural strength, D _s - change in MEF-flexural modules, D _m - change in appearance	EN 438-7, 4.12: EN 438-2, 19 EN 438-2, 19 EN 438-2, 19 & 29	≥ 0,80 % ≥ 0,80 % ≥ rating 4
Durability, - resistance to wet conditions - density	BRL 4101-4, 5.2.4 EN 438-2, 15 EN-ISO 1183-1	Increase in mass: ≤ 5 % (EGS-EDS) ≤ 8 % (EGF-EDF) Change in appearance: ≥ rating 4 ≥ 1350 kg/m ³
Tensile strength: - transverse and longitudinal direction	EN-ISO 527-2	≥ 80 MPa

PRODUCT CHARACTERISTICS

The product meets the product requirements predefined in BRL 4101 part 4. In Table 3 the product characteristics that are part of this KOMO quality statement are listed. They comply with the values specified in the table.

Table 3: Other product characteristics

Properties	Standard	Requirement for the application
Tolerances on dimensions: - length - width - thickness: 5,0 mm ≤ t < 8,0 mm 8,0 mm ≤ t < 12,0 mm 12,0 mm ≤ t < 16,0 mm 16,0 mm ≤ t < 20,0 mm 20,0 mm ≤ t < 25,0 mm - flatness: 6 mm 8 mm 10 mm 12 mm - straightness of edges - squareness	EN 438-2, 6 EN 438-2, 6 EN 438-2, 5 EN 438-2, 9 EN 438-2, 7 EN 438-2, 8	+ 10 / - 0 mm + 10 / - 0 mm ± 0,40 mm ± 0,50 mm ± 0,60 mm ± 0,70 mm ± 0,80 mm ≤ 5,0 mm ≤ 5,0 mm ≤ 3,0 mm ≤ 3,0 mm ≤ 1,5 mm/m ≤ 1,5 mm/m
Dimensional stability at elevated temperature: - change in length - change in width	NEN-EN 438-2, 17	≤ 0,20 % ≤ 0,40 %
Resistance to impact by large diameter ball (shatter resistance) - drop height 1800 mm, diameter print	NEN-EN 438-2, 21	≤ 10 mm
Resistance to SO ₂	DIN 50018 / NEN-ISO 105-A02	≤ rating 4
Resistance to UV - blistering - cracking - change in colour - change in gloss	BRL 4101-4, 5.3.3 BRL 4101-4, 5.3.3 NEN-ISO 105-A02 DIN 67530	none ≥ rating 5 ≥ rating 3 ≤ 50 %

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MARKING

The Gentaş Exterior decorative panels shall be marked with the KOMO wordmark or logo.

The design of this mark shall be:

Application of the mark: the KOMO mark and mandatory information shall be applied to each panel and/or packing unit.

Mandatory information on the label:

- number of the quality statement K77712;
- manufacturer's brand;
- production code to provide traceability (date, machine and/or shift number);
- nominal panel dimensions (length, width, thickness);
- colour code of the design;
- indication fire properties;
- KOMO mark.

The brand and the production date is placed on the product and / or packaging and / or delivery of documents.

SYSTEM SPECIFICATION

Substructure, general

The structure consists of vertical posts with a ventilation column of at least 20 mm deep between the panel and the underlying structure. In order to obtain a flat façade a proper alignment of the support structure is necessary. The center-to-center distance of the posts ranges from 400 to 800 mm. This depends on the thickness of the panel and the number of horizontal fixing points.

The substructure of the façade cladding system should be sufficiently durable and sufficiently strong and stiff, and are to be connected with the building structure in such a way, that the stability of the cladding system is ensured and the loads acting thereon can be transferred to the building structure.

Static calculations for the determination of the dimensioning and fixings of the panel and the sub-structure, shall be executed in accordance with EN 1991, based on the notional value of the:

- dead weight of the panels;
- wind load;
- loads due to differences in temperature;
- loads due to imposed deformations;
- shock loads.

In the determination of the deflection the wind load may be multiplied by 0.7.

Deflection of the panels may not exceed $1/200 \times \text{span} / \text{mounting distance}$.

Edge distances and the number of fixing points are stated in paragraph 2.2.2, tables 5 and 6.

General details are given in chapter 6 of this KOMO quality statement.

