

ATG Technical Approval with Certification



MAIN WORKS – Fixings and anchors
Precast panel hanger system

FIXI3D

Valid from 08/08/2023
until 07/08/2028

Approval and certification operator



Belgian Construction Certification Association
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1 Objective and scope of the technical approval

This technical approval is based on the favourable evaluation of the system (as described above) by an independent approval operator designated by UBAtc, BCCA, for the application mentioned in this technical approval.

The technical approval serves as a record of the approval inspection. This inspection consists of the following: identification of relevant properties of the system for the intended application, laying/installation method, system design and reliability of production.

The technical approval provides a high level of reliability, based on the statistical interpretation of inspection results, regular monitoring and adjustments, in order to keep abreast of the situation, the latest technical developments and quality monitoring by the approval holder.

In order to retain the technical approval, the approval holder must continuously provide evidence that he is taking all necessary steps to demonstrate that the system is suitable for use. In order to do so, it is vital that the conformity of the system with the technical approval is monitored. This monitoring is entrusted by the UBAtc to an independent certification operator known as BCCA.

The approval holder [and the distributor] is [are] required to adhere to the inspection results described in the technical approval if they make information available to third parties. The UBAtc or certification operator may take any steps that become appropriate if the approval holder [or the distributor] fails to do so (to a sufficient extent) of his own accord.

The technical approval and certification for conformity of the system to the technical approval are independent of tasks conducted individually. The contractor and/or architect remain fully responsible for the conformity of the completed work with the provisions contained in the specifications.

The technical approval does not cover, unless stated in specific provisions, on-site safety, health and safety aspects and the sustainable use of raw materials. As a result, the UBAtc shall not be responsible, under any circumstances, for any damage caused by the failure of the approval holder, contractor(s) and/or architect to respect provisions relating to on-site safety, health aspects and the sustainable use of raw materials.

Note: in this technical approval, the word "contractor" will always be used, when referring to the entity that completes the work. This word has the same meaning as other frequently used words, such as "operator", "installer" and "fitter".

Note: § 9 lists the applicable versions of standards, to which this document refers.

2 Information concerning the performance of the system and components included in this declaration of suitability for use

At the request of the approval holder, the following performances were tested by the approval and certification operator as part of the approval process.

The approval holder is required to comply with the test results included in this declaration of suitability for use, in order to determine the component and system performance figures used for marketing. If required, he must adapt them. If the approval holder fails to take the initiative to do so, UBAtc asbl or the certification operator may take this step.

The system described in this declaration of suitability for use must be implemented by specialist installation companies according to the description provided.

3 Object

This technical approval concerns the FIXI3D hanger system, which is adjustable in three directions and used to fasten precast reinforced concrete cladding panels with a minimum thickness of 7 cm to a concrete or metal structure.

A ventilated cavity, which may have thermal and/or acoustic insulation, is located behind the precast panels.

The hanger system components, two of which are provided per panel, consist of:

- "Classic" range: a mounting plate that is hooked onto the supporting structure, an eye pin that allows the suspension hook height to be adjusted, a link pin for lateral adjustment and an insert (straps) that is placed inside in the panel before it is suspended;
- "2.0" range: a mounting plate that is designed to be hooked onto the supporting structure, an eye pin that

allows the suspension hook height to be adjusted, a link pin for lateral adjustment and an insert that is placed inside in the panel before it is suspended; the entire assembly is made from stainless steel.

The following auxiliary products are required alongside the device, but are not covered by the technical agreement and certification:

- Spacers;
- Wind anchors;
- Pins;
- Attachment plugs: if attached to a concrete structure, the mounting plates must be secured using stainless steel metal pins (mechanical or chemically sealed pins) or using rails already fitted to the structure. The pins have a CE mark.
- Bolts: bolts are provided so that the suspension hook can be attached to a metal support.
- Steel frames to be used as reinforcement bars in the concrete.

4 Materials

The hanger system components are made from stainless steel sheets or bars, as shown in Table 1.

Bolts are made from stainless steel A4, Class 70, in compliance with NBN EN ISO 4032.

Reinforcement bars in the precast panel are made from high-adherence steel. These bars are not supplied by the approval holder. They must meet the following requirements:

- BE 500 ES, BE 500 RS, BE 500 S, BE 500 TS or DE 500 BS in compliance with NBN A 24-302, with BENOR mark or equivalent.

The following components are not subjected to mechanical stress:

- Round PVC collars for spacers and pins.
- Oval PVC pin collars.
- Recess formers.

Table 1 – Materials used to produce hanger system components and specifications

Component	Material	Steel type (NBN EN 10088-1 or NBN EN ISO 4032)	Yield strength $R_{p0,2}$	Tensile strength R_m
			[N/mm ²]	[N/mm ²]
"Classic" range				
Plate	Stainless steel sheet	1.4401 / 1.4404 / 1.4162	300	520
Square plate	Stainless steel sheet	1.4401 / 1.4404 / 1.4162	300	520
Eye pin				
smooth part	Stainless steel bar	1.4401	240	500
threaded part	Stainless steel bar	1.4401	350	700
Axle				
5.0 kN - 34.0 kN classes	Stainless steel bar	1.4401 / 1.4362 / 1.4462	320	610
56.0 kN class	Stainless steel bar	1.4362 / 1.4462	650	850
Insert				
straps	Stainless steel sheet	1.4401 / 1.4404 / 1.4162	300	520
connecting brace	Stainless steel bar	1.4401 / 1.4362 / 1.4462	320	600
"2.0" range				
Plate	Stainless steel sheet	1.4401 / 1.4404 / 1.4162	300	520
Square plate	Stainless steel sheet	1.4401 / 1.4404 / 1.4162	300	520
Straight threaded rod	Stainless steel bar	A4 – 70	450	700
Axle – 5.0 kN-60.0 kN classes	Stainless steel bar	1.4401 / 1.4362 / 1.4462	320	610
Traction bushing	Stainless steel sheet	1.4401 / 1.4404	300	520
Insert lugs	Stainless steel sheet	1.4401 / 1.4404 / 1.4162	300	520

5 FIXI3D hanger system

The FIXI3D hanger system consists of a plate, a pin (eye pin or straight threaded rod), a cylindrical axle and an insert. The system components are identified by a defined colour based on the design value N_{Rd} for the tensile strength. The hanger systems have been categorized, according to 8 load categories:

Table 2 – Hanger system types

Colour marking	"Classic" range		"2.0" range	
	Designation	N_{Rd} [kN]	Designation	N_{Rd} [kN]
Black	5	6.75	5	6.75
Red	8	10.80	10	13.50
Green	11.5	15.53	15	20.25
White	16	21.60	20	27.00
Yellow	22	29.70	25	33.75
Blue	27	36.45	35	47.25
Orange	34	45.90	45	60.75
Pink	56	75.60	60	81.00

The dimensions of the different components described above can be found attached, together with an overview drawing of the suspension hook system (Annex 1).

5.1 "Classic" range

The following components are marketed by the approval holder or Belgian distributor and certified by the certification operator, according to the product 5 certification scheme defined in NBN EN ISO/IEC 17067.

5.1.1 The plate

The "Classic range" plate (Annex 2) is created from a strip made from stainless steel sheet, the lower part of which is punched in the form of a tube so that the eye pin can be inserted. Its upper part is cut out in the shape of a notch. The plate can be doubled, if necessary, in order to distribute the load across two pins.

Three types of plate exist for the "Classic range": single plates (PLS), double plates (PLD) and twisted plates (PLV).

The plates are fastened to a concrete structure using stainless steel or chemically sealed stainless steel metal pins. The pins have a CE mark.

If the suspension hook is fastened to metal support, the pin is replaced by a bolt that has been approved by the design office.

The shape of the plate can be adapted to create an acroterion-type attachment device. These adjusted shapes are not covered by the technical agreement and certification.

5.1.2 The eye pin

The eye pin (Annex 3) connects the plate to the insert and is used for vertical adjustment. A cylindrical spindle passes through the eye, so that it can be connected to the insert.

The diameter of the rod depends on the load category. It is threaded at one end, so that its height can be adjusted with a square plate and a nut, and inserted into the upper part of the plate. The other end is smooth, bent and soldered in the shape of an eye, so that the link pin can be inserted, which is used for lateral adjustments.

The threaded part is fitted with a square plate, a nut and a washer. The nut and washer must be lubricated, in order to prevent cold welding (sticking). Ideally, the hanger should be adjusted before tightening. If fine adjustments are required after tightening, they must be conducted in downward direction (loosening).

5.1.3 The "Classic" insert

The "Classic" insert (Annex 4) is placed inside the precast component. It consists of two straps, a connecting axle and an expanded polystyrene cavity (EPS). The straps are connected by a soldered brace.

The two straps are folded in their upper part, so that they stay aligned to the eye pin. One of the two straps has a flat lug that is used to lock the link pin.

This welded assembly is anchored vertically to the precast component, using two folded frames that pass through the two straps. In addition, one or two reinforcement frames are placed on the fold of the straps. The dimensions of these frames are shown in Annex 5.

5.2 "2.0" range

The following components are marketed by the approval holder or Belgian distributor and certified by the certification operator, according to the product 5 certification scheme defined in NBN EN ISO/IEC 17067.

5.2.1 The plate

The plate used in the "2.0" (Annex 2) range is similar to the one used in the "Classic" range.

For the "2.0" range, there are two types of plate: simple plates (PLS) and double plates (PLD).

5.2.2 The straight threaded rod

The straight threaded rod (Annex 3) connects the plate to the "2.0" insert and is used for vertical adjustments.

The diameter of the rod depends on the load category. One of the ends of the rod, fitted with a square plate, a nut and a washer, is inserted into the lower part of the plate, so that the height can be adjusted. The other end is screwed into the metallic traction bushing in the "2.0" insert.

