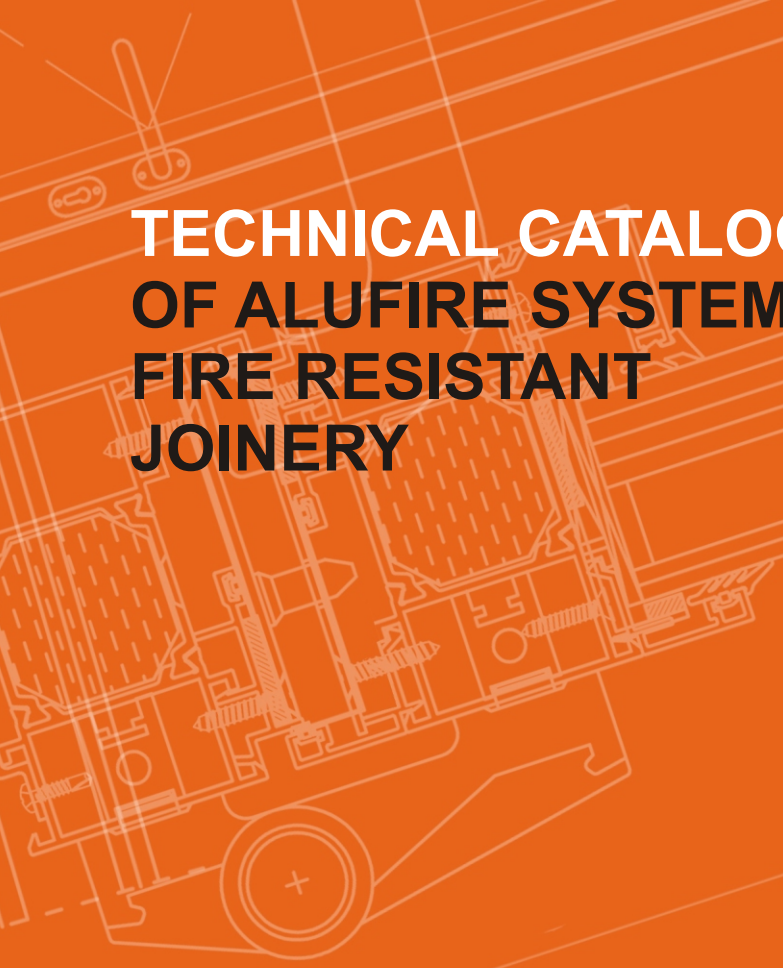
TECHNICAL CATALOGUE OF ALUFIRE SYSTEM FIRE RESISTANT JOINERY



ALUFIRE®

aluminium fire resistant joinery

OCTOBER 2018

LIST OF CONTENTS

ALUFIRE®
aluminium fire resistant joinery

INTRODUCTION

ALUFIRE was founded in 1993 as a producer of regular aluminium joinery. In 2004, our constructors drew up the ALUFIRE fire resistant ODM system and the company had it certified. Thereafter, Alufire obtained Building Research Institute approval. Since then, the Company has been one of the leaders amongst Polish producers of aluminium fire resistant windows and doorsets, ranging from EI15 to EI60 and walls in classes EI15 to EI120.

Currently, the Company offers fire resistant joinery in two systems - muntin and mullion **ALUFIRE Classic** and the all-glass **ALUFIRE Vision Line**.

The ALUFIRE Classic system is characterized by the following features:

- sound reduction:
  - of doors (glass) **R_w = 42 dB**, (R_{A1} = 41dB and R_{A2} = 39dB)
  - of internal walls **R_w = 41 dB**, (R_{A1} = 41dB and R_{A2} = 38dB)
  - of external walls **R_w = 44 dB**, (R_{A1} = 43dB and R_{A2} = 40dB)
  - of doors (panel) **R_w = 38 dB** (R_{A1} = 38dB and R_{A2} = 36dB)

- aluminium fire resistant EI30 and EI60 doors correspond to class 4 of strength requirements according to EN 1192:2001 i.e. conditions of heavy and very heavy duty operation

- segments of fire resistant walls of a maximum height of **4000 mm** for classes from EI15 to EI60 and **4200 mm** for class EI120 unlimited length, with the application of dilatation every 8000 mm and mullions spacing, depending on maximum dimensions of infills (glazing or panel) fulfil the requirements set out for the category IV of use, according to the guidelines for the European Technical Approval ETAG No. 003.

The glazing and non-transparent infills applied in the ALUFIRE system fulfil the requirements imposed on the corresponding classes of fire resistance.

In addition, in the ALUFIRE system, seals expanding under the impact of temperature are applied, which ensures tightening of the joinery in the case of fire, preventing the smoke and fire from getting inside through the partition.

The all-glass ALUFIRE Vision Line (AVL) wall system has the best noise reduction ratio in the market:

- AVL Standard **R_w = 39 dB**, (R_{A1} = 37 dB and R_{A2} = 35 dB)
- AVL Acoustic **R_w = 44 dB**, (R_{A1} = 43 dB and R_{A2} = 39 dB)
- AVL Acoustic+ **R_w = 47 dB**, (R_{A1} = 45 dB and R_{A2} = 42 dB)

ALUFIRE Classic system, Vision Line walls, fire resistant doorsets and windows fulfil the requirements of EN-13501-2+A1:2010 standard, provided for fire-resistance classes EI15, EI30, EI45, EI60 and EI120. All of them are confirmed by certificates issued by British Building Research Institute (**LPCB No. 1406a** and **1406b**), Lithuanian **GTC**, Czech **TZUS** and Polish Building Research Establishment (**AT-15-6520/2016, AT-15-9439/2015**).

Currently, we are in a position to meet the expectations and needs of even the most demanding client requests in the field of aluminium fire resistant joinery.

We are ready to cooperate with the client at each stage of project implementation. Our service to clients covers consultations at the design stage, assistance with the determination of the scope of works, production, assembly, and a full scope of guarantee servicing.

LPCB®

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Certificate of Product Approval

Certificate Number: 1406a Issue: 01

ALUFIRE Sp.z o.o.Sp.k.

Ul. Warszawska 64a,
87-148 Lysomice k.Torunia
Poland

is authorised to use the LPCB mark in association with the product(s) listed in this certificate and appendix having complied with the requirements of the standard(s) as detailed below:

Products
Fire Resistant Glazing
ALUFIRE EI30
ALUFIRE EI60
ALUFIRE EI120
ALUFIRE VISION LINE EI30
ALUFIRE VISION LINE EI60

Standards
1158 - Requirements and tests for fire resistant glazing systems

This Certificate is maintained and held in force through regular surveillance activities and subject to the corresponding ISO 9001 Certificate being maintained.

Signed for LPCB	Damien Ward Certification Scheme Manager	15 March 2017 Date of Issue	15 March 2017 Date of First Issue

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Certificate of Product Approval

Certificate Number: 1406b Issue: 01

ALUFIRE Sp.z o.o.Sp.k

Ul. Warszawska 64a,
87-148 Lysomice k.Torunia
Poland

is authorised to use the LPCB mark in association with the product(s) listed in this certificate and appendix having complied with the requirements of the standard(s) as detailed below:

Products
Fire Doorsets
ALUFIRE EI30 single leaf
ALUFIRE EI30 double leaf
ALUFIRE EI60 single leaf
ALUFIRE EI60 double leaf

Standards
LPS1056 – Requirements for the LPCB approval and listing of fire doorsets, lift landing doors and shutters

This Certificate is maintained and held in force through regular surveillance activities and subject to the corresponding ISO 9001 Certificate being maintained.

Signed for LPCB	Damien Ward Certification Scheme Manager	13 March 2017 Date of Issue	13 March 2017 Date of First Issue

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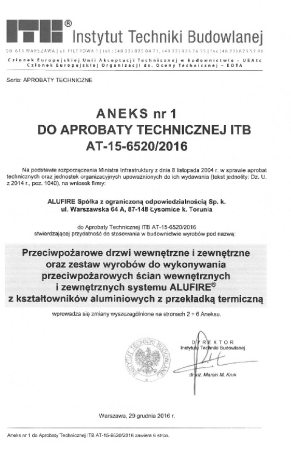
Instytut Techniki Budowlanej

APROBATA TECHNICZNA ITB
AT-15-6520/2016

ALUFIRE Spółka z ograniczoną odpowiedzialnością Sp. k.
ul. Warszawska 64 A, 87-148 Lysomice k. Torunia

Przeciwpożarowe drzwi wewnętrzne i zewnętrzne oraz zestaw wyrobów do wykonywania przeciwpożarowych ścian wewnętrznych i zewnętrznych systemu ALUFIRE® z kształtowników aluminiowych z przekładką termiczną



Instytut Techniki Budowlanej

ANEKS nr 1
DO APROBATY TECHNICZNEJ ITB
AT-15-6520/2016

ALUFIRE Spółka z ograniczoną odpowiedzialnością Sp. k.
ul. Warszawska 64 A, 87-148 Lysomice k. Torunia

Przeciwpożarowe drzwi wewnętrzne i zewnętrzne oraz zestaw wyrobów do wykonywania przeciwpożarowych ścian wewnętrznych i zewnętrznych systemu ALUFIRE® z kształtowników aluminiowych z przekładką termiczną

Certyfikat

Standard odniesienia: ISO 9001:2008
Numer rejestracyjny: 0196 100 01696

Posiadacz certyfikatu: ALUFIRE®

ALUFIRE Spółka z ograniczoną odpowiedzialnością sp. k.
ul. Warszawska 64 A
87-148 Lysomice k/Torunia
Polska

Zakres ważności: Projektowanie, produkcja i montaż stolarki aluminiowej ze szczególnym uwzględnieniem aluminiowej stolarki przeciwpożarowej.

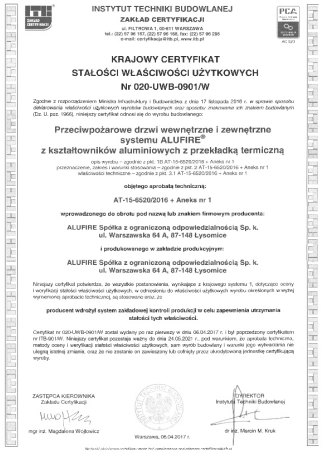
Na podstawie audytu potwierdza się spełnienie wymagań normy ISO 9001:2008.

Okres ważności: Certyfikat jest ważny od 2016-12-21 do 2018-08-24.