Substructure, timber

Constructions have to be made of rectangular timber (not plywood) which at least meets the following specifications:

1. The timber for the support structure shall have a minimum density of 400 kg/m³.
2. The timber shall be classified under durability class 1 or 2, according to NEN-EN 350-1: 1994 (Durability of timber and timber based products – durability of solid timber – Part 1). The required durability can be obtained by thermal or chemical modification of the timber up till the core of the timber. Any timber preservation methods and / or fire retardant treatments must meet the requirements as stated in BRL 0601 (Timber preservation), 0605 (Modified timber) and BRL 0602 (Fire retardant treatment of wood and wood products using the vacuum and pressure method).

The modified timber may not cause any damage to other parts of the supporting structure. With application of timber, modified according the vacuum/pressure method, additional measures shall be taken to avoid water form entering the core of the timber.

Remark

Processing of modified timber may cause a reduction in durability.

3. The timber can be classified in a strength class in accordance with NEN-EN 338.
4. The moisture content of the timber shall not exceed 18 %, determined according to NEN 5461. To prevent rotting of timber, necessary measures must be taken to prevent a permanent moisture load.
5. The timber may not have any active degradation caused by larvae, insects and/or fungi.
6. Soft wood shall at least satisfy quality class C in accordance with NEN 5466.

Dimensions timber support structure

The timber support structure should be detailed in a way, that no ultimate limit state and serviceability limit state is exceeded during the reference period as a result of changes in the geometry.

Remark

In the determination of the size of the timber cross-section(s), the presence of a necessary ventilation column with a depth of at least 20 mm and thickness of the insulating layer if present, must be taken into account. Especially with thermally modified wood a reduced pull-out resistance of the screws must be taken into account. In that case it therefor may be necessary to apply thicker members.

Fasteners timber support structures

The timber support structure must be assembled with fixings that at least meet the requirements of the permissible deviations and basic requirements for class I according NEN-EN 14592. The fasteners for timber substructures must be made in stainless steel, type 1.4401 (AISI 316 = A4). The fasteners for aluminium substructures must be made in stainless steel, type 1.4301 (AISI 304 = A2).

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Blind fixing

With this system the Gentaş Exterior decorative panels are mounted on aluminum mounting structure using hidden connecting clamps.

The aluminum mounting structure must be detailed in a way that the ultimate limit state and serviceability limit state is not exceeded during the reference period. In order to reduce the risk of screws undoing, aluminum profiles shall have a thickness of at least 2.5 mm.

Remark

The strength and stiffness of the aluminum mounting structure shall be demonstrated mathematically and / or by dynamic wind resistance tests.

The dowel to be used for this mounting system will have a blind rivet from itself and conic shaped double split mounting space. The dowel and other parts must be made of stainless steel material.

The dowel is carefully placed on the mounting space on the inside of the wall siding panel.

The recommended panel thickness is between 8 mm and 10 mm. The aluminum structure must be prepared so that no pressure must be applied to the Gentaş Exterior panel by the infrastructure. While performing the connections (drilling the hole, placing the rivet head) personnel which has been educated by the manufacturer must supervise the process.

This type of wall siding materials must be mounted by only educated expert personnel. It is required to cover the supporting profile connections of the structure with panels. Bottom holes must be drilled in the factory or under workshop conditions with special drilling equipment.

The number of dowels to be used must be determined according to the engineering requirements of the building. The dust in the hole left after drilling must be removed completely.

The nominal hole diameters drilled must be in accordance with hole diameters of the plugs used.

The depth of the dowel:

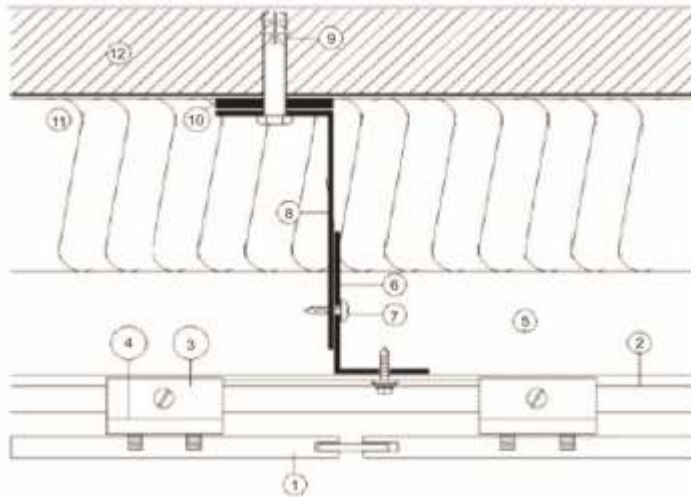
- Panels with 8 mm thickness 4 mm;
- Panels with 10 mm thickness 6 mm.

