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European Technical Assessment

**ETA 16/0475
of 18/06/2021**

I General Part

**Technical Assessment Body issuing the
ETA and designated according to Article
29 of the Regulation (EU) No 305/2011:
Trade name of the construction product**

Technical and Test Institute for Construction
Prague

**Product family to which the construction
product belongs**

**MCT Brattberg multi cable and pipe
transit type modular systems
RGG; RGB**

Holder of the assessment

**Fire stopping modular cable and pipe
penetration sealing system**

**MCT BRATTBERG AB
Lyckeåborg
37192 Karlskrona
Sweden**

Manufacturing plant

**MCT BRATTBERG AB
Lyckeåborg
37192 Karlskrona
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**This European Technical Assessment
including 4 annexes contains**

27 pages

**This European Technical Assessment is
issued in accordance with regulation
(EU) No 305/2011, on the basis of**

European assessment document (EAD)
No. 350454-00-1104
Fire stopping and fire sealing products
Penetration seals

This version replaces

ETA 16/0475 of 09/02/2018

Note:

*On the basis of the manufacturer's request,
the ETA 16/0475 is extended by RGB
modular system (identical system without
holes for drilling) covered by ETA 16/0476
26/07/2017. The ETA 16/0476 will be
cancelled. Furthermore, the use of products
for extended for pipes on the basis of
submitted classification reports.*

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II Specific part

1 Technical description of the product (definition of the product)

This European technical assessment applies to the fire stopping modular multi cable penetration sealing system with designation MCT Brattberg multi cable and pipe transit type modular systems RGG and RGB.



Figure 1: MCT Brattberg multi cable transit type modular system

The system consists of a frame, rubber blocks and a compression unit.

The frame is casted or bolted to a structure and packed with rubber blocks suited to each cable dimension.

The standard frame is made of an angle bar 60x60x6 mm in mild steel, stainless steel or aluminium.

The mild steel frames are supplied with two types of surface finish, primer or galvanized. The internal width is always (120.5 ± 0.5) mm.

All the frames can be manufactured in combinations.

Frame types:

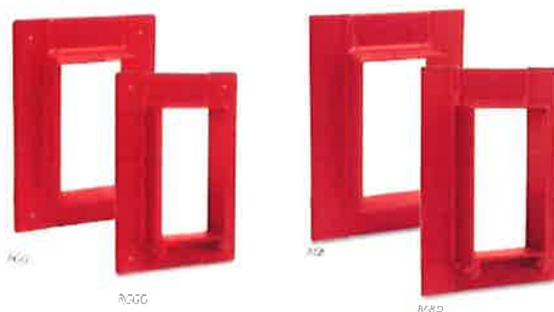


Figure 2: Frames RGG, RGGO and RGB, RGBO.

a) RGG:

-variations: RGG-1;RGG-2; RGG-3; RGG-4; RGG-5; RGG-6; RGG-7; RGG-8; RGG-180; RGG-240 and RGG-360

- thickness of the material: 6 mm

designed for plaster board wall, concrete walls

RGG consists of two parts: a steel frame and a counter frame that both holds the insulation in place and protects the edges of the wall board. Both frames are pre-bored. The counter frame is available in three different depths to fit different wall thickness. RGG frames and the flanges of the counter frame are screwed into the wall. A lycron sealing strip should be used between the wall and the flange to provide a gas tight seal.

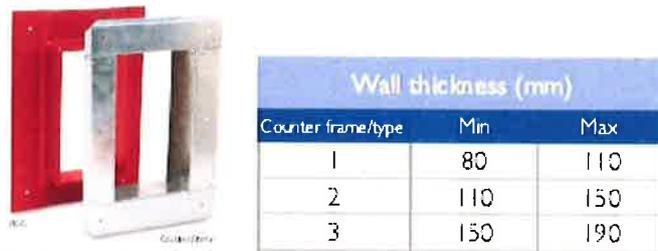


Figure 3: RGG frames and counter frame type with respect to the wall thickness.

b) RGGO:

- frame with openable gable is used for installations where cables already have been pulled

c) RGB:

- standard frame for embedment or built-in
- variations: RGB-1; RGB-2; RGB-3; RGB-4; RGB-5; RGB-6; RGB-7; RGB-8; RGB-180; RGB-240 and RGB-360
- width 120 mm and depth 60 mm is always the same for all variations
- frame profiles width is 60 mm
- thickness of the material: 6 mm
- designed for plaster or concrete walls

d) RGBO:

- frame with openable gable is used for installations where cables already have been pulled

e) multiple frames

- horizontal



Figure 4 Multiple frame

- vertical
- vertical and horizontal

The abovementioned types of frames are compatible with frames RGP/RGPO which has got an individual ETA 16/0474.

Insert blocks manufactured from Lycron (synthetic polymer)

a) Standard blocks

Each block consists of two halves which together creates a square shaped 60 mm sealing insert.

There are seven sizes of the standard blocks: 15; 20; 30; 40; 60; 90 and 120 mm

It is important that the block is the right size with respect to the cable to ensure a proper seal. It is necessary to measure the cable diameters carefully and choose insert blocks accordingly.

Blocks are referred to by their width (A) and hole diameter (B).

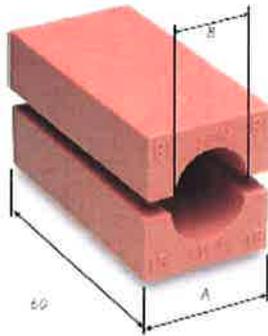


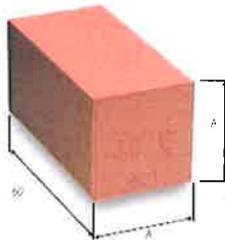
Figure 5 Standard block

For an overview of standard block see Annex No. 1.

b) Spare blocks

Spare blocks are used for filling of unused space in the frame. Using the spare blocks allows the option of fitting new cable in the future.

Sizes: 5; 10; 15; 20; 30; 40 and 60 mm



BLOCK SIZE Width (A) = Height (A)	BLOCK DESIGNATION
5 x 5 Qty. instead of 24 pcs	24 x 5/0
10 x 10 Qty. instead of 12 pcs	12 x 10/0
15 x 15	8/0
20 x 20	20/0
30 x 30	30/0
40 x 40	40/0
50 x 50	50/0
90 x 90	90 x 39/0

Figure 6 Spare block

Spare blocks are denoted A/0 → A = width/height; 0 = solid.