2017-01-10

Grażyna Grabka

www.tuv.com



INSTYTUT TECHNIKI BUDOWLANEJ
ZAKŁAD CERTYFIKACJI

KRAJOWY CERTYFIKAT
STAŁOŚCI WŁAŚCIWOŚCI UŻYTKOWYCH
Nr 020-UWB-0901/W

Przeciwpożarowe drzwi wewnętrzne i zewnętrzne systemu ALUFIRE®
z kształtowników aluminiowych z przekładką termiczną

AT-15-6520/2016 + Aneks nr 1

ALUFIRE Spółka z ograniczoną odpowiedzialnością Sp. k.
ul. Warszawska 64 A, 87-148 Lysomice

producent wdrożył system zakładowej kontroli produkcji w celu zapewnienia utrzymania stałości tych właściwości.

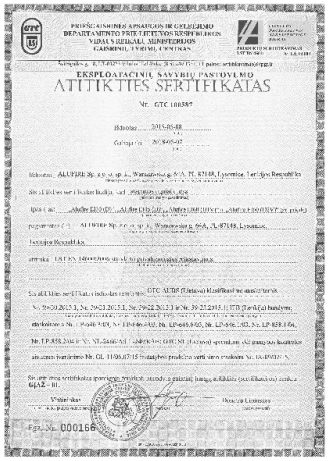
INSTYTUT TECHNIKI BUDOWLANEJ
ZAKŁAD CERTYFIKACJI

CERTYFIKAT ZGODNOŚCI
ITB-2563/W

Zestaw wyrobów do wykonywania przeciwpożarowych ścian wewnętrznych i zewnętrznych systemu ALUFIRE® z kształtowników aluminiowych z przekładką termiczną.

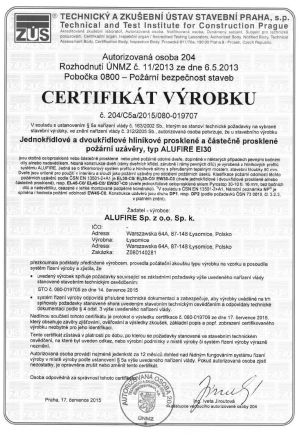
ALUFIRE Spółka z ograniczoną odpowiedzialnością Sp. k.
ul. Warszawska 64 A, 87-148 Lysomice

AT-15-6520/2016 + Aneks nr 1



ATITIKTIES SERTIFIKATAS

Nr. GTC 100587



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague

Autorizovaná osoba 204
Rozhodnutí ÚNMZ č. 11/2013 ze dne 6.5.2013
Pobočka 0800 – Požární bezpečnost staveb

CERTIFIKÁT VÝROBKU
č. 204/C5a/2015/080-019707

Jednokřídlové a dvoukřídlové hliníkové prosklené a částečně prosklené požární uzávěry, typ ALUFIRE EI30

Žadatel - výrobce
ALUFIRE Sp. z o.o. Sp. k.
IČO:
Adresa: Warszawska 64A, 87-148 Lysomice, Polsko
Výrobna: Lysomice
Adresa: Warszawska 64A, 87-148 Lysomice, Polsko
Zakázka: Z560140281

Laboratorium Techniki Budowlanej

ŚWIADECTWO BADAŃ ODPORNOŚCI NA WŁAMANIE

ALUFIRE

EN1627 RC 2

Alufire manufactures single- and double-leaf doors, fixed walls with and without cross-bars, side-hung casement windows and connections for opened elements with fixed walls in various configurations and in different classes of fire resistance EI15, EI30, EI45, EI60 and EI120, as well as smoke leakage performance (EN 1634-3) up to Sa Sm.
Our products are made of aluminium profiles joined by a thermal break made of polyamide, reinforced with glass fibre, which makes up a three-chambered profile. Owing to the application of thermal breaks and filling the profiles chambers with silicate-cement inserts, thermal insulation is maintained during a fire. The number of chambers filled is dependent upon the class of fire resistance of the given element.

Glass panes and non-transparent/solid panels are used as infills for doorsets, windows and fixed walls. The glass panes are composed of several layers of glass which are separated by layers of gel. In case of fire on one side, both glazing and/or infills which fill the profiles are insulating barriers preventing the second side from reaching an average temperature of above 140 °C.

The following classes for Alufire fire resistant doorsets are available: EI15, EI30, EI45, EI60, including smoke leakage classification up to S and Sa - Sm. The EI60 Sa - Sm classification means that the partition can resist the passage of smoke whilst retaining its fire integrity (E) and fire insulation (I) for 60 minutes.

Integrity (E) is the ability of the element of construction that has a separating function, to withstand fire exposure on one side only, without the transmission of fire and hot gases to the unexposed side. In that case the ignition of any adjacent material or surface may happen on unexposed side due to transmission of temperature.

Insulation (I) is the ability of the element of construction to withstand fire exposure on one side only, without the transmission of fire and with limited transmission of heat so that neither the unexposed surface nor any material in close proximity to that surface is ignited. The element is also a sufficient barrier to protect people near to it.

Smoke leakage (S) is the ability of the element to reduce or eliminate the passage of gases or smoke from one side of the element to the other.

Sa considers smoke leakage at ambient temperature only.

Sm considers smoke leakage at both ambient temperature and at 200 °C.

Self-closing (C) is the capacity to release the opened door and window installations and to ensure the reliable closing of the leaves/sashes in the case of fire and smoke.
To fulfil the above condition, i.e. security against fire and smoke, all the elements to be opened are equipped with self-closing devices, referred to as self-closers.
If a fire resistant door is mounted on evacuation routes, it is required to be installed with anti-panic hardware/furniture. The requirements for this type of hardware are laid down in the following standards: EN 179:2009 and EN 1125:2009. These standards set out the requirements related to the hardware production, operation and testing for emergency exit doors with two solutions being taken into account:

- emergency closers for exit started by a handle or pressure plate,
- anti-panic closers for exit started by a horizontal bar (lever or panic bar).

FIRE RESISTANT DOORS

The maximum dimensions for the ALUFIRE system doors are laid down in Technical Approval No. AT-15-6520/2016. They are presented in Figure 1.

Moreover, ALUFIRE doors and windows are approved as fulfilling requirements of classes EI_1 and EI_2.

a) Dependencies between the width of the clear door, the external dimension and the width of the opening in the wall. The below figures are calculated for the door open at 90° position.

Single-leaf doors

Width of clear door opening S_p [mm]*	External width of joinery **S** [mm] S_p + 220 [mm]	Width of the opening in the wall S_o [mm] S_p + 250 [mm]
800	1020	1050
900	1120	1150
1000	1220	1250
1100	1320	1350
1200	1420	1450

Double-leaf door

Width of clear door opening S_p [mm]*	External width of joinery **S** [mm] S_p + 220 [mm]	Width of the opening in the wall S_o [mm] S_p + 250 [mm]
1060	1360	1390
1100	1400	1430
1200	1500	1530
.	.	.
.	.	.
2200	2500	2530

b) Dependencies between the height of the clear door opening, the external dimension and the height of the opening in the wall for the single- and double-leaf doors

Doors without a threshold

Height of clear door opening H_p [mm]*	External height of joinery **H** [mm] H_p + 70 [mm]	Height of the opening in the wall H_o [mm] H_p + 90 [mm]
2000	2070	2090
2100	2170	2190
2200	2270	2290
.	.	.
.	.	.
2680	2750	2770

Doors with a low threshold of 10 mm to be used inside

Height of clear door opening H_p [mm]*	External height of joinery **H** [mm] H_p + 70 [mm]	Height of the opening in the wall H_o [mm] H_p + 90 [mm]
2000	2080	2100
2100	2180	2200
2200	2280	2300
.	.	.
.	.	.
2670	2750	2770

Doors with a high threshold of 20 mm to be used outside

Height of clear door opening H_p [mm]*	External height of joinery **H** [mm] H_p + 70 [mm]	Height of the opening in the wall H_o [mm] H_p + 90 [mm]
2000	2090	2110
2100	2190	2210
2200	2290	2310
.	.	.
.	.	.
2660	2750	2770

*) dimension for door open on 90° position

Technical parameters

The ALUFIRE system doors are characterised by very high mechanical strength, meeting **class 4**: i.e. heavy to very heavy operations, according to standard EN 1192:2001, and they have the highest class of mechanical durability: **C5** (200 000 cycles of opening and closing) according to EN 14600:2009 standard. Having obtained such high strength parameters and mechanical durability enables the application of the ALUFIRE system doors in public facilities such as offices, governmental authorities, schools, hospitals, dispensaries, hotels and warehouses, as well as production plants with a high or very high intensity of traffic.

The aluminium profiles can be protected against corrosion by powder coating or anodic oxidation. which ensures the best class of anti-corrosion resistance of protective coat **C4** for Alufire systems according to standards EN ISO 12944-2:2001.

Anti-burglary door (RC2 class)

The ALUFIRE range includes the anti-burglary fire resistant doorsets of **RC2 class**. Such constructions may be made as a single leaf glazed door with fire resistance, ranging from EI15 to EI60. Maximum dimensions for ALUFIRE anti-burglary doors are **1375x2515 mm**.