The ends of the straight threaded rod must be lubricated in order to prevent cold welding (sticking). Ideally, the hanger should be adjusted prior to tightening. If fine adjustments are required after tightening, they must be conducted in downward direction (loosening).

5.2.3 "2.0" insert

The "2.0" insert (Annex 4) is placed inside the precast component. It consists of two lugs, a traction bushing, a connecting axle and a moulded plastic spacer. The two lugs make it possible to position the connecting axle and frames. The traction bushing consists of a nut, which is welded to a laser-cut part, which pivots around the connecting axle.

This assembly is anchored vertically to the precast component, using folded frames that pass through the two lugs. The dimensions of these frames are shown in Annex 5.

5.3 Auxiliary components

The following auxiliary products are required for use with the device. They are provided under the responsibility of the approval holder or marketed by its Belgian distributor.

The auxiliary components are not certified according to the product 5 certification scheme defined in NBN EN ISO/IEC 17067.

5.3.1 Spacers

Spacers (Annex 6) are used to ensure that there is a gap between the precast cladding component and the load-bearing structure. Ideally, they should be positioned immediately adjacent to the insert and transfer the compressive stress to the supporting structure. The choice of spacer essentially depends on the normal

amount of strain on the spacer and cavity between the precast component and support.

Each spacer consists of a threaded rod, which is welded to a plate, a nut and a washer that is used to adjust the cavity depth. The threaded rod is inserted into the plastic precast component either in a plastic collar with a PVC flange or in a threaded metal socket, which are already located in the precast component.

Two spacers can be fitted to the wind anchors, if there is no risk that the component will become detached from the support due to wind.

The spacer assembly, except for the collar, is made from stainless steel.

5.3.2 The wind anchor

The wind anchor (Annex 7) replaces the spacer if the precast component is likely to rise due to negative wind pressure. Like the spacer, it serves to separate the precast component from the support but absorbs the tensile stress.

The choice of wind anchor depends on the cavity, weight of the hanger component and wind pressure, which is calculated according to Standard NBN EN 1991-1-4+ANB.

The choice of wind anchor depends on the support, the position of the architectural component in relation to the support, any other items fitted to the support and the methods used by the fitter. There are two different types of wind anchorage:

- "rail" or "ridge";
- "plate + rod".

5.3.2.1 "Rail" or "ridge" type wind anchor

In principle, three types of wind anchor use rails, which are selected according to the situation. The anchorage is calculated on the basis of a specific calculation note provided by the manufacturer. Other types of wind anchor are possible, depending on the on-site situation.

The rails are sealed in the supporting structure and panel using feet that are welded to the outer face of the rail. These two rails are orthogonal to each other.

The position and length of the connector can be adjusted in different directions, as all parts are always made from stainless steel.

There are three types of wind anchors on rails:

- Side wind anchor attached to plates with a forged head : a plate is used to connect the structure rail to the panel rail. One of its T-shaped ends is inserted into the panel rail. The other end is depth-adjustable by means of an oblong hole. The depth can be locked by clamping on a striated plate. This wind anchor only absorbs tensile stress;
- Side wind anchors attached to plates using a soldered hammer head bolt: similar to the above, but can be locked at panel rail level by means of a hammerhead bolt;
- Side wind anchors with U section, attached to plates using a soldered hammer head bolt: similar to the first example, but can also withstand compressive stress by means of its U-section.

5.3.2.2 "Plate + rod" type wind anchor

The plate + rod wind anchor (Annex 7) consists of a holding plate combined with a pin and spacer rod.

The holding plate consists of either:

- A drilled rectangular plate with a vertical slot, to which a horizontal cylinder is welded ("classic" wind anchor) or

- A profile bent into a U shape, with stops and a central wedge, which prevents the fastener components from becoming loose ("open" wind anchor).

Two types of assembly can be considered:

- The holding plate is fastened to the supporting structure pins, bolts or screws. The rod connects the plate to the moulded socket in the panel.
- The holding plate is fastened to the panel using a screw or moulded socket in the panel. The rod connects the plate to the female pin fastened to the supporting structure.

Adjustments are made using a screw-nut system. All components (bore diameter, wind anchor section, pin diameter) are selected according to the stress that they must withstand.

5.3.3 Pin

The pin (Annex 8) makes it possible to fasten the precast components to each other and transfer horizontal loads from one component to another, using a pin that is sealed on the edge of the two components. It generally consists of:

- A hollow cylindrical collar made from PVC and sealed on the lower edge of the upper plate;
- A PVC collar with an oval section sealed on the upper edge of the lower plate, as the large size of the section is parallel to the façade;
- A stainless steel pin, the diameter of which is equal to the inner diameter of the cylindrical collar (single pin).

The oval collar on the lower panel has a larger diameter than the pin; the pin is then sealed in the non-shrink mortar (bonded pin/anchor).

6 Manufacture and marketing

6.1 Manufacture

The different components of the "Classic" (§ 5.1) and "2.0" (§ 5.2) ranges in the attachment device are manufactured by the approval holder at its factory in 6040 Jumet, Zoning industriel de Jumet, 1^{ère} Rue 8, Belgium.

All components that form part of the suspension hook system, which are described in § 5, are supplied by the approval holder.

Industrial self-monitoring of manufacturing includes inspecting primary materials, manufacturing and conducting checks on the finished items.

6.2 Marketing

The approval holder is responsible for marketing the suspension hook system and can provide users with technical assistance.

7 Installation

The design office must determine and/or prescribe, depending on the relevant strains:

- The type of suspension hook;
- The position of attachments and accessories;
- The organisation of reinforcement steels in the lining panels (precast components).

It is the responsibility of the panel manufacturer and contractor to use only specialist workers within this field and ensure, by means of regular supervision, that work is completed, at all times and places, according to the specifications of the technical approval and the approval holder. The contractor must also check that the structure is able to distribute the loads created by the panels and the panel manufacturer must ensure that the concrete used in the lining panel is suitable for the exposure class.

7.1 Manufacture of precast cladding components

Pre-condition: the concrete panels must comply with Standard NBN EN 14992 "Precast concrete products – Wall elements" and its national counterpart NBN B 21-612.

The minimum reinforcement according to NBN EN 1992-1-1 must be provided to every precast concrete facing panels. For the "2.0 range", an additional reinforcement is required for types 25 to 60 according to Annex 9. When the panels are manufactured, two suspension hook devices are used for each panel. This principle for fitting attachment components is adjusted to the geometry of the precast component and determined by means of a specific calculation. The choice of suspension hook type is determined by matching the factored actual load of the panel on the suspension hook and the load capacity N_{Rd} (in kN) of the suspension hook system.

The insert is supplied with the polystyrene/plastic recess former and designed to remain in contact with the corresponding formwork face. The reinforcement bars (Annex 5) are slid into the insert straps/lugs, in order to anchor the insert into the concrete. They are kept in place by a set of wedges. Their orientation and level position are maintained by a rigid device that is fastened to the mould. Their dimensions are shown in the relevant table.

A minimum distance to the edge has to be respected to ensure a concrete cover of the reinforcement bars of 25 mm, see Annex 10.

In addition to the suspension hooks, the necessary inserts are fitted for the restraint anchors (spacers, wind anchors, pins, etc.) by fastening them to the casing. Their type and position are determined according to calculations. The concrete around the pin sockets can be reinforced, if required, using stainless steel fretting.

The entire system must be determined by calculations completed by the design office. This calculation is not part of the object of the technical approval and certification.

Table 3 – Adjustment of suspension hooks

Designation	Vertical direction	Lateral direction	Distance from the support
-	[mm]	[mm]	[mm]
"Classic" range			
5	± 30 (by turning the nut that rests on the plate)	± 23	±30 mm (by means of spacers)
8		± 23	
11.5		± 22	
16		± 22	
22		± 21	
27		± 18	
34		± 16	
56		± 16	
"2.0" range			
5	± 30 (by turning the nut that rests on the plate)	± 21	±30 mm (by means of spacers)
10		± 19	
15		± 18.5	
20		± 18.5	
25		± 18.5	
35		± 18.5	
45		± 19	
60		± 19	

7.2 Attaching cladding panels to a concrete or metal structure

The nominal inclination of the tie rods in relation to the vertical elevation is 20 ° (with a tolerance of ± 2 °).

The maximum possible adjustments are shown in Table 3 (above).

Adjustments in lateral direction are made by moving the eye pin on the cylindrical axle.

7.2.1 Concrete structure

Precast components can only be attached if the resistance of the concrete used in the structure and the concrete used in the precast components is at least equal to 30 N/mm² (C25/30 or higher value) and if the resistance of the concrete used in the structure is at least equal to one required for the action of the associated stainless steel anchors.

The panel is secured using the following methods:

Positioning the attachment system:

- Sealing the stainless steel threaded rods in the holes drilled in the concrete structure in the defined positions that are already in place, depending on the layout and situation on the construction site,
- Expanding the metal studs.
- It can be fastened to the rails already moulded in the structure.

The insulation material where the anchors are positioned must be cut carefully, so that it can be put back into place after installation.

Preparation of cladding plates:

- "Classic" suspension hook system:
 - Removing any cavities in the expanded polystyrene,
 - Inserting cylindrical spindles and eye pins, before locking the axle by bending the safety lug welded to each insert.
- "2.0" suspension hook system:
 - Cavity opening;
 - The straight threaded rod is screwed into the metallic traction bushing, while checking that the rod is screwed into the entire length of the nut.

Bolting plates onto the eye pins, Inserting screws and spacers in their sockets/sleeve and any wind anchors in their socket/sleeve and/or rails (adjusting the theoretical dimension)

Lifting and securing the cladding panel:

It is not permitted to lift the panel using suspension hooks/plates.

