

THE MB-86EI SYSTEM OF FIREPROOF PARTITION WALLS AND WINDOWS

1. DESCRIPTION OF THE STRUCTURE

The MB-86EI system of fireproof partition walls and windows with thermal insulation is intended for execution of external fireproof barriers equipped with operable windows of fireproof class EI15 and EI30, according to the standard PN-EN 13501-2+A1. The system has been classified as non-fire propagating (NFP). The structure of the system is based on the MB-86 system, hence the windows feature high thermal and acoustic performance as well as high tightness to water infiltration and air permeability. This system meets all provisions of applicable regulations and standards, especially the ones concerning energy conservation and environmental protection. Application of glazed fireproof barriers in building industry should be subject to the technical documentation of the building, designed in accordance with applicable standards and regulations.

CHARACTERISTICS OF THE MB-86EI WINDOW SYSTEM:

- The construction of the system is based on aluminium profiles with thermal spacers of the MB-86 system. The constructional depths of window profiles is: 77 mm (frame) and 86 mm (sash).
- The profiles applied in this system have three-chamber construction, the core of which is formed by an insulating chamber placed between thermal spacers 43 or 42 mm wide
- Elements of the GKF fire insulation are inserted in the internal chambers of aluminium profiles.
- The system comes with an option incorporating a barrier between thermal spacers dividing the inner air chamber into two parts, as in the MB-86 SI system, thanks to which high insulation performance is achieved.
- Heat transfer coefficients U_f of frames in windows attain very low values, which only marginally exceed the values attained for analogous frames of the base MB-86 system.
- High tightness to water penetration and air infiltration, as well as excellent thermal insulation performance has been possible to achieve mainly due to the special shape of two-component central gasket (with cellular insulating part) as well as glazing and closing gaskets.
- Most gaskets, just like in the MB-86 system (e.g. glazing and internal closing gaskets) are fitted as continuous stripping, without any corner trimming. The ends of gaskets are joined in mid-length of the top rail of the window frame. The central gasket is trimmed at an angle of 45° and glued in the corners or trimmed at an angle of 90° and glued to a rubber corner. The central gasket is also available in the form of a vulcanised frame. Such manner of gasket fitting guarantees very high tightness to water penetration and air infiltration.
- Closed shape of glazing beads, both in the Standard and Prestige versions allow for secure installation of heavy insulating glazing units, consisting, inter alia, of fire-resistant glass panel. Positioning rollers made of EPDM are fitted in the said glazing beads to facilitate the installation of glazing beads in the window frame.
- Internal glazing gaskets are deep-fitted in glazing beads, which is why they are hardly visible from the inside.
- Ranges of glazing thickness possible to achieve are the same as in the case of the MB-86 system: window frame – from 13 to 61 mm, window sash – from 22 to 70 mm. Glazing shims are made of fireproof material.
- The glass panels are additionally protected on the outside with steel holders, screwed to the inner and outer profile with sheet metal screws.
- Application of the standard Euro grooves makes it possible to accommodate most hardware types available on the market, intended for both aluminium and plastic windows.
- Hardware fitted in the system should have approval for use in accordance with regulations applicable in the country where the product is installed.
- Compound profiles of the MB-86 EI version may be subjected to the process of powder coating or anodic oxidation.
- Corner connections are executed with the use of corner cleats and crimping or pinning and gluing with two-component glue CORALGLUE®). Crosswise joints of the “T” type are performed by pinning of crosspieces with the inserted corner cleats and gluing with CORALGLUE®.
- Both concealed and traditional hinges may be fitted in windows of this system. Handles may come either with or without an escutcheon.
- Each structure of the MB-86EI system intended for external development must be equipped with an efficient system of ventilation and drainage deflecting water from the glass chamber.

- Astragals included in the system may be applied on glass panels.
- The technology of fabrication of the construction is simplified as much as possible, hence high time efficiency is achieved in window fabrication.
- Tooling (e.g. drilling templates, presses or blanking dies) may be used for most workings. All elements of the tooling applicable in the MB-86 EI system are contained in the section *Tooling*.
- Maximum dimensions of window sashes significantly exceed the values recognised as the standard ones. Maximum weight and dimensions are presented in the section *Structural Analysis*.
- The product range of window structures is shown in the section *Structural Analysis*.
- The MB-86EI system is fully compatible with the MB-86 system. (they share the same profiles, details, many types of the same hardware, workings, etc.).