Laboratorium Techniki Budowlanej

ŚWIADECTWO BADAŃ ODPORNOŚCI NA WŁAMANIE

Nr 717/AW-2015

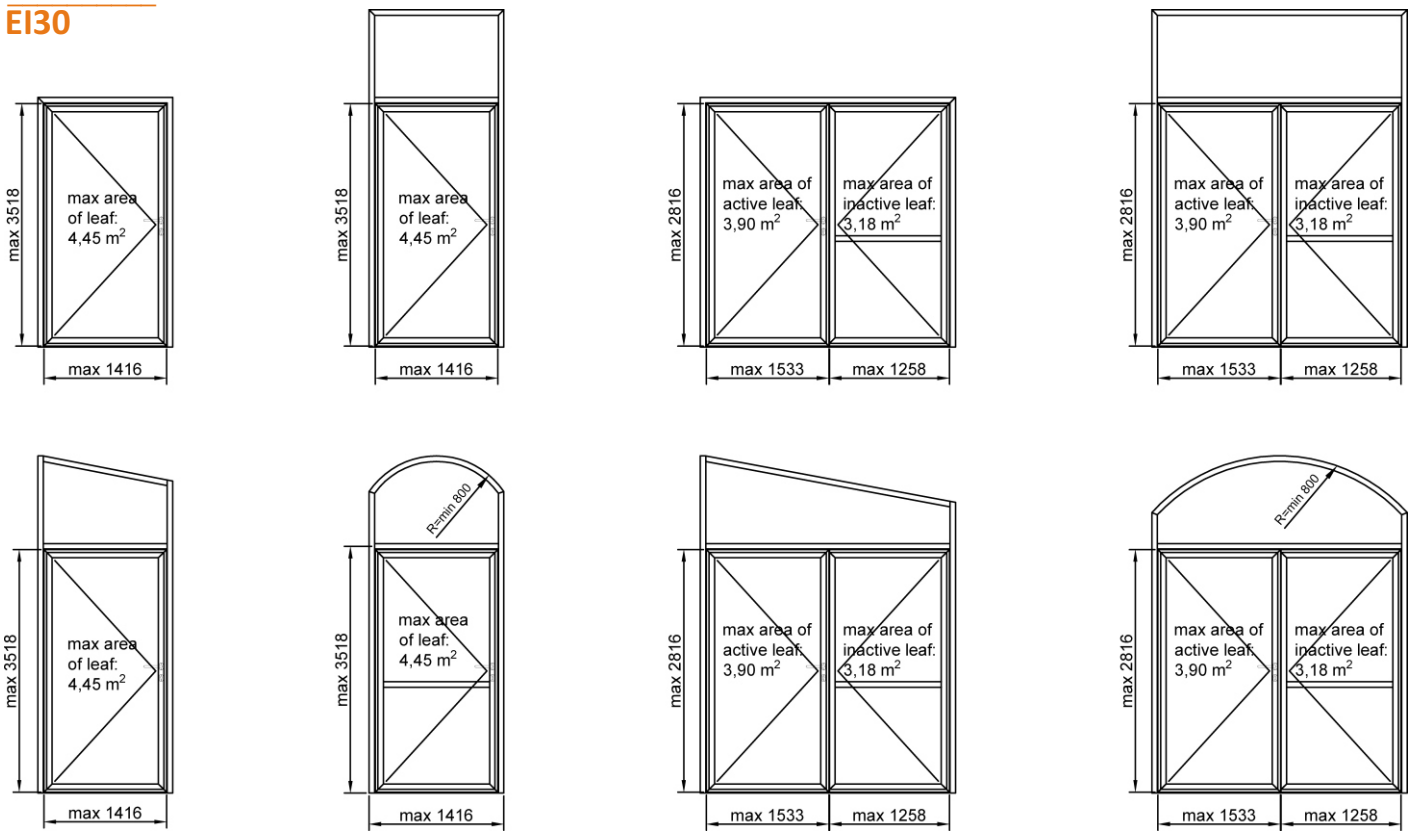
ALUFIRE

Drzwi systemu ALUFIRE®

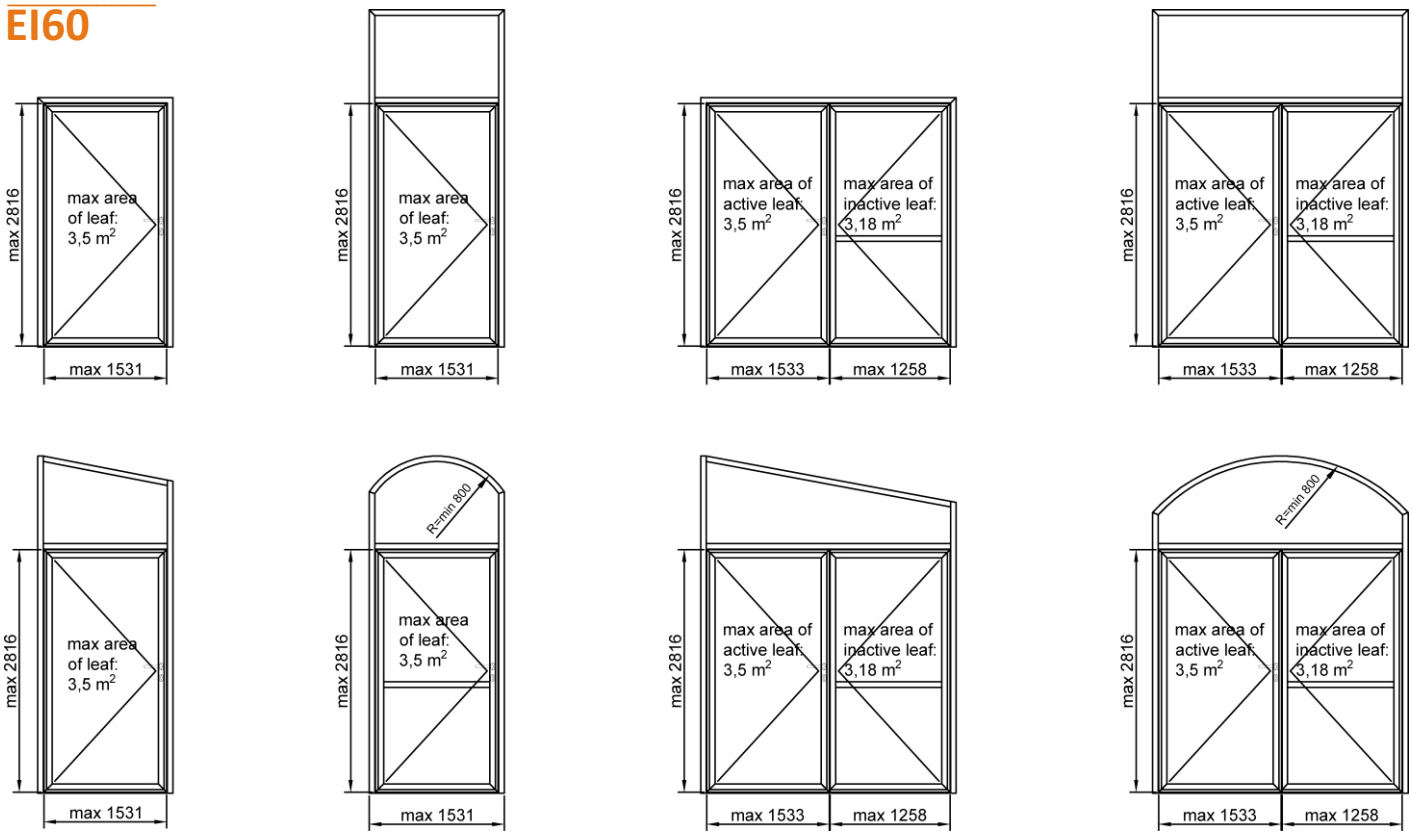
EN1627 RC 2

Figure 1. Maximum dimensions of technical doors and windows – Ei30, EI60 [mm]

EI30

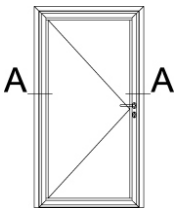


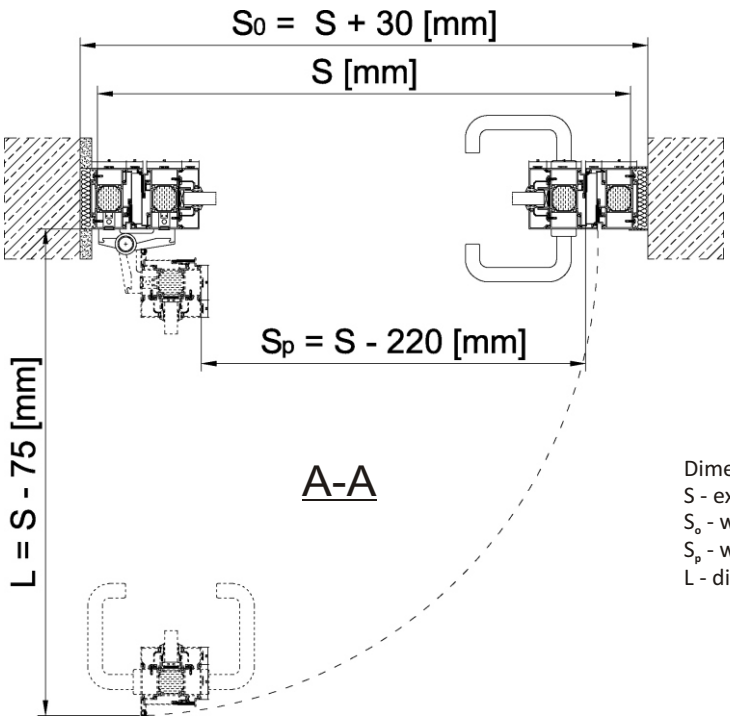
EI60



NOTE: In the case of constructions larger than those released in the Technical Approval, they can be manufactured pursuant to an opinion or individual admission. All matters related to exceeded maximum dimensions shall be consulted with ALUFIRE Distributor.

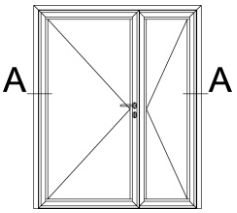
Figure 2. Horizontal cross-section of fire resistant single leaf EI 30 doors (similar to EI15, EI45 and EI60)

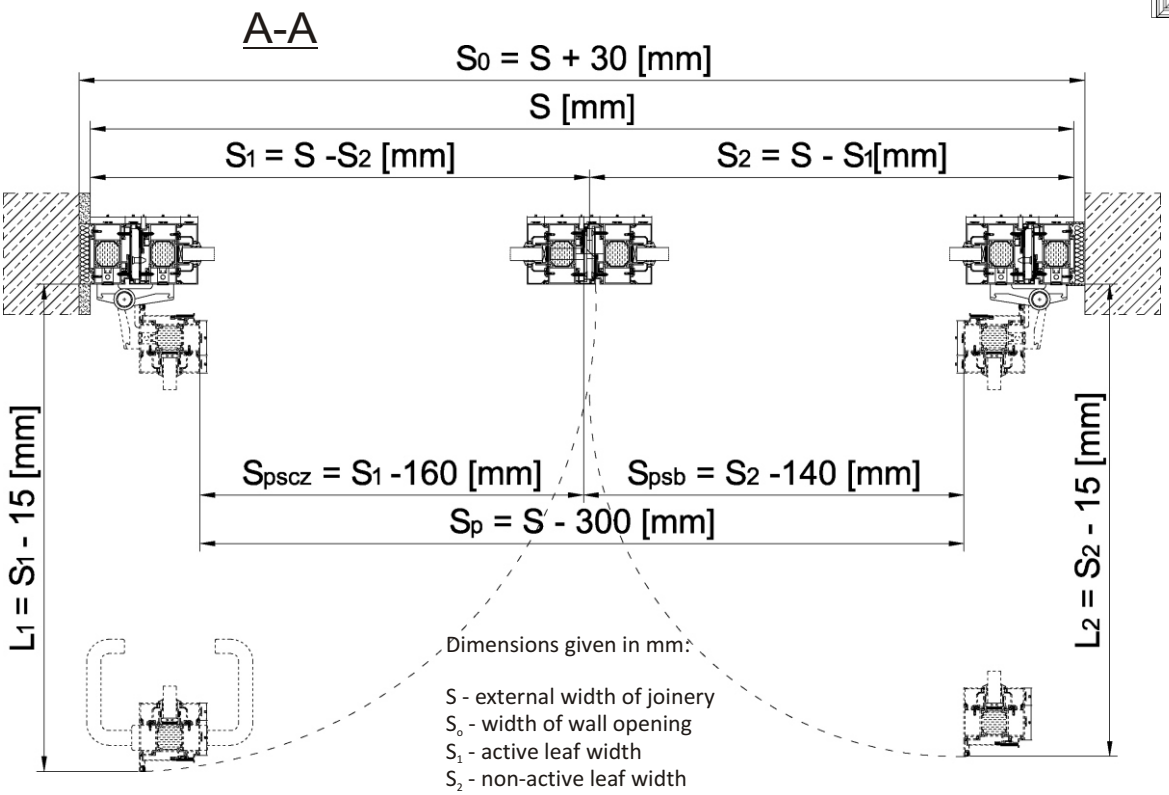




Dimensions given in mm:
S - external width of joinery
S_o - width of wall opening
S_p - width of door clearance
L - distance to the furthest edge of leaf