- Positioning the plate depending on the layout,
- Possible insertion of pins of the upper element and filling oval collars with non-shrink mortar;
- Wedges are placed between 2 panels positioned one above the other in order to provide the correct joint thickness between the 2 panels. Under no circumstances (either during installation or commissioning) must this wedge system allow the upper panel to rest on the lower panel(s). The wedges must be removed after the component is fitted;
- Temporarily positioning plates on the pins on the structure and tightening fixing bolts.
- Vertical adjustment using the eye pin/straight threaded rod (before tightening)

Adjust the depth of cladded panels by adjusting intermediate components (spacers, wind anchors, etc.)

The insulation material is finally put back into place (by plugging or filling).

7.2.2 Metal structure

If the suspension hook is fastened to a metal support, all the requirements for a concrete structure apply.

Only the attachment plugs must be replaced by bolts.

The bolts must be determined by calculations conducted by the design office, according to the requirements of Standard NBN EN 1993-1-8.

7.3 Thermal expansion

As the components are suspended in a fully independent manner, the components are able to expand. Similarly, if a component is fastened to another component by a pin, it can be allowed to expand by sliding the pin in the round PVC tube.

8 Performance

8.1 Tensile strength of the hanger system

Initially, tensile tests were conducted

- On a combination of:
 - The "classic" range: the plate and eye pin;
 - The "2.0" range: the plate, straight threaded rod and traction bushing
- On the inserts in prefabricated panels.

The test results were evaluated according to paragraph D.7.2 of Annex D of Standard NBN EN 1990 "Design assisted by testing". The coefficient γ_M is set at 1.25 (according to paragraph 5.1 NBN EN 1993-1-4 ANB). The factor γ_{Rd} is set at 1.25.

As part of the industrial self-monitoring conducted by the manufacturer, a statistical analysis is conducted.

Table 4 – Hanger system types

"Classic" range			
Plate type	Designation	N _{Rd} [kN]	Colour marking
PLS	5	6.75	Black
PLS	8	10.80	Red
PLS	11.5	15.53	Green
PLS	16	21.60	White
PLS, PLD, PLV	22	29.70	Yellow
PLS, PLD, PLV	27	36.45	Blue
PLS, PLD, PLV	34	45.90	Orange
PLS, PLD	56	75.60	Pink
"2.0" range			
Plate type	Designation	N _{Rd} [kN]	Colour marking
PLS	5	6.75	Black
PLS	10	13.50	Red
PLS	15	20.25	Green
PLS, PLD	20	27.00	White
PLS, PLD	25	33.75	Yellow
PLS, PLD,	35	47.25	Blue
PLS, PLD	45	60.75	Orange
PLS, PLD	60	81.00	Pink

8.2 Reaction to fire

The hanger system meets the requirements of fire reaction class A1 according to NBN EN 13501-1.

8.3 Thermal performance of the FIXI3D hanger system

In the evaluation of the thermal insulation of the building, the thermal transmission coefficient U [W/(m².K)] is the reference parameter. This value U is used for the evaluation of the quality of the thermal insulation of the construction components.

Connections between two construction components create thermal weak points in the envelope. In the case of the hanger system, we speak in terms of isolated thermal bridges, in χ [W/K]. They indicate a localised heat loss linked to the presence of an effective conductor (in this case stainless steel components) through an insulation system (succession of concrete/air/insulation layers).

In the case of FIXI3D, three isolated thermal bridges could be distinguished, linked to three types of connection:

- Suspension hooks FIXI3D: χ_{susp}
- Spacers: χ_{spacer}
- Wind anchors: χ_{wind}

These thermal bridges are mainly caused by the contact surface of components on the supporting structure. The hanger system FIXI3D is designed to secure large panels, while minimising contact surfaces with the supporting structure. In this way, by minimising losses caused by isolated attachment devices, satisfactory overall thermal performance can be obtained for the façade.

In order to determine isolated thermal bridge values χ_i , we use the method described in the European standard for the calculation of thermal bridges (NBN EN ISO 10211). For each of the components, we create a 3D model, which includes the component as it is positioned within the different layers that form part of the overall assembly. On this basis, we simulate the thermal characteristics of the assembly under set temperature and external convection conditions. The simulation produces a coefficient L_{3D} known as the thermal coupling.

From these 3D calculations, we have arrived at the following values NBN EN ISO 10211; according to the following formula:

$$\chi_t = L_{3D} - U_{ref} * A$$

With:

- U_{ref} , thermal transmission coefficient for the component 1D (calculated manually)
- A, the surface of the 3D model studied

The results of this calculation depend on the specific properties and conditions in the walls. A few examples of thermal bridge values are shown below. The following values are assumed for this purpose:

Table 5 – Conditions assumed for the wall

Materials	Thickness [m]	Thermal conductivity [W/(m.K)]
Internal concrete	0.16	1.7
Insulation	0.08	0.035
Ventilated air space (Classic range)	0.04	-
Ventilated air space (2.0 range)	0.07	
Cavity (2.0 range)	-	0.2
External concrete panel	0,07, 0,08 ; 0,09 ; 0,10, 0,12 or 0,14	1.7
Stainless steel 316 (1.4401)	-	16.3

The following temperatures and transition resistances are assumed:

Table 6 – Assumed temperatures

h_{int}	h_{ext}	h_{space}	θ_{int}	θ_{ext}
[W/(m ² .K)]	[W/(m ² .K)]	[W/(m ² .K)]	[°C]	[°C]
7.7	25	7.7	20	0

The calculation model surfaces depend on the width of the area of influence and insulated thermal bridge.

Table 7 – Examples of isolated thermal bridge values

Plate type	External panel thickness	χ_{susp}
	[m]	[W/K]
“Classic” range		
PLS 5	0.08	0.0054
PLS 8	0.08	0.0061
PLS 11	0.08	0.0074
PLS 16	0.09	0.0084
PLS 22	0.09	0.0099
PLS 27	0.10	0.0112
PLS 34	0.10	0.0124
PLS 56	0.14	0.0213
“2.0” range		
PLS 5	0.07	0.0054
PLS 10	0.07	0.0074
PLS 15	0.08	0.0084
PLS 20	0.08	0.0099
PLS 25	0.10	0.0112
PLS 35	0.10	0.0124
PLS 45	0.12	0.0213
PLS 60	0.12	0.0213
Spacer type	External panel thickness	χ_{spacer}
	[m]	[W/K]
04M031-20-y	0.10	0.0291
Wind anchor type	External panel thickness	χ_{wind}
	[m]	[W/K]
04IM070-17	0.10	0.0218

Use of set χ_i values

Based on these values, it is possible to calculate the overall U value, while including all components (the wall and anchors).

For this purpose, the following formula is used:

$$U = U_{ref} + \Delta U$$

with:

$$\Delta U = \frac{n_{susp} * \chi_{susp} + n_{spacer} * \chi_{spacer} + n_{wind} * \chi_{wind}}{A_{panel}}$$

in which $n_{element}$ is the number of each component: suspension hook, spacer or wind anchor, $\chi_{element}$ is the isolated thermal transmission coefficient of the component, A_{panel} is the surface of the panel secured by means of attachment devices.

The ratio $\frac{\Delta U}{U}$ therefore indicates the proportion of heat losses caused by the anchors.

9 References

NBN A 24-302:1986 – Steel for reinforcement - Steel bars and hot rolled wire

NBN B 21-612:2021 – Precast concrete products - Wall elements - National application document to NBN EN 14992+A1:2012

NBN EN 1990:2002 + NBN EN 1990:2002/A1:2005 + NBN EN 1990:2002/A1:2005/AC:2010 – Eurocode - Basis of structural design

NBN EN 1991-1-4 ANB:2010 – Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions - National annex

NBN EN 1992-1-1:2005 - Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings (+AC:2010, +A1:2015, + ANB:2010)

NBN EN 1993-1-4 ANB:2011 – Eurocode 3 - Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels - National annex

NBN EN 1993-1-8:2005 – Eurocode 3 - Design of steel structures - Part 1-8: Design of joints - National annex (+AC:2009, + ANB:2010)

NBN EN 10088-: 2014-- 1: Stainless steels - Part 1: List of stainless steels

NBN EN 13501-1:2019 – Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

NBN EN 14992+A1:2012 – Precast concrete products. Wall elements

NBN EN ISO 4032:2013 – Hexagon regular nuts (style 1) - Product grades A and B

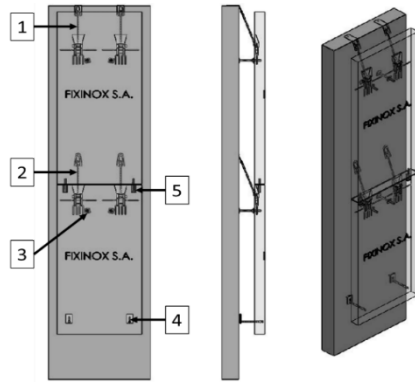
NBN EN ISO 10211:2017 – Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations

10 Conditions

- A.** This technical approval refers exclusively to the system mentioned on the cover page of the technical approval.
- B.** Only the approval holder and, if applicable, the distributor may assert rights based on the technical approval.
- C.** The approval holder and, if applicable, the distributor are not permitted, in any way, to use the name of the UBAtc, its logo, the technical approval mark, the technical approval or the approval number to demand the evaluation of products that fail to comply with the technical approval or products, equipment or systems, including their properties or characteristics, which do not form the object of the technical approval.
- D.** Information provided in any way by the approval holder, distributor or an approved contractor or by their representatives for (potential) users of the system, which is described in the technical approval (e.g. for clients, contractors, architects, consultants, designers, etc.) must not be incomplete or contradict the content of the technical approval or information listed in the technical approval.
- E.** The approval holder is bound at all times to provide UBAtc, the approval operator and the certification operator with prompt or prior notification of any adjustments made to primary materials and products, installation instructions and/or the manufacturing, installation and equipment process. According to the information communicated, the UBAtc, the approval operator and the certification operator will judge whether it is necessary to adjust the technical approval.
- F.** The technical approval is based on the available knowledge and technical/scientific information, together with information provided by the applicant and complemented by an approval inspection, which takes account of the specific nature of the system. However, users remain responsible for selecting the system, as described in the technical approval, for the specific use intended by the user.
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- I.** The UBAtc, the approval operator and the certification operator cannot be held responsible for any damage or adverse consequences suffered by third parties (e.g. the user) that result from the failure of the approval holder or distributor to respect the provisions of Article 10.