Conformance with the instructions presented in this catalogue guarantees that the finished product will meet expectations of users over many years' operation.

In the event of any queries or doubts, ALUPROF S.A. specialists are always ready with their assistance and advice.

Each structure made of elements of the MB-86 EI system must have approval for use in accordance with regulations applicable in the country in which it is mounted. A reference document used by the manufacturer to declare performance properties at the stage of marketing the fire-resistant product strictly defines the range of structures allowed for use in a particular country, including detailed solutions. Only solutions presented herein may be applied in the fabrication of the product.

Solutions presented in this catalogue are subject to additional restrictions resulting from approvals for use applicable in the country where they are used. The said restrictions are specified in supplements, which form an integral part of this catalogue.

NOTE:

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2. TECHNICAL DESCRIPTION OF MATERIALS AND RAW MATERIALS

2.1. ALUMINIUM PROFILES

Aluminium profiles are made during the forming process of aluminium alloy EN AW-6060 as per PN-EN 573-3, T66 temper, according to the standard 515 or from the alloy AlMgSi0,5 F22 as per DIN 1725 T.1.

Profiles are conformant with the PN-EN 755-1 standard.

Mechanical properties of profiles comply with PN-EN 755-2.

Tolerances on dimensions and form - according to PN-EN 12020-2.

Surfaces of profiles should be finished with anodic oxidation coatings according to the Qualanod requirements or with polyester powder coatings according to the Qualicoat requirements - as protection against corrosion.

2.2. THERMAL SPACERS AND BARRIERS

Thermal spacers and barriers are made of polyamide profiles strengthened with fibreglass PA 6,6 GF25 as per DIN 16941 T.2 (they have manufacturer's certificate).

Chamber thermal spacers feature very high resistance and their thermal expansion is similar to aluminium, which excludes the risk of joint deformation and prevents tearing of joints on the polyamide / aluminium border when the face of buildings is exposed to significant changes in temperature.

Properly crimped thermal spacers ensure such resistance of compound profile as provided under the relevant standard concerning resistance of the compound profile.

2.3. FIRE INSULATION ELEMENTS

Infills are made of GKF plasterboards. Fire- resistant expanding strips are cut off from boards or supplied in rolls. These elements are performed in accordance with the applicable standards and relevant technical approvals

2.4. GASKETS

Glazing and closing gaskets are made of synthetic rubber EPDM as per DIN7863 and working standard DIN7715 E2 or ISO3302-1. Gaskets are connected with each other in the process of gluing or vulcanising.

2.5. GLASS PANELS

Transparent areas are glazed with special glass panels, selected in such a manner that the assembly conforms to the requirements set for the relevant fireproof class EI15 or EI30, thermal standards and sound-proof performance of rooms.

All glass panels installed in the MB-86 EI system must have approval for use in respect of fireproof structures according to regulations applicable in a particular country. Maximum dimensions of glass panels should be consulted with the glass panel supplier.

2.6. ALUMINIUM SHEETS

Aluminium sheets are made of aluminium alloy as per the standard PN-EN 485, subjected to anodic oxidation or powder coating, used for sheet working and finish.

2.7. FIXATION ELEMENTS

Fixation elements (self-tapping and self-drilling screws, bolts, rivets, nuts, washers) applied to make connections, are made either of stainless steel or are zinc-coated in accordance with the standards referred to in the system documentation.

2.8. HARDWARE

Hardware should be mounted onto the window profiles in accordance with the system documentation or the documentation of the hardware manufacturer. Hardware should be adapted to the dead weight of sashes, their operating load and dimensions.

2.9. AUXILIARY MATERIALS

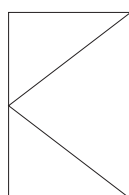
Auxiliary elements (glazing shims, glues, mineral wool and silicones used to seal joints) – in accordance with the system documentation.