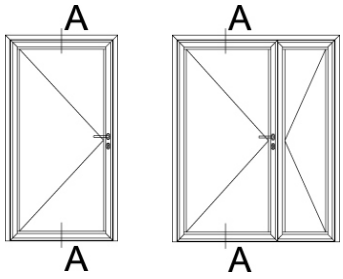
Figure 3. Horizontal cross-section of double leaf fire resistant doors of EI30 (similar to EI15, EI45 and EI60)



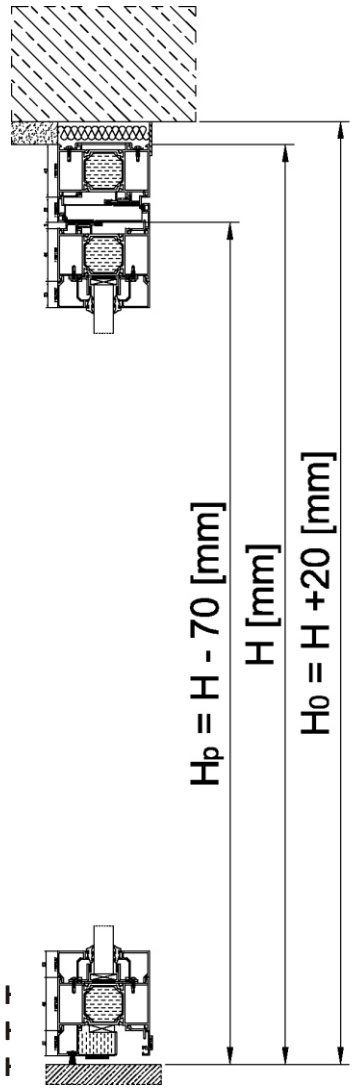


Dimensions given in mm:

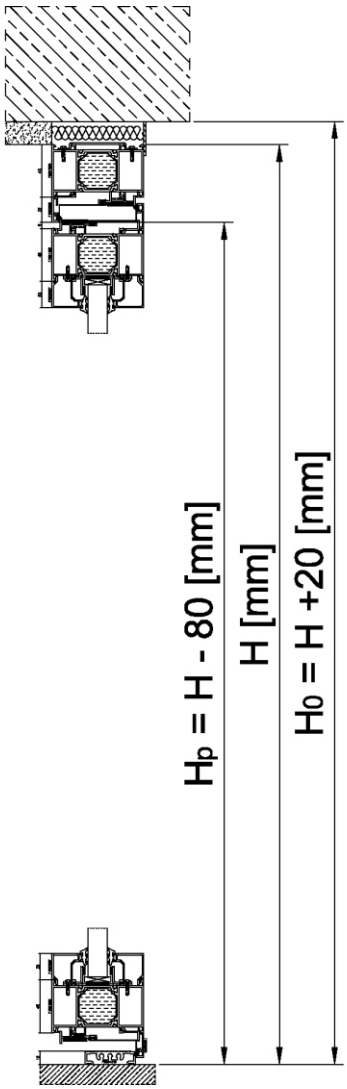
S - external width of joinery
S_o - width of wall opening
S_1 - active leaf width
S_2 - non-active leaf width
S_{pscz} - clearance of active leaf
S_{psb} - clearance of non-active leaf
S_p - width of door clearance
L_1, L_2, - distance from the leaf furthest edge



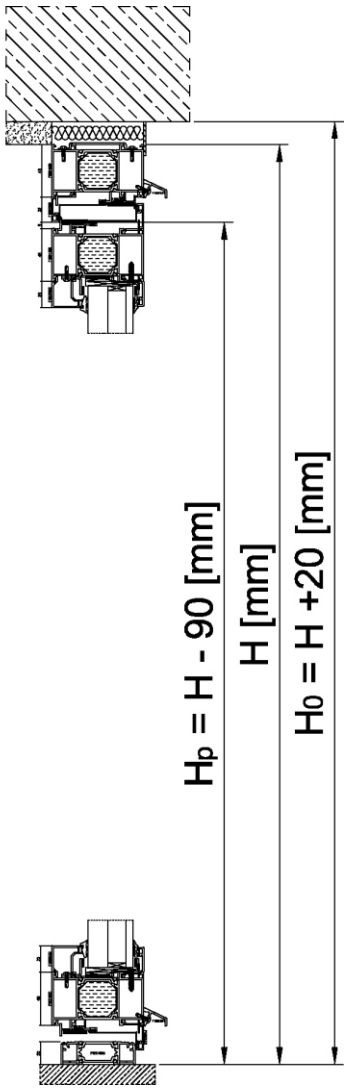
a) A-A



b) A-A



c) A-A



Dimensions given in mm:
H - external height of joinery
H_0 - wall opening height
H_p - door clearance height

MUNTIN AND MULLION FIRE RESISTANT WALLS - ALUFIRE CLASSIC

The maximum dimensions of the fixed walls are laid down by Technical Approval No AT-15-6520/2016. Fixed walls with doors or without them may have a maximum height of 4200 mm. The width of walls is not limited provided that dilatation every 8000mm is applied, whereby the spacing of mullions for internal and external joinery depends upon types of glazing and infills. (Table 1).
ALUFIRE makes fixed walls in fire resistance classes EI15, EI30, EI45, EI60 and EI120.

Figure 5. Dimensions of fixed walls with or without doors

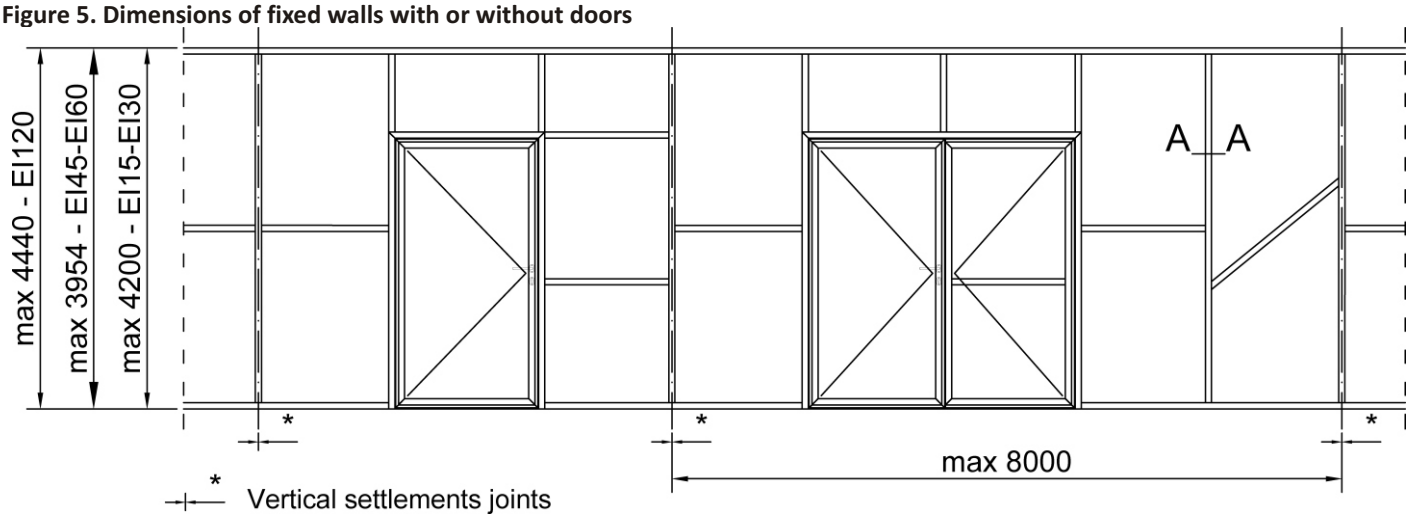


Figure 6. Horizontal cross-section through the internal wall (W) and external wall mullions (Z) - EI30, EI60

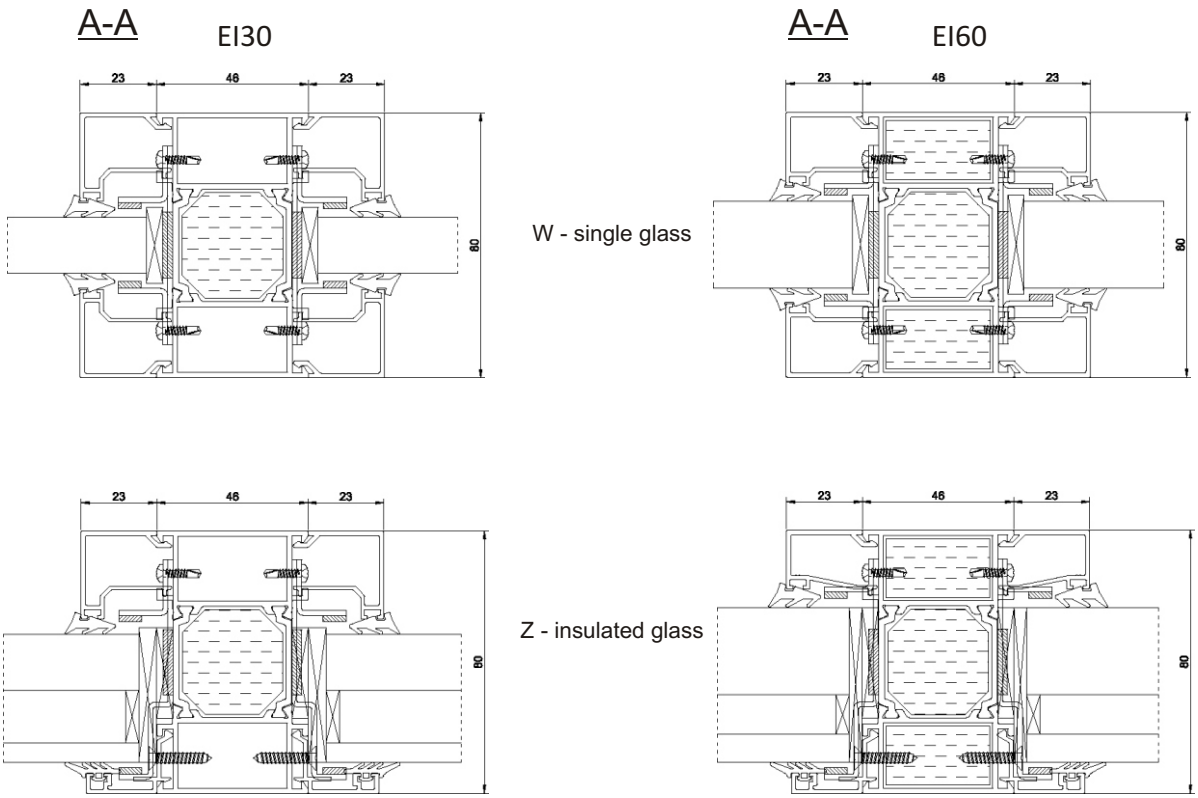
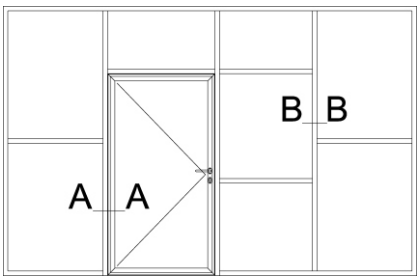