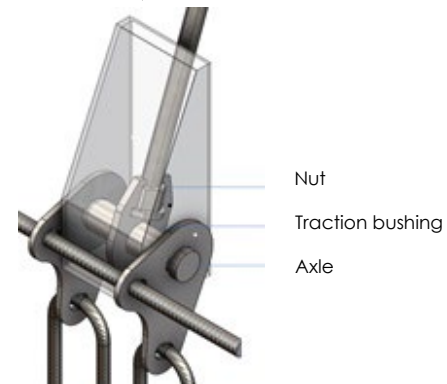
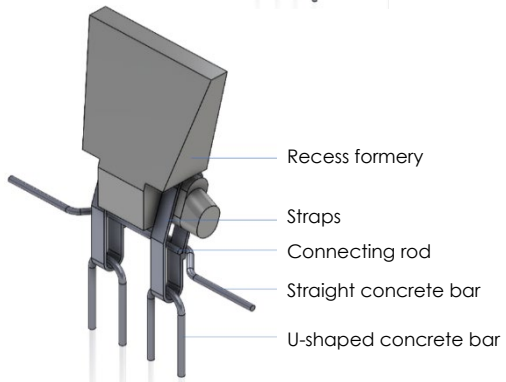
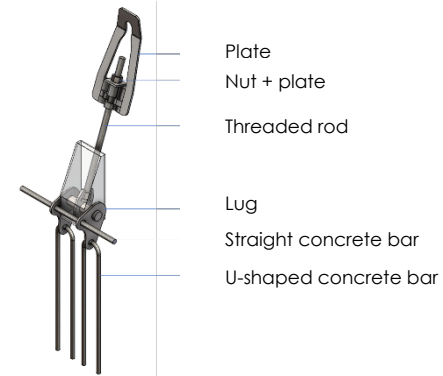
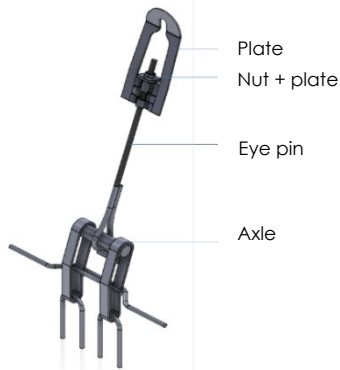
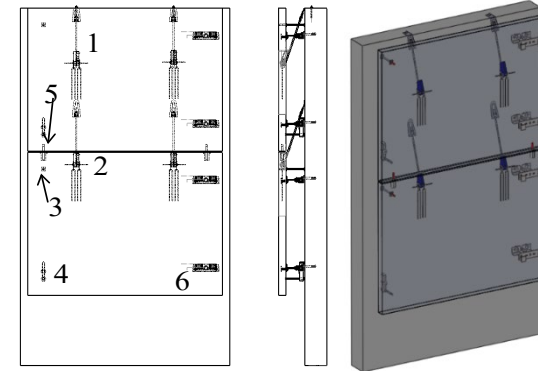
Annex 1: General overview of FIXI3D suspension hook system

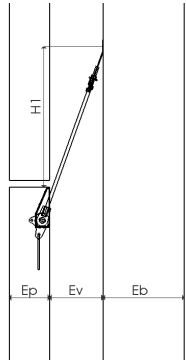
"Classic" range



1. Attika suspension hooks
2. Single suspension hooks
3. Spacers
4. Wind anchors
5. Pins
6. Earthquake protection (not shown in this ATG)

"2.0" range





Colour	External dimensions							
	"Classic" range				"2.0" range			
	Designation	$E_{b_{min}}$ [mm]	$E_{v_{min}}$ [mm]	$E_{p_{min}}$ [mm]	Designation	$E_{b_{min}}$ [mm]	$E_{v_{min}}$ [mm]	$E_{p_{min}}$ [mm]
Black	5	100	60	70	5	100	60	70
Red	8	100	60	70	10	100	60	70
Green	11	120	60	80	15	140	60	80
White	16	140	80	90	20	140	80	80
Yellow	22	140	80	90	25	170	80	100
Blue	27	170	80	100	35	220	80	100
Orange	34	200	80	100	45	220	80	120
Pink	56	220	90	140	60	220	90	120

The value $E_{v_{min}}$ is the minimum value for the cavity. The value $E_{b_{min}}$ is the minimum value for the thickness of the concrete wall, for which a pin exists, including pins marketed by Fixinox S.A. The value $E_{p_{min}}$ is the minimum value for the thickness of the precast cladding panel.

"Classic range" – Length of the eye pin and vertical distance insert/anchor H1 in function of the cavity (Ev) – angle of 20°

Designation	Type	Length of the eye pin in function of the cavity (Ev) – angle de 20°														
		Ev [mm]														
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
5	PLS	216	245	274	303	333	362	391	420	450	479	508	537	567	596	625
8	PLS	218	248	277	306	335	364	394	423	452	481	511	540	569	598	628
11,5	PLS	213	242	271	301	330	359	388	417	447	476	505	534	564	593	622
16	PLS	-	-	271	300	329	359	388	427	446	476	505	534	563	593	622
22	PLS	-	-	265	294	323	353	382	411	440	470	499	528	557	586	616
22	PLD	-	-	288	317	346	376	405	434	463	493	522	551	580	609	639
22	PLV	-	-	-	-	-	315	344	374	403	432	461	491	520	549	578
27	PLS	-	-	272	301	331	360	389	418	448	477	506	535	565	594	623
27	PLD	-	-	291	320	350	379	408	437	467	496	525	554	584	613	642
27	PLV	-	-	-	-	-	318	348	377	406	435	465	494	520	552	582
34	PLS	-	-	296	325	355	384	413	442	472	501	530	559	589	618	647
34	PLD	-	-	311	340	370	399	428	457	487	516	545	574	604	633	662
34	PLV	-	-	-	-	-	338	368	397	426	455	485	514	543	572	602
56	PLS	-	-	-	336	365	394	424	453	482	511	541	570	599	628	658
56	PLD	-	-	-	335	365	394	423	452	482	511	540	569	599	628	657

Designation	Type	Vertical distance insert/anchor H1 in function of the cavity (Ev)														
		Ev [mm]														
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
5	PLS	99	126	153	181	208	236	263	291	318	346	373	401	428	456	483
8	PLS	99	126	153	181	208	236	263	291	318	346	373	401	428	456	483
11,5	PLS	97	124	151	179	206	234	261	289	316	344	371	399	426	454	481
16	PLS	-	-	153	181	208	236	263	291	318	346	373	401	428	455	483
22	PLS	-	-	153	181	208	236	263	291	318	346	373	401	428	455	483
22	PLD	-	-	177	204	232	259	287	314	342	369	397	424	451	479	506
22	PLV	-	-	-	-	-	257	285	312	340	367	395	422	449	477	504
27	PLS	-	-	153	180	208	235	263	290	318	345	373	400	427	455	482
27	PLD	-	-	177	204	232	259	287	314	342	369	397	424	451	479	506
27	PLV	-	-	-	-	-	257	285	312	340	367	395	422	449	477	504
34	PLS	-	-	163	190	218	245	273	300	328	355	383	410	438	465	493
34	PLD	-	-	190	218	245	273	300	328	355	383	410	438	465	493	520
34	PLV	-	-	-	-	-	271	298	326	353	381	408	436	463	491	518
56	PLS	-	-	-	207	234	262	289	317	344	372	399	427	454	482	509
56	PLD	-	-	-	218	245	273	300	328	355	383	410	438	465	493	520

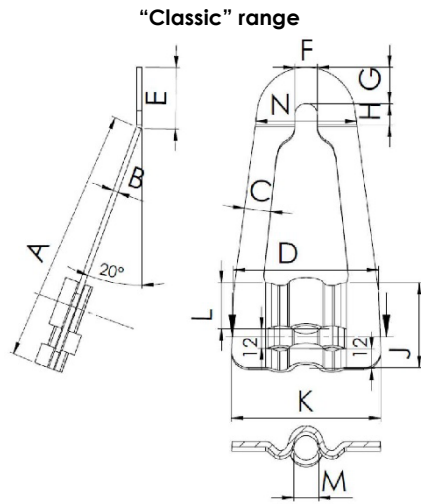
"2.0 range" – Length of the threaded rod and vertical distance insert/anchor H1 in function of the cavity (Ev) – angle of 20°

Designation	Type	Length of the threaded rod in function of the cavity (Ev) – angle of 20°																								
		Ev [mm]																								
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
5	PLS	192	221	250	280	309	338	367	397	426	455	484	514	543	572	601	631	660	689	718	748	777	806	835	864	894
10	PLS	175	204	233	262	292	321	350	379	409	438	467	496	526	555	584	613	643	672	701	730	759	789	818	847	876
15	PLS	176	205	234	264	293	322	351	381	410	439	468	498	527	556	585	614	644	673	702	731	761	790	819	848	878
20	PLS	-	-	220	249	278	307	337	366	395	424	454	483	512	541	570	600	629	658	687	717	746	775	804	834	863
25	PLS	-	-	240	270	299	328	357	387	416	445	474	504	533	562	591	621	650	679	708	738	767	796	825	854	884
35	PLS	-	-	248	278	307	336	365	395	424	453	482	511	541	570	599	628	658	687	716	745	775	804	833	862	892
45	PLS	-	-	281	311	340	369	398	427	457	486	515	544	574	603	632	661	691	720	749	778	808	837	866	895	925
60	PLS	-	-	-	310	340	369	398	427	456	486	515	544	573	603	632	661	690	720	749	778	807	837	866	895	924