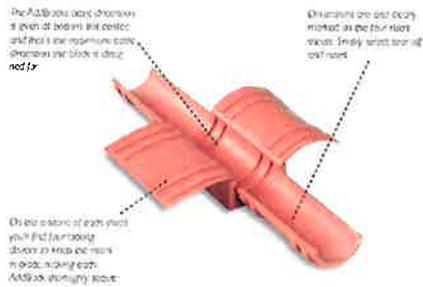
The length of all spare blocks is 60 mm.

c) Add blocks

Add blocks are all the same length (60 mm) as standard blocks.

The width are 20; 30; 40; 60 or 90 mm.

By tearing off the wing – like inserts and inserting them in the main block it is possible to accommodate different cable and pipe dimensions from 3.5 mm to 69.5 mm.



ADDBLOCK DIMENSION	CABLE OR PIPE DIMENSION	WEIGHT PER HALF (G)
20/4 - 8	3.5 - 8.5*	23*
20/9 - 13	8.5 - 13.5	23
30/14 - 18	13.5 - 18.5	45
30/19 - 23	18.5 - 23.5	43
40/24 - 28	23.5 - 28.5	71
40/29 - 33	28.5 - 33.5	62
60/34 - 38	33.5 - 38.5	150
60/39 - 43	38.5 - 43.5	136
60/44 - 48	43.5 - 49.5	128
90/50 - 58	49.5 - 59.5	348
90/60 - 68	59.5 - 69.5	318

* A = 20 mm; B = 4 - 8 mm;

Figure 7 Add blocks' dimensions, weight and suitable cable or pipe dimensions.

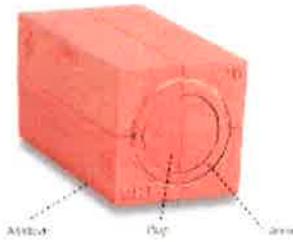
d) Plugs and wraps(sleeves)

Plugs and wraps are used to convert an Add block into a spare block.

Wraps are used to extend the diameter of a plug to suit the bigger type of each Add block size.

Plugs are used mainly as a preparation for future cable drawing where they together with Add blocks form a spacer. When the cables are eventually drawn the plugs are removed and Add blocks are reused.

Plugs and wraps are available from Add block size 20 to 60 mm.

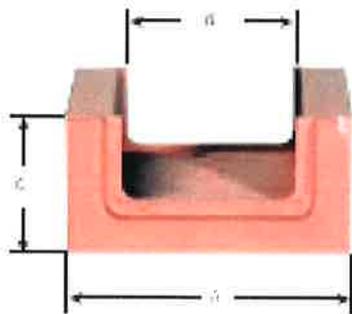


ADDBLOCK	PLUG	SLEEVE
20/4 - 8	P 20/8	
20/9 - 13	P 20/18 +	W 20/18 - 13
30/14 - 18	P 30/18	
30/19 - 23	P 30/18 +	W 30/18 - 23
40/24 - 28	P 40/28	
40/29 - 33	P 40/28 +	W 40/28 - 33
60/34 - 38	P 60/38	
60/39 - 43	P 60/38 +	W 60/38 - 43
60/44 - 48	P 60/38 +	W 60/38 - 43 and W 60/43 - 48

Figure 8 Add block consisted of a plug and a sleeve. Overview of plug/combination of plug and wrap-around casing to use when turning an Add block into a Spare block.

e) U-Block

The U-Block is used to convert the external dimensions of Insert blocks, Add blocks and Spare blocks to the next modular size.



Dimensions in mm			
U-BLOCK	A	B	C
U-10	10	70	15
U-15	15	80	20
U-20	20	90	25
U-30	30	100	35
U-40	40	110	45

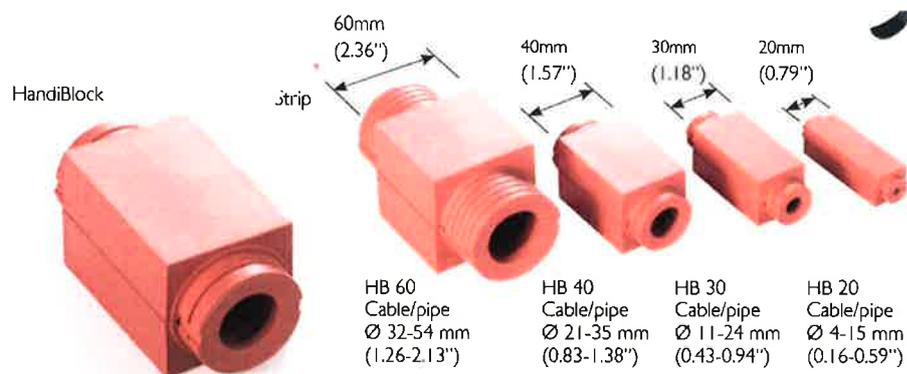
Figure 9: Dimensions of U-Blocks

f) HandiBlock

The HandiBlock is designed to facilitate installation and minimize errors, allowing corrections of errors and consequently minimization of wastage.

The HandiBlock is safe, flexible and easy-to install insert block. HandiBlock is available in four sizes to fit cables/pipes or tubing from 4 to 54 mm. A Handiblock consist of two half mainblocks and two insert strips consisting of many compressed rings in different sizes. Every compression ring in the insert strip has a clear marking to indicate different cable/pipe diameters for a safe and quick installation. This means that all parts can be reused when repacking.

By installing a HandiPlug (see Figure No. 15) in the HandiBlock, you can quickly and easily create a spare block. This spare can later be opened and easily adjusted for new cable/pipes.