Plugs must be mounted in place using an instrument which is appropriate for this system. Random checks must be carried out on the holes which are chosen randomly. The following measurements must be carried out according to the information supplied by the manufacturer of the plugs and those measurements must be kept in recorded reports and documented accordingly:

- Cylindrical drill hole diameter;
- The diameter of the dowel which is cut from the bottom part;
- The examination of the upper part of the drill hole and the depth of the hole.

Eye examination is required to understand whether the Plug has entered the drilled hole in an appropriate manner or not. The side of the hole must sit on the clamp and must support itself strongly.

The construction manager or his representative must collect and keep the evidences showing whether the mounting operation carried out correctly or not.



1. Gentaş Exterior Panel
2. U Profile
3. Secret Joint Element
4. Compact Joint Screw
5. Ventilation Area
6. Aluminum T or P Profiles
7. Screw
8. Aluminum Anchorage
9. Steel Wall Plug
10. Insulator
11. Insulation
12. Wall

Blind fixing with rivets

It is the most widely used method for Ventilated Exterior Cladding systems in the world. It is a method of fixing Gentaş Exterior Cladding Panels on aluminum structure by means of appropriate rivets. While establishing the aluminum structure profile, national and international regulations must be taken into account. The aluminum support structure shall be detailed in a way that outermost limits or condition of use during the reference period will not be exceeded. To reduce the risk of unscrewing of fasteners, aluminium profiles shall have a thickness of at least 2.5 mm.

Remark

The strength and stiffness of the aluminium support structure has to be demonstrated by means of calculations and /or tests.

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This aluminum structure is composed of support profiles basically mounted vertically to the wall. Due to the material characteristics of Gentaş Exterior panels, panels are affected by weather conditions especially from changes in temperature and humidity. As a result of these effects, minimal size changes can be observed. See also paragraph 1.3, table 3, dimensional stability at elevated temperature (changes in size at 70 °C and under 90% humidity). Values stated in Gentaş Exterior Technical Data Page must be taken into account by the users. Smoothly cut sides provide the balanced and smooth vision of a structure to which cladding is carefully applied. This cut may be carried out with Professional diamond cutters. When mounting panels it is required to leave at least an 8 mm gap taking size changes into account. In aluminum structures, you can use rivets with colours of panel colours.

Rivet shell: Al Mg 5

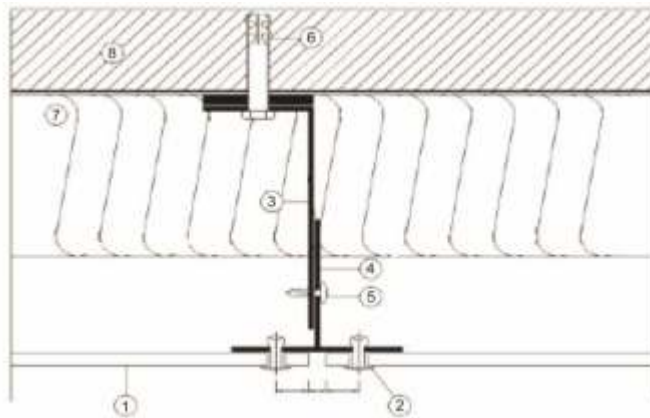
The resistance of rivet spindle against tension: 5,2 KN.

Diameters of holes to be drilled in Gentaş Exterior panels: 5,1 mm - 8 mm or required diameter.

The diameter of the hole to be drilled in aluminium infrastructures: 5,1mm.

The distance between rivets must be calculated in accordance with the engineering requirements of the construction. Unless recommended otherwise, in applicable regulations the following range can be recommended:

- For 6 mm: 45 cm – 60 cm;
- For 8 mm: 60 cm – 80 cm;
- For 10 mm: 70 cm – 90 cm.



1. Gentaş Exterior Panel
2. Rivet
3. Aluminum Anchor
4. Aluminum T or P Profiles
5. Screw
6. Steel Wall Plug
7. Insulation
8. Wall

Mounting structure, aluminum

The aluminium mounting structure must be detailed in a way that the ultimate limit state and serviceability limit state is not exceeded during the reference period.

Remark

The strength and stiffness of the mounting structure of aluminum to be mathematically and / or by dynamic wind resistance tests are demonstrated.