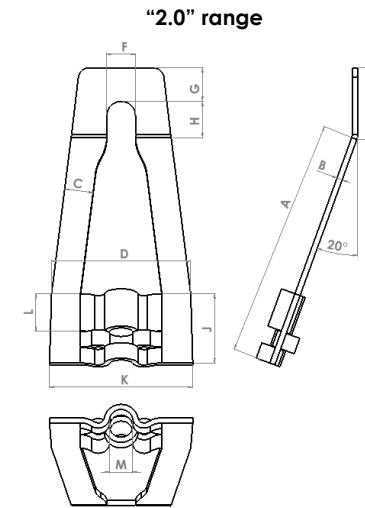
Designation	Type	Vertical distance insert/anchor H1 in function of the cavity (Ev) – angle of 20°																								
		Ev [mm]																								
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
5	PLS	138	165	193	220	248	275	303	330	357	385	412	440	467	495	522	550	577	605	632	660	687	715	742	770	797
10	PLS	135	163	190	218	245	273	300	328	355	383	410	437	465	492	520	547	575	602	630	657	685	712	740	767	795
15	PLS	131	158	186	213	241	268	296	323	351	378	406	433	460	488	515	543	570	598	625	653	680	708	735	763	790
20	PLS	-	-	187	214	242	269	297	324	352	379	407	434	461	489	516	544	571	599	626	654	681	709	736	764	791
25	PLS	-	-	161	188	215	243	270	298	325	353	380	408	435	463	490	518	545	573	600	628	655	683	710	738	765
35	PLS	-	-	160	187	215	242	270	297	325	352	380	407	435	462	490	517	545	572	600	627	655	682	709	737	764
45	PLS	-	-	186	214	241	269	296	324	351	378	406	433	461	488	516	543	571	598	626	653	681	708	736	763	791
60	PLS	-	-	-	213	240	268	295	323	350	377	405	432	460	487	515	542	570	597	625	652	680	707	735	762	790

Annex 2: the plate

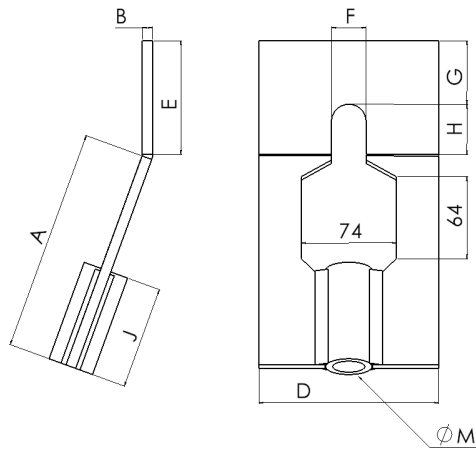
1. Single plate (PLS)



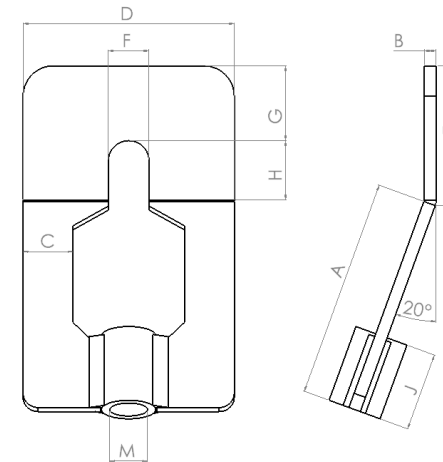
Single plate for classes 5.0 - 34.0 kN



Single plate for classes 5.0 - 35.0 kN



Single plate for class 56.0 kN

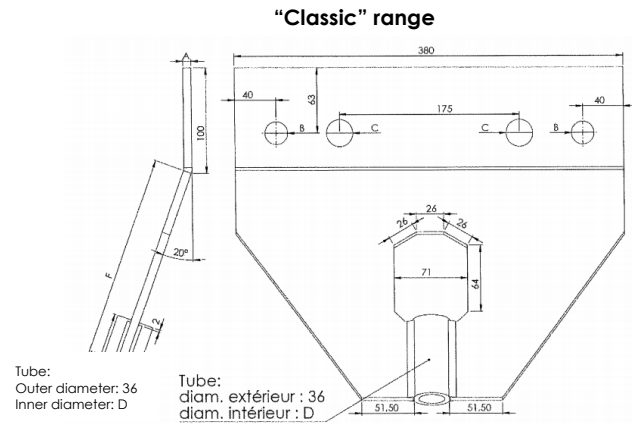


Single plate for classes 45,0 and 60,0 kN

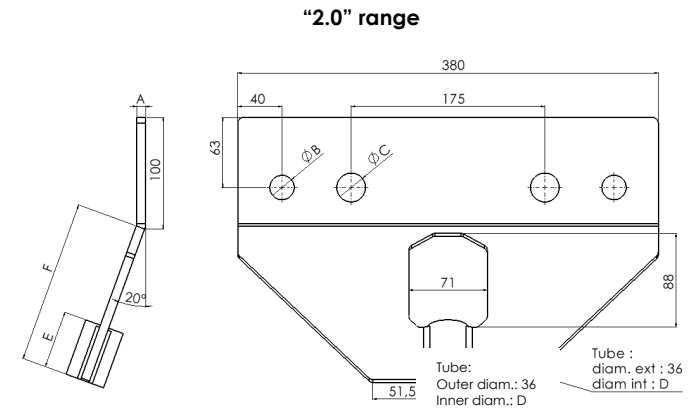
Designation	Colour	Single plate dimensions [mm]													Recess former dimensions [mm]	
		"Classic" range													Height	Width
		A	B	C	D	E	F	G	H	J	K	L	M	N		
5	Black	126	2	15	70	34	13	15	19	46	70	20	9	63	152	70
8	Red	125	2	15	70	35	13	15	19	46	69	20	10	63	152	70
11	Green	144	3	15	78	39	13	21	18	47	78	21	13	60	176	79
16	White	159	4	18	92	42	17	22	21	50	92	24	14	64	193	95
22	Yellow	179	4	18	94	44	17	22	22	53	94	26	17	63	214	95
27	Blue	177	4	22	105	47	21	24	23	57	107	30	19	72	214	105
34	Orange	182	4	24	112	56	21	35	21	71	111	44	21	93	229	109
56	Pink	176	8	-	140	90	25	50	39	80	-	-	24	-	254	140
Designation	Colour	"2.0" range													Height	Width
5	Black	125	2	15	71	34	13	15	19	45	71	20	13	-		
10	Red	145	3	15	77	38	13	21	16	47	80	21	16	-	171	85.5
15	Green	158	4	18	93	45	17	22	24	50	94	24	16	-	189	95
20	White	175	4	18	97	47	17	22	25	52	98	26	16	-	210	95
25	Yellow	171	4	21	105	54	21	24	30	57	107	30	21	-	217	105
35	Blue	176	4	27	116	63	25	33	31	70	117	13 ^(*)	18	-	227	109
45	Orange	135	6	33	140	91	27	47	44	42	-	-	24	-	218	140
60	Pink	145	8	33	140	90	27	48	43	53	-	-	24	-	228	140

(*) 5 series of bends

2. Double straight plate (PLD)



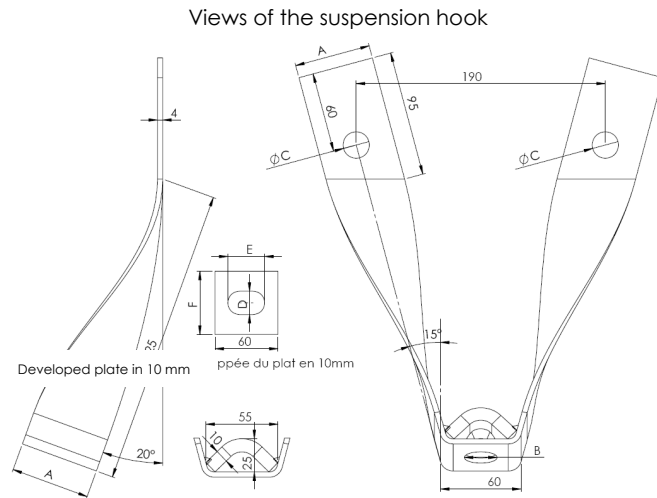
Single plate for classes 22.0 - 56.0 kN



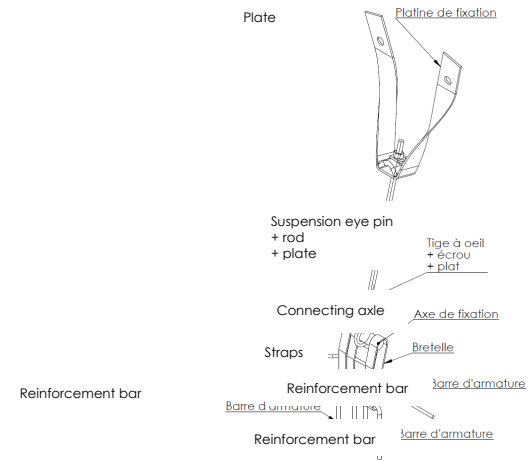
Single plate for classes 20.0 - 60.0 kN

Designation	Colour	Double plate dimensions [mm]						Recess former dimensions [mm]	
		"Classic" range						Height	Width
		A	B	C	D	E	F		
22	Yellow	6	14	22	20	70	165	256	380
27	Blue	6	18	22	20	70	165	256	380
34	Orange	6	18	22	24	70	165	256	380
56	Pink	8	22	26	24	80	175	331	380
Designation	Colour	"2.0" range						Height	Width
20	White	6	14	22	20	42	137	232	380
25	Yellow	6	18	22	20	42	137	232	380
35	Blue	6	18	22	20	42	137	232	380
45	Orange	8	22	26	24	42	137	235	380
60	Pink	8	22	26	24	52	147	245	380