Size	HandiBlock complete with Plug		HandiBlock without Plug		Plug		Mainblock		Insert Strip			
	mm	(inches)	gram	(Oz)	gram	(Oz)	gram	(Oz)	gram	(Oz)	gram	(Oz)
20	0.79		37	1.31	32	1.13	5	0.18	22	0.78	10	0.35
30	1.18		90	3.17	73	2.57	17	0.60	46	1.62	27	0.95
40	1.57		150	5.29	117	4.13	33	1.16	72	2.54	44	1.55
60	2.36		382	13.58	300	10.58	85	3.00	155	5.47	144	5.08

Figure 10 HandiBlock's dimension



Figure 11 HandiPlug

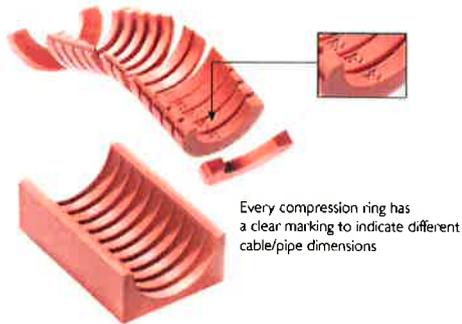


Figure 12 Compression ring

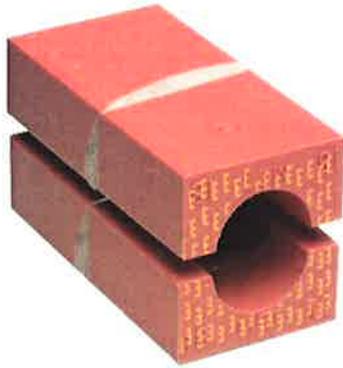
g)E-insert blocks (EMC) manufactured from Lycron E-Standard Block

Each E-block consists of two halves which together creates a square shaped 60 mm sealing insert.

The E-Block has an integral copper sheet as discharging and shielding protection between the cable and the system. There are 2 different designs of copper sheets, one for outer cable diameters up to 10 mm and one for outer cable diameters over 10 mm. The sheet is 0,3 mm thick.

There are seven sizes of the standard block: 15, 20, 30, 40, 60, 90, 120 mm.

It is important that the block is the right size with respect to the cable to ensure a proper seal. It is necessary to measure the cable diameters carefully and choose insert blocks accordingly.



E-Block Size in mm

CABLE DIAM.	A		B	CABLE DIAM.	A		B	CABLE DIAM.	A		B
	15	20			30	30			40	60	
3.5-4.5	E-15/4	E-20/4	4	21.5-22.5	E-30/22	E-40/22	22	35.5-37.5	E-60/36	36	
4.5-5.5	E-15/5	E-20/5	5	22.5-23.5	E-30/23	E-40/22	23	37.5-39.5	E-60/38	38	
5.5-6.5	E-15/6	E-20/6	6	23.5-25.5	E-30/24	E-40/24	24	39.5-41.5	E-60/40	40	
6.5-7.5	E-15/7	E-20/7	7	25.5-27.5		E-40/26	26	41.5-43.5	E-60/42	42	
7.5-8.5	E-15/8	E-20/8	8	27.5-29.5		E-40/28	28	43.5-45.5	E-60/44	44	
8.5-9.5	E-15/9	E-20/9	9	29.5-31.5		E-40/30	30	45.5-47.5	E-60/46	46	
9.5-10.5		E-20/10	10	31.5-33.5		E-40/32	E-60/32	47.5-49.5	E-60/48	48	
10.5-11.5		E-20/11	11	33.5-35.5		E-40/34	E-60/34	49.5-51.5	E-60/50	E-90/50	50
11.5-12.5		E-20/12	E-30/12					51.5-53.5	E-60/52	E-90/52	52
12.5-13.5		E-20/13	E-30/13					53.5-55.5	E-60/54	E-90/54	54
13.5-14.5		E-20/14	E-30/14					55.5-57.5		E-90/56	56
14.5-15.5			E-30/15					57.5-59.5		E-90/58	58
15.5-16.5			E-30/16					59.5-61.5		E-90/60	60
16.5-17.5			E-30/17					61.5-63.5		E-90/62	62
17.5-18.5			E-30/18					63.5-65.5		E-90/64	64
18.5-19.5			E-30/19					65.5-67.5		E-90/66	66
19.5-20.5			E-30/20					67.5-69.5		E-90/68	68
20.5-21.5			E-30/21					69.5-71.5		E-90/70	70

Blocks are referred to by their width (A) and hole diameter (B). Thus a module with a width of 15 mm and a hole diameter of 4 mm is referred to as E 15/4.

Figure 13: E-Block's dimensions

E-Spare Blocks

Spare Blocks are used for filling of unused space in the frame. Using E-spare blocks allows the option of fitting new cables in the future. The E-Spare Block has an integral 0,3 mm thick copper sheet as discharging and shielding protection between the cable and the system.

Sizes: 5, 10, 15, 20, 30, 40, and 60 mm.



E-BLOCK SIZE Width (A) = Height (A)	E-BLOCK DESIGNATION
5 x 120	E-24 x 5/0
10 x 120	E-12 x 10/0
15 x 15	E-15/0
20 x 20	E-20/0
30 x 30	E-30/0
40 x 40	E-40/0
60 x 60	E-60/0

Figure 14 E-Spare Block's dimensions

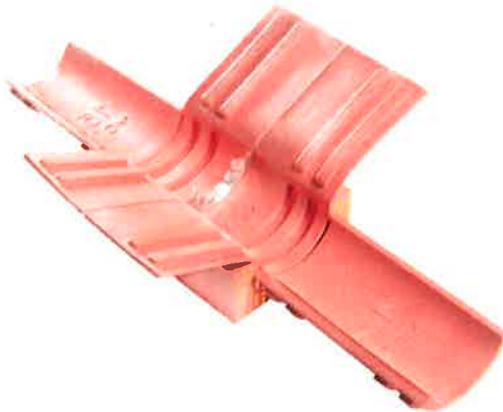
E-Add Blocks

E-Add Blocks have the same length (60 mm) as standard blocks.

The width is 20, 30, 40, 60, or 90 mm.

By tearing of the wing – like inserts and inserting them in the main block it is possible to accommodate different cable and pipe dimensions from 3.5 mm to 69.5 mm.

The E-Add block has an integral copper sheet as discharging and shielding protection between the cable and the system. There are 2 different designs of copper sheets, one for outer cable diameters up to 10 mm and one for outer cable diameters over 10 mm. The sheet is 0,3 mm thick.