Table 1. Glass applied in ALUFIRE Systems

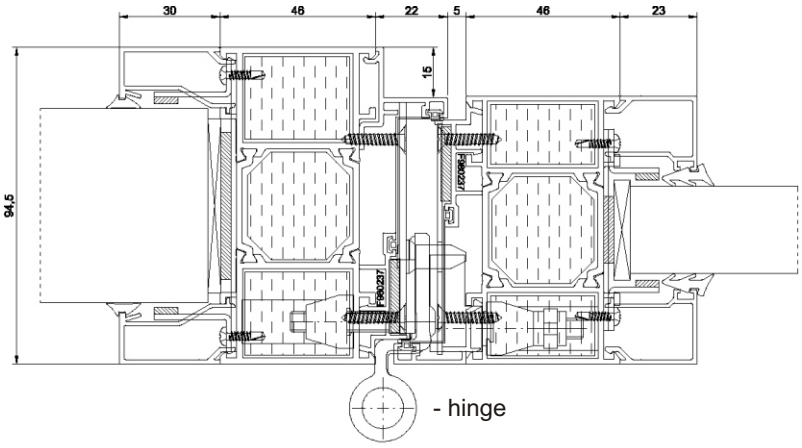
Pos.	Manufacturer	Glass pane type	Used in non-loadbearing walls system ALUFIRE	Thickness [mm]	Max. dimensions in portrait orientation (width x height) [mm]	Max. dimensions in landscape orientation (width x height) [mm]
1.	AGC	Pyrobel 8	EI15	9,3	1400 x 2500	2500 x 846
2.	AGC	Pyrobel 8EG	EI15	13,1	1400 x 2500	2500 x 846
3.	PILKINGTON	PYRODUR 30-103	EI15	9	1400 x 2500	2500 x 846
4.	PILKINGTON	PYRODUR 30-201	EI15	10	1400 x 2500	2500 x 846
5.	AGC	Pyrobel 16	EI15, EI30	17,3	1540 x 2750, at maximum area 3,87 m^2 1000 x 2888	2750 x 931, at maximum area 2,34 m^2
6.	AGC	Pyrobel 16EG	EI15, EI30	21,1	1400 x 2500 1000 x 2888	2500 x 846
7.	AGC	Pyrobel 17	EI15, EI30	17,8	1400 x 2500 1000 x 2888	2500 x 846
8.	AGC	Pyrobel EI30/16	EI15, EI30	16	1148 x 2225	1148 x 2225
9.	PILKINGTON	PYROSTOP 30-10	EI15, EI30	15	1680 x 3000, at maximum area 4,24 m^2	3000 x 1015, at maximum area 3,75 m^2
10.	PILKINGTON	PYROSTOP 30-20	EI15, EI30	18	1400 x 2500	2500 x 846
11.	REGLAS S.r.o	PYROBAT 15	EI15, EI30	15	1127 x 2050	2050 x 1127
12.	PILKINGTON	PYROSTOP 30-10	EI45	15	1123 x 2223	1123 x 2223
13.	PILKINGTON	PYROSTOP 30-20	EI45	18	1100 x 2000	1100 x 2000
14.	PILKINGTON	PYROSTOP 60-101	EI45, EI60	23	323 x 2700 1500 x 2500	2500 x 1300
15.	PILKINGTON	PYROSTOP 60-201	EI45, EI60	27	323 x 2700 1500 x 2500	2500 x 1300
16.	VETROTECH SAINT GOBAIN	CONTRAFLAM N2	EI45, EI60	23	1146 x 2223	1146 x 2223
17.	GLASS TEAM	POLFLAM EI60	EI45, EI60	34	1423 x 2223	1423 x 2223
18.	AGC	PYROBEL 25	EI45, EI60	26,6	1200 x 3465, at maximum area 3,49 m^2 1400 x 2500	2500 x 846
19.	AGC	PYROBEL 25EG	EI45, EI60	30,4	1000 x 2888 1400 x 2500	2500 x 846
20.	PILKINGTON	PYROSTOP 120-10	EI120	58	1702 x 2662, at maximum area 3,81 m2	2662 x 1582, at maximum area 3,54 m2
21.	PILKINGTON	PYROSTOP 120-380	EI120	64	1320 x 2440, at maximum area 2,94 m2	2440 x 693, at maximum area 1,54 m2
22.	ALUFIRE	Non-transparent panel	EI15, EI30	28	1800 x 3000, at maximum area 4,54 m2	1800 x 3000, at maximum area 4,54 m2
23.	ALUFIRE	Non-transparent panel	EI45, EI60	40,5	1500 x 2500	1500 x 2500
24.	ALUFIRE	Non-transparent panel	EI120	62	1324 x 2400, at maximum area 2,71 m2	2274 x 763, at maximum area 1,46 m2

Figure 7. Cross-section through mullion of internal wall (W) and external wall (Z) of EI120 fire resistant wall with EI60 door

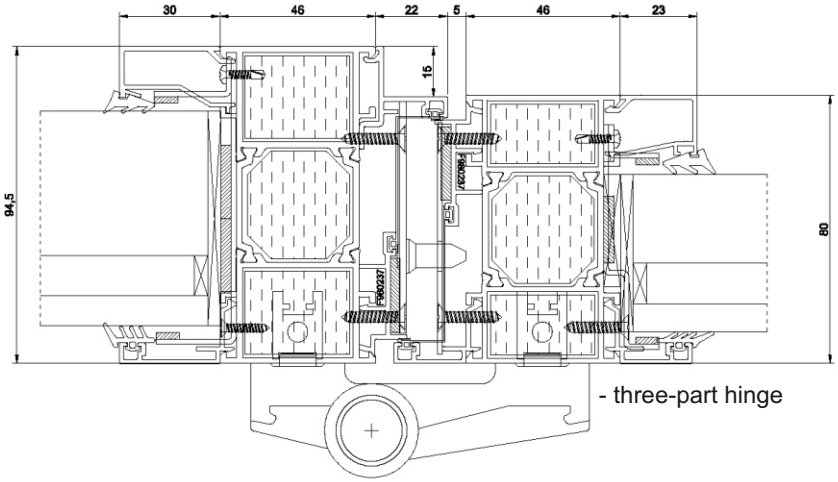


A-A

W

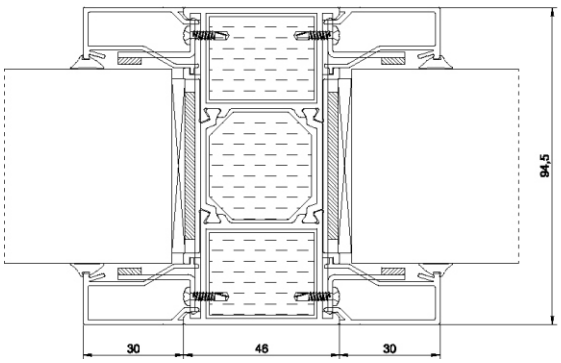


Z

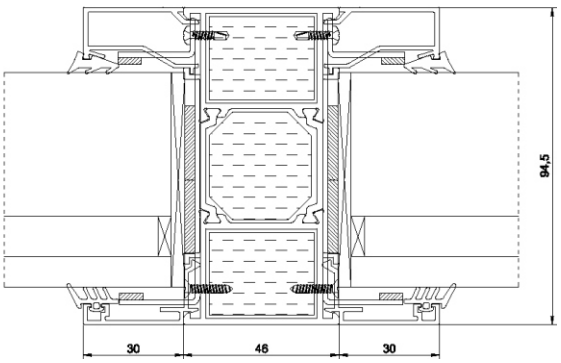


B-B

W



Z



TECHNICAL FIRE RESISTANT WINDOWS

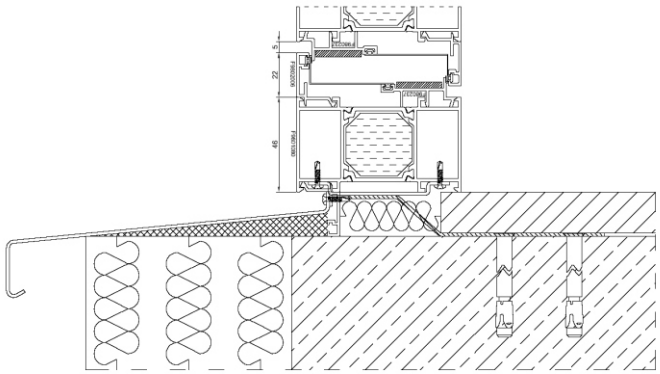
For windows, we apply furniture/hardware designated for production of doors, i.e. a lock with an insert and a half-handle, three-part hinges per window leaf and a self-closer. The whole construction is manufactured in the door system - the frame runs along the whole circumference of the window (there is no threshold). We manufacture only side-hung windows without the function of bottom-hung windows. The minimum dimensions of window constructions are 600x600 mm.

We also produce air-vent windows - with pushers - in such a case, the window is not equipped with self-closure. The function of opening or closing is fulfilled by the GEZE K600 F air vent, connected to the fire resistant centre (Photo 1).

Photo 1. Window GEZE K600 F air vent

NOTE: Pursuant to the fire resistance provisions, a fire resistant window must be equipped with a self-closer.

Figure 9. Exemple detail of window with sill joining



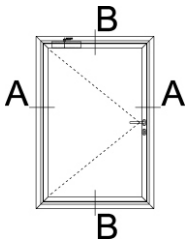
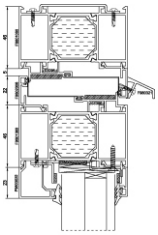


Figure 10. Vertical cross-section for EI30 (similar to EI15, EI45 and EI60).