3. SUPPLEMENTARY INFORMATION

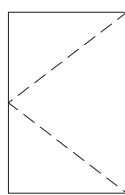
3.1. GRAPHIC PRESENTATION OF DOOR AND WINDOW TYPE OF OPERATION

A figure or a drawing always shows the view of the construction as seen from the outside, i.e. where the glazing beads are not visible.

3.1.1. Sash swing direction

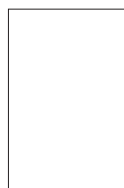


outward

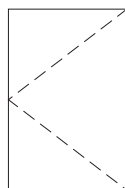


inward

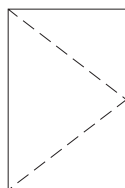
3.1.2. Graphic presentation of window types



fixed



casement - left hand operation



casement – right hand operation



tilt & turn



bottom-hung

3.2. CONSTRUCTION OF PROFILES

The profiles applied in the MB-86EI system feature three-chamber construction, the core of which is an insulating chamber placed between thermal spacers 43 or 42 mm wide. The central chamber of each compound profile is divided into two separate chambers by means of thermal barriers. The system of connections with thermal spacers enables application of dual-colour profiles – different on the inside and different on the external part of the façade. The chamber-shape of thermal spacers guarantees high rigidity, very good thermal insulation properties and proper drainage of internal chambers of the profile.

3.3. SOUND INSULATION

The values of sound insulation index $R_w(C,C_{tr})$, R_{A1} and R_{A2} depend on the applied glass unit and the type of the structure.

3.4. AIR PERMEABILITY

- Air permeability of windows and balcony doors in external development, according to PN-EN 12207 standard, has been classified as class 4.

3.5. STRENGTH CALCULATIONS

Proper selection of optimal construction profiles should be based on the guidelines contained in the section *Structural Analysis*. That section also provides information regarding maximum dimensions of sashes and leaves, preconditioned by the type of applied profiles, hardware, etc.

3.6. MB-CAD and MB-SOFT SOFTWARE

Computer software MB-CAD and MB-SOFT is a convenient tool to quickly design and prepare offers, production cuttings (containing profiles, accessories and infills), to carry out structural analysis, material orders, etc. Detailed information about the software and how to acquire it is available on the premises of Aluprof S.A.

3.7. WORKING

Decorative surfaces of profiles should be covered with protective foil for protection from any working-related damage. Tolerances for linear and angular dimensions without individual tolerance indications, as per PN-EN 22768-1, class of tolerance – m (medium accuracy level). Any splinters which occur in the process of working should be absolutely deburred.

3.8. STORAGE AND TRANSPORT

- Storage

Aluminium profiles, details, infills, glass panels, windows and doors should be stored in dry rooms so as to protect them against mechanical damage and against damage to the anodised or painted coatings. Elements of fire insulation GKF and CI should be stored in original packaging in a vertical position. Where re-packing is required, the following principles should be followed:

- the inserts must lie in a horizontal position on a firm and flat surface (e.g. on a chipboard),
- subsequent layers should be interleaved with PE foil (e.g. thin drop sheet),
- maximum number of layers - 25 in one packaging, but the stack must not be higher than 600 mm.

Products should be stored in warehouses in normal weather conditions, i.e. in the temperature between 5° and 25°C and humidity ranging between 50 and 80%.

After opening the package and taking the required number of inserts, the package should be covered with protective foil. It should be protected against dampness and excessive drying up. The inserts should be carefully carried to avoid any possible damage – breakage.

The principles of storage and application of an expanding tape are contained in the section *Working*.

- Transport

Aluminium profiles, details, infills, glass panes, windows and doors may be transported by any means of transport provided they are protected against soiling, dust, weather conditions and exposure to any damage during transportation.

3.9. ASSEMBLY GUIDELINES AT THE BUILDING SITE

Partition walls and windows in the MB-86EI system, class EI15 and EI30 may be fixed to:

- walls built of solid, perforated or chequer brick of thickness at least 12 cm,
- concrete and reinforced concrete walls of thickness at least 8 cm,
- cellular brick or cellular concrete walls of thickness at least 12.5 cm,
- light plasterboard walls featuring fire-proof class not lower than EI30.

The MB-86EI partition walls may be erected in a vertical position or at the angle $\pm 10^\circ$ out of plumb, windows, however, must be installed only in a vertical position.

Installation of partition walls and windows on a building site should be carried out in the temperature not lower than 5°C. During its installation, the structure should be protected against exposure to weather conditions, such as water, snow and any type of mortar and builders dust.

Partition walls and window frames must be fixed with wall plugs min. $\varnothing 10$ mm, system-based steel anchors, bolts or screws min. $\varnothing 5$ mm (M5), spaced up to 600 mm but their distance from the corners must not exceed 250 mm and 200 mm from the wall mullions. The gaps formed between the wall or the window and masonry should be filled with non-flammable mineral wool of min. density 70 kg/m³ or with any other fireproof filling, allowed for use in fireproof structures and then they should be covered with non-flammable material (e.g. plasterboard, concrete-lime plaster, fireproof caulk, aluminium profile, steel profile or metalworking).

Detailed information regarding the assembly of products is contained in the section *Examples of Development*.

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 off (its hardening must not be allowed). Failure to wash off the mortar will result in permanent discolouring and will damage the surface.

In places of contact between aluminium and other metals or their alloys, electrochemical oxidation of aluminium occurs. The process of this kind of corrosion is particularly quick when there is a lot of moisture in the surrounding atmosphere. Therefore aluminium should be separated from other metals with an insulating layer.

3.10. HARDWARE ADJUSTMENT

After mounting sashes, their position in relation to the window frame and adjacent sashes (adjustment of hinges, friction stays) should be adjusted, then adjustment of hardware elements cooperating with each other (strikers, bolts) should be made. The sashes should be levelled and the distance between the profiles of adjacent sashes should be the same.

3.11. MAINTENANCE

Anodised or paint-coated aluminium profiles should be washed with a soft cloth and mild cleaning agents. Alkaline-based liquids are not allowed, as they may damage the anodic oxidation coatings or paint coatings. Cleaning agents with pH below 5 or over 8 must not be used. While cleaning, the temperature of coatings and the temperature of water must not exceed 25°C. After each cleaning the surface must be immediately rinsed with clean and cold water.

Regular cleaning prevents formation of obstinate and difficult to remove dirt.

Maintenance of hardware should be performed in accordance with the instructions provided by manufacturers of the hardware.


















3.12. CATALOGUE UPDATES

The catalogue should be updated by downloading PDF files from <http://www.aluprof.eu> in the authorised section *Catalogues*

3.13. AVAILABILITY OF CATALOGUE PRODUCTS

Rules and availability dates of the elements presented in the catalogue have been specified in Aluprof SA' price lists, included in the authorised section of the website <http://www.aluprof.eu> in the section *Price Lists*.

4. GRAPHIC SYMBOLS USED IN THE CATALOGUE

	Number		Working
	Notes		Compatible elements
	Total area [dm ² /m]		Cut
	Decorative area [dm ² /m]		Glue with two-component adhesive
	Cutting angle [°]		Glue and seal
	Dimension [mm]		Seal with neutral silicone
	Number of items		Glue
	Material		Perform by using: _ _ _ _ _
	Standard		

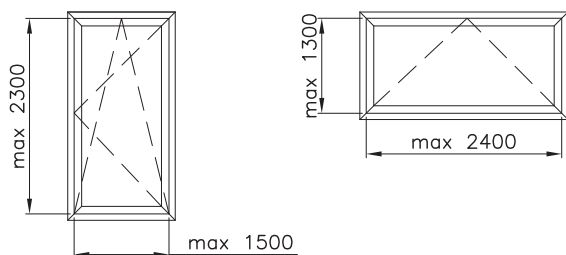
MB-86EI

EI 30 Maksymalne wymiary okien.

EI 30 Maximum dimensions of windows.

EI 30 Максимальные размеры окон.

EI 30 Maximale Abmessungen der Fenster.



Maksymalne wymiary szyb konsultować z dostawcą szyb.

The maximum dimensions of the glass panes please consult with the glass supplier.

Максимальные размеры стекол согласовывать с поставщиком стекол.

Die maximale Glasmasse nach der Abstimmung mit dem Glashersteller.