E-ADDBLOCK DIMENSION	CABLE OR PIPE DIMENSION	WEIGHT PER HALF (G)
E-20/4 - 8	3.5 - 8.5	23
E-20/9 - 13	8.5 - 13.5	23
E-30/14 - 18	13.5 - 18.5	45
E-30/19 - 23	18.5 - 23.5	43
E-40/24 - 28	23.5 - 28.5	71
E-40/29 - 33	28.5 - 33.5	62
E-60/34 - 38	33.5 - 38.5	150
E-60/39 - 43	38.5 - 43.5	136
E-60/44 - 48	43.5 - 49.5	128
E-90/50 - 58	49.5 - 59.5	348
E-90/60 - 68	59.5 - 69.5	318

1. The E-AddBlock comes complete with 4 inserts to give 5 different block sizes.



2. Remove all inserts.



3. Select the insert with the required diameter and tear along the perforations.



4. Attach the two inserts into the locating ridges.

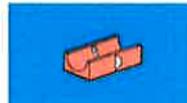


Figure 15 E-add blocks dimensions

E-PTG Presswedge

PTG Presswedge can be placed anywhere in the frame. It is made of Lycron, with stainless steel fitting.

The 0,3 mm copper sheet forms a contact between the frame and the Stayplate. E-PTG shall always be installed in a combination with Stayplate. Available in 120 mm or 60 mm width and with 6mm Allen or 13mm hexagon key grip.



Figure 16: E-PTG Presswedge

Stayplate

Stayplate anchors blocks within the frame, increases stability and is placed between each row of blocks. Stayplates are manufactured in galvanized steel, stainless steel and aluminium.



Figure 17 Stayplate

Compression plate

Compression plate is usually assembled above the top row of blocks. The plate bolt is equipped with a special telescopic bolt which is tightened to compress blocks around cables, while providing room for STG endpacking. It is manufactured from glassfibre reinforced polyester(=GRP).



Figure 18: Compression plate

The compression unit is inserted to compress the rubber blocks against cables to establish a tight seal.

STG-Endpacking

STG-Endpacking is made of Lycron with galvanized mild steel or stainless steel fittings. It is installed between compression plate and the top of the frame, completing the seal.



Figure 19 STG-Endpacking

PTG-Presswedge

PTG-Presswedge can be used as an alternative to compression plate and STG. It can also be placed anywhere in the frame. It is made of Lycron, with stainless steel fittings. It shall always be installed in a combination with Stayplate.



Figure 20 PTG-Presswedge

Weights in kilograms			
STG	PTG	COMPRESSION PLATE	STAY PLATE
C6	C6H	C6H	C11

Figure 21: Overview table of weight of STG, PTG, Compression plate and Stayplate.

For an overview of all metal components with respect to their material composition and dimensions see Annex No. 2.

Metal components based on the coated mild steel with protective coating

Steel frames are also available in coated mild steel.

Protective coating FONTECRYL 10/FONTECRYL 50 ensures only transportation protection of the metal components. Final protection shall be made by the final user.

Thickness $\geq 120 \mu\text{m}$

Lubricant

MCT Brattberg Lubricant consists of pure beef tallow. It is used to improve the system's water and gas tightness and shall be applied on all Lycron parts sealing surfaces when such demands exist.

Thermal insulation

Used mineral wool shall comply with requirements of harmonised standard EN 13162 or EN 14303 and shall be CE marked.

Density: min. 35 kg/m^3

Thickness : 150 mm

Supporting construction

Detailed information about the supporting construction can be found in the Annex No. 3.

The ancillary products referred to in this ETA as a part of installation provisions or in the framework of determining performances (e.g. fire resistance) are not covered by this ETA and may not be CE-marked separately on the basis of this ETA.

Concerning packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

All mounting and fixing details shall be executed according to the manufacturer's installation manual.

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

2.1 Intended use

This ETA covers fire stopping modular penetration sealing system intended as a penetration seal which is used to maintain the fire resistance of a separating element at the position where services pass through.

Details of the supporting constructions and cables are shown in Annex No. 3.

Use category related to the type of environmental conditions according to EAD No. 350454-00-1104:

- Type X (Intended for use in conditions exposed to weathering) for the system with components of austenitic stainless steel or galvanized steel

Note: Products that meet requirements for type X, meet the requirements for all other types (Y₁; Y₂; Z₁ and Z₂)

- Type Z₂ (Intended for uses in internal conditions with humidity lower than 85% RH, excluding temperatures below 0°C) for the system with components of coated mild steel and aluminium

The ETA is issued for the above mentioned products on the basis of agreed data/information, deposited with the Technical Assessment Body - Technical and Test Institute for Construction Prague, which identifies the products that have been assessed.

2.2 Assumed working life

Provisions made in this European Technical Assessment are based on an assumed intended working life of 25 years, provided that the assembled product is subject to appropriate use and maintenance in accordance with this ETA.

Indications given regarding the working life cannot be interpreted as a guarantee given by the producer or the Technical and Test Institute for Construction Prague, but are to be regarded only as a mean for choosing the appropriate product(s) in relation to the expected economically reasonable working life of the construction works.

3 Performance of the products and references to the methods used for their assessment

Characteristics stated below are applicable to all combinations of materials, components and dimensions described in this European Technical Assessment.

The service support construction shall be fixed on both sides of the penetration in such a manner that in case of fire no additional load is imposed on the seal. Furthermore, it is assumed that this support is maintained for the required period of fire resistance.

Table No. 1: Essential characteristics

No	Essential characteristic and method of verification and assessment	Expression of product performance
Basic Works Requirement 1: Mechanical resistance and stability		
Not relevant		
Basic Works Requirement 2: Safety in case of fire		
1	Reaction to fire (Cl. 2.2.1 of EAD No. 350454-00-1104)	Class E
2	Resistance to fire (Cl. 2.2.2 of EAD No. 350454-00-1104)	See Annex No. 3 -5
Basic Works Requirement 3: Hygiene, health and environment		
3	Air permeability (Cl. 2.2.3 of EAD No. 350454-00-1104)	No performance assessed
4	Water permeability (Cl. 2.2.4 of EAD No. 350454-00-1104)	No performance assessed
5	Content, emission and/or release of dangerous substances (Cl. 2.2.5 of EAD No. 350454-00-1104) Release scenarios: IA1, IA2 and S/W2	No performance assessed
Basic Works Requirement 4: Safety and accessibility in use		

No	Essential characteristic and method of verification and assessment	Expression of product performance
6	Mechanical resistance and stability (Cl. 2.2.6 of EAD No. 350454-00-1104)	No performance assessed
7	Resistance to impact/movement (Cl. 2.2.7 of EAD No. 350454-00-1104)	No performance assessed
8	Adhesion (Cl. 2.2.8 of EAD No. 350454-00-1104)	No performance assessed
9	Durability (Cl. 2.2.9 of EAD No. 350454-00-1104)	Use category X for the system with components made of austenitic or galvanised steel Use category Z ₂ for the system with components made of coated mild steel or aluminium
Basic Works Requirement 5: Protection against noise		
10	Airborne sound insulation (Cl. 2.2.10 of EAD No. 350454-00-1104)	No performance assessed
Basic Works Requirement 6: Energy economy and heat retention		
11	Thermal properties (Cl. 2.2.11 of EAD No. 350454-00-1104)	No performance assessed
12	Water vapour permeability (Cl. 2.2.12 of EAD No. 350454-00-1104)	No performance assessed

All components of the system were clearly identified according to Cl. 2.2 of EAD No. 350454-00-1104 and the received data are confidential and are deposited by TZÚS Praha, s.p..