Fasteners aluminum mounting structure

The manufacturer must determine the number of anchoring and fixing points, sizing and order of assembly. The attachments should be calculated and / or tested for wind forces (pull). The confirmation must be taken sufficient account of the material bound thermal length changes. The panels should as far as possible free of tension to be confirmed.

Thermal insulation

Insulation in the shape of panels or blankets, whether or not featuring a coating, shall be processed in accordance with the manufacturers instructions or valid quality declaration granted by an Institute accredited by the Board of Accreditation (RVA). The type of insulation and thickness shall be tuned to the requirements by the Dutch Building Decree.

Remark

The insulation shall be sufficiently watertight. It is advised to use a mineral wool with a waterproof coating. When using open joints higher demands shall be set on the water tightness of the insulation. With mineral wool a heavier coating shall be applied with a prolonged resistance to UV radiation.

In case battens are used, a WBO-membrane can be applied. In this case the insulation does not have to have a coating unless required by the open time of the insulation.

Accessories

Sealing profiles of aluminium, plastic or EPDM-rubber for sealing joints between panels shall be mounted tight and in the correct place.

Sealing profiles may not be stapled but must be attached by means of glue for example.

Bars, drip rails water and so on must be provided with recesses.

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PROCESSING

GENERAL

Transport

During transport of the Gentaş Exterior decorative panels, sturdy and flat pallets shall be used of a size that is at least the same as panels. To prevent scratching, panels must be lifted and not slid across underlying ones. During manual handling like loading and unloading, panels shall be lifted one by one.

Storage

Gentaş Exterior decorative panels shall be stored on flat surfaces to avoid warping of the panels.

During storage, panels shall be protected against moist, strong changes in temperature, pollution and damaging

panels should be stocked indoor in normal conditions between 45 and 70% ambient humidity and regular temperatures.

At the building site the panels shall be protected against moist rising from the ground. Panels preferably shall be stored horizontally, supported on the entire surface.

In case horizontal storage is not possible, than panels can be stored 'vertically' at an angle of 60-70° whereat the total surface will be supported. In all cases the supporting surface shall be completely flat.

The top panel shall be stored with a protective sheet or board.

Processing instructions

Gentaş Exterior decorative panels shall be cut before use.

- Gentaş Exterior decorative panels can be machined in any shape of form with regular cutting equipment.
- It is recommended to use saws and chisels with carbide cutting edges.
- Panels must be cut with visible side facing upwards when using circular saws, downward with portable tools.
- When cutting panels to size, longer side of piece should coincide with the panel machine direction to ensure better panel stability.
- Preferably use machinery with fixed blades and moving tables.
- Use spacing papers or boards and make sure these do not contain splinters with reuse.
- Inside corners of, for example, openings shall have rounded edges with a minimum of 5 mm radius.

MOUNTING INSTRUCTIONS

General

The mounting system refers to panels which are screwed to a timber or aluminium sub frame by means of screws. Several mounting methods (visible and invisible) are possible.

Supporting structure

The constructor shall determine the amount of anchoring and fixing points, the dimension of the supporting structure and the following order of mounting. The mounting and fixing points shall be calculated on loads as mentioned in paragraph 1.5.1.

For determination of the fixing points of the panels, tables 5 and 6 may be used.

Adequate information on the used fasteners shall be available. Especially on allowable stress, the accompanying deformations and the behaviour in time as a result of physical and chemical circumstances. In all cases, fasteners shall be corrosion proof

The fasteners for façade cladding shall be of stainless steel, type 1.4301 (AISI 304 = A2). Changes in dimensions due to thermal changes shall be taken into account. For this reason a panel shall be fixed with one fixed point, preferably in the middle. Other fixing points shall be expansion points. The fasteners for the fixed and expansion points will have to be pre-drilled with a drill conductor to realise the required expansion space.

In case of aluminum the holes in the panels and the supporting structure shall be pre-drilled at the same time by 'gradually' shaped drills. In case of mounting with rivets a special rivet washer shall be used which makes sure that rivets are mounted sliding.

Thermal changes in sizes shall be adequately taken into account. See also table 3, dimensional stability at elevated temperature (changes in measurements at 70 °C and 90% relative humidity. The panels shall be mounted free of stress as much as possible. To avoid deformation of the panels, over tightening of the screws shall be prevented.

Screwed fixing points on timber members

RVS Torx-screw (see figure 1);

- Panel thickness: 6 up till 10 mm;
- Shaft diameter: 4,8 mm;
- Hole diameter: 8 mm in panel.