3. Double twisted plate (PLV) for classes 22.0kN, 27.0kN, 34.0kN of the “Classic” range



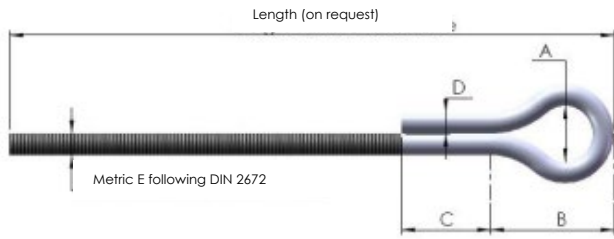
Perspective of the suspension hook



Class [kN]	Colour	Double twisted plate dimensions [mm]						Recess former dimensions [mm]	
		“Classic” range						Height	Width
		A	B	C	D	E	F		
22	Yellow	50	18	14	18	30	165	307	270
27	Blue	50	20	18	20	33	165	307	270
34	Orange	60	25	18	22	35	165	307	270

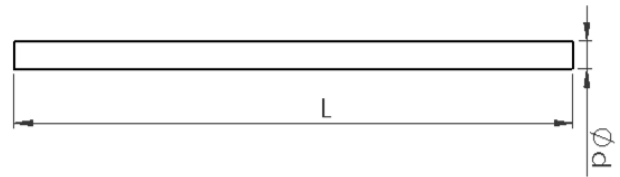
Annex 3: The suspension eye pin and the square plate

“Classic” range



Eye pin

“2.0” range

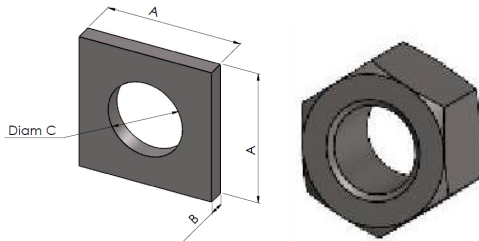


Straight threaded rod

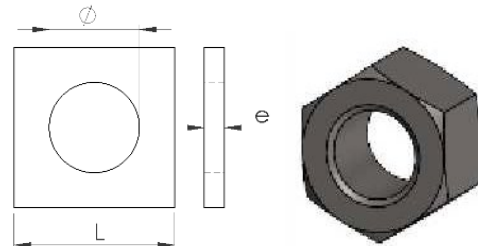
Designation	Colour	Rod dimensions [mm]				
		A	B	C	D	E
5	Black	22	67	> 20	7.1	8
8	Red	22	52	> 20	8.9	10
11	Green	28	57	> 30	10.6	12
16	White	30	70	> 30	12.5	14
22	Yellow	34	73	> 40	14.6	16
27	Blue	36	82	> 40	16.1	18
34	Orange	38	87	> 40	18.2	20
56	Pink	38	87	> 40	18.2	20

Designation	Colour	Rod dimensions [mm]	
		Diameter p	Length L
5	Black	8	Variable according to the gap length, plate type and suspension hook angle
10	Red	10	
15	Green	12	
20	White	12	
25	Yellow	16	
35	Blue	16	
45	Orange	20	
60	Pink	20	

Note: The total length of the suspension rod depends on the selected suspension hook, cavity and plate type.



Square plate and accessory



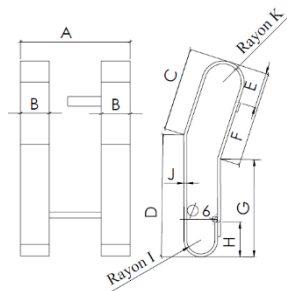
Square plate and accessory

Designation	Colour	Square plate dimensions [mm]			
		A	B	C	Nut
5	Black	24	4	8.5	M8
8	Red	24	4	10.5	M10
11	Green	24	4	12.5	M12
16	White	32	4	15	M14
22	Yellow	32	4	18	M16
27	Blue	32	4	18	M18
34	Orange	34	5	22	M20
56	Pink	34	5	22	M20

Designation	Colour	Square plate dimensions [mm]			
		L	e	Φ	Nut
5	Black	24	4	8.5	M8
10	Red	24	4	10.5	M10
15	Green	24	4	12.5	M12
20	White	24	4	12.5	M12
25	Yellow	32	4	18	M16
35	Blue	32	4	18	M16
45	Orange	34	5	22	M20
60	Pink	34	5	22	M20

Annex 4: the insert

1. Straps with polystyrene recess former and connecting axle ("Classic" range)



View of straps

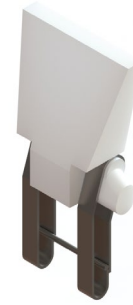
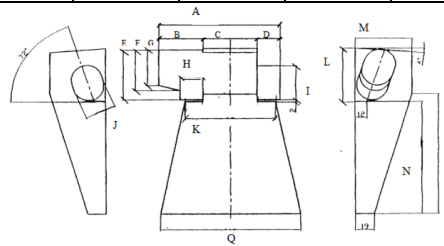


Photo of straps

Designation	Colour	Strap dimensions [mm]										
		A	B	C	D	E	F	G	H	I	J	K
5	Black	85	15	64	70	24	81	49	34	9	3	13
8	Red	85	15	64	70	24	81	49	34	9	3	13
11	Green	95	20	63	105	28	83	79	30	9	3	13
16	White	97	20	88	95	29	118	56	31	9	3	17
22	Yellow	97	20	88	95	29	118	56	31	9	3	17
27	Blue	103	25	89	103	37	102	84	43	14	3	17
34	Orange	112	30	83	127	41	127	76	37	14	3	19
56	Pink	112	30	89	127	40	128	80	47	13	5	19

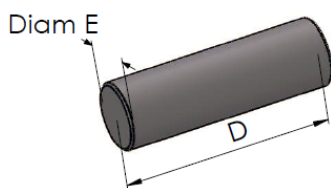


Tolérance sur les cotes : +0.0 / -1.0

View of recess component

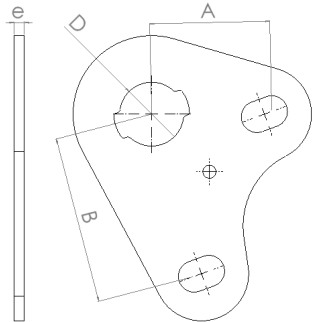
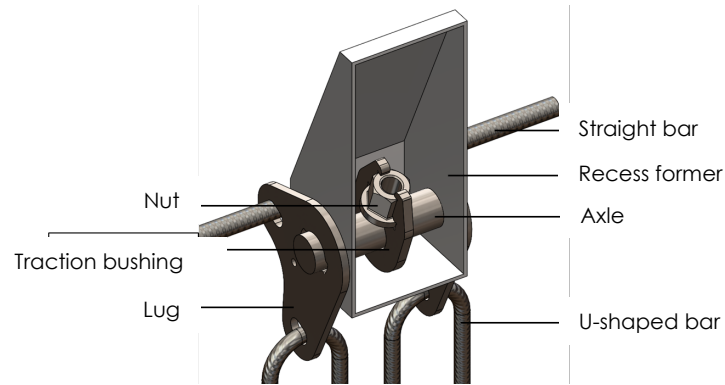
Designation	Colour	Cavity dimensions [mm]															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q
5	Black	119	44	54	21	50	40	32	24	30	25	95	55	54	120	128	144
8	Red	119	44	54	21	50	40	32	24	30	25	95	55	54	120	128	144
11	Green	119	44	54	21	50	40	32	24	30	25	95	55	54	120	128	144
16	White	125	44	57	24	55	45	39	24	38	32	95	59	60	120	128	146
22	Yellow	125	44	57	24	55	45	39	24	38	32	95	59	60	120	128	146
27	Blue	131	51	52	28	81	68	60	28	40	34	110	86	60	117	130	150
34	Orange	150	66	52	32	78	68	60	32	49	37	110	86	60	117	130	150
56	Pink	150	66	52	32	78	68	60	32	49	37	110	86	60	117	130	150

Note: The 2 straps and polystyrene recess former form the insert. This insert is accompanied by the connecting axle.