Basic durability assessment of the system components was performed and the received data are confidential and are deposited by TZÚS Praha, s.p.. Expression of basic durability assessment of the system is stated above in the Table No. 1.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

4.1. Assessment and verification of constancy of performance (AVCP) system

According to the decision 1999/454/EC of the European Commission as amended, the assessment and verification of constancy of performance **system 1** applies.

In addition, according to the decision 1999/454/EC of the European Commission, as amended, the assessment and verification of constancy of performance **system 4** applies with regard to reaction to fire.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

In order to help the notified body to make an evaluation of conformity, the Technical Assessment Body issuing the ETA shall supply the information detailed below. This information shall initially be prepared or collected by the Technical Assessment Body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

1) The ETA

Where confidentiality of information is required, this ETA makes reference to the manufacturer's technical documentation which contains such information.

2) Basic manufacturing process

The basic manufacturing process is described in sufficient details to support the proposed FPC methods.

3) Product and materials specifications

The manufacturer's documentation includes:

- detailed description of the components of the kit,
- incoming (raw) materials specifications and declarations,
- references to European and/or international standards,
- technical and safety data sheets of the products.

4) Control Plan (as a part of FPC)

The manufacturer and the Technical and Test Institute for Construction Prague have agreed a Control Plan which is deposited with the Technical and Test Institute for Construction Prague in documentation which accompanies the ETA. The Control Plan specifies the type and frequency of checks/tests conducted during production and on the final product. This includes the checks conducted during manufacturing process on properties that cannot be inspected at a later stage and for checks on the final product.

It must be demonstrated to the notified body that the FPC system contains elements securing that the manufacturer of the final product use during the manufacturing process only products from his supplier(s) which conform to the Control Plan.

In cases where the provisions of the European Technical Assessment and its Control Plan are no longer fulfilled, the notified body shall withdraw the certificate and inform the Technical and Test Institute for Construction Prague without delay.

Issued in Prague on 18.06.2021

By

Ing. Mária Schaan

Head of the department Technical Assessment Body



Annexes:

Annex No. 1: Overview of standard blocks (size in mm, weight)

Annex No. 2: Overview of all metal components with respect their material composition and dimensions

Annex No. 3: Overview of resistance to fire classification according to EN 13501-2 for RGG

Annex No. 4: Overview of resistance to fire classification according to EN 13501-2 for RGB

Annex No. 5: Overview of resistance to fire classification according to EN 13501-2 RGG, RGGO, RGB and RGBO

Annex No. 2: Overview of all metal components with respect to their material composition and dimensions

Frame size		H	W – Width combination frame (mm)							Frame materials available				RGGO bolt kit materials	
RGGO	RGG	Height (mm)	X 1	X 2	X 3	X 4	X 5	X 6	X n	Coated mild steel	Galvanized mild steel	Stainless steel 316L	Aluminum 6082	Galvanized mild steel	Stainless steel 316L
2	2	221	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4	4	279,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
6	6	338	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
8	8	396,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+2	2+2	332	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+4	2+4	390,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+6	2+6	449	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+8	2+8	507,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4+4	4+4	449	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4+6	4+6	507,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4+8	4+8	566	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
6+6	6+6	566	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
6+8	6+8	624,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
8+8	8+8	683	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	Yes
1	1	221	180							yes	yes	yes	yes	yes	Yes
3	3	279,5	180							yes	yes	yes	yes	yes	Yes
5	5	338	180							yes	yes	yes	yes	yes	Yes
7	7	396,5	180							yes	yes	yes	yes	yes	Yes
180	180	340	300							yes	yes	yes	yes	yes	Yes
240	240	400	360							yes	yes	yes	yes	yes	Yes
360	360	560	480							yes	yes	yes	yes	yes	Yes

n= number of frames in width.

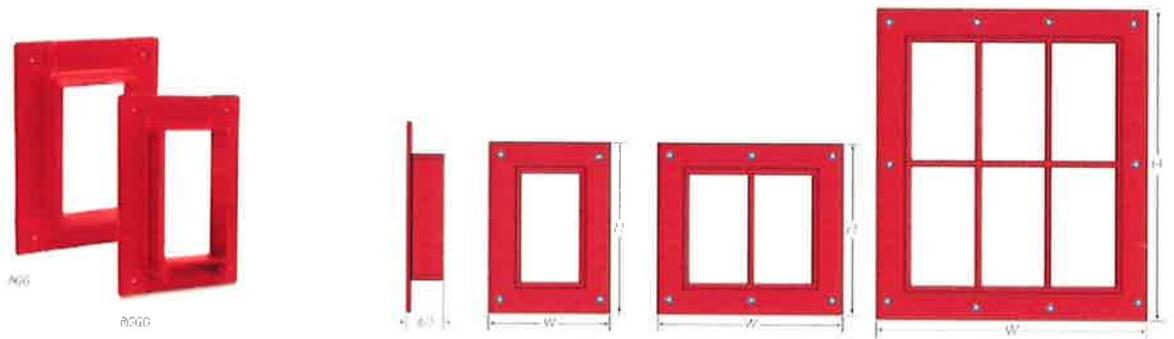
Thickness of material 6mm except for internal horizontal and vertical partitions in combination frames which is 10mm.

Frame size		H	W – Width combination frame (mm)							Frame materials available				RGBO bolt kit materials	
RGBO	RGB	Height (mm)	X 1	X 2	X 3	X 4	X 5	X 6	X n	Coated mild steel	Galvanized mild steel	Stainless steel 316L	Aluminum 6082	Galvanized mild steel	Stainless steel 316L
2	2	221	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4	4	279,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
6	6	338	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
8	8	396,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+2	2+2	332	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+4	2+4	390,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+6	2+6	449	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
2+8	2+8	507,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4+4	4+4	449	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4+6	4+6	507,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
4+8	4+8	566	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
6+6	6+6	566	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
6+8	6+8	624,5	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	yes
8+8	8+8	683	240,5	371	501,5	632	762,5	893	W=110+130,5xn	yes	yes	yes	yes	yes	Yes
1	1	221	180							yes	yes	yes	yes	yes	Yes
3	3	279,5	180							yes	yes	yes	yes	yes	Yes
5	5	338	180							yes	yes	yes	yes	yes	Yes
7	7	396,5	180							yes	yes	yes	yes	yes	Yes
180	180	340	300							yes	yes	yes	yes	yes	Yes
240	240	400	360							yes	yes	yes	yes	yes	Yes
360	360	560	480							yes	yes	yes	yes	yes	Yes

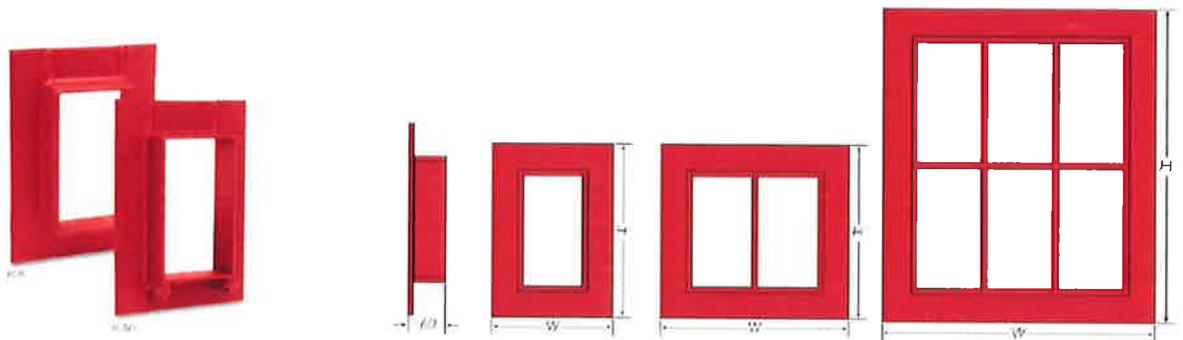
n= number of frames in width.

Thickness of material 6mm except for internal horizontal and vertical partitions in combination frames which is 10mm.

Frames:



Frames:



Components metal parts:

Type	Dimensions of fittings or main steel material (mm)			Main or fitting material		Bolt material/size			Nut material and size	
	Width	Height	Thickness	Galvanized mild steel	Stainless steel 316L	Galvanized mild steel	Stainless steel A4	Black chromated	Galvanized mild steel	Stainless steel A4
Stayplate	128,6	82,9	4,9	Yes	Yes	Yes/M8	Yes/M8	No	Yes/M8	Yes/M8
Compression plate	No fittings	No fittings	No fittings	No	No	No	No	Yes/24mm	No	No
STG-Endpacking	117	36	2,5	Yes	Yes	Yes/M8	Yes/M8	No	Yes/M8	Yes/M8
PTG-Presswedge	Moulded in fittings	Moulded in fittings	Moulded in fittings	No	Yes	No	Yes/M10	No	No	Yes/M10

Annex No. 3: Overview of resistance to fire classification according to EN 13501-2 for RGG

Services: Penetration shall be composed of electric services only. Mixing types of services is not allowed. The distance between services shall be at least equal to 200 mm.

Orientation: horizontal and vertical support

1) Resistance to fire classification regarding to supporting constructions

a) Supporting construction:

aerated concrete wall of thickness 150 mm and density 550 kg/m³

Table No. 1:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification		
				E	EI	
RGG-2 RGG-4 RGG-6 RGG-8 and their combination	Screwed on exposed side	A1	150 mm of rockwool Thickness:45 mm Density: 35 kg/m ³	120	120	
		A2		120	120	
		A3		120	120	
		B			120	90
		C1	Thermal insulation placed on non-exposed side	120	90	
		C2		120	90	
		C3		120	60	
		D1		120	60	
		D2		120	120	
		D3		120	90	
		E**		120	60	
		F	120	120		

Notes:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 apart from tied bundles, waveguides and non -sheathed cables. Optical cables are covered.

**Cable E is equipped with 200 mm of rock wool of thickness 45 mm and thickness 35 kg/m³

b) Supporting construction:

98/48 plasterboard partition with double layer of standard BA 13 and rock wool inner insulation of thickness 45 mm and density 40 kg/m³

Table No. 2-a:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification		
				E	EI	
RGG-2 RGG-4 RGG-6 RGG-8 and their combination	Screwed on exposed side	A1	150 mm of rockwool Thickness:45 mm Density: 35 kg/m ³	60	60	
		A2		60	60	
		A3		60	60	
		B			60	60
		C1	Thermal insulation placed on non-exposed side	60	60	
		C2		60	60	
		C3		60	60	
		D1		60	60	
		D2		60	60	
		D3		60	60	
		E**		60	60	
		F	60	60		

Notes:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 apart from tied bundles, waveguides and non -sheathed cables. Optical cables are covered.

**Cable E is equipped with 250 mm of rock wool of thickness 45 mm and thickness 35 kg/m³

Table No. 2-b:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
				E	EI
RGG-2 RGG-4 RGG-6 RGG-8 and their combination	Screwed on non-exposed side	A1	150 mm of rockwool Thickness:45 mm Density: 35 kg/m ³ Thermal insulation placed on exposed side	60	60
		A2		60	60
		A3		60	60
		B		60	60
		C1		60	60
		C2		60	60
		C3		60	60
		D1		60	60
		D2		60	60
		D3		60	60
		E		60	60
		F		60	60

Notes:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 apart from tied bundles, waveguides and non-sheathed cables. Optical cables are covered.

- c) Supporting construction:
aerated concrete wall of thickness 150 mm and density 550 kg/m³

Table No. 3:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
				E	EI
RGG-2 RGG-4 RGG-6 RGG-8 and their combination	Screwed on non-exposed side	A1	150 mm of rockwool Thickness:150 mm Density: 35 kg/m ³ Thermal insulation placed on exposed side	120	120
		A2		120	120
		A3		120	120
		B		120	120
		C1		120	60
		C2		120	90
		C3		120	90
		D1		120	90
		D2		120	120
		D3		120	90
		E		120	120
		F		120	120

Note:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5, apart from tied bundles, waveguides and non-sheathed cables. Optical cables are covered.

- d) Supporting construction:
concrete slab of thickness 200 mm and density 900 kg/m³

Table No. 4:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
				E	EI
RGG-2 RGG-4 RGG-6 RGG-8 and their combination	Screwed on non-exposed side	A1	150 mm of rockwool Thickness:45 mm Density: 35 kg/m ³ Thermal insulation placed on exposed side only	120	60
		A2		120	60
		A3		120	60
		B		120	60
		C1		120	60
		C2		120	60
		C3		120	60
		D1		120	60
		D2		120	60
		D3		120	60
		E		120	60
		F		120	60

Note:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 apart from tied bundles, waveguides and non-sheathed cables. Optical cables are covered.

e) Others

Table No. 5:

Supporting construction	Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
					E	EI
Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³	RGG RGGO	Non-fireside only	Blank opening	Mineral wool INSULFRAX S Density: 128 kg/m ³	240	240
Wall Reinforced concrete with minimum thickness of 200 mm and minimum density 2200 kg/m ³		Non-fireside only	Blank opening		120	120
Wall Reinforced concrete with minimum thickness of 200 mm and minimum density 2200 kg/m ³ Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³		All	A1, A2, A3, B, C1, C2, C3, D1, D2, D3, E et F	Rockwool Density: 85 kg/m ³	240	120
Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³		All	A1, A2, A3, B, C1, C2, C3, D1, D2, D3, E et F	Mineral wool INSULFRAX S Density: 128 kg/m ³	240	240
Wall Reinforced concrete with minimum thickness of 200 mm and minimum density 2200 kg/m ³		RGG 8+8x2	Back -to-back	A1, A2, A3, B, C1, C2, C3, D1, D2, D3, E et F	No	240
Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³	RGG 8+8x2	Back -to-back	A1, A2, A3, B, C1, C2, C3, D1, D2, D3, E et F	No	120	120

2) Resistance to fire classification regarding to cable size

Table No. 6:

Classification	Validated electric cable size [mm]	Validated telecommunication cable size [mm]
EI 60	Ø 80	Ø 21
EI 90	Ø 21	Ø 21
E 120	Ø 80	Ø 21
EI 120	Ø 21	Ø 21

Table No. 7:

Supporting construction	Modular system	Classification	Validated electrical cable size in [mm]	Validated telecommunication cable size [mm]
Wall and floor in armoured concrete 2200 kg/m ³	RGG with rock wool or INSULFRAX S	EI 120	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
Floor in armoured concrete 2200 kg/m ³	RGG with INSULFRAX S or Rock wool	EI 240	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
Floor in armoured concrete 2200 kg/m ³	RGG Back-to-Back	EI 120	Ø 80	Ø 21
		E 120	Ø 80	Ø 21

More detailed information about the resistance to fire classification and mounting details are deposited by the TAB.

Annex No. 4: Overview of resistance to fire classification according to EN 13501-2 for RGB

Services: Penetration shall be composed of electric services only. Mixing types of services is not allowed. The distance between services shall be at least equal to 200 mm.

Orientation: horizontal and vertical support

1) Resistance to fire classification regarding to supporting constructions

a) Supporting construction:

aerated concrete wall of thickness 150 mm and density 550 kg/m³

Table No. 1:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
				E	EI
RGB-2, RGB-4, RGB-6, RGB-8 and their combination	embedded and placed front-flush on non-exposed side	A1	Rockwool	120	120
		A2	Thickness:150 mm	120	120
		A3	Density: 35 kg/m ³	120	120
		B	Thermal insulation placed on non-exposed side	120	120
		C1		120	120
		C2		120	120
		C3		120	120
		D1		120	90
		D2		120	120
		D3		120	120
		E		120	120
		F	120	120	

Note:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 , apart from tied bundles, waveguides and non -sheathed cables. Optical cables are covered.

b) Supporting construction:

aerated concrete wall of thickness 150 mm and density 550 kg/m³

Table No. 2:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
				E	EI
RGB-2, RGB-4, RGB-6, RGB-8 and their combination	embedded and placed front-flush fire side	A1	Rockwool	120	60
		A2	Thickness:150 mm	120	60
		A3	Density: 35 kg/m ³	120	60
		B	Thermal insulation placed on exposed side	120	60
		C1		120	60
		C2		120	60
		C3		120	60
		D1		120	90
		D2		120	60
		D3		120	60
		E		120	60
		F	120	60	

Note:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 , apart from tied bundles, waveguides and non-sheathed cables. Optical cables are covered.

- c) Supporting construction:
 floor made of concrete slab of thickness 200 mm and density 900 kg/m³
 Table No. 3:

Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
				E	EI
RGB-2, RGB-4, RGB-6, RGB-8 and their combination	embedded and placed front-flush fire side	A1	Rockwool Thickness:150 mm Density: 35 kg/m ³ Thermal insulation placed on exposed side only	120	120
		A2		120	120
		A3		120	120
		B		120	120
		C1		120	120
		C2		120	120
		C3		120	120
		D1		120	60
		D2		120	120
		D3		120	120
		E		120	120
		F		120	120

Note:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 , apart from tied bundles, waveguides and non-sheathed cables. Optical cables are covered.

- d) others

Table No. 4:

Supporting construction	Modular system	Position in supporting construction	Cables*	Thermal protection	Classification	
					E	EI
Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³	RGB RGO	Non-fireside only	Blank opening	Mineral wool INSULFRAX S Density: 128 kg/m ³	240	240
Wall Reinforced concrete with minimum thickness of 200 mm and minimum density 2200 kg/m ³		Non-fireside only	Blank opening		120	120
Wall Reinforced concrete with minimum thickness of 200 mm and minimum density 2200 kg/m ³ Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³		All	A1, A2, A3, B, C1, C2, C3, D1, D2, D3, E et F	Rockwool Density: 85 kg/m ³	240	120
Floor Reinforced concrete with minimum thickness of 300 mm and minimum density 2200 kg/m ³		All	A1, A2, A3, B, C1, C2, C3, D1, D2, D3, E et F	Mineral wool INSULFRAX S Density: 128 kg/m ³	240	240

Note:* Types of cables according to Table A. 1 of EN 1366-3.

Standard sheathed cables cover all cable types usually currently and commonly used in building practice in Europe in dimensional limits indicated in Table No. 5 , apart from tied bundles, waveguides and non-sheathed cables. Optical cables are covered.

2) Resistance to fire classification regarding to cable size

Table No. 5:

Modular system	Classification	Validated electric cable size [mm]	Validated telecommunication cable size [mm]
RGB-2, RGB-4, RGB-6, RGB-8 and their combination	EI 60	Ø 80	Ø 21
	E 120	Ø 80	Ø 21

Table No. 6

Supporting construction	Modular system	Classification	Validated electrical cable size [mm]	Validated telecommunication cable size [mm]
Wall and floor in armoured concrete 2200 kg/m ³	RGB with rock wool or INSULFRAX S	EI 120	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
Floor in armoured concrete 2200 kg/m ³	RGB with INSULFRAX S or Rock wool	EI 240	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
Wall in armoured concrete 2200 kg/m ³	RGB Back-to-Back	EI 240	Ø 80	Ø 21
		E 240	Ø 80	Ø 21
		E 120	Ø 80	Ø 21

More detailed information about the resistance to fire classification and mounting details are deposited by the TAB.

Annex No. 5: Overview of resistance to fire classification according to EN 13501-2 RGG, RGGO, RGB and RGO

(protection of mechanical services - pipes)

Pipes and conduits of reaction to fire class A1 according to EN 13501-1* with a melting or decomposition point greater than 1000°C – metal pipes based on black or stainless steel
Orientation: horizontal and vertical support

Note: *means classification according to EN 13501-1 or classification A1 according to Decision 96/603/EEC as amended or according to a relevant CWFT Decision

1) Resistance to fire classification regarding to supporting constructions

Supporting construction:

Horizontal implementation of modular system:

- reinforced concrete slabs with a minimal thickness of 300 mm and minimal density of 2200 kg/m³

Vertical implementation of modular system:

- reinforced concrete walls with a minimal thickness 200 mm and minimal density 2200 kg/m³

Table No. 1:

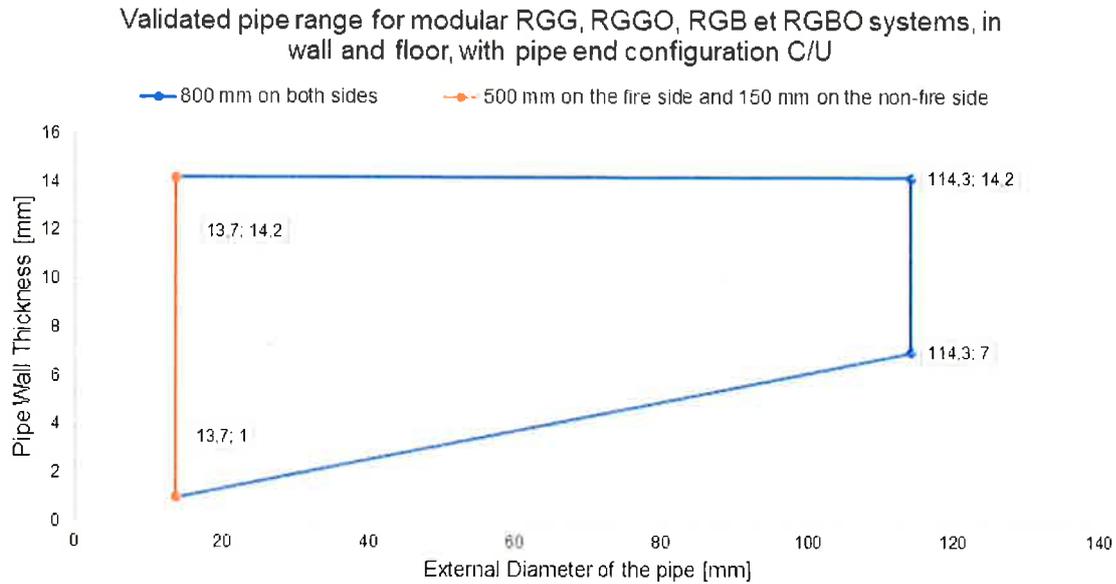
Orientation	Pipes			Modular system	Thermal protection				Classification		Pipe end configuration
	DN	Ø _{ext} [mm]	Thickness [mm]		Position	Fire side	Non fire side	Cavity	Thickness [mm]	E	
Wall	8	13.7	1	Embedded in the thickness of the support construction	500	150	X	25	240	180	C/U
	100	114.3	7		800	800	X	50	240	180	
Floor	8	13.7	1	Embedded and flush-mounted on the non-fireside	150	500	X	25	120	120	
	100	114.3	7		800	800	X	50	120	120	

Note:

*DN = nominal diameter

The classification may be interpolated to pipes of the same material, with diameters and wall thickness between those tested.

Type of pipe material: Results obtained on a particular pipe material covers pipe materials with a thermal conductivity lower than tested., subject to the material having a melting pint at least equal to that of the material tested or greater than the furnace temperature achieved at the required classification period.



Graph No. 1 : Validated pipe range for modular RGG, RGGO, RGB and RGBO systems in wall and floor, with pipe end configuration C/U.

Pipe arrangement: Results obtained on aligned tubes do not cover non-aligned tubes (cluster, triangle...) unless the distance between two tubes (or between two cores, if applicable) is greater than 100 mm.

Number of pipes: Results from a multiple penetration seal may be extended to a single penetration seal of the same type but not on the contrary.

Pipe end configuration:

The pipe end configuration is C/U(=Capped/Uncapped), this configuration only covers itself and C/C(=Capped/Capped) configuration.

Pipes fitted with an insulation material having class A1 or A2 according to EN 13501-1 made from glass wool or stone wool:

Results obtained on insulated pipes does not cover non-insulated pipes. The test conducted on non-insulated pipes covers the integrity criterion of pipes with interrupted insulation (cases LI and CI). The length of a local insulation may be increased but may not be reduced. The density of the insulation may be increased but may not be reduced. If a single pipe was tested perpendicular to the supporting construction all angles between 90°C and 45°C are covered. If a pipe was tested perpendicular to the supporting construction as well as oblique, the result is valid for each angle between a right-angle and the angle tested.