RVS mounting screw with nylon washer and covering cap (see figure 2):

- Panel thickness: 6 tot 10 mm;
- Shaft diameter: 4,8 mm;
- Hole diameter: 8 mm in panel.

Countersunk screws are not allowed.

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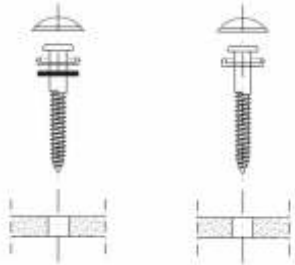


Figure 1.

Figure 2.

Table 4: Required hole diameters

Screw type	Hole diameter
Self centering RVS Torx—of mounting screw	8 mm
Pan head screw Ø 4 mm or Ø 5 mm, length at least 35 mm, head diameter 11 mm maximal	1,5x diameter screw

Mounting distances

Mounting distances shall be determined on basis of maximum deflection of the panels and the minimum pull out resistance of the screw as used. The pull out resistance of a screw in an aluminum member is better. Additionally the strength of a rivet is higher.

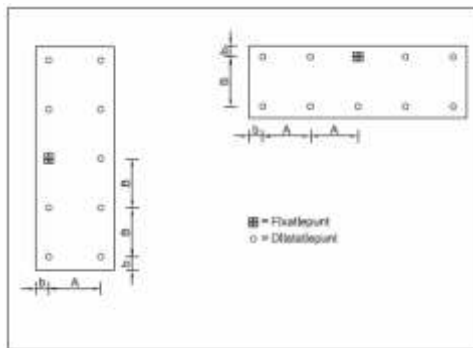


Figure 3: 2-point fixation

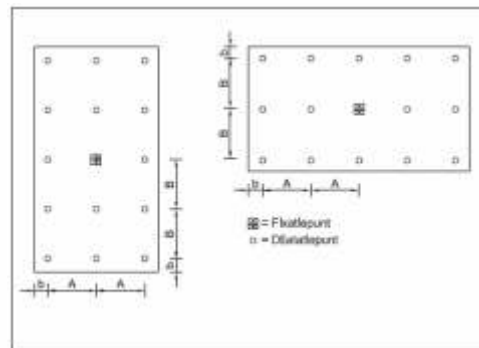


Figure 4: 3 or more point fixation

For a 6 mm panel, in tables 5 and 6 the maximum distances of fixation A and B in relation to the application area are given (building height per wind fastness area and terrain category). These distances are based on a timber supporting frame in accordance with paragraph 1.5.2.

Table 5: Maximum mounting distances 2-point fixation (A, B in mm) in relation to areas of application (building height in m)

2-point fixation according figure 3									
Mounting distance ¹⁾		Wind area I			Wind area II			Wind area III	
A [mm]	B [mm]	coast [m]	unbuild [m]	build [m]	coast [m]	unbuild [m]	build [m]	unbuild [m]	build [m]
480	360	2	10	20	3	20	20	20	20
420	360	3	20						
360	360	6							
300	360	15							

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Table 6: Maximum mounting distances 3 or more point fixation (A, B in mm) in relation to areas of application (building height in m)

3 or more point fixation according figure 4									
Mounting distance ¹⁾		Wind area I			Wind area II			Wind area III	
A [mm]	B [mm]	coast [m]	unbuild [m]	A [mm]	B [mm]	coast [m]	unbuild [m]	A [mm]	B [mm]
420	360	2	10	20	5	10	20	10	20
360	360	4	20		10	20		20	
360	300	10							
300	300								

1) The mounting distances mentioned above are based on a timber substructure with a minimum density of the timber of 400 kg/m³.

Ventilation

For a proper application of panels a good ventilation behind the panels is indispensable. In order to remove any water by evaporation and drainage behind panels and the underlying wall / insulation layer:

- An uninterrupted cavity with a depth of at least 20 mm behind the panels.
- Ventilation openings at the top and bottom of façade with area:
 - $\geq 20 \text{ cm}^2$ /linear meter for height up to 1 m;
 - $\geq 50 \text{ cm}^2$ /linear meter above 1 m;
- Nesting of rats and mice behind the façade must be prevented. Openings wider than 1 cm for joints, where the panels meet other structures or for ventilation shall be fitted with closable screens.

Instructions on joints

Open Joints

When using horizontal or vertical open joints, high demands on the quality of the insulation material are set. In case of mineral wool a heavier coating shall be applied. This shall have a prolonged resistance to moist, high wind loads and UV radiation.

In case battens are used, a WBO-membrane can be applied. In this case the insulation does not have to have a coating unless required by the open time of the insulation.

Also additional demands shall be set on durability of the supporting structure. In case a timber supporting structure is used it shall be classified under durability class 1 or 2, according to NEN-EN 350-1: 1994 (Durability of timber and timber based products – durability of solid timber – Part 1).

Closed joints

A closed joint can be achieved by using various horizontal and vertical plastic or aluminium sealing profiles. Application of these profiles may not hinder the hygrothermal working of the panels.

Use of elastic kit for joints is not recommended since they may hinder the hygrothermal working of the panels. Furthermore the working life of the kit is limited and it may attract dirt more.

The type of seal used depends on how the panels are mounted.

REPAIRS

Repairs are only allowed by or under responsibility of the manufacturer.

MAINTENANCE

Areas of light dirt contamination can be cleaned with a towel, hot water or standard, non-abrasive cleaning agents. Areas of heavier dirt contamination may be cleaned with standard solvents. Always start by cleaning a small area first whilst observing any changes in appearance.

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PERFORMANCES

Building Decree

Nr	article; sections	section	Limit/ determination method	Performance according to quality statement	Application notes
2.1	2.2 2.3 2.4; 1a, b, d en 2	General strength of the building structure	No collapse according: - NEN-EN 1990, - NEN-EN 1991 (own weight, - NEN-EN 1991-1-4 (wind) - NEN-EN 1995-1-5 (differences in temperature)	Suited for the application (situation and height building) Screw holding value ≥ 2000 N	Joints to be made in accordance with paragraph 2.2.4
2.8	2.57	Limitation of the occurrence of a fire risk situation	Fire class A1 according NEN-EN 13501-1	The non-flammability is not determined	
2.9	2.67 2.68; 1 t/m 3	Limitation of the development of fire and smoke	The fire class and smoke class determined according to NEN-EN 13501-1 must be at least D respectively s2.	G-ext EDS, ≥ 10 mm : B-s1, d0 G-ext EDF, ≥ 6 mm: B-s1, d0	
2.10	2.84	Limitation of spread of fire	WBDBO (Resistance to Fire Penetration and Flash-over) determined according to NEN 6068 is minimal 30 min.	The panels shall not be assumed to limit the spread of fire	Performance depends on total partition
3.1	3.2 3.3	Protection from external noise, new buildings	Typical sound-proofing determined between outdoors and residential area ≥ 20 dB(A) and between outdoors and residential room ≥ 18 dB(A)	Typical sound-proofing is not determined	Performance depends on total partition
3.5	3.21; 1 t/m 3 3.22	Moisture proofing	Waterdicht, volgens NEN 2778 Temperatuurfactor $> 0,5$ of $0,65$, volgens NEN 2778	Panels are watertight, joints are water resistant Temperature factor of the interior surface $> 0,5$ of $0,65$	Performance depends on total partition
3.9	3.63	Limitation of the presence of hazardous substances and ionising radiation	The cladding contains no hazardous substances or ionising radiation	Panels meet requirements	
3.10	3.69	Protection from rats and mice	No openings wider than 0.01 m	No openings $> 0,01$ m	
5.1	5.3 5.4 5.5	Energy efficiency, new buildings	Heat resistance ≥ 3.5 m ² K/W, determined according to NEN 1068. Air volume flow rate of all the occupied areas, toilet and bathroom areas (0.2 m ³ /s, determined according to NEN 2686.	Contribution to heat resistance of panels with closed joints en cavity 0.3 W/m ² K according NEN-EN 438-7 Panels do not contribute to limit of air flow volume	Performance depends on total partition

RECOMMENDATIONS TO INSTALLERS

After delivery of the products listed under "Technical specifications" check if:

- the delivery corresponds with the order;
- the marks and their application are correct;
- the products do not exhibit visible damage due to transport, etc.

After delivery of the products listed under "Installation" verify if they comply with the stated specifications.

If, given the above, you reject the delivery, then contact:

- GENTAŞ A.Ş.
- and, if necessary;
- Kiwa Nederland B.V.

Store, transport and install the materials in accordance with the provisions of "Installation".

Observe the installation conditions listed under "Performance".

In the context of this statement will be no quality control, instead of the accuracy of the performance of the essential characteristics.

The statements in this quality statement shall not be used to replace the CE marking and / or the relevant mandatory Declaration of performance.