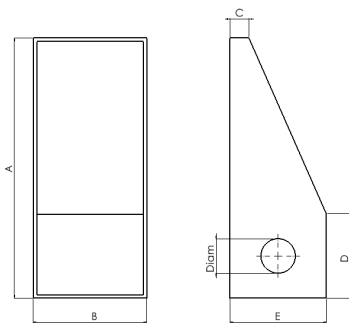


Designation	Colour	Connecting axle dimensions [mm]	
		D	E
5	Black	20	8
8	Red	20	10
11	Green	24	12
16	White	26	14
22	Yellow	30	16
27	Blue	32	18
34	Orange	36	20
56	Pink	36 (duplex)	20

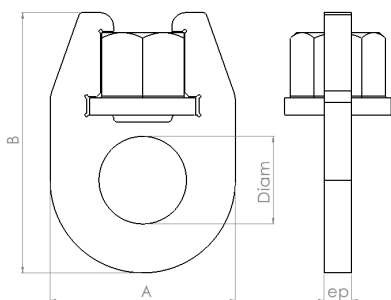
2. Lugs with plastic recess former, traction bushing and axle ("2.0" range)



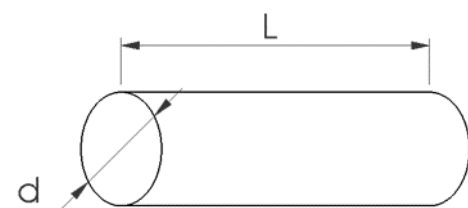
Designation	Colour	Lug dimensions [mm]			
		A	B	D	e
5	Black	35	53	16.2	2
10	Red	35	53	16.2	3
15	Green	40.5	58	20.3	3
20	White	40.5	58	20.3	4
25	Yellow	46	64	24.4	4
35	Blue	46	64	24.4	5
45	Orange	54.5	72	30.5	6
60	Pink	54.5	72	30.5	8



Designation	Colour	Box size	Recess former dimensions [mm]					Diam.
			A	B	C	D	E	
5	Black	1	127	64	11	43	48	16
10	Red							
15	Green	2	151	66	11	49	56	20
20	White							
25	Yellow	3	195	72	11	58	64	24
35	Blue							
45	Orange	4	206	79	11	68	76	30
60	Pink							



Designation	Colour	Traction bushing dimensions [mm]				
		A	B	Diam	Thickness	Nut
5	Black	36	48	17.5	3	M8
10	Red	37	52	17.5	4	M10
15	Green	44	61.1	21.5	5	M12
20	White	44	61.1	21.5	6	M12
25	Yellow	54	75.8	25.5	6	M16
35	Blue	54	75.8	25.5	8	M16
45	Orange	64	91.8	31.5	8	M20
60	Pink	64	91.8	31.5	10	M20

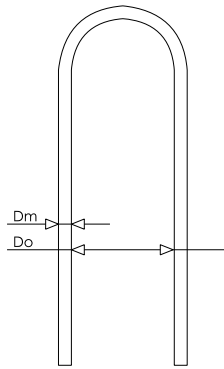


Designation	Colour	Connecting axle dimensions [mm]	
		L	d
5	Black	79	16
10	Red	79	16
15	Green	85	20
20	White	85	20
25	Yellow	97	24
35	Blue	97	24
45	Orange	114	30
60	Pink	114	30

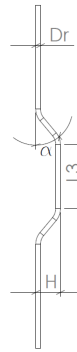
Annex 5: Reinforcement bars

1. Reinforcement bars for the “Classic” range

View of anchor frames



View of reinforcement frame



Total length L1 (prior to bending)

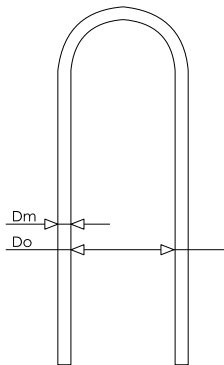
Designation	Colour	Frame dimensions [mm]			Quantity
		L1	Do	Dm	
5	Black	200	30	6	2
8	Red	250	30	6	
11	Green	280	40	8	
16	White	360	50	10	
22	Yellow	400	50	10	
27	Blue	460	50	10	
34	Orange	470	60	12	
56	Pink	800	60	12	

Total length L2

Designation	Colour	Frame dimensions [mm]				Angle [°]	Quantity
		L2	Dr	L3	H		
5	Black	300	6	88	30	45	1
8	Red	345	6	89	30	45	
11	Green	450	6	97	30	45	
16	White	450	6	95	40	45	2
22	Yellow	570	6	105	40	45	
27	Blue	520	8	112	50	45	
34	Orange	630	8	124	50	45	
56	Pink	900	8	124	80	60	

2. Reinforcement bars for the “2.0” range

View of anchor frames



View of reinforcement frame



Total length L1 (prior to bending)

Designation	Colour	Frame dimensions [mm]			Quantity
		L1	Do	Dm	
5	Black	460	24	6	2 (*)
10	Red	520	24	6	
15	Green	630	32	8	
20	White	730	32	8	
25	Yellow	835	40	10	4
35	Blue	935	40	10	
45	Orange	1040	48	12	
60	Pink	1140	48	12	

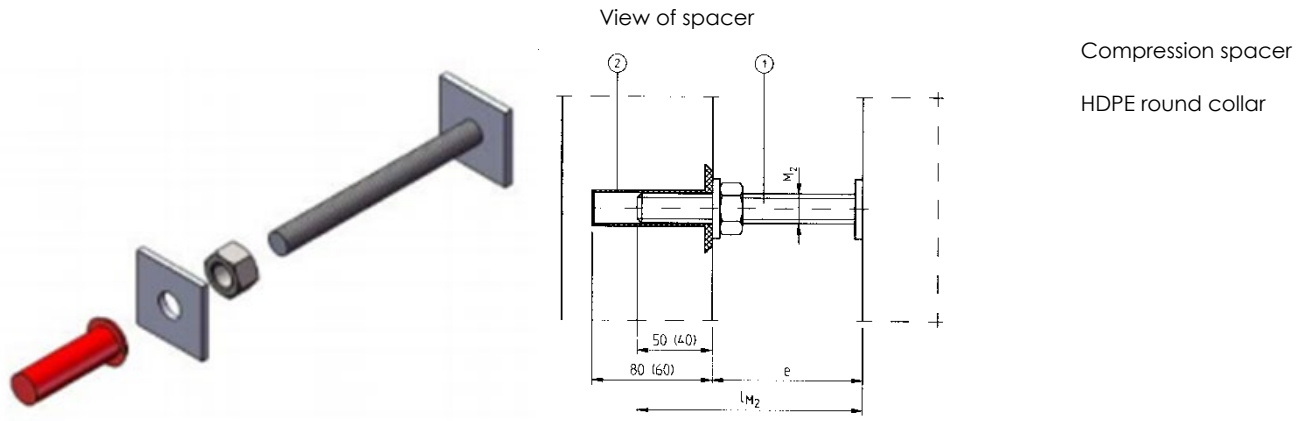
Total length L

Designation	Colour	Frame dimensions [mm]		Quantity
		L	D	
5	Black	200	8	1 (*)
10	Red	250	8	
15	Green	250	10	
20	White	300	10	
25	Yellow	-	-	
35	Blue	-	-	
45	Orange	-	-	
60	Pink	-	-	-

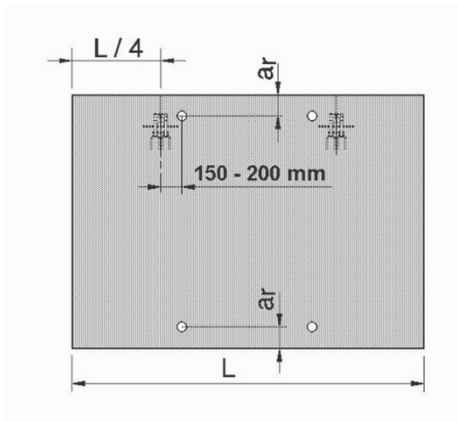
(*) It is possible to replace the right frame with two U-shaped frames if they are only a short distance from the edge.

(*) It is possible to replace the right frame with two U-shaped frames if they are only a short distance from the edge.

Annex 6 : The spacer:



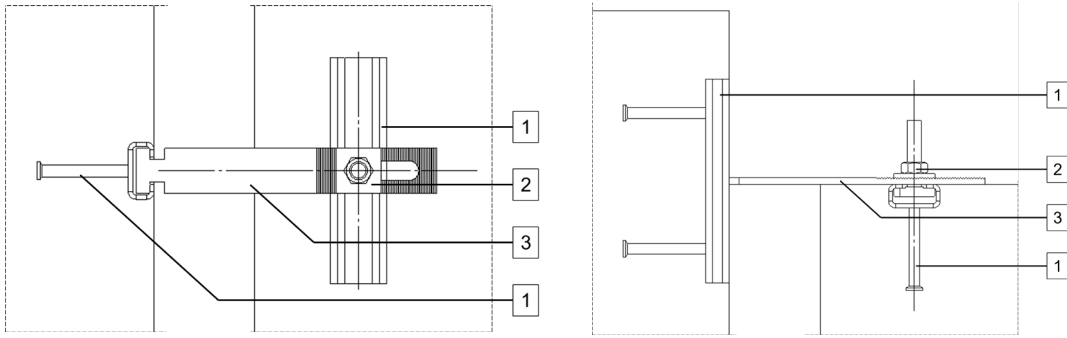
The dimensions and arrangement of the spacers is shown below:



The permissible loads for the spacer and minimum distance (a_r) must be provided by the manufacturer.

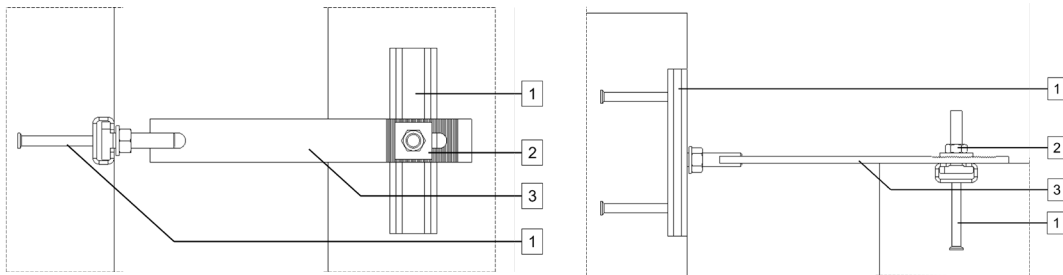
Annex 7: The wind anchor

Edge wind anchor with flat connection and T-head



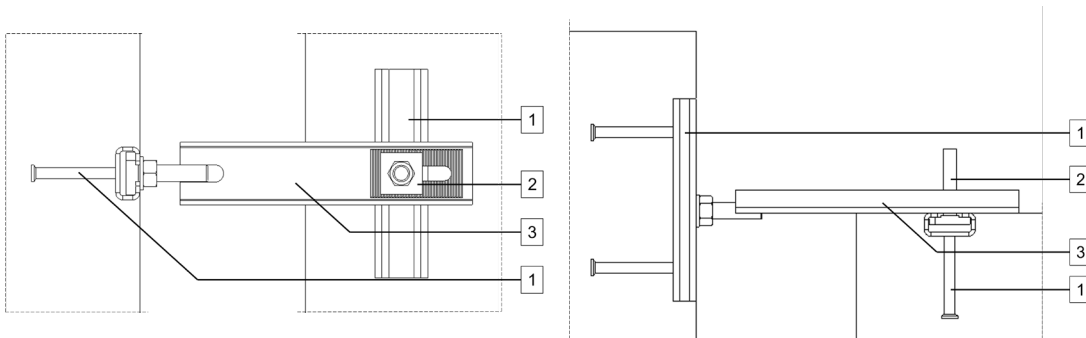
- 1: Rail
- 2: Hammer head bolt + serrated plate
- 3: Notched wind anchor with hammer head

