TECHNICAL DESCRIPTION OF A MULLION/TRANSOM WALL OF MB-SR50 EI SYSTEM

1. DESCRIPTION OF CONSTRUCTION

The system of a mullion /transom wall of MB-SR50 EI system is designed for the construction and execution of light-weight fire-proof curtain walls of the suspended or filling type, of fire-proof class EI15, EI30, EI45, EI60 according to the standard PN-EN 1364-3. The system has been classified as non-fire-propagating (NFP).

The construction of the system is based on the load-bearing grid structure composed of vertical members (mullions) and horizontal members (transoms) of box-shape section and characteristic width 50 mm. The profiles of mullions and transoms are suitably connected with each other and form an aluminium grid structure, which is mounted to the building construction with suitable brackets.
In order to obtain fireproof aluminium profiles, mullions and transoms have been equipped with special fireproof inserts. A fireproof insert consists of a special-shape aluminium profile, fulfilling the function of reinforcement, shielded with panels made from fireproof materials.
This design of the construction made it possible to admit to the system standard profiles of mullions and transoms applied in the MB-SR50 system, which significantly enhanced cost efficiency of the whole construction and ensured identical appearance to the profiles of the MB-SR50 system.
The MB SR50 EI construction utilizes mullions ranging from 85÷185mm in depth and transoms whose depth is between 65÷145mm.
The system provides for a possibility of overlapping connection between transom and mullion, which enables efficient water deflection and proper ventilation of inter-pane space.
In order to achieve optimal thermal and acoustic insulation performance there has been applied a continuous thermal break (insulator) made of material called ”HPVC” and profiled EPDM glazing gaskets.
Glass panels or other infills are fitted in glazing grooves, shaped from mullion and transom profiles and a clamping strip. Additionally, a special expanding tape has been applied in glazing grooves of mullions and transoms. A clamping strip is fixed to the load-bearing sections with a metric screw and a stainless steel washer.
Such system of glazing protects a fireproof glass panel or other infills from falling off from the frame during fire. In the case of an angular wall special gaskets have been applied.
The wall of the MB SR50 EI system should be executed in accordance with working design, prepared individually for each object. Subject to the system documentation and structural analysis, the design should specify aluminium profiles for mullions and transoms, accessories to fasten mullions to the structure of the building and transoms to mullions, a lay-out of points where the construction of the wall is to be fixed to the building construction.
The design should also take into account all other materials and elements of the wall, details of connections and sealing between wall elements and the building construction, ventilating method and drainage of the wall. While taking into account requirements connected with the function and location and geometry of the building, the wall should be designed in accordance with applicable standards.
Allowable height of a curtain wall is a derivative of resistance-related parameters, ensuing from the structural analysis. However, at every floor the structure should be divided with vertical thermal expansion joints. Allowable spacing and span of load-bearing profiles, based on assumed structural analysis diagram result from structural analysis of construction and dimensions of infills. The curtain wall is in no way restricted as to its length, providing the horizontal expansion joint has been applied.

2. TECHNICAL DESCRIPTION OF RAW MATERIALS AND MATERIALS

2.1 ALUMINIUM PROFILES

Aluminium profiles are produced in the process of forming of the aluminium alloy: **EN AW-6060** as per **PN-EN 573-3,** version**T66** as per **PN-EN 515 (AlMgSi0,5 F22 as per DIN 1725 T.1)**

- **dimensional deviations of profiles as per PN-EN 12020-2**
- **mechanical properties PN-EN 755-2**
- **meet the requirements PN-EN 755-1**

The surface of profiles should be finished with anodic oxide coating or polyester powder coating as a protection against corrosion.
Anodic oxide coating should conform to the following standards:
- thickness of the layer as per PN-EN ISO 2360 or PN-EN ISO 2808 20-30μm
- external appearance in compliance withPN-80/H-97023
- degree of tightness of coating as per PN-90/H-04606/02
- coating resistance to corrosion as per PN-76/H-04606/03

Polyester powder coating should meet the following standards:
- thickness of coating as per PN-EN ISO 2360 or PN-EN ISO 2808 75±15μm
- relative hardness of the coating as per PN-EN ISO 1522 min. 0,7
- resistance of paint coatings to separation from substrates PN-EN ISO 2409 level 0
- resistance to salt spray (fog) as per PN-ISO 7253
- resistance to liquids as per PN-EN ISO 2812

2.2 THERMAL BREAK (INSULATORS)

The insulators - through which clamping strips fixing glass panels or other infills are fastened to the mullions and transoms are made of HPVC plastic, in accordance with the standard BN-79/9031-01.

2.3 FIRE PROTECTION ELEMENTS

Fire protection elements are made of GKF plasterboards, silicate-cement panels manufactured by PROMATEC -H and panels made from CI material. There are also applied fireproof expanding tapes cut off from the panels or supplied in rolls, as well as fireproof sealants.

2.4 GLAZING GASKETS

Glazing gaskets for sealing glass panels and other infills are made of synthetic rubber EPDM as per DIN7863 and a working standard DIN7715 E2 or ISO3302-1.
Corners are joined directly during the process of gluing or through corner elements, e.g. rubber corners, in compliance with the constructional documentation of the system.

2.5 GLASS PANELS

Transparent fields of a curtain wall MB-SR50 EI are glazed with fireproof panels of type-1 and type-2, selected in such a manner as to meet the requirements in view of fire resistance specified for a relevant class EI15, EI30, EI45, EI60. Glass panels conform to the standard PN-EN 1279-1:2006 and PN-EN 1279-5:2006.

SPECIFICATION OF FIREPROOF GLASS **Type-1**

Maximum dimensions of glass panels in a vertical arrangement 2400 x 1400 [mm].
Maximum dimensions of glass panels in a horizontal arrangement 2400 x 1400 [mm].

Glass panels meeting fire resistance requirements of class EI 15 can be made from the following types of glass:

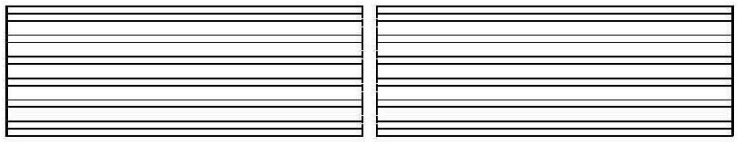
- Pyrobel – single glass or gazing units in internal or external applications, class EI15 and minimum thickness 12 mm.
- Swissflam – single glass or glazing units in internal or external applications, class EI15 and minimum thickness 13 mm.

Glass panels meeting fire resistance requirements of class EI30 can be made from the following types of glass:

- Pyrostop – single glass or glazing units in internal or external applications, class EI30 and minimum thickness 15 mm.
- Swissflam – single glass or glazing units in internal or external applications, class EI30 and minimum thickness 16 mm.
- Pyrobel – single glass or glazing units in internal or external applications, class EI30 and minimum thickness 16 mm.
- Promaglas – single glass or glazing units in internal or external applications, class EI30 and minimum thickness 17 mm.
- Pyranowa – singla glass or glazing units in internal or external applications, class EI30 and minimum thickness 16 mm.

Glass panels meeting fire resistance requirements of class EI45 or EI60 can be made from the following types of glass:

- Pyrostop – single glass or glazing units in internal or external applications, class EI60 and minimum thickness 23mm.
- Swissflam – single glass or glazing units in internal or external applications, class EI60 and minimum thickness 25mm.
- Pyrobel – single glass or glazing units in internal or external applications, class EI60 and minimum thickness 25mm.
- Promaglas – single glass or glazing units in internal or external applications, class EI60 and minimum thickness 21mm.

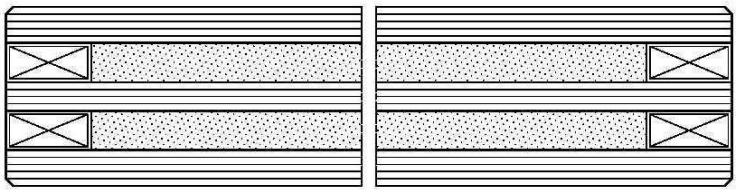


Example of glass panels Type-1

SPECIFICATION OF FIREPROOF GLASS **Type-2**

Maximum dimensions of glass panels in a vertical arrangement 3000 x 1500 [mm].
Maximum dimensions of glass panels in a horizontal arrangement 1200 x 1700 [mm].

- CONTRAFLAM 60 – single glass or glazing units in internal or external applications, class EI60 and minimum thickness 25mm.



Example of glass panels Type-2

2.6 INFILLS OF NON-TRANSPARENT SECTIONS

Fillings of opaque sections (lintel and sill belts) are built as sandwiched elements in accordance with the constructional documentation of the system and are arranged as follows:

- single glass, air void, plasterboard GKF of thickness 12.5 mm, mineral wool of minimum thickness 110 mm and minimum density 60 kg/m^3, steel sheet of thickness 0.5 ÷ 1.25 mm and plasterboard GKF of thickness 12.5 mm;
- glazing unit, mineral wool of minimum thickness 110 mm and minimum density 60 kg/m^3, steel sheet of thickness 0.5 ÷ 1.25 mm and plasterboard GKF of thickness 12.5 mm;
- steel sheet of thickness 0.5÷1.25 mm (zinc-coated or powder-coated), mineral wool of minimum thickness 110 mm and minimum density 80 kg/m^3, steel sheet of thickness 0.5÷1.25 mm and plasterboard GKF of thickness 12,5 mm;
- aluminium sheet (anodised or powder-coated) of thickness 1÷3 mm; mineral wool of minimum thickness 110 mm and minimum density 80 kg/m^3, steel sheet of thickness 0.5 ÷ 1.25 mm and plasterboard GKF of thickness 12.5 mm.

2.7 FIXATION ELEMENTS

Fixation elements (screws, self-drilling screws, self-tapping screws for sheets, bolts, nuts, washers) applied to make connections are made of stainless steel according to standards referred to in the system documentation.

2.8 ALUMINIUM SUPPORTS AND CONNECTING MEMBERS

Aluminium supports and connecting members are made from aluminium alloy AlMgSi0,5 F22 and protected against corrosion with oxide coatings.

2.9 STEEL SUPPORTS

Steel supports are made from steel sheet and protected against corrosion; points of contact between steel and aluminium elements are isolated.

2.10 AUXILIARY ELEMENTS

Auxiliary elements (shims, adhesives and silicones) used to seal connections according with the system documentation.

3.0 SUPPLEMENTARY INFORMATION

3.1 WORKING

Decorative surfaces of profiles should be covered with protective foil for protection from any working-related damage.
Linear and angular dimensional tolerance, disregarding individual designation of tolerance, as per EN 22768-1, Class of tolerance – m (medium accuracy level).
Any splinters which occur in the process of working should be deburred.

3.2 ASSEMBLY GUIDELINES AT THE BUILDING SITE

The assembly of a mullion/transom wall of the MB-SR50 EI should be carried out in the minimum temperature of 5ºC. During the assembly the construction should be protected against external conditions, such as water, snow, any types of mortar or building dust. Aluminium profiles with fire resistance inserts and expanding mats adhered onto them should be prepared for transport and storage in such a way as to protect them against the above mentioned external conditions. Where mechanical working of fire resistance materials CI is required, after working, the surfaces should be protected with a double layer of polyurethane varnish.
In the case of fitting an expanding mat, the process should be carried out in the temperature not lower than 5°C. Before application of an expanding mat the surface should be prepared – it must be clean, smooth and degreased (e.g. wiped with acetone or extraction naphtha). Protective strip should be removed from adhesive tape and now the tape should be applied. The upper layer of sealing may be cleaned with a damp cloth soaked in non-aggressive detergents. Sharp tools which may damage sealing material must never be used. After fitting

an expanding sealant, filling elements should be installed, such as glass panels or other infills, clamping and masking strips.
The mullion/transom wall of the MB-SR50 EI system is fastened to the structure of the building by means of special steel or aluminium support brackets. Elements of brackets are screwed on to the floor/ceiling slab of the building with steel expansion bolts (or other bolts suitable for a particular type of the slab).
Vertical profiles (mullions) are fastened to the bracket with mounting screws.
Transoms are fastened between mullions. The whole forms a load-bearing truss-type construction.
Glass panels or other infills are mounted in the fields between mullions and transoms

WARNING:
Lime, cement, alkaline and cleaning substances (e.g. bleaches, abrasive pastes) have particularly harmful effect on aluminium profiles, especially on decorative protective surfaces. Thus any "wet" works must be limited to the minimum.
Should mortar be brought into contact with the surface of aluminium, it must be immediately washed (its hardening must not be allowed). Failure to wash mortar will result in permanent discolouring and will damage the surface.

3.3 STORAGE AND TRANSPORTATION

- Aluminium profiles

Aluminium profiles, details, infills, glass panels, windows and doors should be stored in dry rooms to protect elements against mechanical damage and against damage of anodised or painted coatings.
Aluminium profiles, details, infills, glass panels, windows and doors may be transported by any means of transport provided they are protected against soiling, dust and exposure to any damage during transportation.

- Fireproof materials CI

They should be stored in original packaging in horizontal position. If re-packing of inserts is required the following rules should be observed:
- inserts should be placed in a horizontal position on a flat surface (e.g. on a chipboard),
- subsequent layers should be interleaved with PE foil (e.g. thin painter's foil),
- maximum number of layers in one packaging: 25, but the stack must not be higher than 600 mm.
They should be stored in storerooms in normal weather conditions, i.e. in the temperature from 5ºC to 25 ºC and humidity between 50% and 80%.

After opening the packaging and taking the required number of inserts, the packaging must be covered with protective foil. The content should be protected against getting wet or drying up. The inserts should be carried carefully to avoid any damage – cracks.

3.4 MAINTENANCE

Anodised or coated aluminium profiles should be washed with a soft cloth and mild cleaning agents. No alkaline-based liquids are allowable as they may damage the oxide coating.

3.5 CATALOGUE UPDATES

The catalogue should be updated by downloading PDF files at (http://www.aluprof.eu) in the authorized section "Catalogues".