B-B



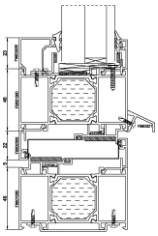
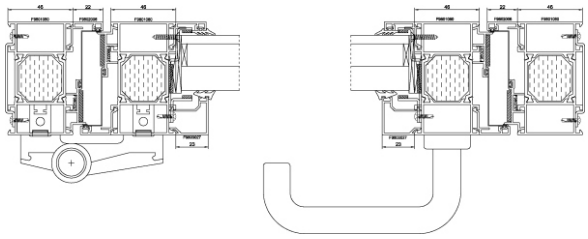


Figure 8. Horizontal cross-section of EI30 window (similar to EI15 and EI60)

A-A



In the windows, inter-glaze dividers may be applied 8,18, 26, 45 mm wide in any RAL colour (examples of windows and walls with intra-glazing dividers are presented in Photo 2.

Photo 2. ALUFIRE fire resistant technical window with a fixed wall (intra-glazing dividers)

HARDWARE AND ACCESSORIES OF FIRE RESISTANT DOORS

Fire resistant doors are equipped with a bolt-catch lock with a lock insert, a U-form safe handle made of stainless steel, three-part and roller hinges and a self-closer, as standard.
There is also the possibility to apply other hardware, which is more typical for a particular market on condition that is certified as fire resistant.

Handles and doorknobs

Photo 3. Handle and fixed doorknob

The stainless-steel handle, of U-form and L-form types, comes with an oval divided rosette and a fixed doorknob to control the access on one side. Assembly of the rosette, handle and door knob takes place with the use of **rivet nuts.**

Self-closers

Self closers shall be assembled exclusively with the help of **rivet nuts**.

Photo 4. GEZE TS 2000 self-closer

- three basic colours: white, silver and brown
- adjustable power of closing 2-/5
- adjustable speed of closing and final pressure
- delayed opening action
- mounting to the left and right doors on the side of hinges and on the opposite side
- alternative option DORMA GROOM GR 200

Photo 5. GEZE TS 4000 self-closer

- three basic colours: white, silver and brown
- smooth adjustable power of closing 2-5, adjusted by hydraulic valve
- adjustable speed of closing and final pressure
- delayed opening action
- mounting to the left and right doors on the side of hinges and on the opposite side
- alternative option DORMA TS 83

Photo 6. GEZE TS 5000 self-closer

- three basic colours: white, silver and brown
- closing power 2-5, adjusted by hydraulic valve
- three speeds of closing, adjusted by hydraulic valves
- mounting to the left and right doors
- mounting on the door-leaf on the side of hinges
- alternative options:
  - TS 5000 S with adjusted function of delayed closing
  - TS 5000 E with built in electromagnetic retainer in a rail
  - TS 5000 R with electromagnetic retainers and smoke sensor integrated in a rail
  - DORMA TS 93

Photo 7. GEZE TS 5000 self-closer together with rail

- three basic colours: white, silver and brown
- closing power 2-5, adjusted by hydraulic valve
- three speeds of closing, adjusted by hydraulic valves
- mounting to the left and right doors
- mounting on the door-leaf on the side of hinges
- alternative options:
  - TS 5000 ISM with integrated adjustor of the sequence of closing
  - TS 5000 E-ISM with integrated adjustor of the sequence of closing and electromagnetic retainers in the rail
  - TS 5000 R-ISM with integrated adjustor of the sequence of closing, electromagnetic retainers and smoke sensor in a rail
  - DORMA TS 93

Photo 8. Concealed self-closer of GEZE - BOXER type

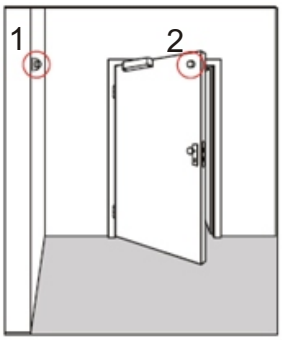
The self-closer for assembling in the door construction is completely concealed in the leaf and frame profile. The closing force is in accordance with the guidelines of EN 1154 standard. The speed of closing, the functions of end stop and mitigating closing are adjusted hydraulically with the use of screws available also after assembling in the leaf. The self closer may be applied in doors of a leaf weight up to 130 kg.

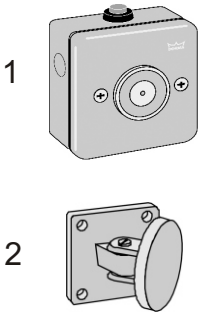
Electromagnetic door retainer

In particular cases, when it is necessary to keep the leaves permanently open, an electromagnetic door retainer connected to SAP system shall be used.
We apply the following types of door retainers:
- wall-mounted point door retainer
- floor-mounted point door retainer
- retainer integrated in the slip rail of self-closer

Figure 11. Placing of wall-mounted electromagnetic door retainer

1) electromagnet with a switch-off
2) armature plate





Access control

a) Single-sided/averse electric strike
- single-sided access control
- hardware: handle - knob
- closed without electric current NC
- mounting next to the main lock
- supply 12 or 24 V DC
- optional electric strike with monitoring

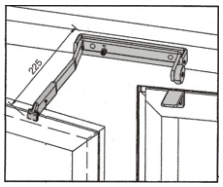
a) Double-sided/reverse electric strike
- double-sided access control
- hardware: handle - handle
- open without electric current NO
- mounting next to the additional lock
- suggested mounting in emergency escape doors
- supply 12 or 24 V DC
- optional electric strike with monitoring

b) Electromagnetic dead bolt
- double-sided access control
- hardware: handle - handle
- open without electric current NO
- surface mounting
- suggested mounting in emergency escape doors
- supply 12 or 24 V DC

c) Electric locks
- single-sided access control - lock type EL 460
- double-sided access control - lock type EL 461
- adjusted side of escape handle - lock type EL 460
- unlocking the lock with the use of a key, magnetic card, coder, etc
- working mode NC/NO
- supply 12 or 24 V DC
- monitoring functions:
  - bolt position
  - trigger position
  - handle position
  - key position

Closing sequence adjustor

Figure 12. Lever closing sequence adjustor



Closing sequence adjustor for doors serves to ensure the correct sequence of leaf door closing. It is applied when both leaves are open and their closing is controlled remotely with the use of electromagnetic retainers or anti-panic door hardware.

We can distinguish two types of closing sequence adjustor: lever adjustor (Figure 12) and one integrated in the slip rail of self-closure (Photo 7). When applying the lever closing sequence adjustor, self-closures are applied on both leaves.

Anti-panic devices

Emergency closures solutions for exits started with a handle are applied in buildings whose users are familiar with the facility and the security systems applied, the action of emergency closures included, and the outbreak of panic is deemed to be unlikely. In other cases, anti-panic closures are applied to exits, started with a horizontal “pressure rod” or a “pressure strip”.

Anti-panic closures make it possible to remove people with minimum effort and without any earlier knowledge of the device's functioning, which means acting on reflex. The basic requirement imposed on this hardware is that the doors should be easy to open for inexperienced people, as well as the elderly and the handicapped.

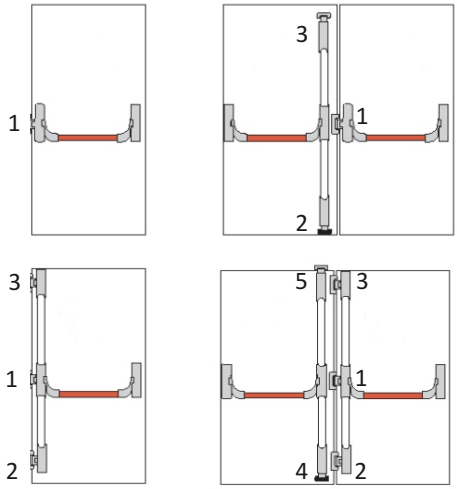
For single-leaf doors, anti-panic hardware is applied, blocked in one point, and for smoke-resistant doors, hardware blocked in three points is applied, which improves the smoke resistance of such a construction. In double-leaf doors, the passive leaf is always blocked in two points (top and bottom), and the active leaf, similarly to the single-leaf doors, in one or three points, for smoke-resistant doors.

Access control in a door with anti-panic hardware is possible through the application of a reverse electric strike or an electromagnetic dead bolt. In this case, there is no need to apply an additional element to cut off the voltage from the inside of the door, as the anti-panic hardware is equipped with a contactor, cutting off the voltage from the system of access control.

Figure 13. Examples of anti-panic hardware and number of points of leaf blocking

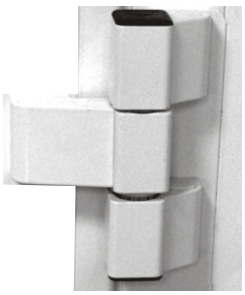
a) standard door

b) smoke-resistant door

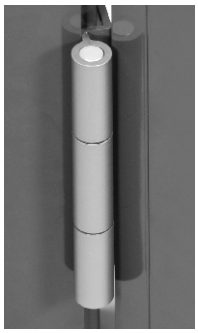


Hinges

Photo 9. Three-part and roller hinges



three-part hinge

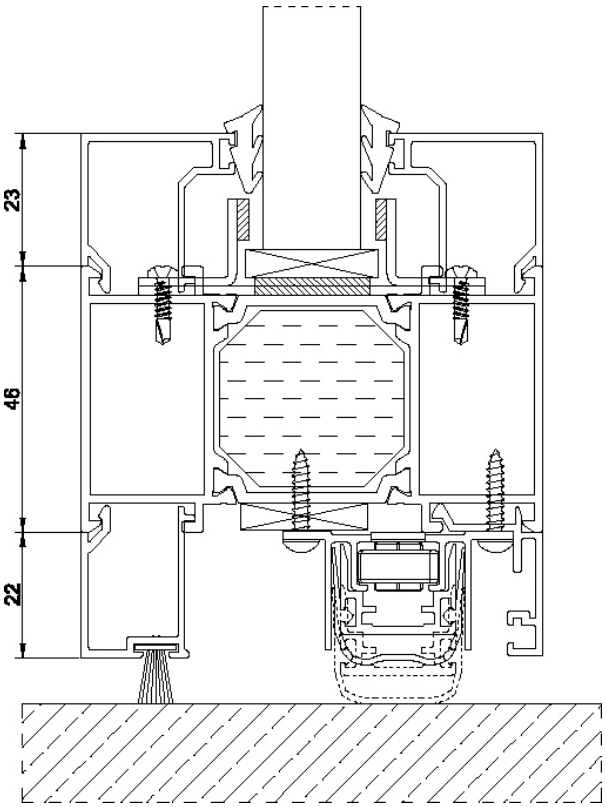


roller hinge

Smoke resistant doors

Smoke resistant doors in the ALUFIRE system, over 2300 mm high, are equipped with a three-point rod lock instead of a standard bolt-catch lock. The application of such a solution causes increased tightness of the door. In addition, from the bottom of the door leaves, we apply an automatically drop seal which additionally seals the space between the leaf and the floor and protects against smoke getting into the premises. Such doors may be equipped with an access control in the form of reverse electric strike or electromagnetic deadbolt. The application of the reverse electric strike is not possible because the lock has three catches.

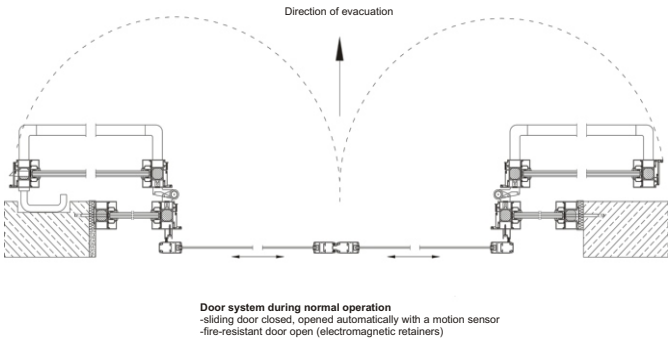
Figure 14. Vertical cross-section through the bottom profile of smoke resistant door with an automatically dropping seal



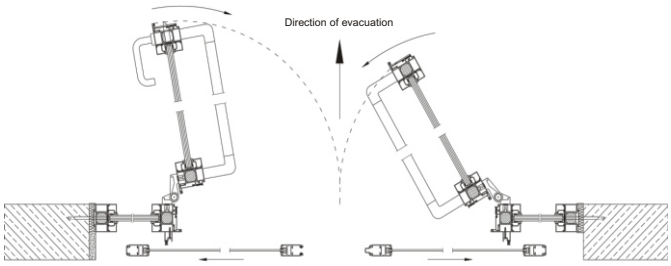
Automatic sliding doors

ALUFIRE offers an alternative for fire resistant automatic sliding doors. This solution consists in a parallel connection of the automatic sliding door without fire resistance and the fire resistant side-hung door with anti-panic hardware and electromagnetic retainers. The system of this solution is presented in Figure 15.

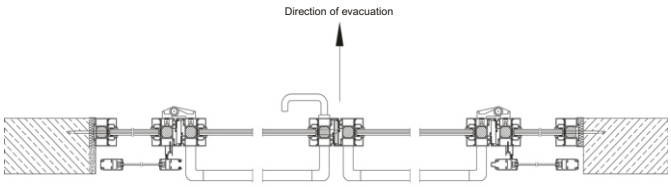
Figure 15. Solution for sliding fire resistant door construction



Door system during normal operation
-sliding door closed, opened automatically with a motion sensor
-fire-resistant door open (electromagnetic retainers)



Door system during fire alarm
-sliding door starts to open
-after the retainers are released, fire-resistant door closes (first the passive leaf, then, the active leaf)



Door system during fire (evacuation)
-sliding door opened permanently
-fire-resistant door closed automatically, but may be opened manually with using panic bar

Side-hung doors opened automatically

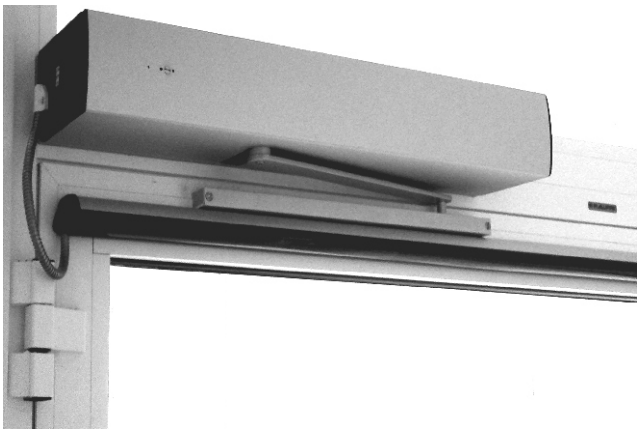
Side-hung doorsets opened automatically are applied most frequently in the places with high movement intensity, in health care buildings, commercial centres and so on. The application of electric strike allows the opening the door with the use of an automatic system without having to press the handle and release the lock catch.

The automatic system is connected to the averse electric strike which releases the leaf at the moment the automation system starts to operate. After the leaf has been opened, the voltage is cut from the automatic electric strike, which causes its closed position.

Several devices that open the automatic system can be connected to it, for instance: a motion sensor, an automatic opening button or a magnetic card reader. The type of devices applied depends upon the client's needs and the functionality of the facility. The application of a doorknob on one side, and for instance, a magnetic card reader makes it possible to have a single-side access control where the door leaves open automatically after the card reader is decoded.
Cutting off voltage from the automation system during a fire alarm causes the self-closing of the door leaves. In such a case, the door can be manually opened.

Hardware applied:
- SLIMDRIVE EMD-F by GEZE company (photo 10)
  - supply 230 V AC 50/60 Hz
  - power 230 W
  - supply to external devices 24 V DC
- 24 V DC forward electric strike
- automatic flush bolts (only for double-leaf doors)

Photo 10. SLIMDRIVE EMD-F



Air vent doors and windows

According to the last evidence, over 90% of building fire victims die from of smoke or toxic gas poisoning. Air vent doors/windows serve to supply air to the facility and to remove the smoke and toxic gases from the emergency exits and premises. For this purpose, fire resistant doors are equipped with pushers which are connected to the SAP system and during an intensive accumulation of smoke, they automatically open the leaves.
The doors/windows with pushers must be equipped in an averse electric strike which opens the moment the pushers' operation starts. After opening the leaf, the voltage is cut off from the electric strike and it remains closed. The application of electric strike is necessary because the door leaf must have a chance to be automatically opened without the necessity of pressing the handle and release the lock latch.

Hardware applied:
- K600 pusher of GEZE company (photo 11)
  - 24 V DC supply
  - force of pressure 500 N
  - rated current 1.2 ÷ 1.25 A-
- 24 V DC averse electric strike
- automatic flush bolts (for double-leaf doors)
- adjustor of closing sequence (for double-leaf doors)
- the pushers shall be mounted exclusively with the help of **rivet nuts**

Each fire resistant door with an aerating/air vent function and equipped with pushers must be connected to the fire signalling system, and at the door, smoke sensors along with temperature sensors shall be mounted. The type of sensors applied, the centre, the distances from the doors and their number shall be in accordance with the design of the fire signalling system. In cases of extensive smoke, the door shall automatically be opened to supply fresh air and the smoke shall be removed by gravitation or mechanically through the smoke damper to carry out a quick and efficient evacuation. If the fire causes the temperature to start rising around the opened door, the aerating/air vent door shall close automatically, owing to a signal of a temperature sensor sent from the centre of fire signalling system, to create a permanent barrier for fire. Only the properly designed and mounted outfit shall ensure the proper operation of fire resistant aerating/air vent door.

Photo 11. Pusher for aerating/air vent door

Ventilation grilles

ALUFIRE offers ventilation grilles for fire resistant doors. They are applied in premises where gravitation ventilation is required.

Basic parameters of grilles:
- external dimensions 300 x 150 mm
- colour of front cover, according to the RAL palette
- air flow 295 cm^3/s

Photo 12. ALUFIRE door with ventilation grilles

Infills of door-leaves and wall segments

In the first quarter of 2011, we launched a fire resistant glass cutting line.
The investment was related to the dynamic growth in orders of the recent years and its purpose was to shorten the lead times for carrying out orders, and to improve competitiveness.
We apply most frequently, panes of the three largest fire resistant glazing manufacturers such as AGC, Pilkington and Vetrotech.
Non-transparent infills for door leaves and wall segments are made of fire-resistant panels which are clad on both sides with aluminium or steel sheet, powder-coated in any colour.

Joinery colour

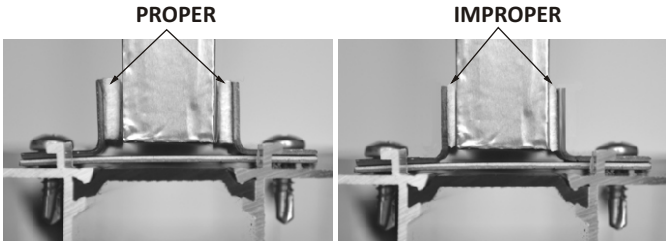
The surfaces of the profiles and non-transparent infills may be painted in any colour the customer needs, according to the RAL, NCS and DECORAL palettes. We can apply a wood-like veneer and profile anodizing. We can manufacture the joinery in two colours. You can select metallic or matte varnish, with a smooth or coarse texture. The coats are made in the DECORAL system with texture, design and colours which resemble tree annual rings (of pine, apple, oak, mahogany and many other trees). Varnish coats applied by us are characterized by an extreme resistance to abrasion and are durable in conditions of external exposure.
ALUFIRE may also suggest profiles with a protective coat which prevents aluminium profiles against corrosion. During tests our profiles achieved the corrosion category class **C4**, according to EN ISO 12944-2:2001, which signifies high resistance of corrosion.

Mounting

To ensure long-term and problem free operation, the joinery shall be mounted correctly.
The doors and wall segments may be mounted exclusively by authorised employees. Such licences are granted to authorised mounting teams and also, it could be possible that ALUFIRE Representatives will be delegated to, supervise, help and advise during mounting.

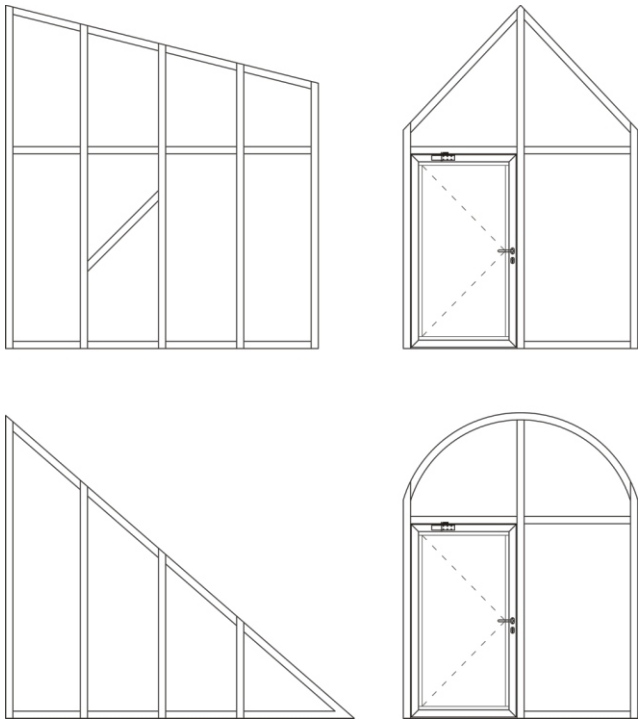
An important component of the proper mounting of ALUFIRE fire resistant joinery is the steel angle bars which fix the infill of the construction in the frame. A clearance shall be maintained between the pane and angle bars ranging from 1 to 2 mm (0.5 - 1 mm per each side). This is necessary because of pane swelling during a fire and/or damage (if any) during mounting (photo 13).

Photo 13. Proper mounting (felt washer, not deformed) and improper mounting (lack of clearance caused by non-parallel screwing of steel angle bar or by use of inappropriate angle bar)



A detailed scope of cross-bar construction mounting is presented in the **Mounting Manual**, which can be downloaded at:
http://www.alufire.com/en/documents/

Figure 16. Examples of non-typical shapes of fire resistant constructions

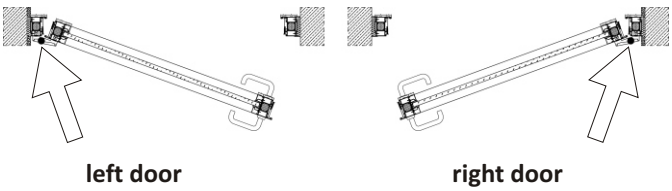


Quotation inquiry

Filing a quotation inquiry, the following should be stated:
- dimension and fire resistance class (EI15/EI30/EI45/EI60/EI120),
- whether door smoke resistance is required
- whether constructions are to be internal or external (with raised thermal insulated power)
- additional requirements related to hardware (for instance panic bars lever, electric strike, electric retainer)
- colour, according to corresponding palette
- sound reduction
- direction of opening (Figure 17),

Quotation inquiries shall be made to the address: info@checkmatefire.com

Figure 17. Setting out the direction of door opening



Direction of door opening is set out, standing on the side of the hinges

ALUFIRE VISION LINE (AVL)

The first Polish system of fire resistant all-glass walls in classes EI30 and EI60.

In the applied frameless system is laminated fire resistant glass, owing to which the gap between the panes, filled in with non-flammable silicone, is at the same time the total width of the non-transparent strip and ranges only from **4 to 6 mm.**

For comparison, other available systems apply fire resistant toughened glass where a non-transparent strip of as much as 30 mm occurs.

The AVL system has the best sound reduction ratio on the Polish market, Rw up to 47 dB, and it is certified to be installed in **C and D category** premises and, in accordance with **ETAG 003**, may be mounted on the **edges of ceiling** which allows safe access and evacuation of people from upper floors.

The all-glass AVL system has the following R_w parameters - only for single pane:

- AVL Standard **R_w = 39 dB**, (R_{A1} = 37 dB and R_{A2} = 35 dB)
- AVL Acoustic **R_w = 44 dB**, (R_{A1} = 43 dB and R_{A2} = 39 dB)
- AVL Acoustic+ **R_w = 47 dB**, (R_{A1} = 45 dB and R_{A2} = 42 dB)

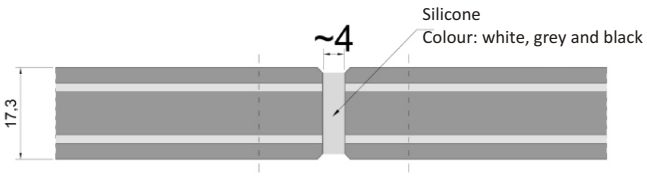
The difference in sound reduction depends upon the glazing applied. In the case of AVL Acoustic and AVL Acoustic+ walls, a special glass of higher sound reduction parameters and thickness is applied.

The width of walls is not limited and the height, depending upon the version may reach as high as 3.3 m.

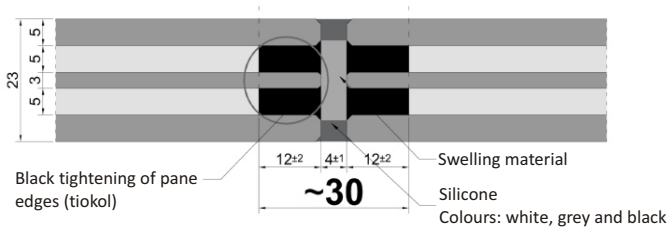
Angle and **T** type connections are made on the principle: "glass to glass" without the application of any additional cover strips.

Figure 18. Total width of non-transparent strips on connections of layered pane of Alufire Vision Line (A) and toughened panes of other systems (B) - comparison.

A) ALUFIRE Vision Line - layered panes



B) Other systems - toughened panes



To maintain the cohesive appearance of the construction mounted close to each other, we can construct all glass walls with non-fire resistant panes in places where fire resistance is not required. ALUFIRE fire resistant system doors, no class wooden doors, or all-glass doors can be a supplement to the wall.
Glass fire resistant walls of Alufire Vision Line give unlimited visual possibilities to increase the interior and to bind it to the remaining space, at the same time maintaining fire resistant safety.

NOTE: Because of their complexity, all-glass Alufire Vision Line walls are mounted only by authorised ALUFIRE installers.

Table 2. Maximum dimensions of AVL walls

Maximum dimensions of ALUFIRE Vision Line walls	
Wall height [mm]	2988 / 3034*
Wall height [mm] – unit release	3300* / 3840
Width of single glazing module EI30 [mm]	1000
Width of single glazing module EI30 [mm] – unit release	1920
Width of single glazing module EI60 [mm]	1200
Width of walls	unlimited

*It is possible to manufacture higher frameless glass walls than mentioned in the above table. For more information please contact: **office@alufire.com** or **+48 56 674 88 30**.

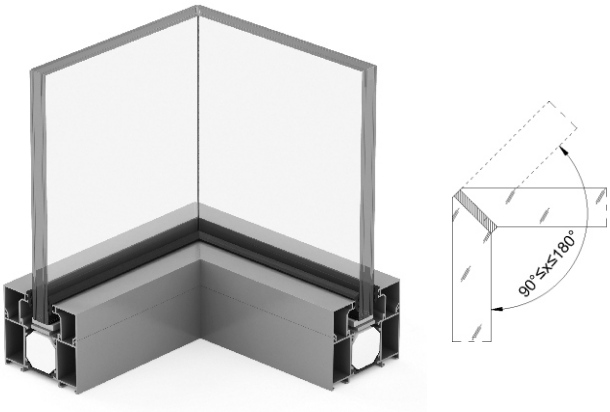
All-glazed fire resistant walls of ALUFIRE Vision Line have Building Research Establishment LPCB British and also Technical Approval No AT-15-9439/2015 certification.


LPCB®
Certificate of Product Approval
Certificate Number: 1406a
Issue: 01
ALUFIRE Sp.z o.o.Sp.k.
Ul. Warszawska 64a
87-148 Lysomice k.Torunia
Poland
Products
Fire Resistant Glazing
Standards
LPCB
bre

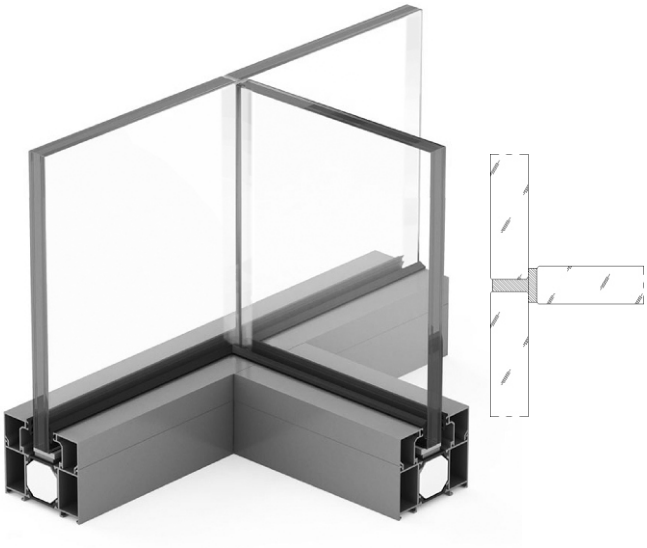
LPCB Certificate Number: 1406a

Figure 19. Connections in AVL constructions

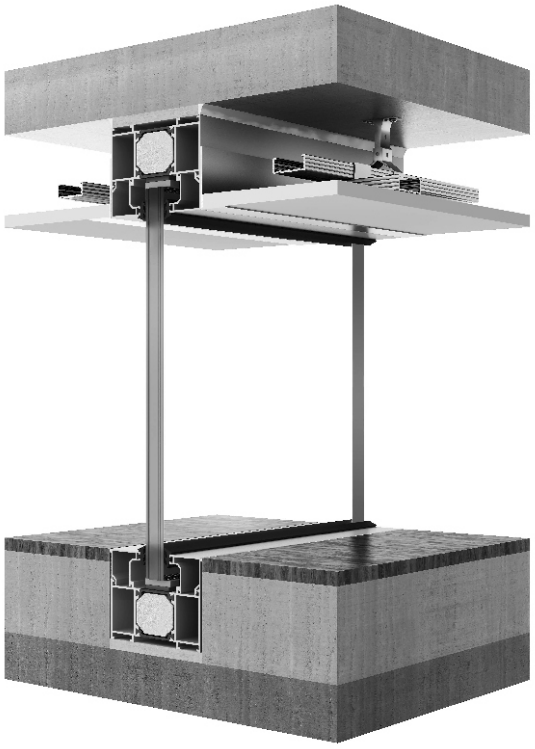
“pane to pane” connection



“pane to pane” angle connection



“pane to pane” T connection



hidden AVL profile

Figure 20. Examples of non-typical AVL construction shapes

Figure 21. Examples of angle connection of AVL construction - horizontal cross-section through designed wall with doors.

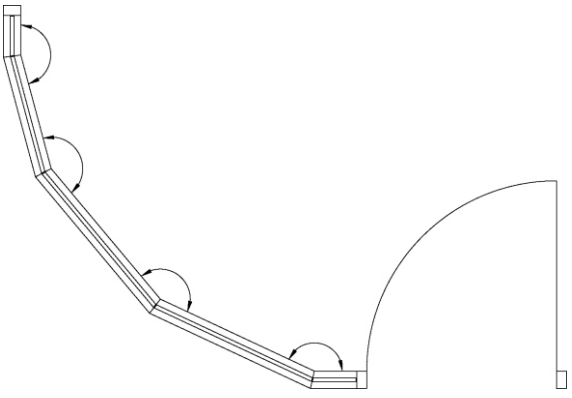


Photo 14. Example of angle connection of AVL construction - photo of the construction in accordance with the above cross-section

The above example of angle wall is an alternative for expensive constructions with bent glass. An additional value of such a solution is no deformation of the image when compared to the bent glass.

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