Edge wind anchor with flat connection and welded hammer head bolt



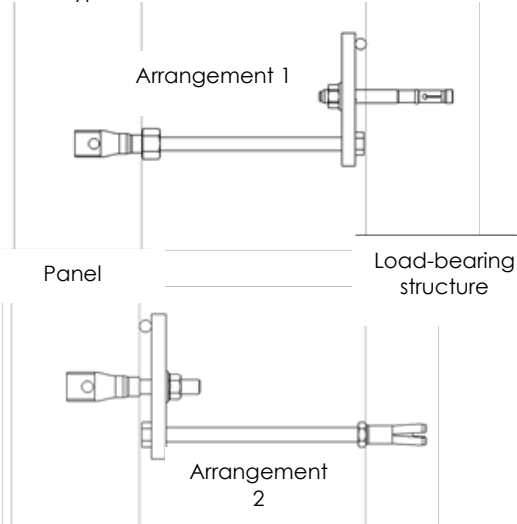
- 1: Rail
- 2: Hammer head bolt + serrated plate
- 3: Serrated wind anchor + welded hammer head bolt

Edge wind anchor with U-section and welded hammer head bolt

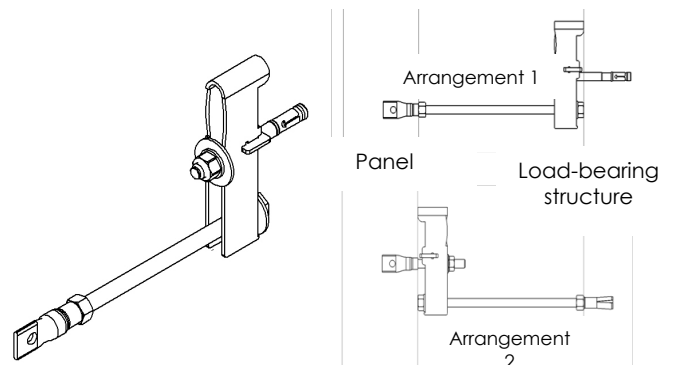


- 1: Rail
- 2: Hammer head bolt + serrated plate
- 3: Serrated wind anchor with U-section + welded hammer head bolt

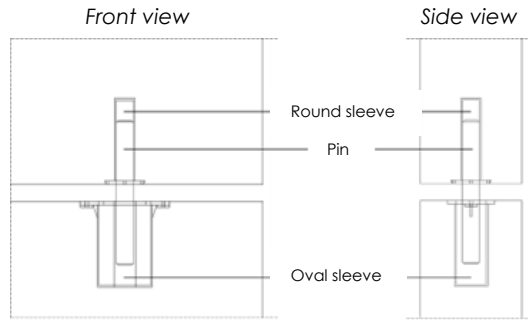
"Plate + rod" type wind anchor



"Open" wind anchor

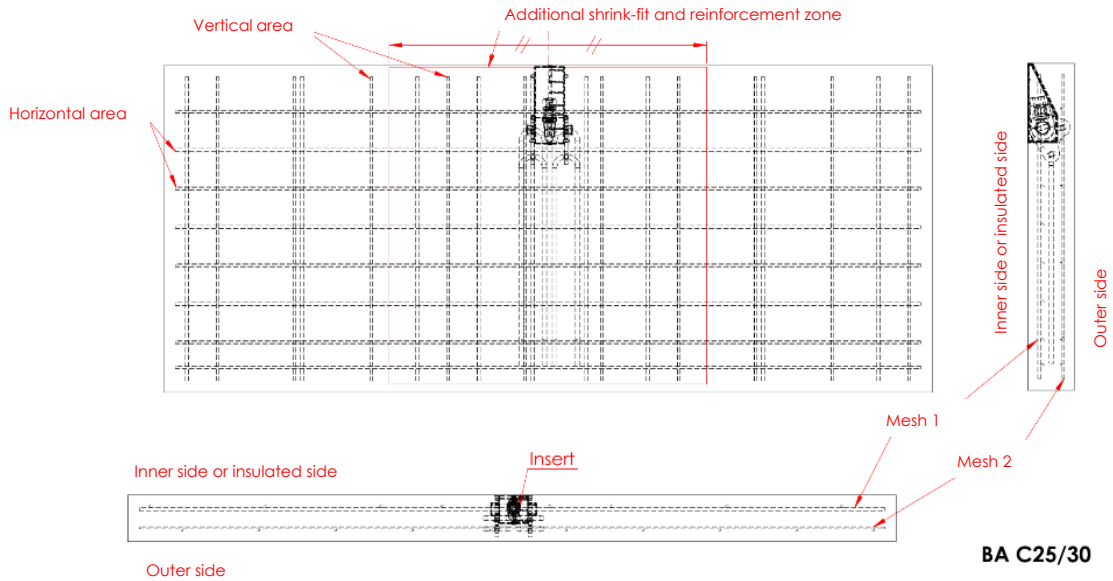


Annex 8: Pin



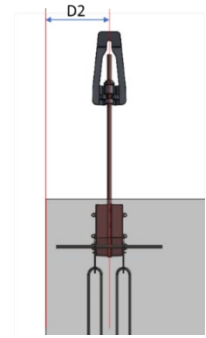
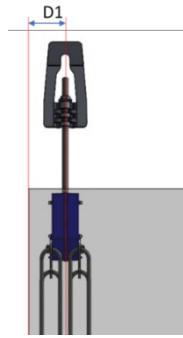
Annex 9 : Reinforcement ("2.0 range") and additional reinforcement for types 25, 35, 45 and 60

Designation	Mesh over the entire surface of the panel					Reinforcement in the shrink-fit area (inside only)		Total reinforced area [cm ² /m]
	Mesh	Direction	Minimum area (cm ² /m)	Diameter [mm]	Spacing [mm]	Area [m x m]	Additional area [cm ² /m]	
5 and 10	1	horiz./vert.	1,42	6	200	-	-	1,42
	2	-	-	-	-	-	-	-
15 and 20	1	horiz./vert.	1,42	6	200	-	-	1,42
	2	-	-	-	-	-	-	-
25 and 35	1	horizontal	2,50	8	200	0,85 x 0,85	2,50	5
		vertical	2,50	8	200		-	2,50
	2	-	-	-	-	-	-	-
45 and 60	1	horizontal	2,50	8	200	1,00 x 1,00	2,5	5
		vertical	2,50	8	200		-	2,50
	2	horizontal	1,42	6	200	-	-	1,42
		vertical	1,42	6	200		-	1,42



Annex 10 : Minimum distances from the middle of the insert to the edge of the panel

Designation	Colour marking	Minimum distance	
		D1 [mm]	D2 [mm]
5	Black	76	125
10	Red	76,5	150
15	Green	83,5	150
20	White	84	175
25	Yellow	93	-
35	Blue	93,5	-
45	Orange	103,5	-
60	Pink	104,5	-



This technical approval has been published by UBAtc, under the responsibility of the approval operator BCCA, and based on favourable feedback from the specialist "MAIN WORKS AND CONSTRUCTION SYSTEMS" group, issued on June 21st 2022.

In addition, the BCCA certification operator has confirmed that the production process meets the conditions for certification and that a certification agreement was signed by the technical approval holder.

Date of issue: 8th August 2023.

This ATG replaces ATG 2630, valid from 21/10/2022 to 20/10/2027. The modifications compared with previous version are summarised below:

Modifications compared with the previous version

Minor editorial corrections.

Correction in Annex 2 – metric F for plates 34 and 56 ("classic range") and plates 25 and 35 ("2.0 range").

Correction in Annex 5 – parameter Dm for hanger system type 20 ("2.0 range"), L and D for all hanger system types ("2.0 range").

Addition of the length of the eye pin / threaded rod and vertical distance insert/anchor H1 in function of the cavity (Ev).

Addition of details regarding the reinforcement ("2.0 range") and additional reinforcement for types 25, 35, 45 and 60.

Addition of minimum distances from the middle of the insert to the edge of the panel.

For UBAtc, declaration of the validity of the approval process

For the approval and certification operator



Eric Winnepeninckx,
Secretary general



Benny De Blaere,
Director



Olivier Delbrouck,
Managing director

This technical approval shall remain valid, provided the system, its manufacture and all processes that are appropriate for this purpose:

- are maintained, in order to achieve, as a minimum, the inspection results defined in the approval document;
- are continuously monitored by the certification operator, which confirms that the certification continues to be valid;

If these conditions are no longer met, the technical approval shall be suspended or withdrawn and the approval document shall be deleted from the UBAtc website. The technical approvals are regularly updated. It is recommended that you always use the version published on the UBAtc website (www.butgb-ubadc.be).

The most recent version of the technical approval can be consulted using this QR code.



UBAtc asbl has been notified by the FPS Economy within the framework of Regulation (EU) 305/2011. Certification bodies designated by UBAtc asbl operate in compliance with a system that is set to be accredited by BELAC (www.belac.be).

UBAtc asbl is an accredited body and member of:

