

Evidence of Performance

Fire classification of construction products and building elements



Classification Report

No.: 11-000323-PR03
(KB-F14-01-en-02)

Client
ALUMIL S.A.
Industrial Area
61100 Kilkis
(Greece)

Prepared by the notified body
ift Rosenheim GmbH
Theodor-Gietl-Straße 7-9
83026 Rosenheim
(Germany)

Notified body No. 0757

Product name
"Alumil M50 Energy FP fireproof series"
(as specified by client)

Classification
Classification of fire resistance according to
EN 13501-2:2007+A1:2009 / EN 13501-2:2016

Issue No. 2



Curtain walling

Classification

El 30 (o↔i)

ift Rosenheim
10.09.2021



Gerhard Wackerbauer *Claudia Rieß*

Dr. Gerhard Wackerbauer, Dipl. Phys.
Deputy Head of Product Certification
Certification & Surveillance Body

Claudia Rieß, Dipl.-Ing. (FH)
Deputy Head of Testing Department
Fire Safety

Basis

EN 13501-2:2007+A1:2009
EN 13501-2:2016
EN 1363-1:2020
EN 1364-3:2014
EN 13830:2003
EN 13830:2015+A1:2020

Instructions for use

This classification report defines the classification assigned to the building element according to its product name in conformity with the methods set out in EN 13501-2. This classification document does not represent type approval or certification of the product.

Validity

This report does not allow any statement to be made on any further characteristics regarding performance and quality of the product presented.

Notes on publication

The ift Guidance Sheet "Conditions and Guidance for the Use of ift test reports" applies.

Contents

The classification report consists of 81 pages and may only be used or reproduced in its entirety.

- 1 Introduction
 - 2 Details of classified product
 - 3 Test reports/extended application reports and test results in support of the classification
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1 Introduction

This classification report defines the resistance to fire classification assigned to element "Alumil M50 Energy FP fireproof series" in accordance with the procedures given in EN 13501-2:2016.

The element "Alumil M50 Energy FP fireproof series" was classified for the first time in the classification report 11-000323-PR03 (KB-F14-01-en-01) dated 30.03.2012. This issue 2 replaces the previous issue 11-000323-PR03 (KB-F14-01-en-01) dated 30.03.2012.

2 Details of classified product

2.1 General

The element "Alumil M50 Energy FP fireproof series" is defined as a curtain walling according to EN 13830.

Its function is to resist fire exposure on one face according to the fire performance parameters set out in the case of fire by Clause 5 of EN 13501-2 from inside to outside ($i \rightarrow o$) or from outside to inside ($o \rightarrow i$).

The classification for both exposures, $o \rightarrow i$ and $i \rightarrow o$, based on standard temperature/time curve as per EN 1363-1:2020, Clause 5.1.1, equation (1).

The classification includes the perimeter seal and the vertical linear gap seal.

2.2 Description

The element "Alumil M50 Energy FP fireproof series" is fully described below and in the test reports in support of classification listed in 3.1.

"Alumil M50 Energy FP fireproof series" is a fireproof curtain wall.

The system uses columns and transoms of "M50 STANDARD", providing flush appearance in the interior, combined with appropriate fire components and fire resistant glass.

The maximum span length is 3926 mm whereby the width of the construction is not limited. The minimum dimensions of the mullions and transoms are 50 x 105 mm and the maximum dimensions are 62,5 x 210 mm.

It can be used opaque infill panels made of ≥ 30 mm Rigips gypsum board and external layers for optical reasons made of e.g. 1,25 mm steel sheet or metal, stone, concrete or glass, with outer width ≤ 900 mm, outer height ≤ 2136 mm with a maximum area of 1,62 m².

Also it can be used transparent infill panels "THERMOBEL", manufacturer AGC, with dimensions of width ≤ 1452 mm, height ≤ 3204 mm with a maximum area of 3,23 m².

The tested details are also presented in the annex.

3 Test reports/extended application reports and test results in support of the classification

3.1 Test reports/extended application reports

The following test reports, test results and evaluations have been provided to justify this classification.

Name of laboratory/ NB Number	Name of sponsor	Report ref. no	Test standard and date/field of extended application standards and dates
ift Rosenheim/ 0757	ALUMIL S.A. 61100 Kilkis (Greece)	11-000323-PR01 (PB-B01-01-de-01)	EN 1364-3:2006
ift Rosenheim/ 0757	ALUMIL S.A. 61100 Kilkis (Greece)	11-000323-PR02 (PB-F12-01-de-01)	EN 1364-3:2006

3.2 Results

Test report number	Parameter	
11-000323-PR01 (PB-B01-01-de-01) Date: 08.02.2012	Supporting construction	Concrete according to EN 1364-3
	Exposed face	i→0
	Criteria	Results
	E - integrity	45 minutes
	W - radiation max. 15 kW/m ²	npd
	I - insulation	45 minutes

Test report number	Parameter	
11-000323-PR02 (PB-F12-01-de-01) Date: 20.12.2011	Supporting construction	Concrete according to EN 1364-3
	Exposed face	0→i
	Criteria	Results
	E - integrity	40 minutes
	W - radiation max. 15 kW/m ²	npd
	I - insulation	40 minutes

3.3 Validation

The test reports according to older editions of the respective test standards were validated with regard to the currently valid test standards. The results given in 3.2 can be used.

4 Classification and field of application

4.1 Reference for classification

This classification has been carried out in accordance with Clause 7 of EN 13501-2:2016.

4.2 Classification

The element "Alumil M50 Energy FP fireproof series" is classified according to the example of the following combinations of performance parameters and classes as appropriate.

R	E	I	W		t	t	-	M	S	C	IncSlow	sn	ef	r	G	K
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Fire resistance classification: EI 30 (o↔i)

4.3 Field of application

4.3.1 General

This classification is valid for the following end use applications:

EN 13830:2003 / EN 13830:2015+A1:2020 Curtain walling - Product standard

4.3.2 Field of direct application as per EN 1364-3

Following configurations of the product are in accordance with the direct application of the test results for the classification under 4.2.

Reference to standard EN 1364-3	Permitted changes to the tested specimen				
13.1	General rules				
13.1.1	General The rules given in 13.2 to 13.4 apply to stick constructions only. For rules for unitised constructions see Annex A. The rules given in 13.2 to 13.4 shall not be used for curtain walling constructions with glued infill panels (e.g. Structural Sealant Glazing Systems - SSGS). Rules which result in higher weight of the curtain walling are only applicable if the fixing of the framing system used in practice has been designed for the higher load. The measured temperature at the fixing of the framing system shall be taken into account.				
13.1.2	Exposure conditions Test results from tests using the standard temperature time curve cover a test condition using the external fire curve but not vice versa.				
13.1.3	Overrun time For some rules to be applicable an overrun time in the fire test result compared to the envisaged classification time is required. The required overrun time is shown in Table 2. The overrun time is required for the following criteria: - E classification: integrity - EW classification: integrity and radiation - EI classification: integrity and insulation Table 2 - Overrun time <table border="1"> <thead> <tr> <th>Classification time</th><th>Overrun time</th></tr> </thead> <tbody> <tr> <td>30 min, 45 min and 60 min</td><td>minimum 6 min</td></tr> </tbody> </table> An overrun time was reached.	Classification time	Overrun time	30 min, 45 min and 60 min	minimum 6 min
Classification time	Overrun time				
30 min, 45 min and 60 min	minimum 6 min				
13.2	Rules for the complete construction				
13.2.1	Width of the curtain walling Test results are equally valid for curtain walling with classification E and EI extending over one or more fire separating walls with a higher distance between the fire separating walls than the width of the tested construction provided - the construction (distance of mullions etc.) are the same as the one tested; - option A for detail D1 according to Figure 7 was used in the test on one side, and				

Reference to standard EN 1364-3	Permitted changes to the tested specimen
	- a vertical linear gap seal abutting a simulated wall according to Detail D3 in Figures 18 and 19 was used on the other side. NOTE Width refers to the heated area of the test specimen. The requirements were met. The width of the construction is not limited.
13.2.2	Height of the curtain walling Test results are valid for a curtain walling of increased overall height, i.e. repetition of the tested construction in vertical direction provided the construction is the same as the one tested. NOTE Height refers to the heated area of the test specimen.
13.2.3	Span length Test results are also valid for curtain walling with classification E and EI for a higher span length subject to a maximum of 1.2 times the span length used in the test provided Test results are also valid for a higher span length subject to a maximum of 1.3 times the span length used in the test provided - an overrun time as defined in Table 2 has been achieved, and - the maximum deflection perpendicular to the surface measured during the fire test is less than 100 mm, and - there is sufficient elongation allowance of the mullions. In test 11-000323-PR01 (PB-B01-01-de-01), a span length of 3020 mm was tested. The requirements were met. The maximum span length is 3926 mm.
13.2.4	Installation angle (vertical/sloped) Test results on a vertical curtain walling cover curtain walling sloped inside or sloped outside to a maximum angle of 10° from the vertical axis for both exposure orientations (o→i and i→o). Test results on a vertical curtain walling with an EI classification cover curtain walling sloped inside or sloped outside to a maximum angle of 15° from the vertical axis provided an overrun time was achieved according to Table 2 and the screws for fixing the infill panels/spandrel panels penetrate the mullions/transoms.
13.2.5	Facet angles of horizontally faceted curtain walling
13.2.5.1	Installation tolerance Facet angles between 0 and 1.5° (angle β in Figure 1) is covered by a test on a straight curtain walling. In case the curtain walling includes fire resistant translucent or transparent infill panels the rule is only applicable if the overlap of the pressure plate and/or the edge cover on the inner side of a fire resistant translucent or transparent infill panel, whatever is smaller, is minimum the same as in the fire test for infill panels with EI classification and the same as tested for

Reference to standard EN 1364-3	Permitted changes to the tested specimen																		
	infill panels with E or EW classification (see Figure 20).																		
13.2.5.2	Small facet angles Facet angles between $\geq 1.5^{\circ}$ and 5° are covered by a test on a straight curtain walling provided - the system remains the same as in the fire test and - the pressure plate remains the same as in the fire test and - the nominal inner or outer edge cover of the translucent or transparent infill panel, whichever would be decreased by the inclination of the translucent or transparent infill panel, remains the same as in the fire test and - an overrun time according to Table 2 has been achieved. NOTE The maximum facet angle covered will depend on the thickness of the translucent or transparent infill panel and on the maximum distance the translucent or transparent infill panel can be moved towards the centre of the mullion. This rule does not apply to curtain walling with E and EW classification.																		
13.3	Framing system																		
13.3.1	Distance between mullions and transoms The distance between the mullions and transoms is defined by the rules for the infill panels, based on test results on straight specimens. Test results on a higher distance between the mullions and/or transoms cover smaller distances. Test results cover a higher distance between mullions and/or transoms than tested subject to the rules given in 13.4, provided that all of the relevant frame junctions have been tested in accordance with this standard.																		
13.3.2	Geometry/dimension of mullions and transoms Test results cover higher wall thickness of mullions and transoms made of metal subject to a maximum of 1.5 times the thickness used in the test. Decrease of wall thickness is not permitted. Test results cover width and depth ranges of mullions and transoms as given in Table 3. A decrease of width and/or depth of mullions and transom is not permitted. The values given in Table 3 refer to the factor the width and depth may be higher in comparison to the width and/or depth used in the test. Table 3 - Factor for width and depth of mullions and transoms <table><tr><th rowspan="3">Framing material</th><th colspan="4">Classification EI</th></tr><tr><th colspan="2">Transom</th><th colspan="2">Mullion</th></tr><tr><th>Width</th><th>Depth</th><th>Width</th><th>Depth</th></tr><tr><td>Aluminium</td><td>1.25^a</td><td>2^b</td><td>1.25^a</td><td>2</td></tr></table> ^a In case the transom or mullion contains a core material for the purpose of improving the fire resistance the dimensions of this core material shall be increased so that the contact area with the aluminium remains minimum the same and the overlap between the infill panel and the core material remains minimum the same. ^b But maximum to the depth of the mullion.	Framing material	Classification EI				Transom		Mullion		Width	Depth	Width	Depth	Aluminium	1.25 ^a	2 ^b	1.25 ^a	2
Framing material	Classification EI																		
	Transom		Mullion																
	Width	Depth	Width	Depth															
Aluminium	1.25 ^a	2 ^b	1.25 ^a	2															

Reference to standard EN 1364-3	Permitted changes to the tested specimen
	The dimensions of the mullions and transoms in the tests were 50 x 105 mm. The maximum dimensions are 62,5 x 210 mm.
13.3.3	Connection between mullions and transoms
13.3.3.1	Connection geometry Figure 21 shows a cross connection, vertical T-connection, horizontal/standing and horizontal/hanging T-connection. Test results for a cross-connection do not cover T-connections and vice versa. A horizontal T-connection does not cover a vertical one and vice versa. A standing T-connection does not cover a hanging T-connection and vice versa. Test results for cross connections or T-connections with an angle of 90° between mullions and transoms cover situations where the angle between mullions and transoms is minimum 80° and maximum 100° disregarding whether the mullions are vertically oriented or not or the transoms are horizontally oriented or not. This rule also applies to corner connections of unitised systems. Cross-connections and horizontal T-connections are possible.
13.3.3.2	Connection system between framing members Test results for a particular connection system are only valid for connection systems of the same construction principle. The dimensions of the connection system may be varied as required in relation to dimension changes of mullions and transoms according to 13.3.2.
13.3.4	Framing material
13.3.4.1	Metal framing Test results for steel do not apply to aluminium and vice versa. Test results apply only to the aluminium alloy used in the test. Change to another aluminium alloy is not permitted.
13.3.5	Decorative frame surface treatments/coverings/coatings Decorative frame surface treatments/coverings/coatings which achieve minimum class A2 according to EN 13501-1 together with the relevant frame component may be added or changed without restrictions. Any decorative frame surface treatments/coverings/coatings with a thickness equal to or less than 1.5 mm may be added or changed without restrictions for curtain walling classified EI. Decorative frame surface treatments/coverings/coatings of more than 1.5 mm thickness other than covered by the rule given in the first paragraph shall be included in the test as part of the test specimen. Test results of such decorative frame coverings/coatings apply only to decorative frame coverings/coatings made of the same material type and thickness.
13.3.6	Fixing of the framing system (anchoring) Fixing system made of aluminium/aluminium alloys: no change in material is

Reference to standard EN 1364-3	Permitted changes to the tested specimen																																																											
	permitted. Test results for a fixing system made of aluminium/aluminium alloys covers steel but not vice versa. Fixing system made of steel: change of alloy within construction steels (unalloyed/low alloy steels) is permitted. Combinations of fixing positions in relation to the floor (in front, on top or below) and positions of the fixed and loose anchor (hanging or standing curtain walling) are covered by test results on a particular combination according to Table 5. Table 5 is applicable for internal exposure. Test results on a particular fixing system type (anchored or cast-in or welded) are not applicable to another type. Change in geometrical shape and/or linear dimensions within a fixing system type is permitted on the basis of a proper static calculation. The temperature at the fixing measured in the fire test shall be taken into account. If no temperature data of the fixing are available only increase in linear dimensions is permitted. Test results for a non-insulated fixing system (not embedded in insulation material) apply equally to the same fixing system embedded in insulation material of reaction to fire class A1 or A2 according to EN 13501-1 but not vice versa.																																																											
	<table><tr><th colspan="12">Table 5 - Field of application rules for fixing positions</th></tr><tr><th rowspan="2">Tested ↓</th><th colspan="11">Covered →</th></tr><tr><th>AF/ AL</th><th>BF/ BL</th><th>CF/ AL</th><th>CF/ BL</th><th>CF/ CL</th><th>AL/A F</th><th>AL/B F</th><th>BL/B F</th><th>CL/ AF</th><th>CL/ BF</th><th>CL/ CF</th></tr><tr><td>AF/AL</td><td></td><td>N</td><td>N</td><td>N</td><td>N</td><td>Y</td><td>N</td><td>N</td><td>N</td><td>N</td><td>N</td></tr><tr><td colspan="12"> A Fixing in front of the floor (see Figure 22) N not covered B Fixing on top of the floor (see Figure 22) Y covered without restriction C Fixing on bottom of the floor (see Figure 22) Y1 covered, provided the fixing is completely made of steel F Fixed bearing L Floating bearing (to allow thermal extension) The first position indicates the type of fixing on the upper floor, the second position the type of fixing on the lower floor, e. g.: AF/BL: Fixed bearing in front of the floor used on the upper floor/floating bearing on top of the floor used on the lower floor (hanging curtain walling) AL/BF: Floating bearing in front of the floor used on the upper floor/fixed bearing on top of the floor used on the lower floor (standing curtain walling) For further explanation see B.7.6.3. </td></tr></table> In test 11-000323-PR01 (PB-B01-01-de-01) the fixing position AF/AL was tested.	Table 5 - Field of application rules for fixing positions												Tested ↓	Covered →											AF/ AL	BF/ BL	CF/ AL	CF/ BL	CF/ CL	AL/A F	AL/B F	BL/B F	CL/ AF	CL/ BF	CL/ CF	AF/AL		N	N	N	N	Y	N	N	N	N	N	A Fixing in front of the floor (see Figure 22) N not covered B Fixing on top of the floor (see Figure 22) Y covered without restriction C Fixing on bottom of the floor (see Figure 22) Y1 covered, provided the fixing is completely made of steel F Fixed bearing L Floating bearing (to allow thermal extension) The first position indicates the type of fixing on the upper floor, the second position the type of fixing on the lower floor, e. g.: AF/BL: Fixed bearing in front of the floor used on the upper floor/floating bearing on top of the floor used on the lower floor (hanging curtain walling) AL/BF: Floating bearing in front of the floor used on the upper floor/fixed bearing on top of the floor used on the lower floor (standing curtain walling) For further explanation see B.7.6.3.											
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	AF/ AL	BF/ BL	CF/ AL	CF/ BL	CF/ CL	AL/A F	AL/B F	BL/B F	CL/ AF	CL/ BF	CL/ CF																																																	
AF/AL		N	N	N	N	Y	N	N	N	N	N																																																	
A Fixing in front of the floor (see Figure 22) N not covered B Fixing on top of the floor (see Figure 22) Y covered without restriction C Fixing on bottom of the floor (see Figure 22) Y1 covered, provided the fixing is completely made of steel F Fixed bearing L Floating bearing (to allow thermal extension) The first position indicates the type of fixing on the upper floor, the second position the type of fixing on the lower floor, e. g.: AF/BL: Fixed bearing in front of the floor used on the upper floor/floating bearing on top of the floor used on the lower floor (hanging curtain walling) AL/BF: Floating bearing in front of the floor used on the upper floor/fixed bearing on top of the floor used on the lower floor (standing curtain walling) For further explanation see B.7.6.3.																																																												
13.3.7	Pressure plate system																																																											
13.3.7.1	Edge cover/overlap of pressure plate Results from tests with a smaller edge cover/overlap of the pressure plate on the infill panel are also valid for a higher edge cover/overlap but not vice versa. This rule applies for both, the outer and inner edge cover (Figure 20).																																																											

Reference to standard EN 1364-3	Permitted changes to the tested specimen
13.3.7.2	Size of pressure plate Smaller and higher widths of the pressure plate are covered provided the moment of inertia of the pressure plate in the axis as shown in Figure 20 is minimum the same as tested and the overlap is minimum the same as tested subject to the rules given in 13.3.7.1.
13.3.7.3	Material of pressure plate Results for aluminium pressure plates are also valid for steel pressure plates of the same width, but not vice versa. The flexural strength of the pressure plate shall be equal or higher than the flexural strength used in the test.
13.3.7.4	Screws The screws shall have minimum the same effective screw depth (i.e. depth in the mullion/transom) and minimum the same cross section as used in the test. The distance between the screws may be reduced but not increased.
13.3.7.5	Mullion and transom cover cap Test results on any cover cap are equally valid for all other types of cover plates of minimum the same classification according to EN 13501-1, subject to maximum the same width in case of classifications E and EW.
13.3.8	Other fixing systems than pressure plate Test results are only applicable to the fixing system used in the test. Results from tests with a smaller edge cover/overlap of the fixing system on the infill panel are also valid for a higher edge cover/overlap but not vice versa. This rule applies for both, the outer and inner edge cover. This does not apply to fire resistant translucent or transparent infill panels with E or EW classification.
13.4	Infill panels
13.4.1	Opaque (non-translucent/non-transparent) infill panels
13.4.1.1	Type/construction Test results cover only the type/construction of the infill panel(s) used in the test. In test 11-000323-PR02 (PB-F12-01-de-01), an opaque infill panel with the following design was tested: 1,25 mm steel sheet / 30 mm Rigips gypsum board / 1,25 mm steel sheet (W x H) 750 x 1780 mm
13.4.1.2	Dimensions Test results cover smaller panel width and height. Test results cover a higher thickness of the panel. Test results cover a higher thickness of the panel insulation. Test results for an infill panel of particular dimensions cover dimensions up to a maximum of the tested dimension multiplied by a factor 1.2 in width and/or height but only up to an area of maximum the tested area multiplied by a factor 1.21 provided an overrun time according to Table 2 has been achieved in the

Reference to standard EN 1364-3	Permitted changes to the tested specimen
	test. Test results cover smaller distances in between fixing centres, vertical and horizontal. The requirements were met. The following dimensions for opaque infill panels are possible: Width ≤ 900 mm Height ≤ 2136 mm Area $\leq 1,62$ m²
13.4.1.3	Aspect ratio of individual infill panels Test results for rectangular panels with portrait as well as landscape format cover all aspect ratios subject to the rules given in 13.4.1.2 provided that all panels have been tested in an identical framing system.
13.4.1.4	Geometrical shapes Test results for a rectangular panel cover all other shapes provided that their size can be cut out of the tested rectangular size, subject to the rules given in 13.3.3.1.
13.4.1.5	Materials Test results of gypsum plasterboards except gypsum plasterboards type F according to EN 520 are valid for all types of gypsum plasterboards provided the thickness is minimum the same. Test results of gypsum plasterboards type F according to EN 520 are not valid for other types of gypsum plasterboard. Test results of all types of gypsum plasterboards apply equally to boards made of CaSi boards but not vice versa provided the thickness is minimum the same. Test results of boards made of CaSi are only valid for CaSi boards. The thickness of the board may be increased. Test results of a non-faced mineral wool board are equally applicable to an aluminium faced version of this mineral wool board but not vice versa. The insulation material as used in the test shall not be changed. The thickness of the insulation may be increased. The type of fixing of the components to each other (e.g. gluing) shall not be changed. External layers for optical reasons (e.g. metal, stone, concrete, glass) may be added or changed without restriction to the material. Increased weight of the infill panels as a result of changes according to the rules above shall be considered for the anchoring, the dimensioning of mullions and transoms and the fixing system for the panels.
13.4.1.6	Back panel metal sheeting Change of thickness of metal sheeting is not permitted.
13.4.3	Translucent or transparent infill panels
13.4.3.1	Type of fire resistant translucent or transparent infill panel

Reference to standard EN 1364-3	Permitted changes to the tested specimen
13.4.3.1.1	General Three major types of fire resistant translucent or transparent infill panels were identified: - a fire resistant translucent or transparent infill panel consisting only of the glass component that gives the fire resistance; this may be a monolithic pane, a laminated pane or a gel type glass depending on the required classification (E, EW or EI), indicated A in Figure 23 - an IGU consisting of the part that gives the fire resistance and a single pane for UV/acoustic/safety performance (counter pane), with or without additional coatings on either side of the counter pane, indicated B in Figure 23 (example shown with coating inside) - an IGU consisting of the part that gives the fire resistance and a laminated pane for UV/acoustic/safety performance (counter pane), with or without additional coatings on either side of the counter pane, indicated C in Figure 23 (example shown with coating inside) In tests 11-000323-PR01 (PB-B01-01-de-01) and 11-000323-PR02 (PB-F12-01-de-01), transparent infill panels THERMOBEL, manufacturer AGC, with the following design was tested: Type C: 16 mm Pyrobel / 8 mm cavity / 6 mm LSG (with 2x 0,38 mm foil) Maximum dimensions (W x H) 11-000323-PR01 (PB-B01-01-de-01): 1210 x 2670 mm 11-000323-PR02 (PB-F12-01-de-01): 1220 x 2710 mm
13.4.3.1.2	Classification EI (i→o) Test results of type A are equally applicable to type B and C but not vice versa. Test results of type B are equally applicable to type C and vice versa. Test results of type B without additional coatings are equally applicable to type B with additional coatings but not vice versa. Test results of type C without additional coatings are equally applicable to type C with additional coatings but not vice versa. NOTE For details see Figure 23.
13.4.3.1.3	Classification EI (o→i) Test results of type C are equally applicable to type B but not vice versa. Test results of type B without additional coatings are equally applicable to type B with additional coatings and vice versa. Test results of type C without additional coatings are equally applicable to type C with additional coatings and vice versa. Test results of type C with additional coatings are equally applicable to type B without additional coatings but not vice versa. NOTE For details see Figure 23.

Reference to standard EN 1364-3	Permitted changes to the tested specimen
13.4.3.1.5	Provisions All rules given in 13.4.3.1.2 and 13.4.3.1.3 are valid only provided - the glass component that gives the fire resistance is of the same type (monolithic, laminated or gel type) as tested and is made by the same manufacturer, and - the fire resistant translucent or transparent infill panel is CE marked based on a classification according to EN 13501-2 in minimum one glazed construction.
13.4.3.2	Dimensions of individual rectangular fire resistant translucent or transparent infill panels Test results cover smaller panel width and height. Test results cover a higher thickness of the panel. The framing system under consideration shall be able to support the additional weight due to the increased thickness of the panel. Test results for a panel of particular dimensions cover dimensions up to a maximum of the tested dimension multiplied by a factor 1.2 in width and/or height but only up to an area of maximum the tested area multiplied by a factor 1.21 provided an overrun time according to Table 2 has been achieved in the test. The requirements were met. The following dimensions for transparent infill panels THERMOBEL, manufacturer AGC, are possible: Width ≤ 1452 mm Height ≤ 3204 mm Area $\leq 3,23$ m²
13.4.3.3	Aspect ratio of individual rectangular fire resistant translucent or transparent infill panels Test results for rectangular translucent or transparent infill panels with portrait as well as landscape format cover all aspect ratios up to an area $A \leq 1/2 * (A_{\text{portrait}} + A_{\text{landscape}})$ provided that - all translucent or transparent infill panels have been tested in an identical framing system, - the largest tested width as well as the largest tested height is not exceeded. In case an overrun time has been achieved according to Table 2 the values for A_{portrait} and $A_{\text{landscape}}$ may be determined by using the rules for dimensions given in 13.4.3.2. No transparent infill panels were tested in landscape format.
13.4.3.4	Geometrical shapes Test results for a rectangular translucent or transparent infill panel cover all other shapes provided that their size can be cut out of the tested rectangular size subject to the rules given in 13.3.3.1.

Reference to standard EN 1364-3	Permitted changes to the tested specimen
13.4.3.5	Asymmetry in thickness If the translucent or transparent infill panel is asymmetrical in an axis perpendicular to the surface the test result is only valid for the direction and type of exposure (internal or external exposure) as tested.
13.4.4	Glazing materials
13.4.4.1	Gaskets
13.4.4.1.1	General Gaskets with a higher material cross sectional area in the uncompressed state cover gaskets with a smaller cross sectional area but not vice versa. The cross sectional area in the uncompressed state may be increased by maximum 50 % compared to what was tested. Test results from particular gasket geometry are also applicable to other geometries. In case of curtain walling classified E or EW no material addition (e.g. lips) is permitted on the side of the gasket that is visible in the built-in situation. Test results cover only the gasket material used in the test.
13.4.4.1.2	Sealants Change in type of material (e.g. acrylic, silicone) is not permitted. Test results cover a lower sealant height (for definition see Figure 20) and a higher sealant height up to a maximum of 1.2 times the height used in the test. The sealant depth (for definition see Figure 20) shall be minimum the same as tested.
13.4.4.1.3	Intumescent strips/layers Changes to intumescent strips/layers are not permitted.
13.5	Perimeter seals/vertical linear joint seals
13.5.1	General Perimeter seals tested according to this standard shall not be used where in practice movement of the perimeter joint is expected. NOTE For information on test requirements for perimeter seals in case of required movement capability see B.7.8.
13.5.2	Orientation Results from tests on perimeter seals (horizontal linear gap seals) are only valid for perimeter seals. Results from tests on vertical linear gap seals are only valid for vertical linear gap seals.
13.5.3	Material Test results for non-faced mineral wool are equally applicable to an aluminium faced version of the same mineral wool product (brand designation) but not vice versa. Test results for mineral wool are valid for a version with higher density of the same mineral wool product (brand designation) as long as it is compressible to the same extent as in the test, subject to restrictions depending on the direction

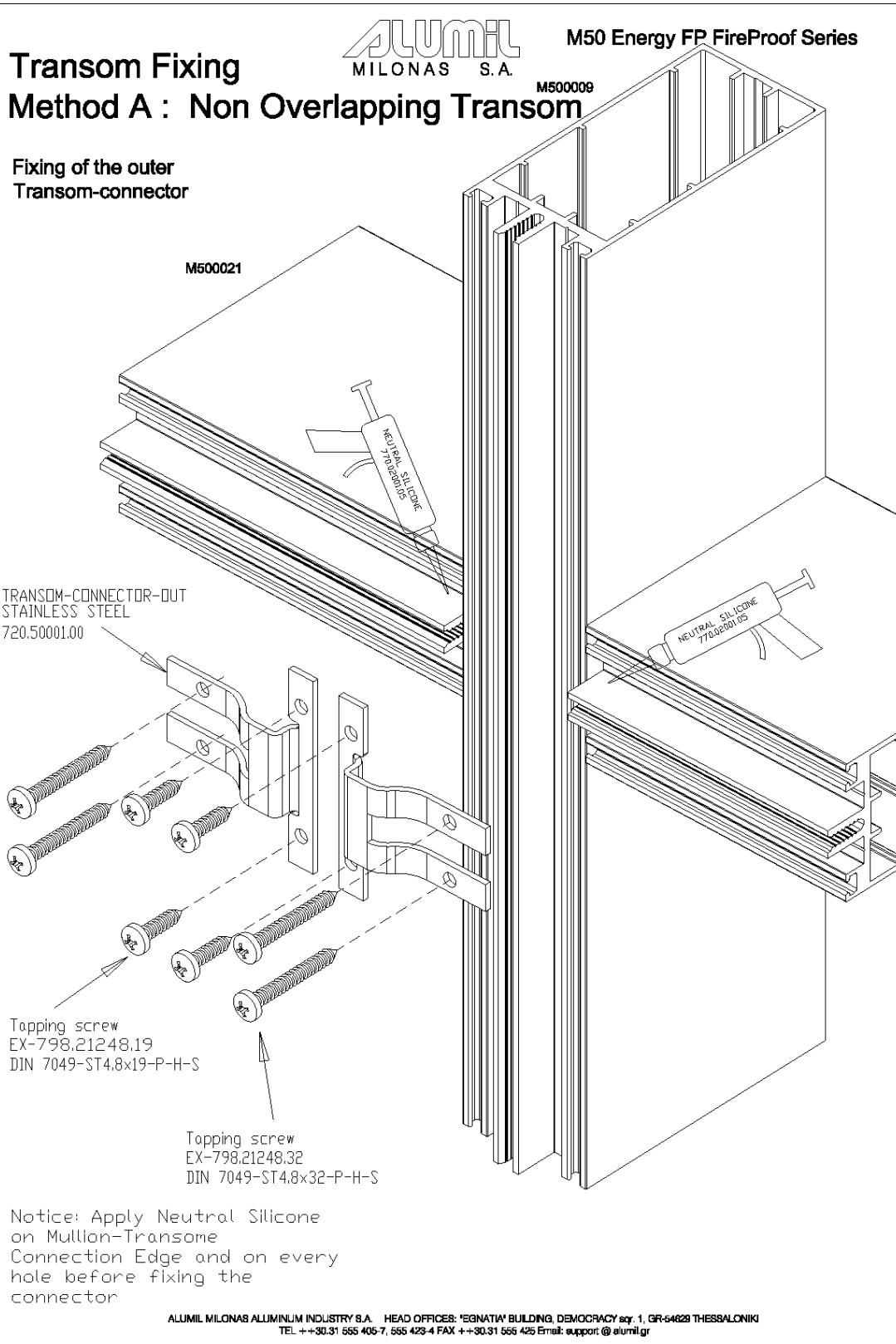
Reference to standard EN 1364-3	Permitted changes to the tested specimen
	of compression given in 13.5.5.4. Test results for compressed mineral wool are equally applicable to mineral wool of higher compression, subject to restrictions depending on the direction of compression given in 13.5.5.4. Changes to other materials or components are not permitted.
13.5.4	Width/depth For definition of width and depth of the perimeter seal see Figure 22. For definition of width and depth of the vertical linear gap seal see Figure 7C. Test results for linear joint seals or seal components with lower depth are equally applicable to linear joint seals with higher depth but not vice versa. For membrane forming coatings and elastomeric strips the results apply for all thicknesses within the tolerance band for the membrane/strip and higher depth of mineral wool (or other backing material). Test results for linear joint seals with higher nominal width are equally applicable to linear joint seals with narrower nominal width but not vice versa, subject to the depth of the seal or its components being minimum the same as tested and subject to the rules regarding compression (see 13.5.5.4). For membrane forming coatings and elastomeric strips the overlap on the floor and the spandrel shall be in practice minimum the same as tested. Test results for linear joint seals with an overrun according to Table 2 cover a nominal width range up to 1.2 times the tested nominal width, except for products with distinct sizes for specific gap widths and preformed products which are kept in place by compression (no additional mechanical fixing provided). In case an intumescent sealant is used as component of the perimeter seal its depth may be increased. For definition of depth see Figure 22.
13.5.5	Fixing of the perimeter seal
13.5.5.1	For mechanically fixed seals the fixing of the perimeter seal is restricted to the fixing used in the test.
13.5.5.2	For self-adherent seals or seal components, e.g. membrane forming coatings and sealants, as well as for adhesion fixed seals or seal components, e.g. elastomeric strips, the results apply for all substrates for which the adhesion is shown to be equal to or better than that in the fire test. NOTE An example for adhesion fixing is the use of a glue to fix the seal or seal component.
13.5.5.3	For friction fixed seals or seal components, e.g. mineral wool and compressible strips, minimum the same compression shall be used in practice as used in the test, subject to the following rule.
13.5.5.4	For mineral wool with compression direction B-B or C-C according to Figure 24 the compression shall be minimum the same as tested but sufficiently low not to induce a mechanical failure of the seal, e.g. by de-lamination fracture.
13.5.6	Covering Tests without steel sheet covering cover perimeter seal systems including steel sheet covering, provided it is not force-fit fixed to the curtain walling, disregard-

Reference to standard EN 1364-3	Permitted changes to the tested specimen
	ing whether the steel sheet covering is installed on top or on bottom of the seal, but not vice versa. Test results are only valid for the covering material used in the test. No additional coverings of reaction to fire classification B to F according to EN 13501-1 are permitted on bottom side of perimeter seals and on both sides of vertical linear gap seals.
13.6	Supporting floor Test results obtained with the standard supporting floor construction may be applied to concrete floors of a thickness and density equal to or greater than that of the floor construction used in the test.
13.7	Walls abutting the curtain walling Test results obtained with rigid standard wall constructions according to 7.3.1 may be applied to concrete or masonry separating wall constructions of a thickness and density equal to or greater than that of the wall construction used in the test.

5 Limitations

This classification document does not represent type approval or certification of the product.

ift Rosenheim
10.09.2021

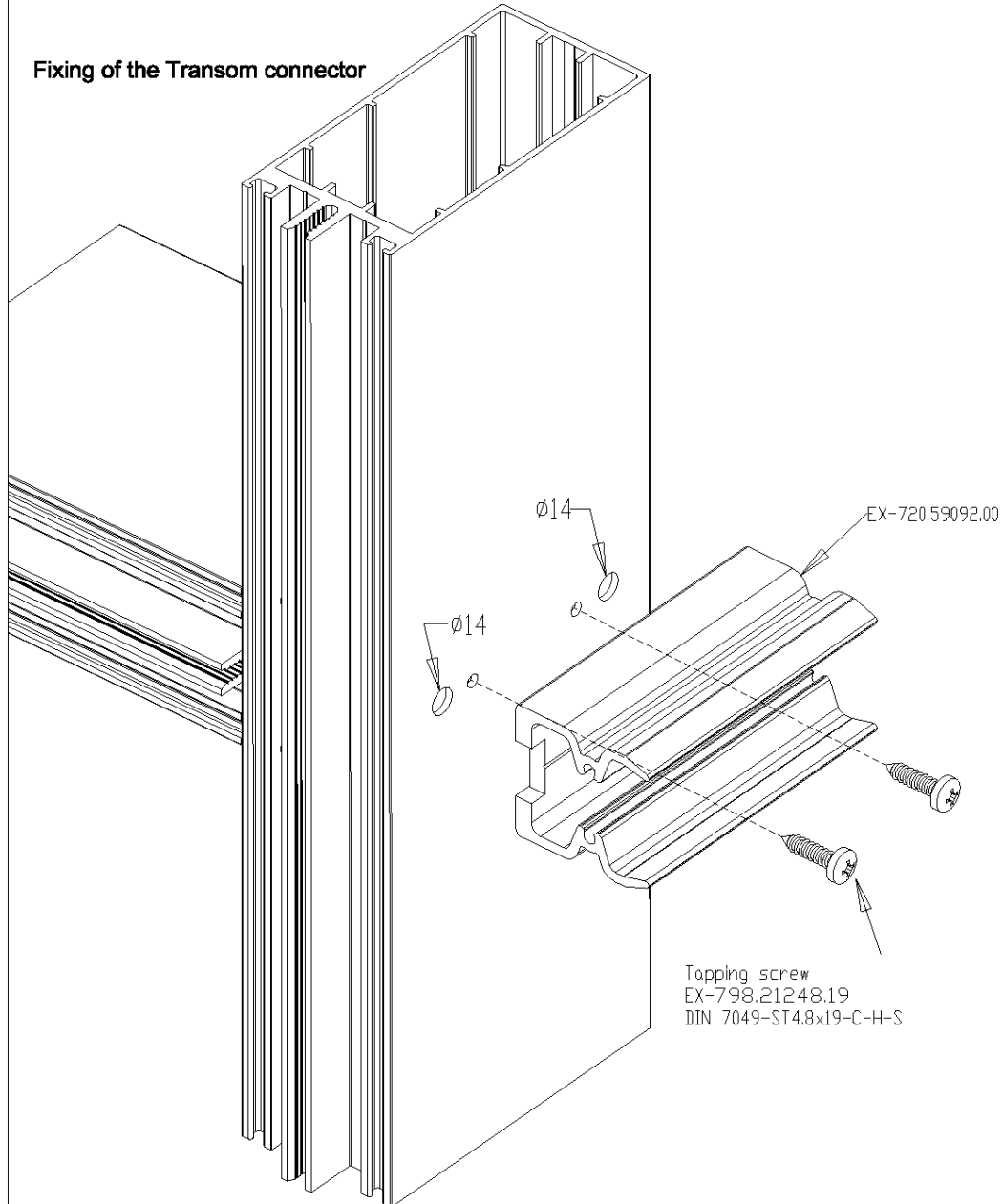


Transom Fixing Method A : Non Overlapping Transom

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Fixing of the Transom connector

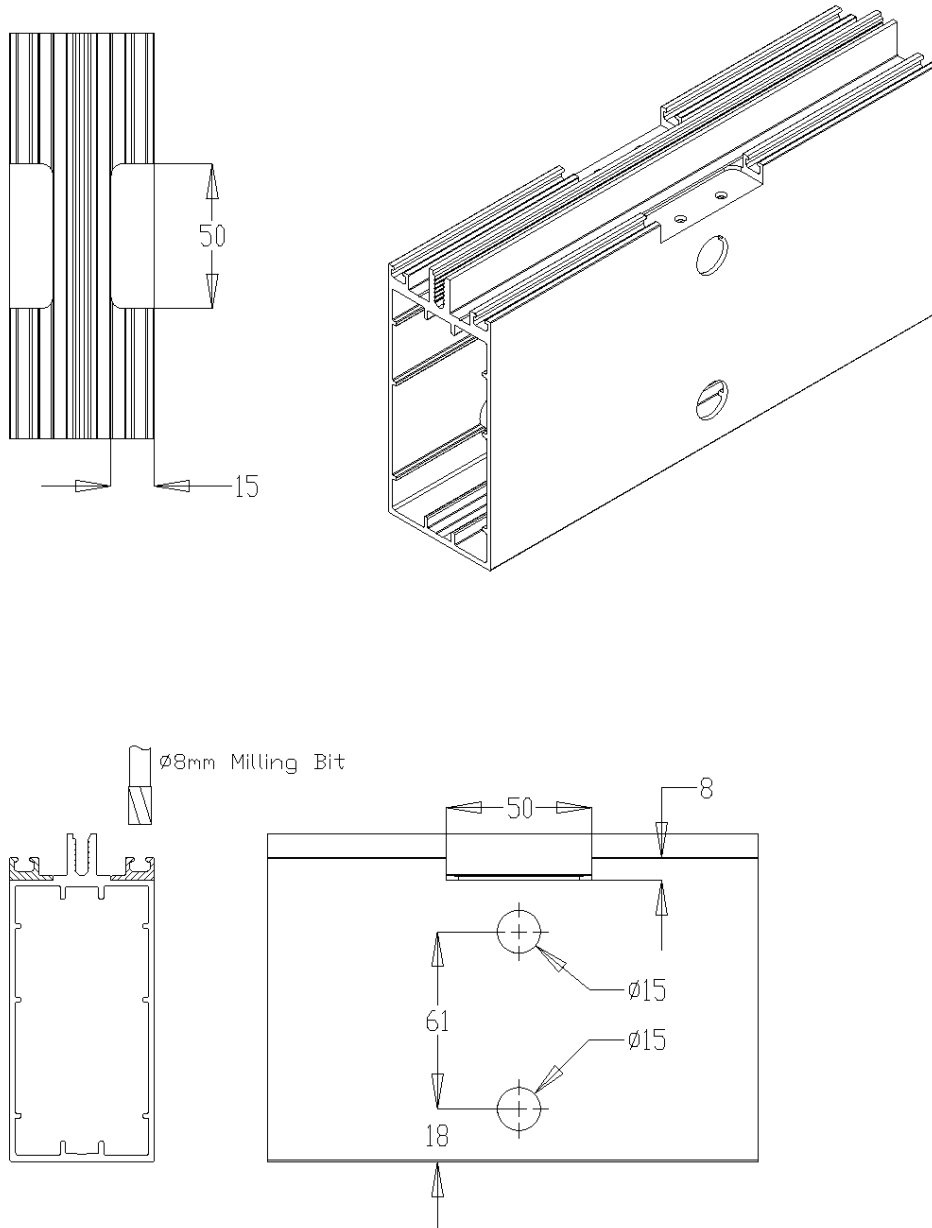


Transom Fixing Method B : Overlapping Transom

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Mullion Milling

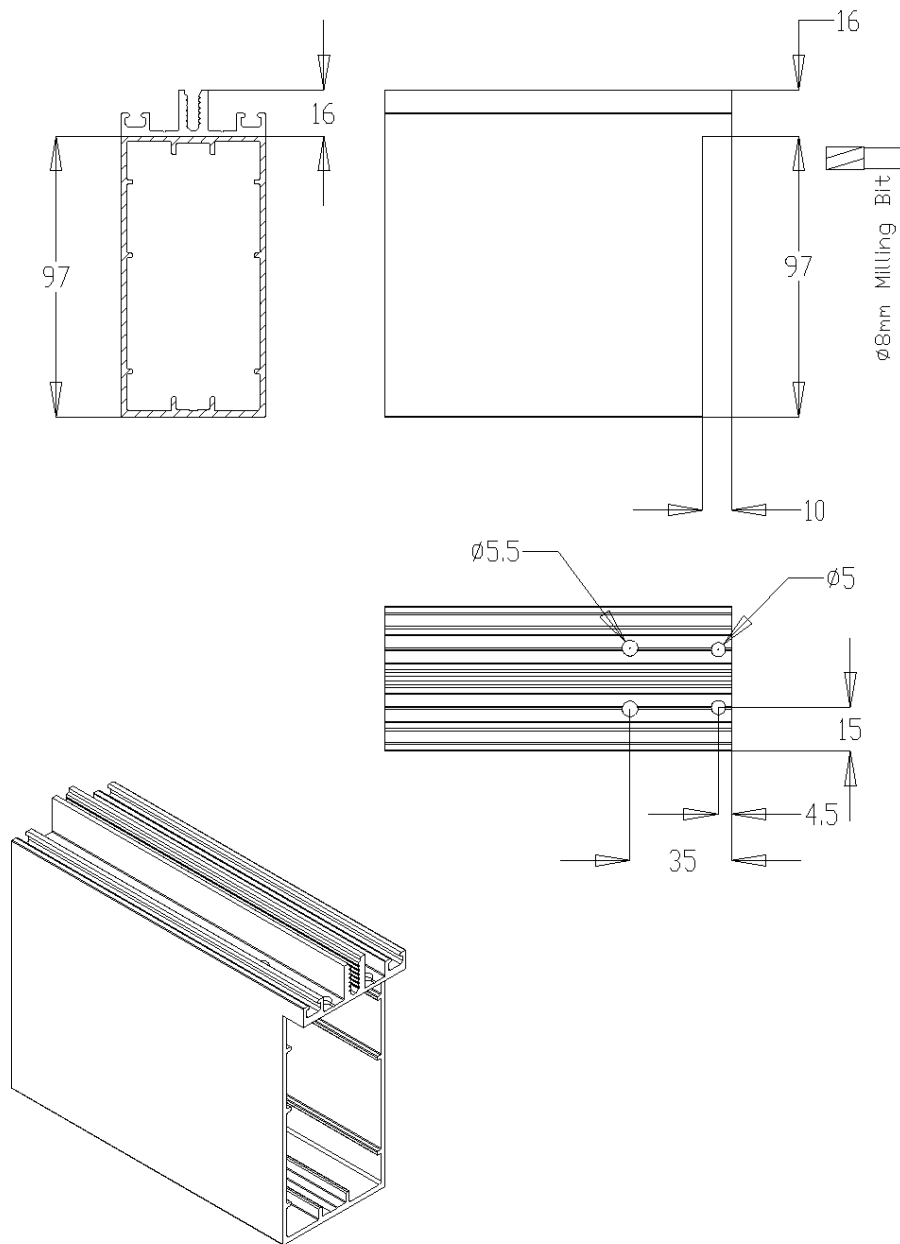


Transom Fixing Method B : Overlapping Transom

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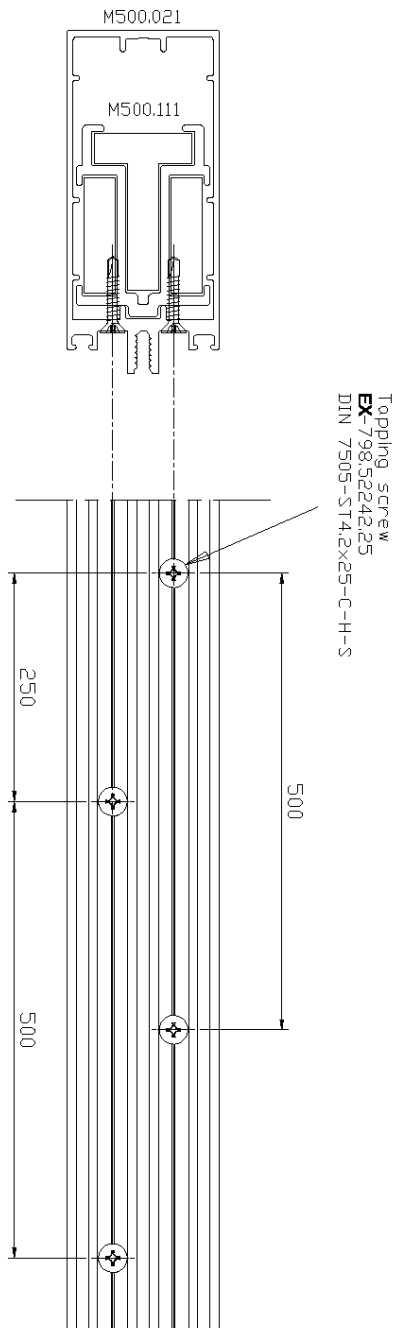
Transom Milling



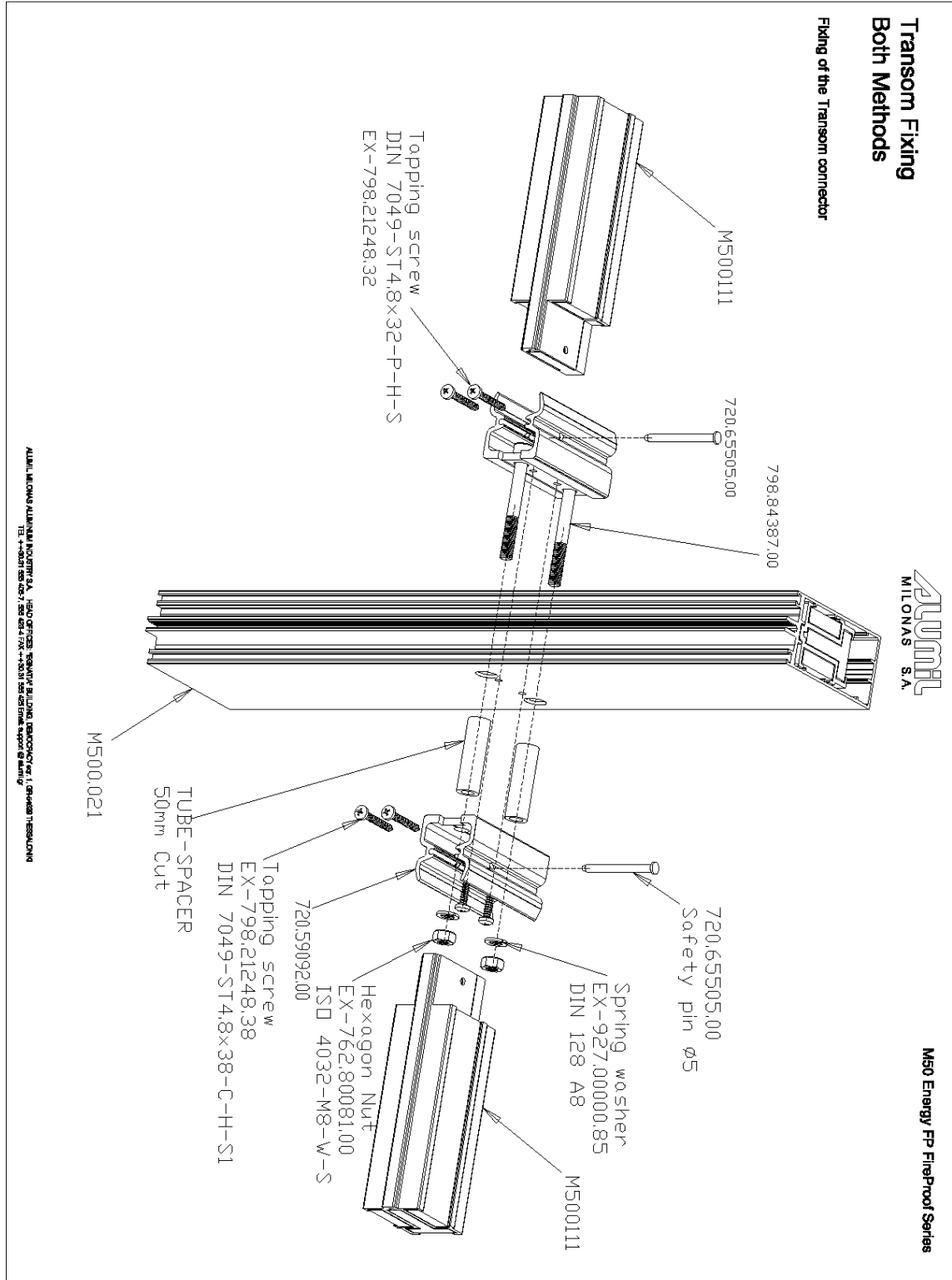
Cooling and Reinforcement Profile Placement

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M50 Energy FP FireProof Series



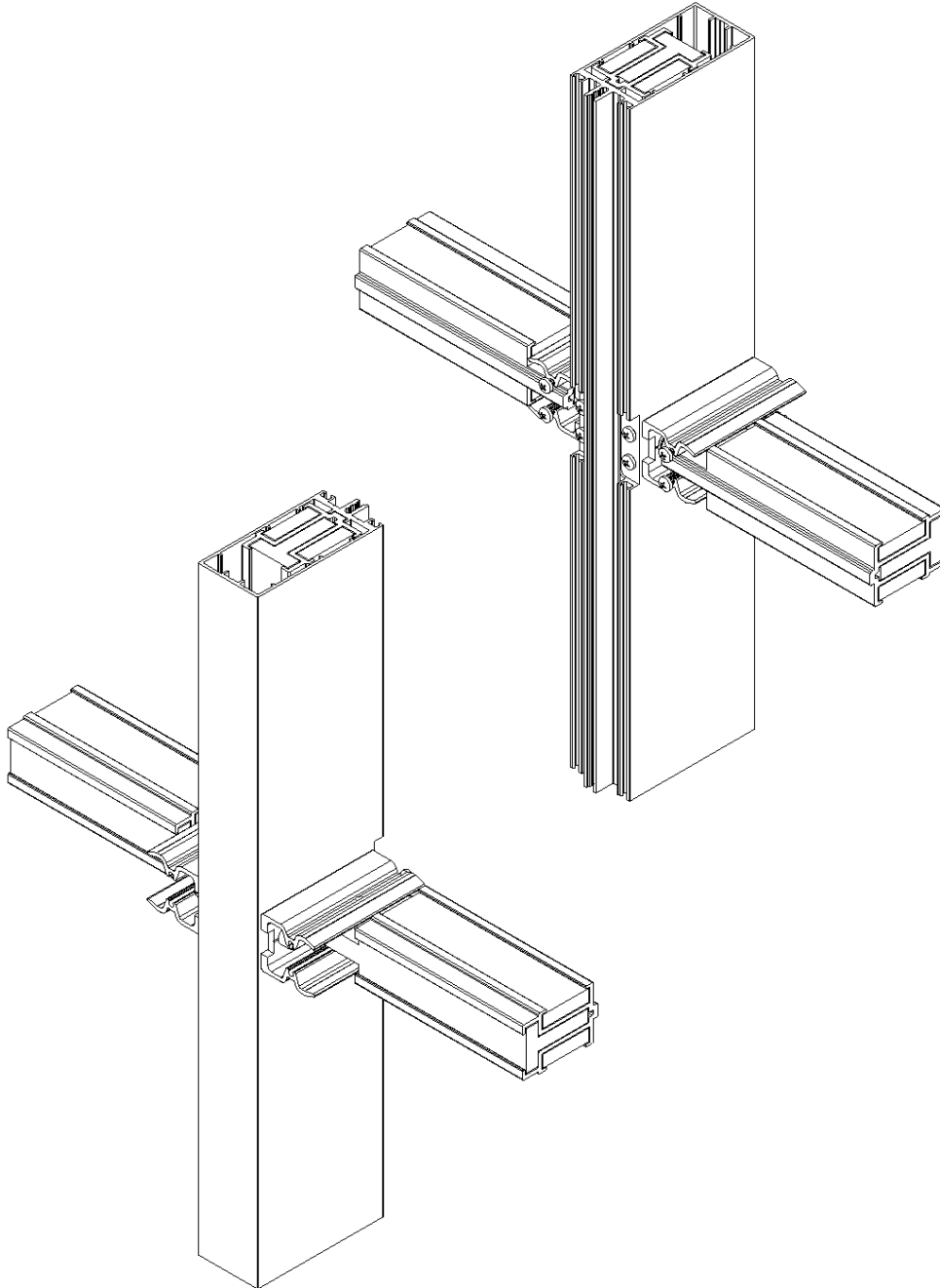
ALUMIL MILONAS ALUMINUM INDUSTRIES S.A. - HELLAS OFFICES - RESISTANCE BUILDING, PROTECTIVE OF 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 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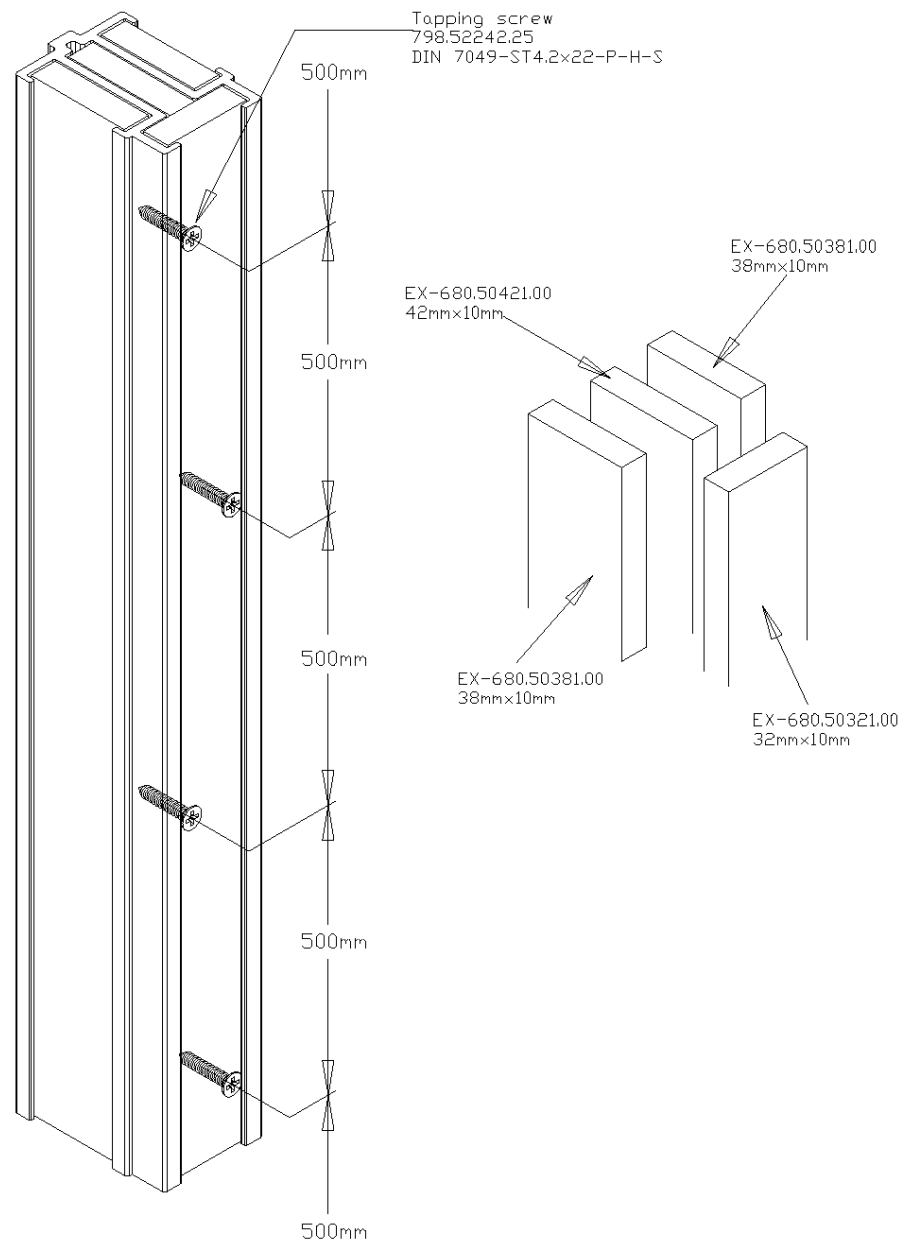
Cooling and Reinforcement Profile Placement



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M50 Energy FP FireProof Series

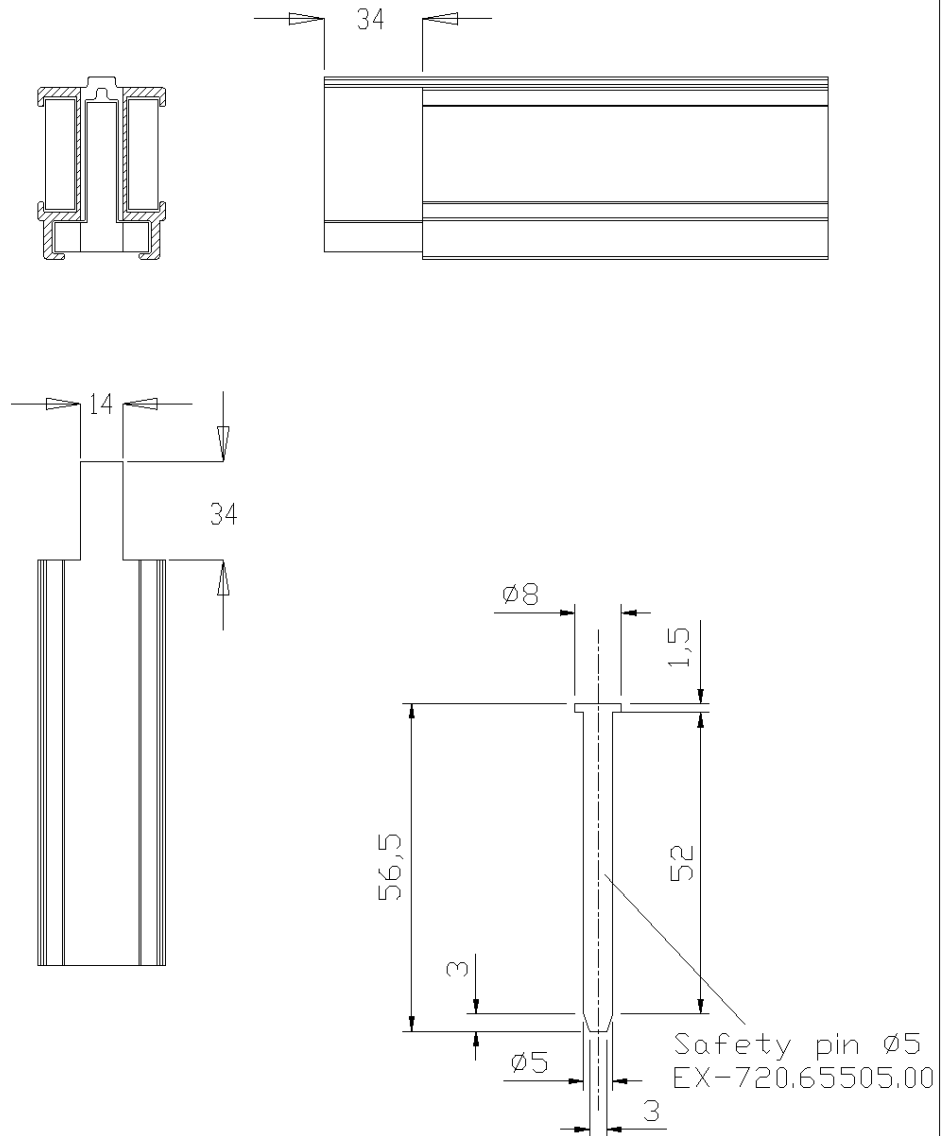
Cooling and Reinforcement Profile Treatment



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M50 Energy FP FireProof Series

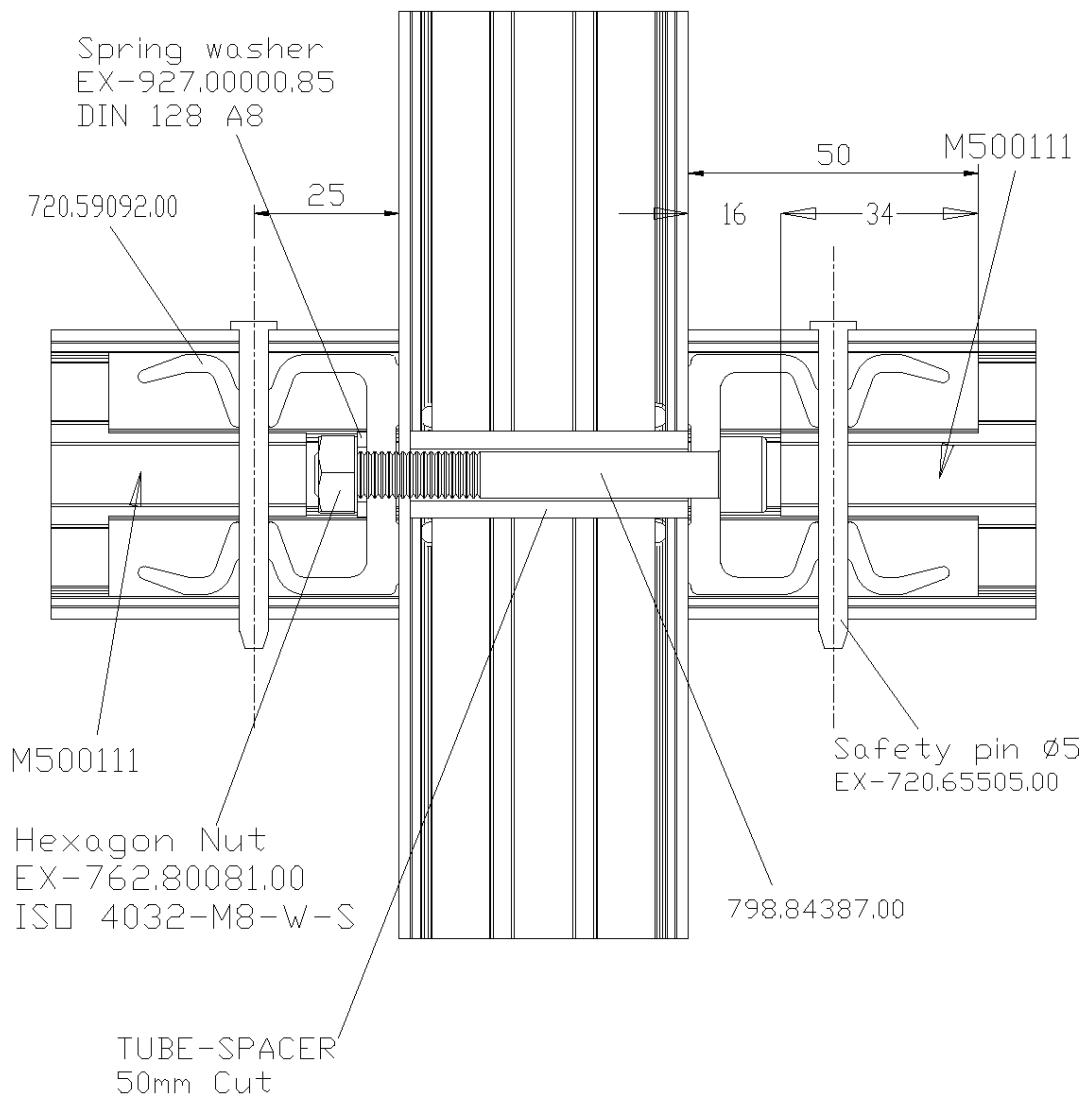
Cooling and Reinforcement Profile Milling



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M50 Energy FP FireProof Series

Cooling and Reinforcement Profile Milling

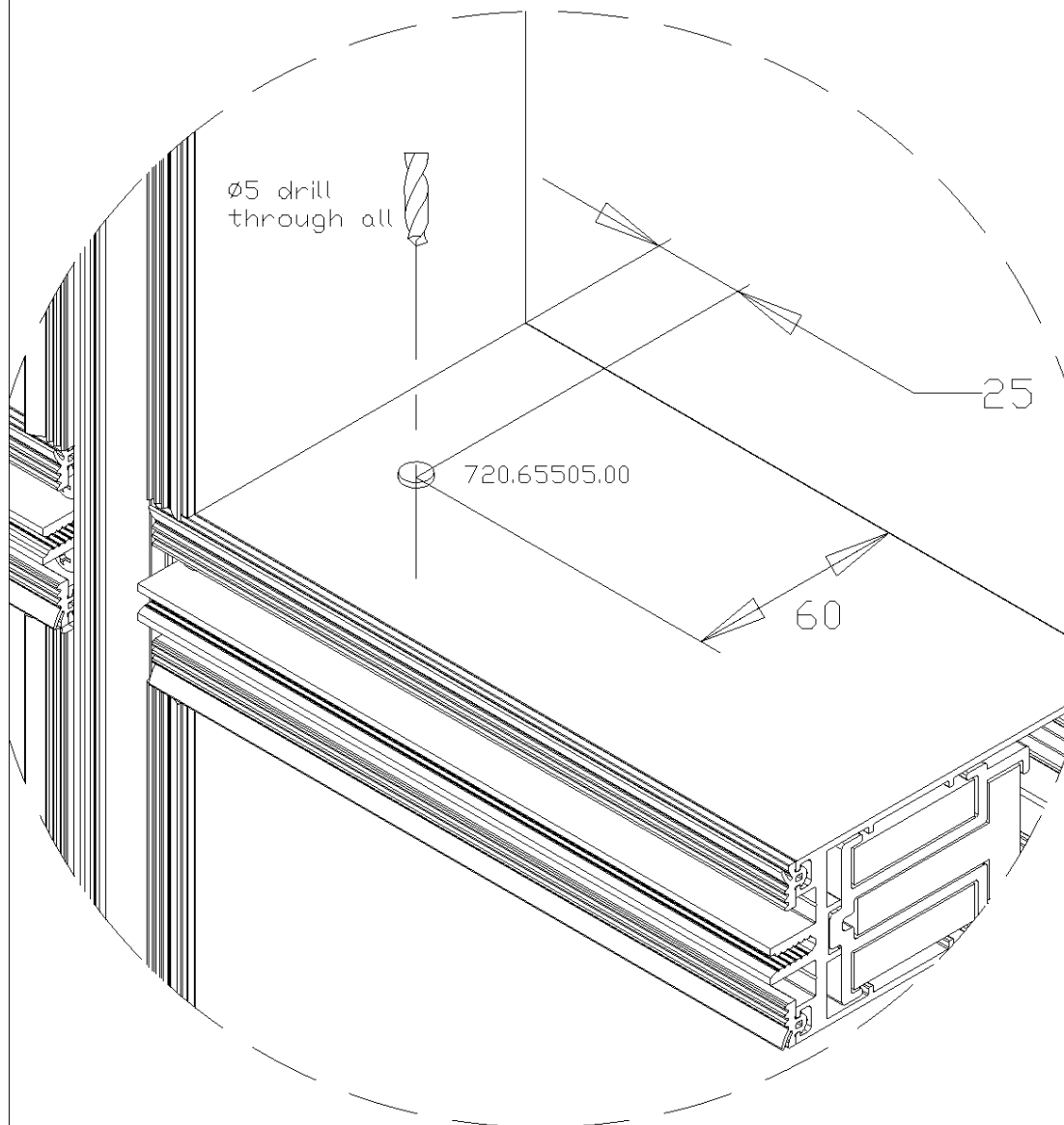


Transom Fixing



M50 Energy FP FireProof Series

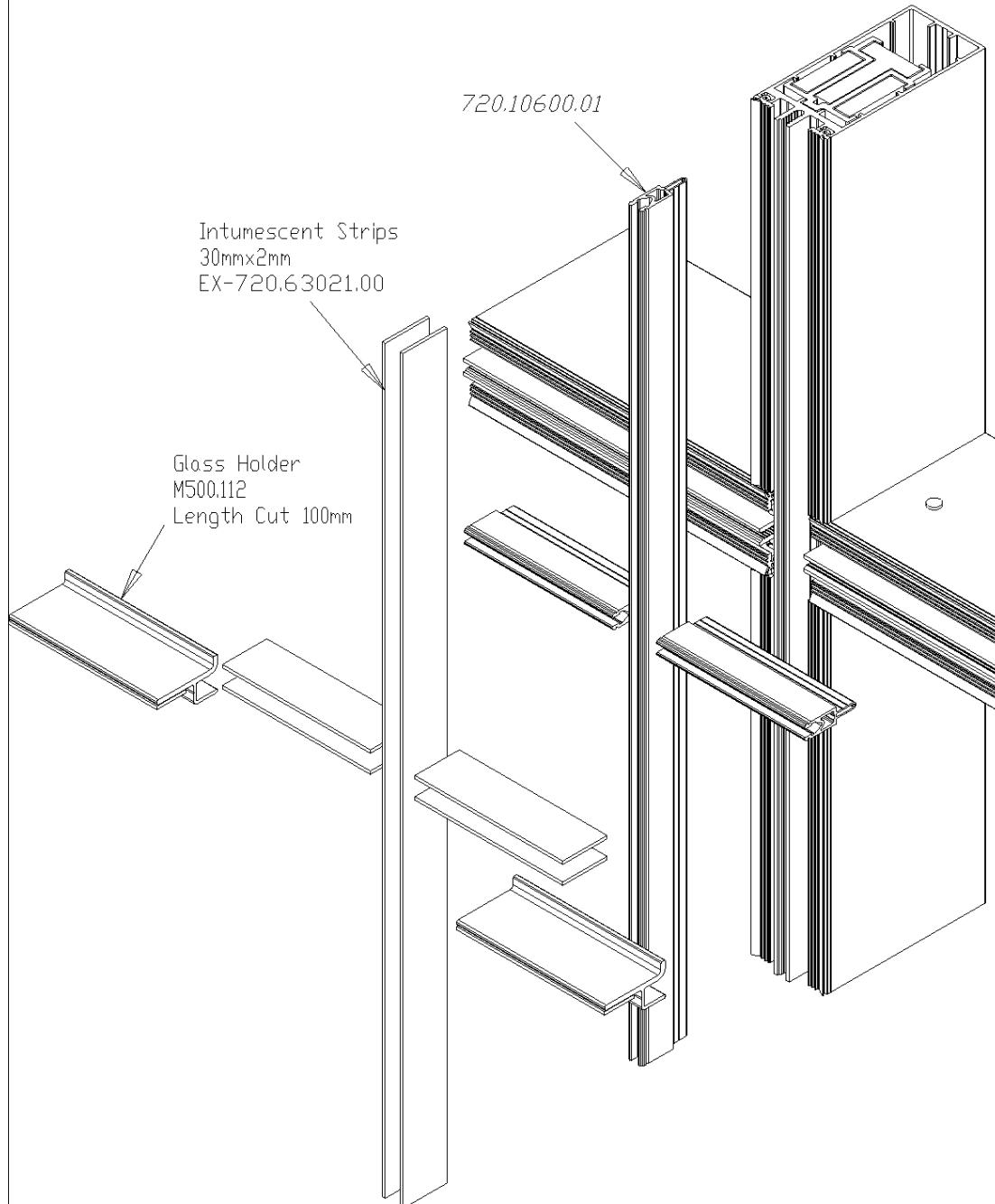
Securing the Transom with safety pin



Isolator and Intumescent stripes placement

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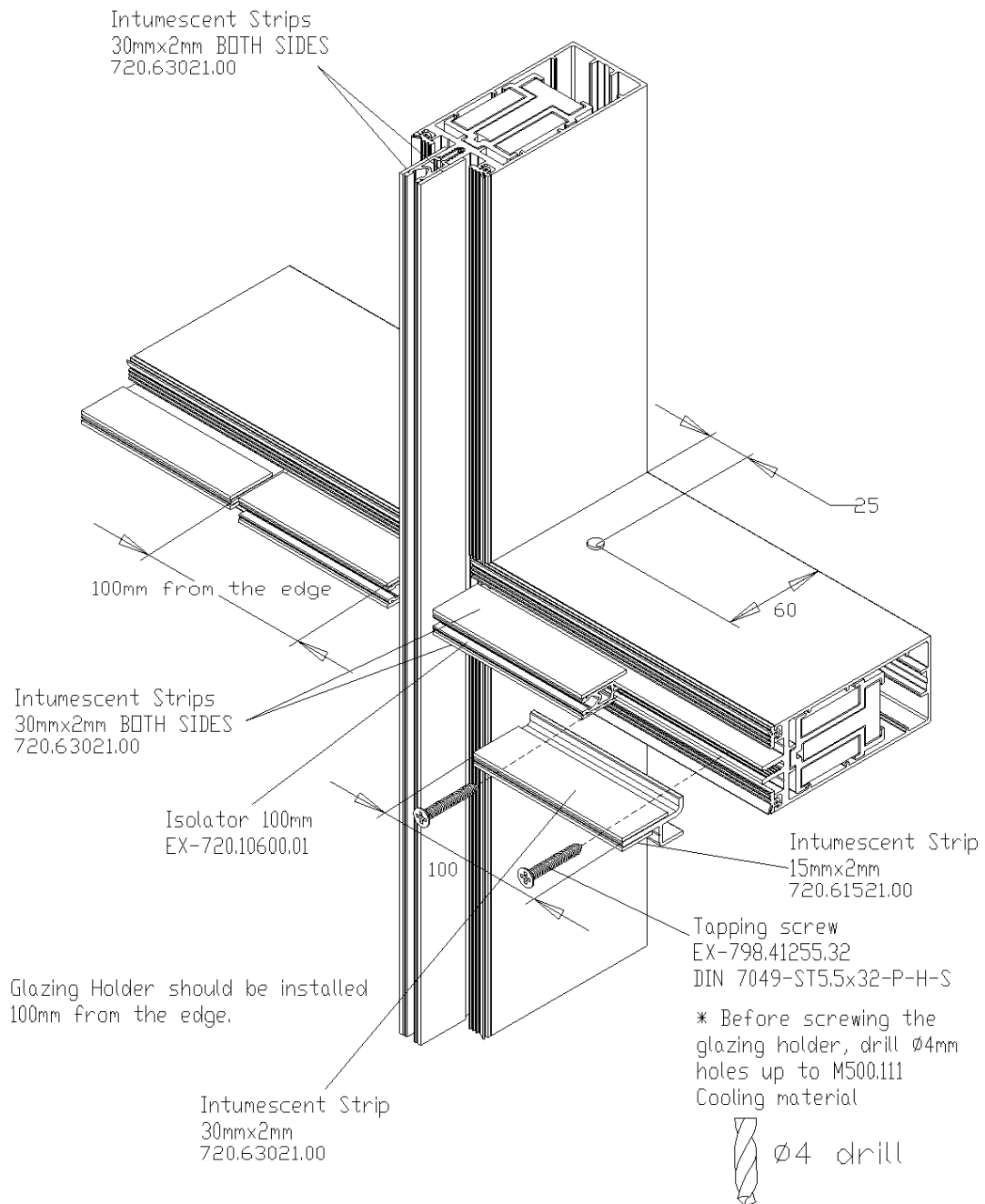
M50 Energy FP FireProof Series



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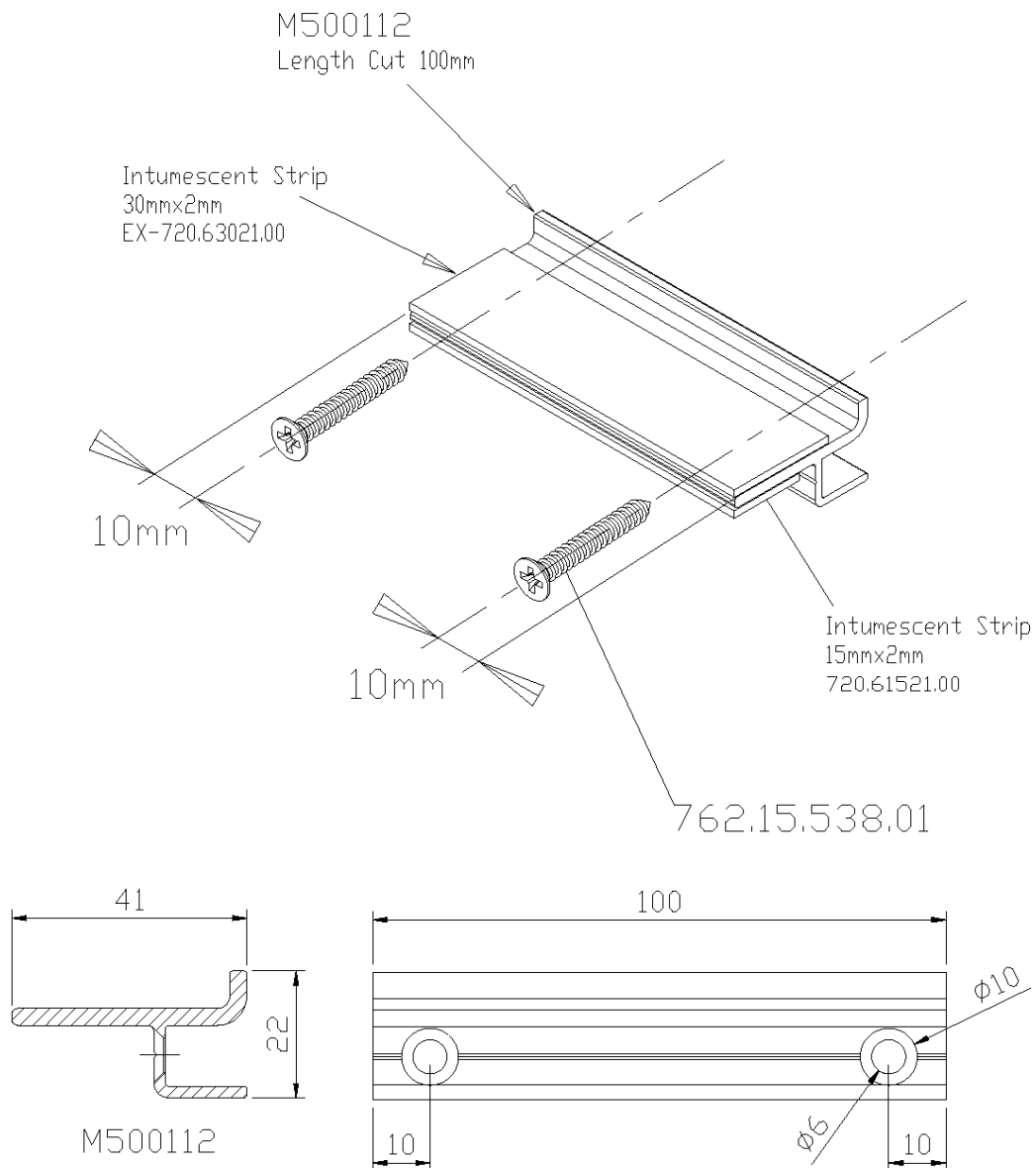
Glazing Holder placement





M50 Energy FP FireProof Series

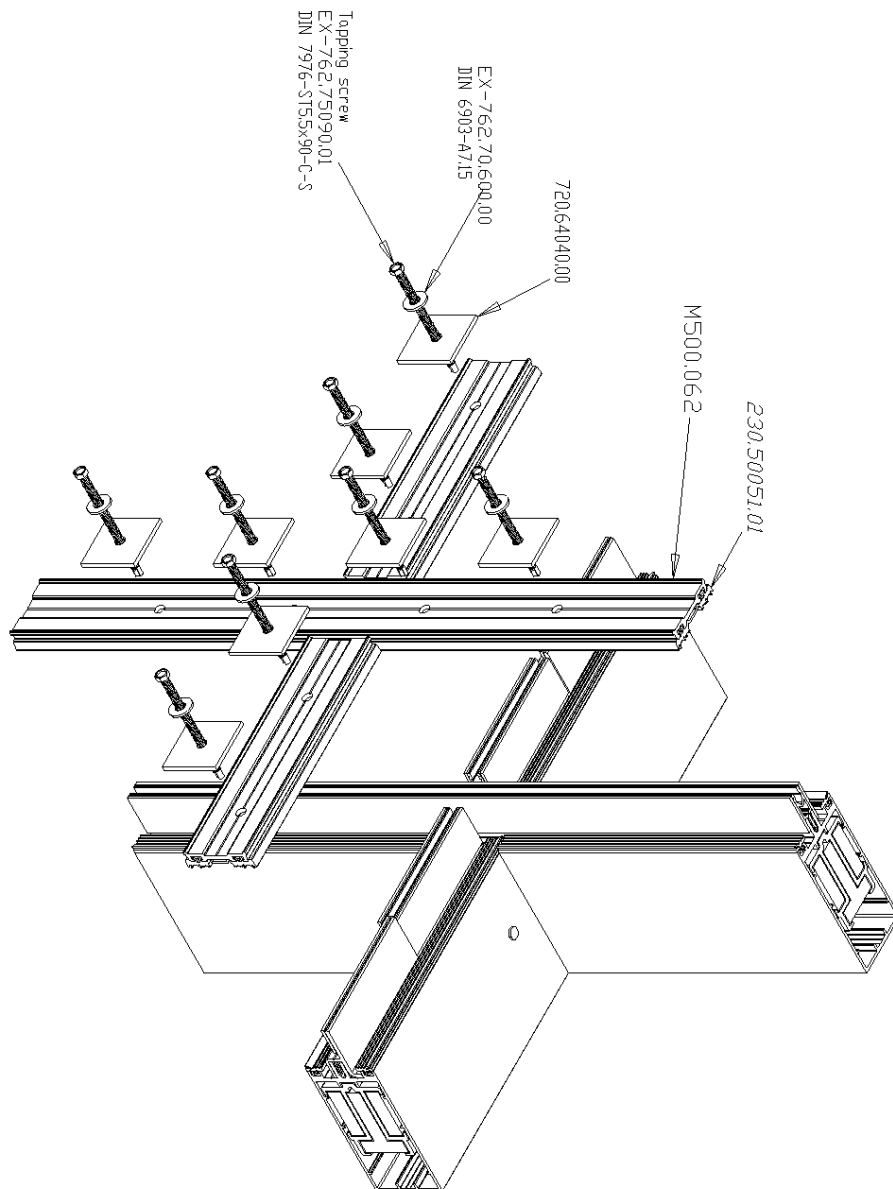
Glazing Holder placement



Pressure Plate and Reinforcement Pieces

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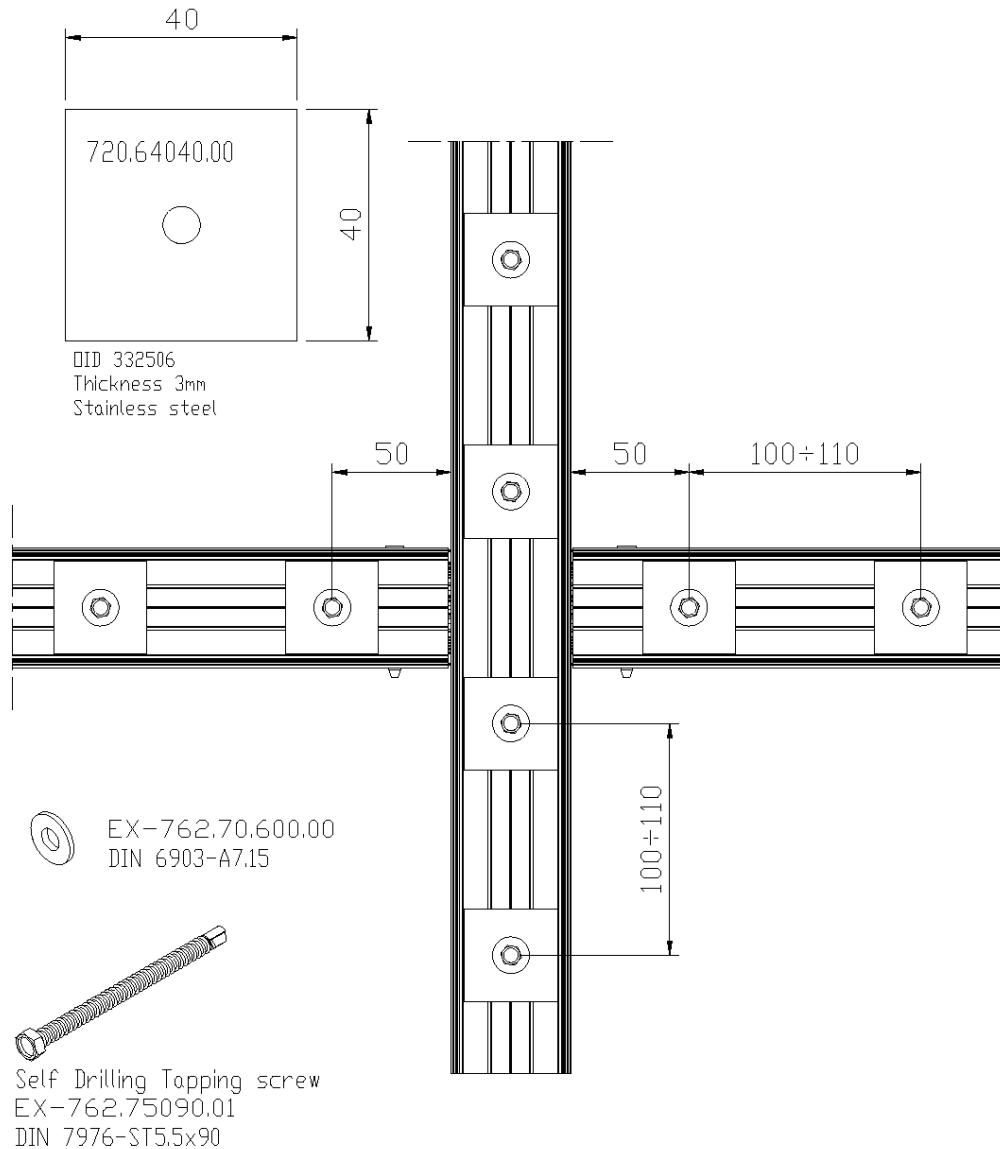


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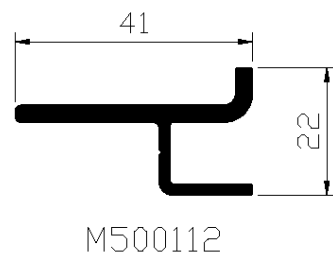
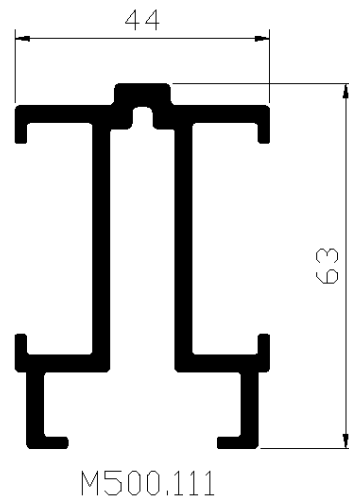
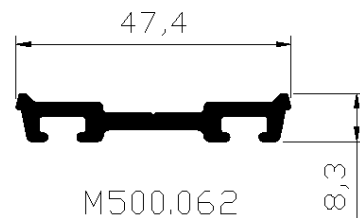
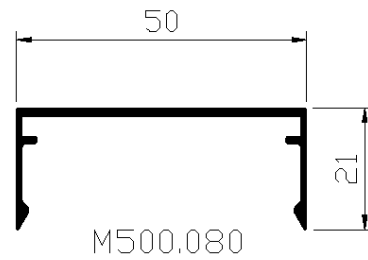
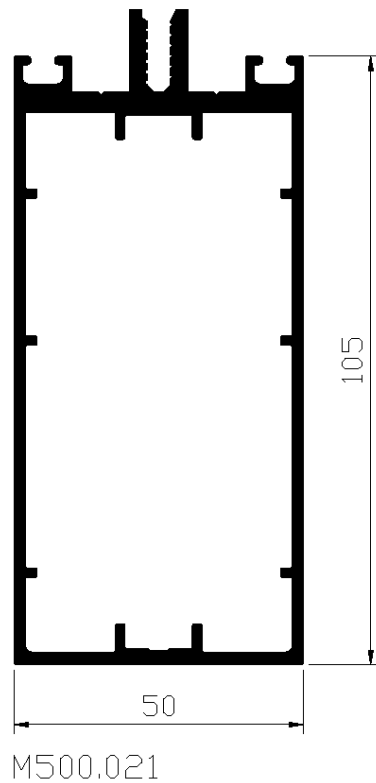
Pressure Plate and Reinforcement Pieces



Profiles

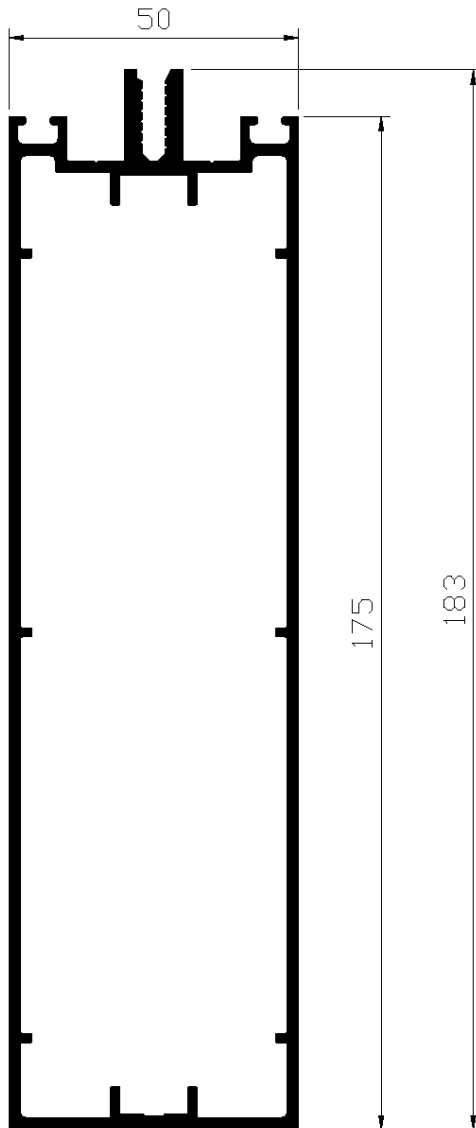
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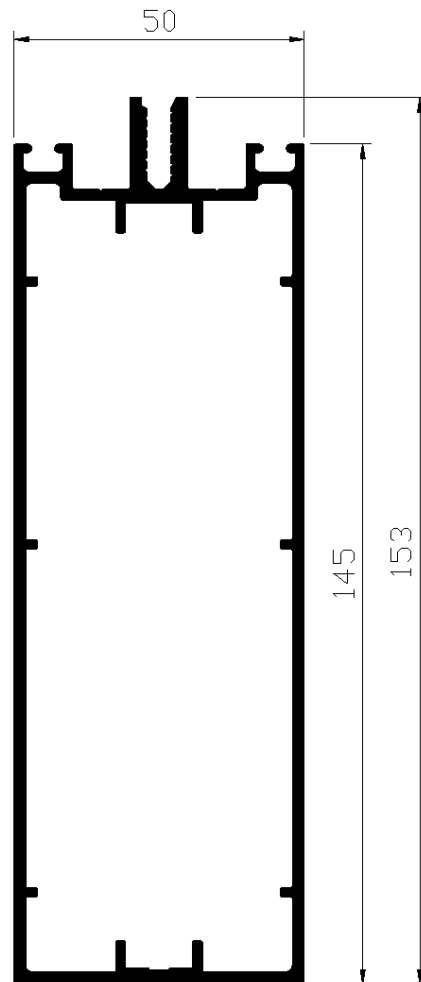


Profiles

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M500.013

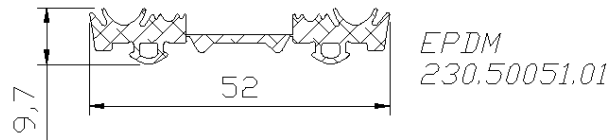
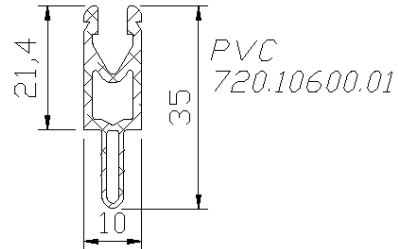
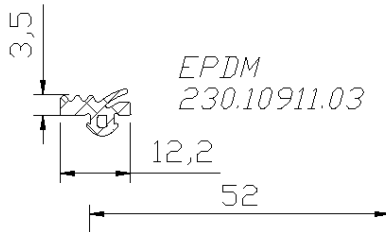


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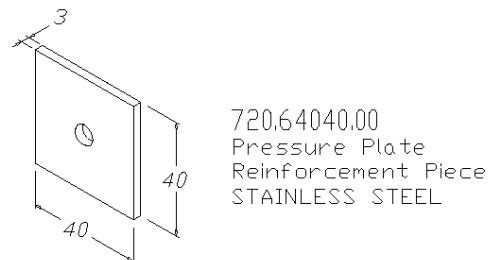
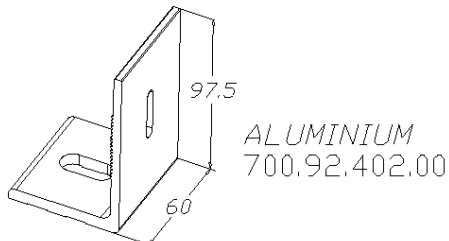
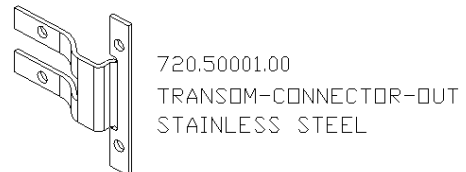
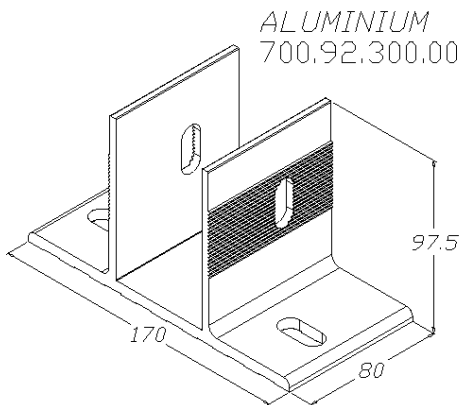
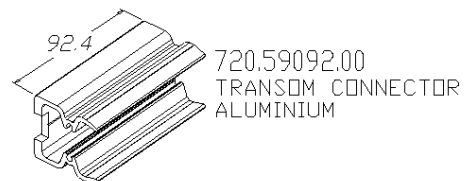
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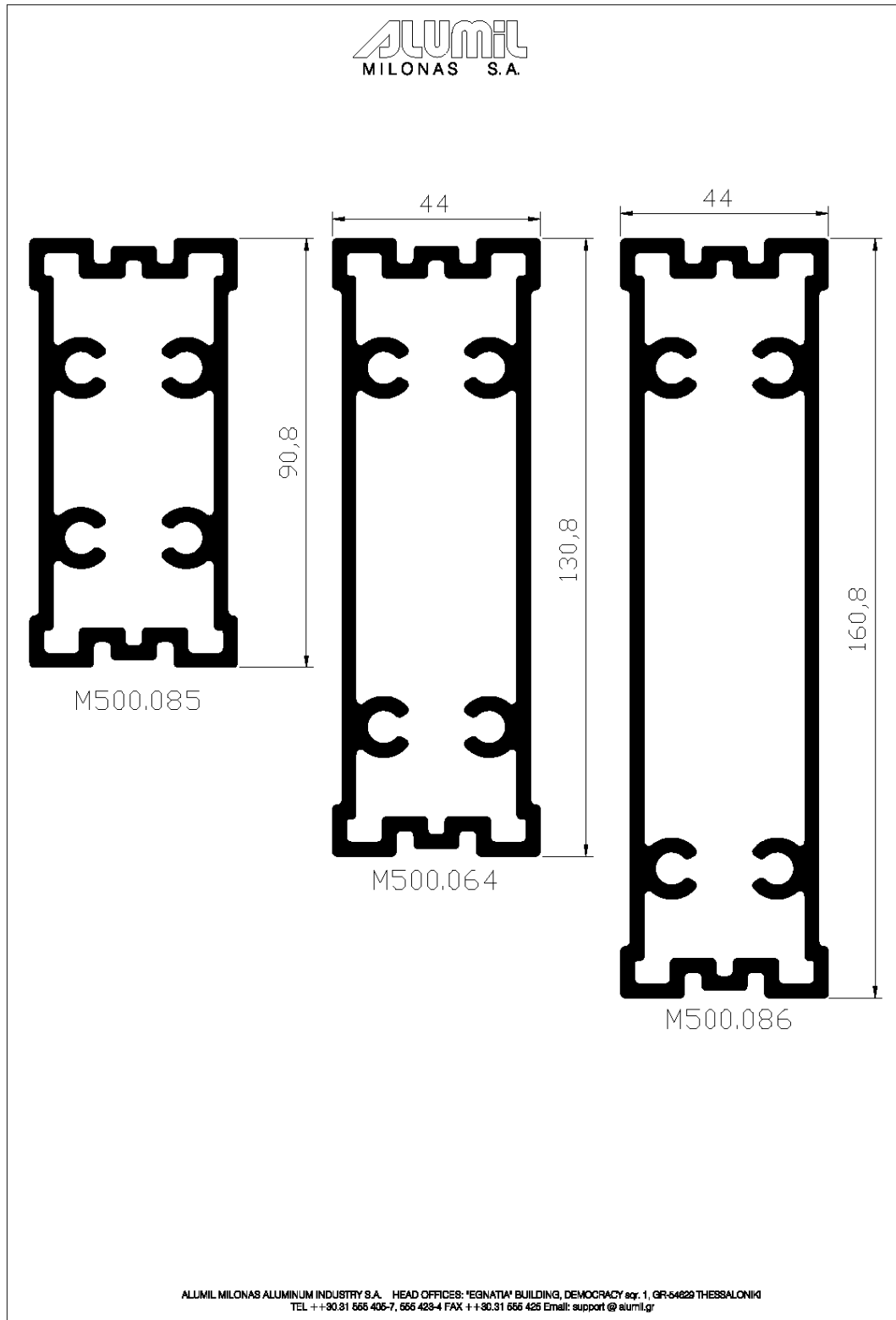
M50 Energy FP FireProof Series

Accessories



Accessories





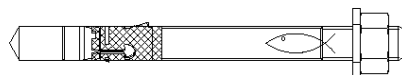


M50 Energy FP FireProof Series

Accessories



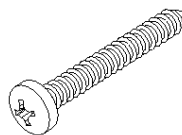
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 CONCRETE SCREW T30 7,5x80
 GALVANIZED YELLOW CHROMATED



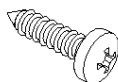
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 Concrete anchor bolt 12x100



Tapping screw
 DIN 7049-ST5.5x38-C-H-S
 798.12255.38



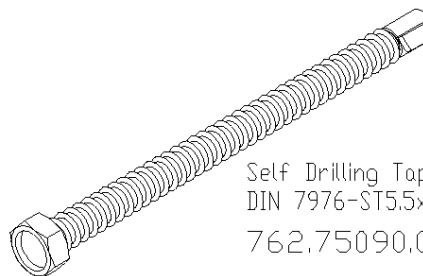
Tapping screw
 DIN 7049
 ST4.8x32-□-H-S
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Tapping screw
 DIN 7049
 ST4.8x19-□-H-S
 798.21248.19



DIN 6903-A7.15
 762.70.600.00



Self Drilling Tapping screw
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720.65505.00
 Safety pin Ø5

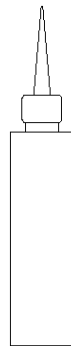


Tapping screw
 798.52242.19 DIN 7505-ST4.2x19-C-H-S
 798.52242.25 DIN 7505-ST4.2x22-C-H-S
 798.52242.32 DIN 7505-ST4.2x32-C-H-S



M50 Energy FP FireProof Series

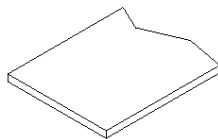
Accessories



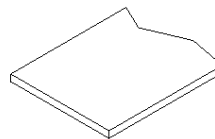
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FIRECRYLIC FR
B1 CLASS
ACRYLIC SEALANT



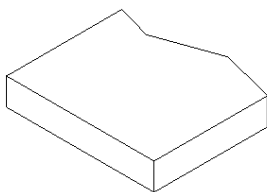
NEUTRAL SILICONE
770.02001.05



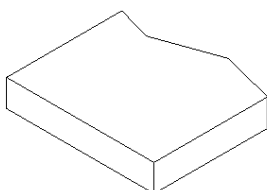
INTUMEX L
Intumescent Strips
30mmx2mm
720.63021.00



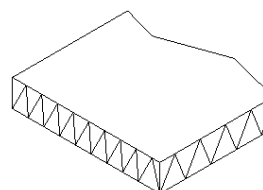
INTUMEX L
Intumescent Strips
15mmx2mm
720.61521.00



680.50321.00	RIGIPS	GYPSUM	BOARD	32x10x2000
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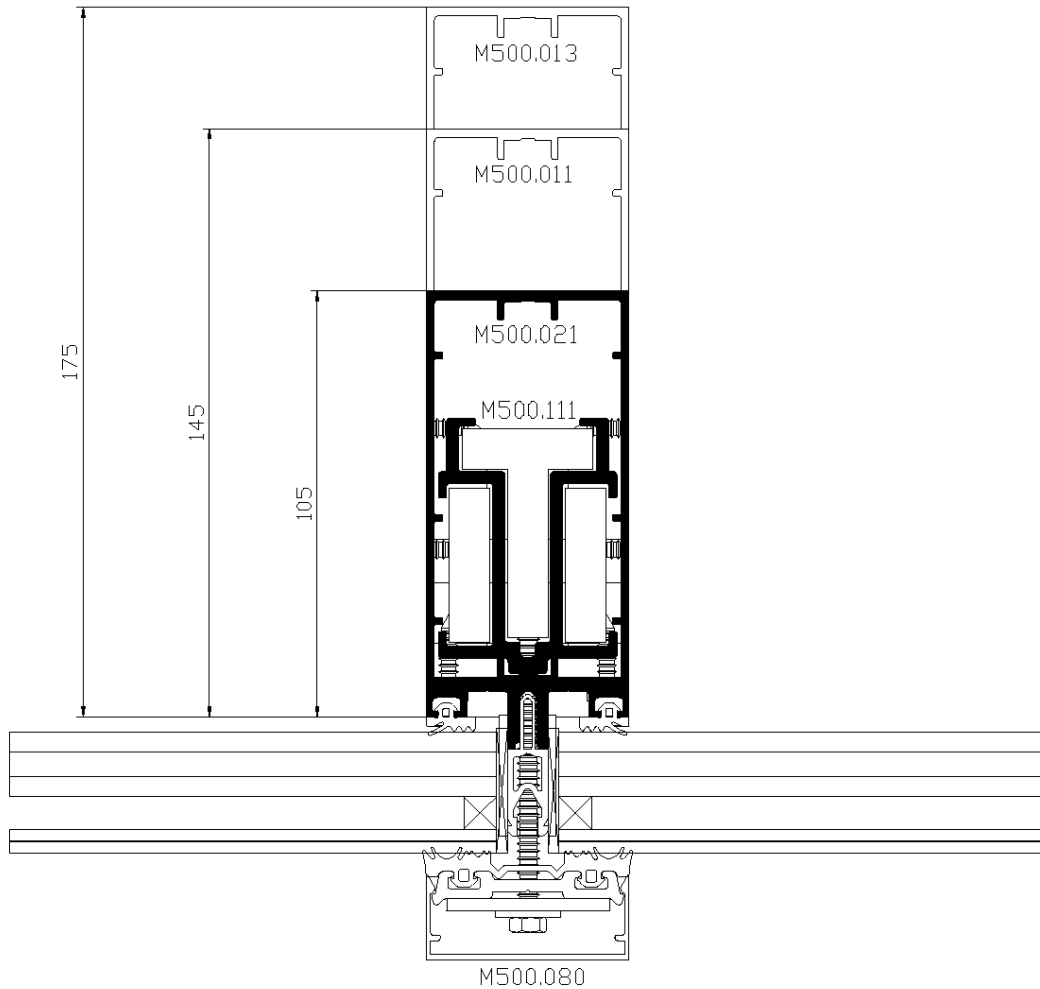


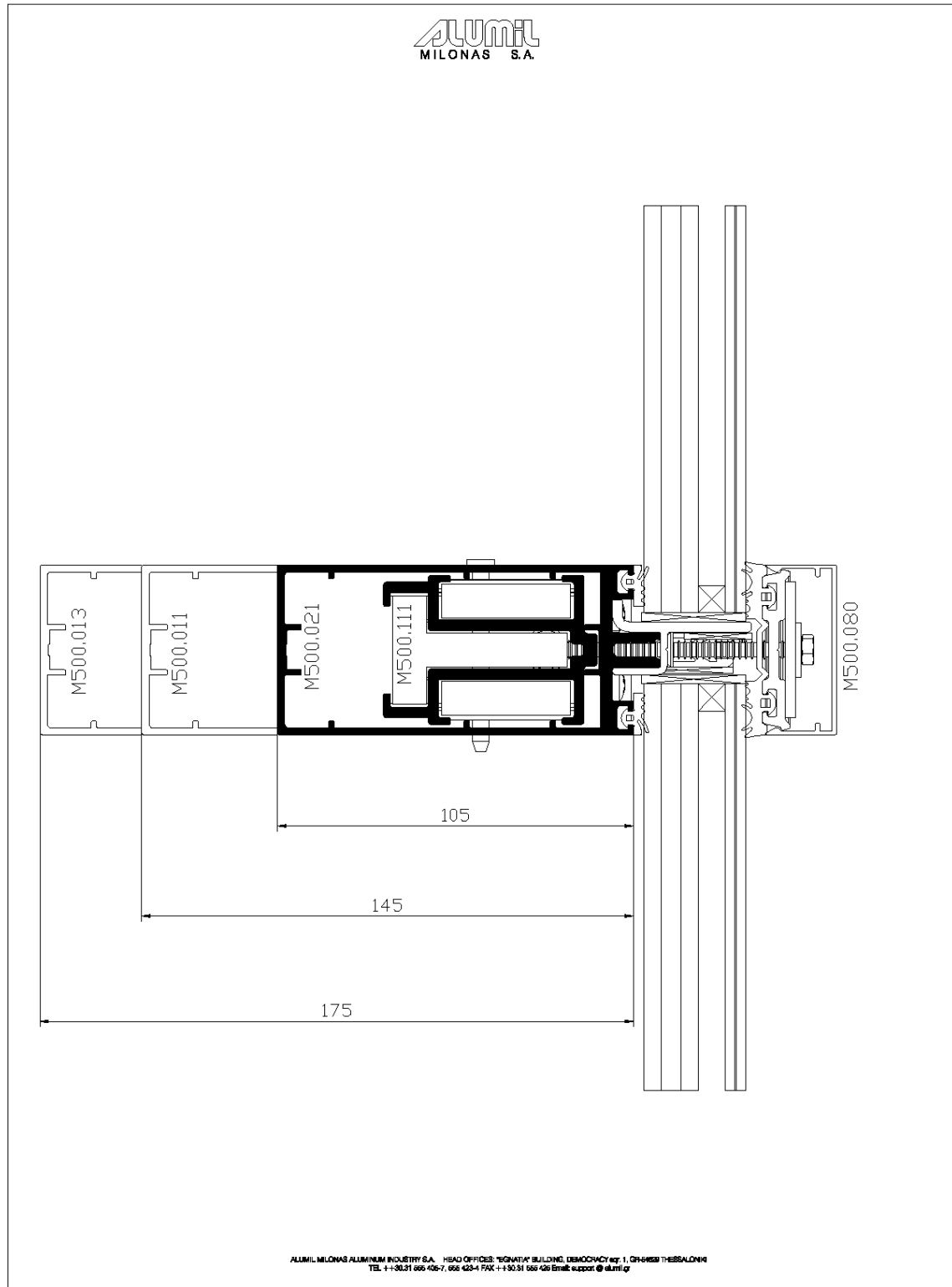
PROMATECT -H
FIREBOARD

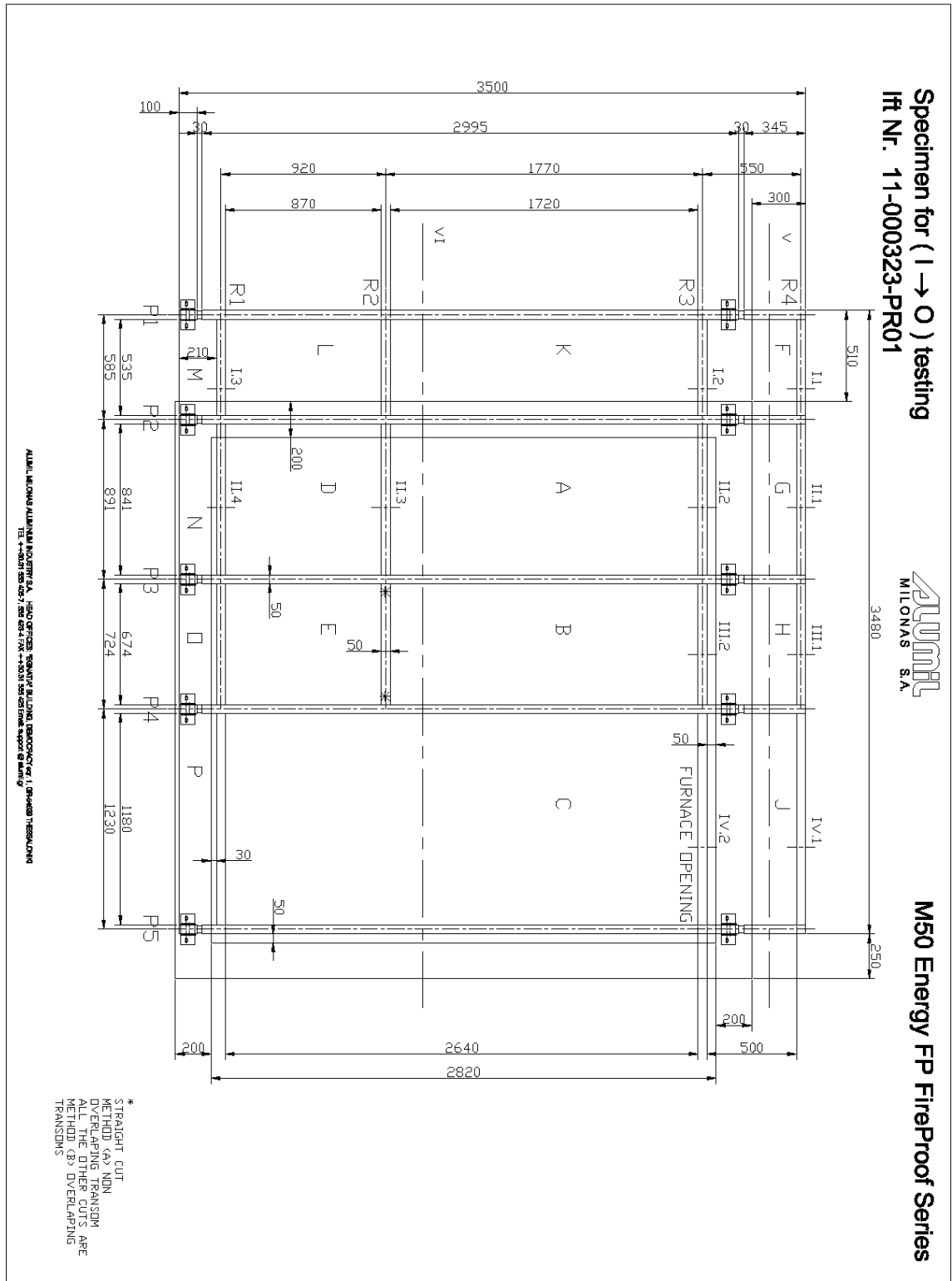


ISOVER N
MINERAL
WOOL d=40mm
d=14.8Kg/m³

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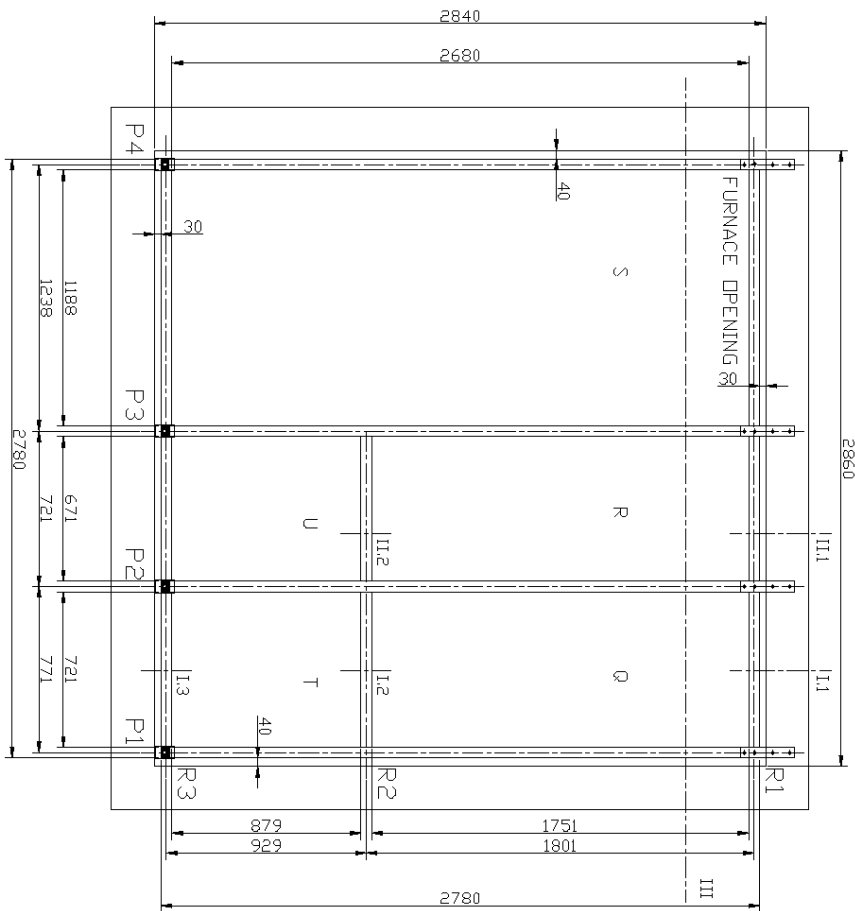




Specimen for (O → I) testing
Ifit Nr. 11-000323-PR02

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M50 Energy FP FireProof Series



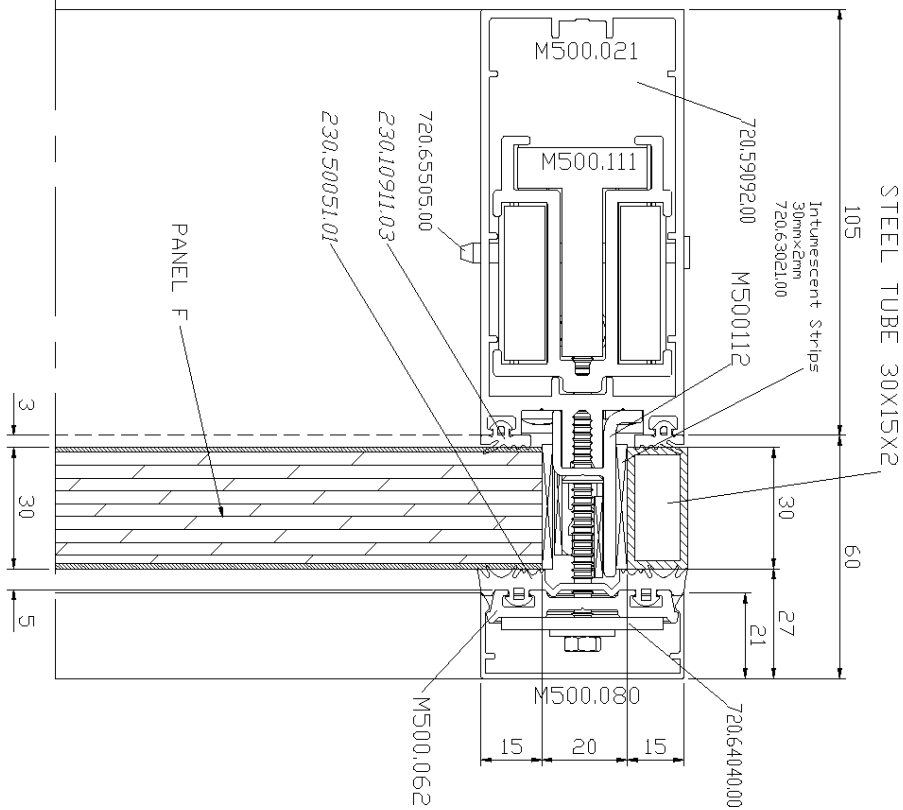
ALUMIL MILONAS ALUMINIA INCORPORATED S.A. - HISO OFFICES - SIGNATURE BUILDING, DRACOSKY str. 1, 0946003718504000
TEL: ++00357 268 405 7 268 405 4 19X ++00357 268 405 1800 support @alumil.gr

Specimen Sections I.1

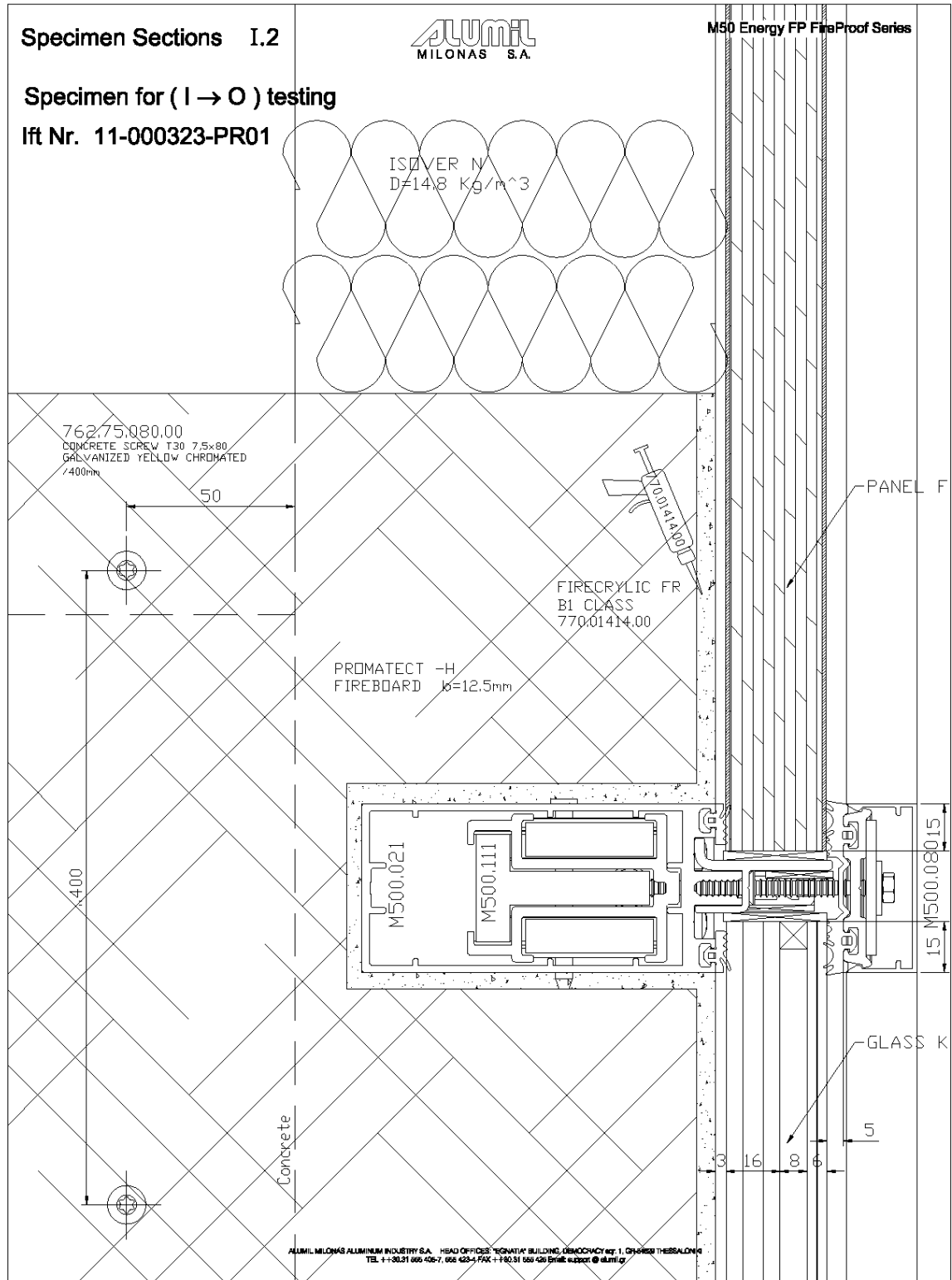
Specimen for (I → O) testing
ift Nr. 11-000323-PR01

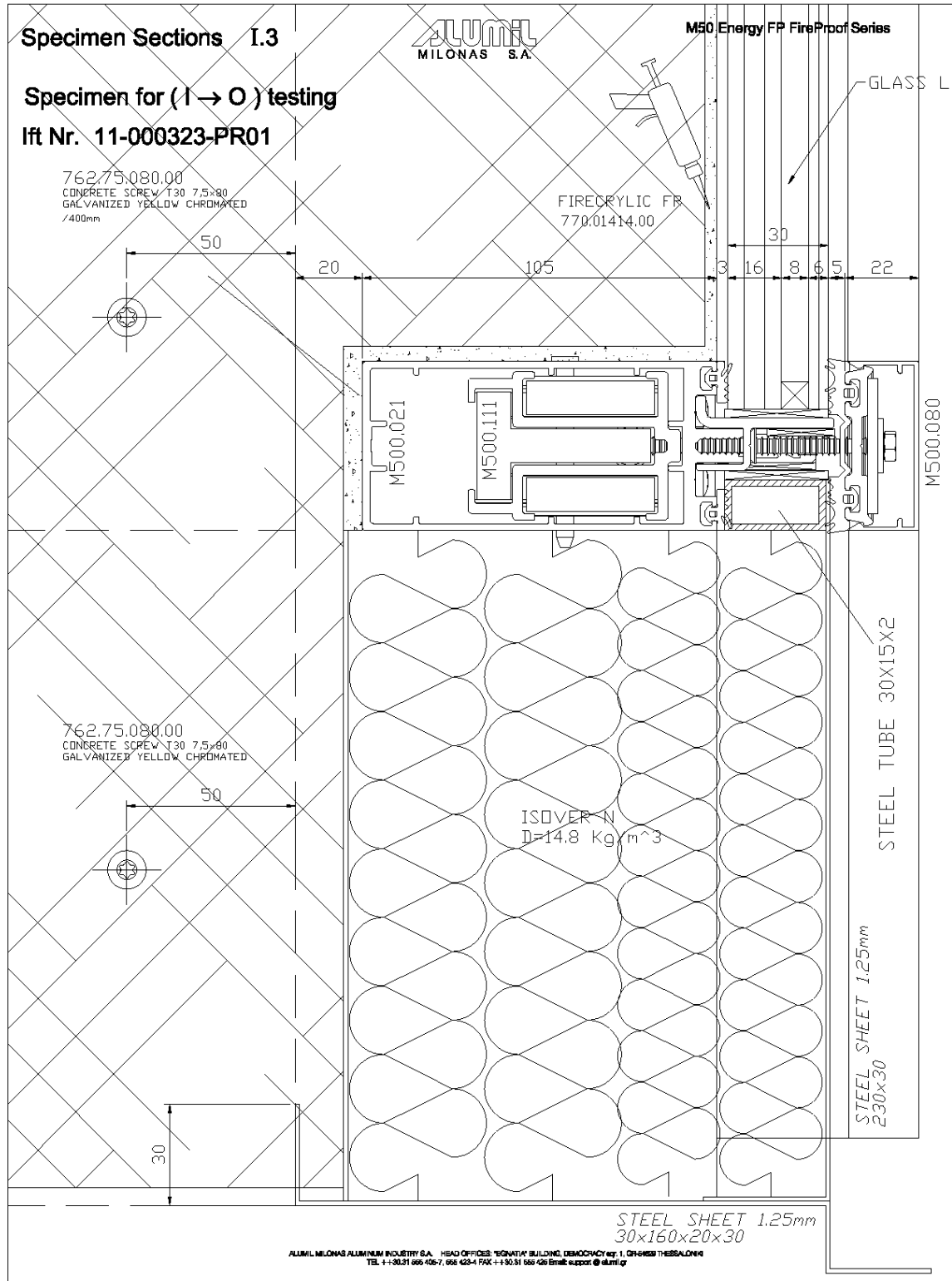
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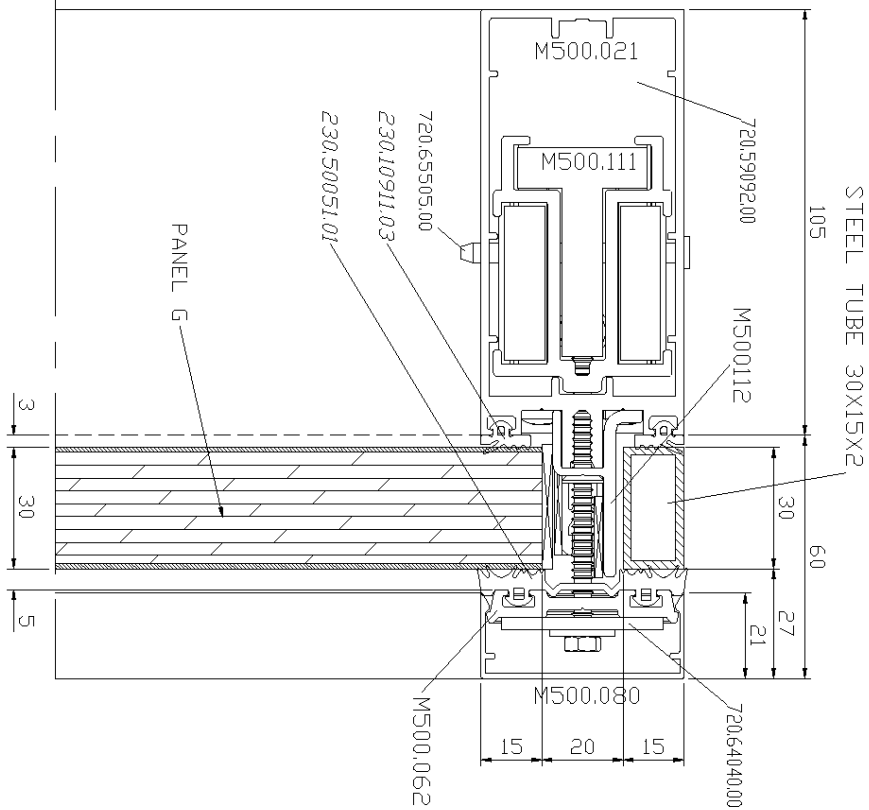


Specimen Sections II.1

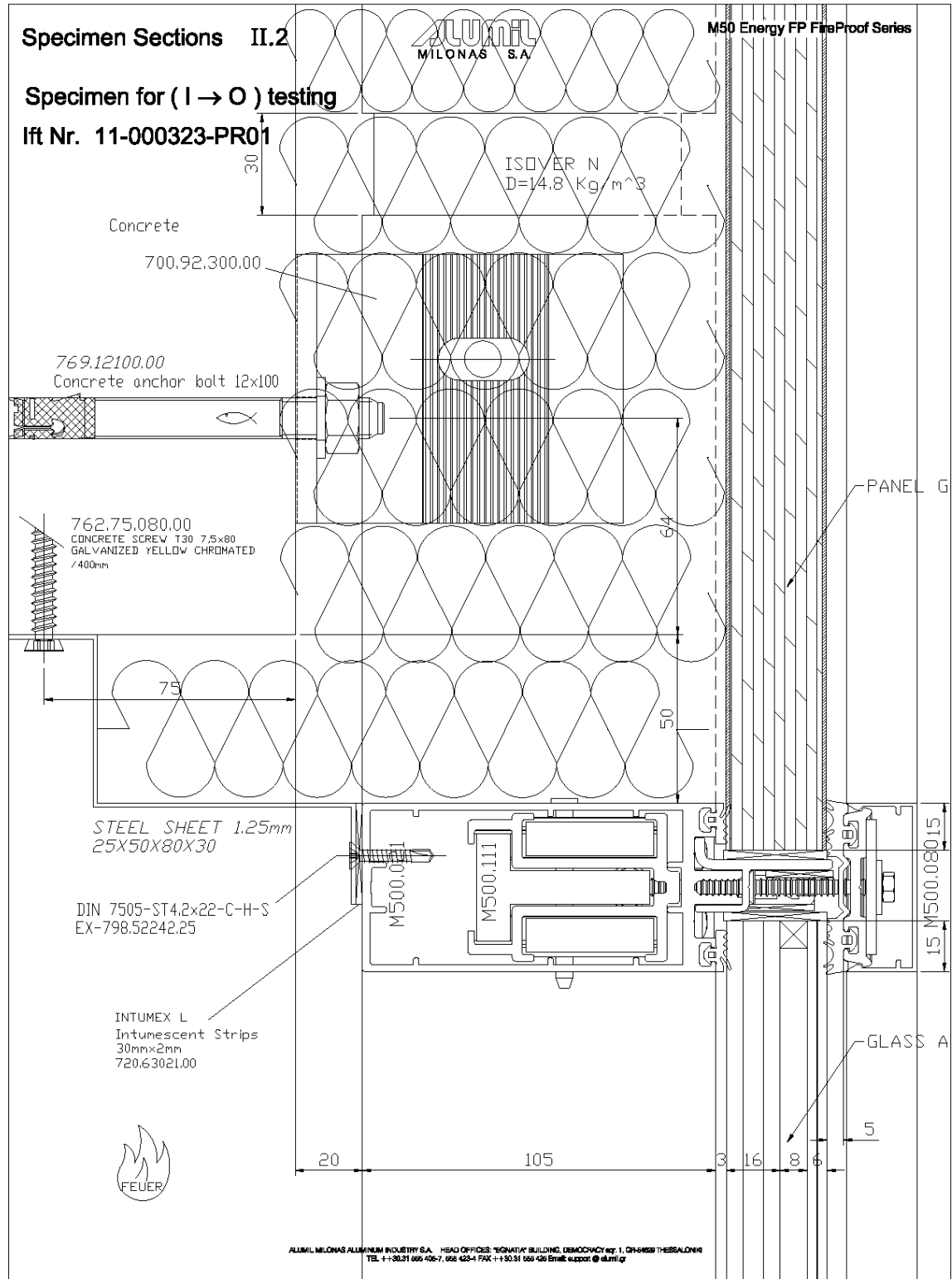
Specimen for (I → O) testing
ift Nr. 11-000323-PR01

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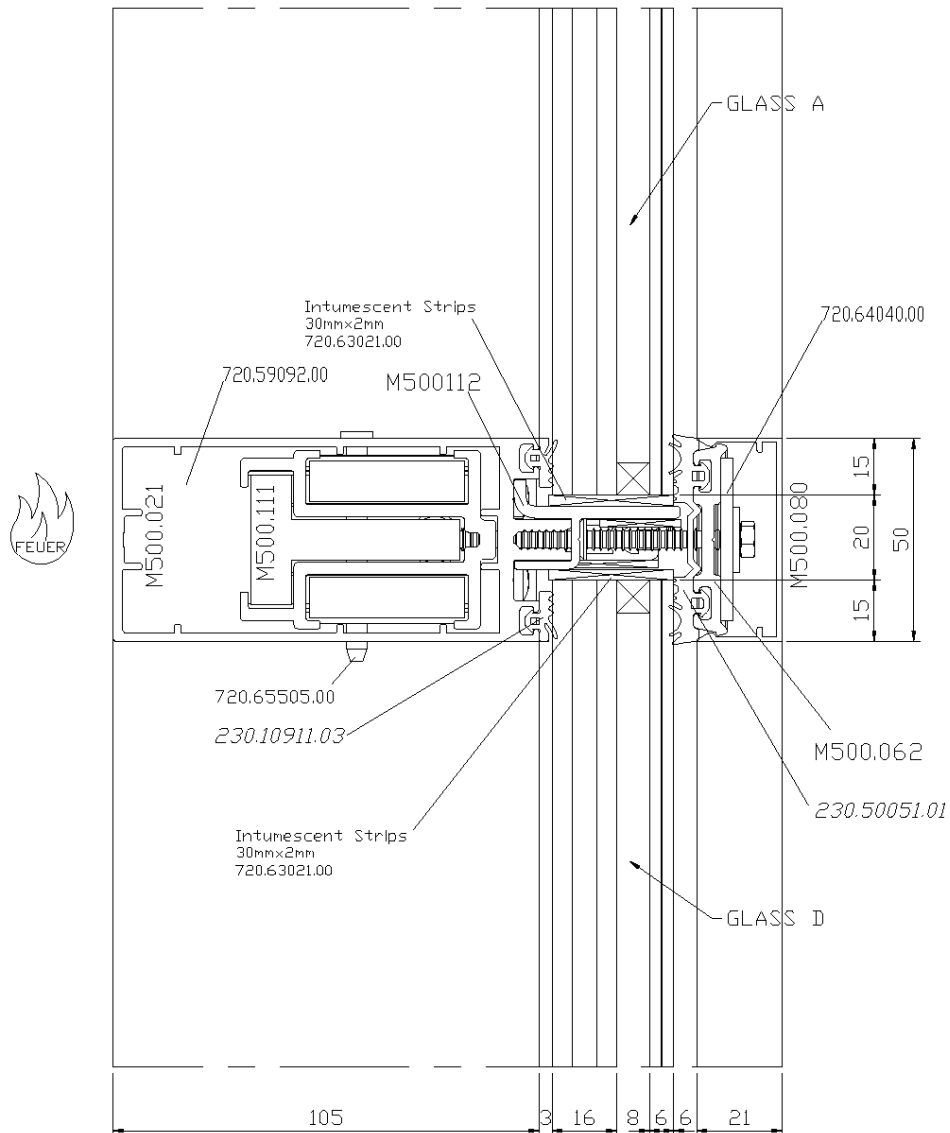
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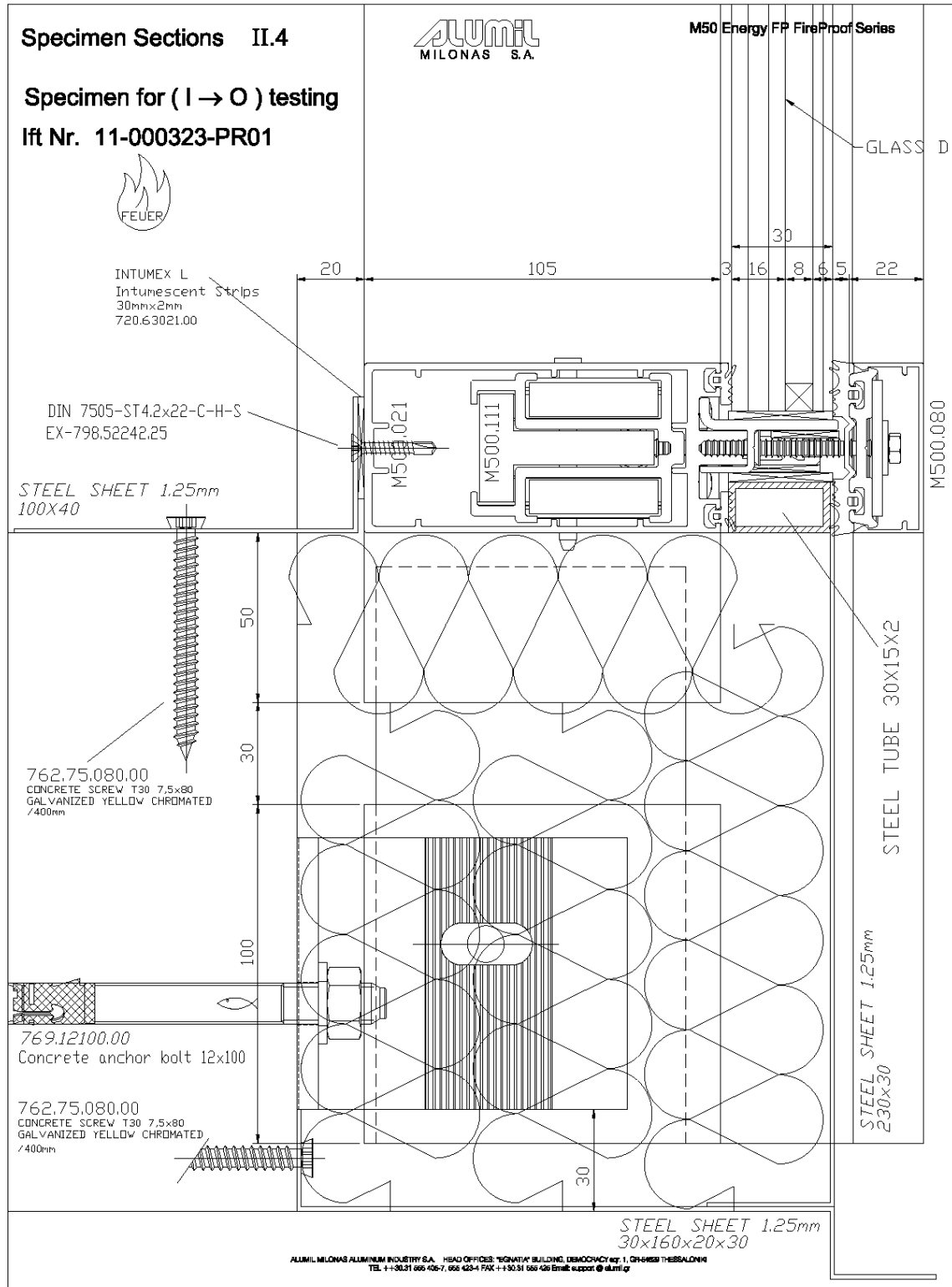


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Specimen for (I → O) testing

Ift Nr. 11-000323-PR01





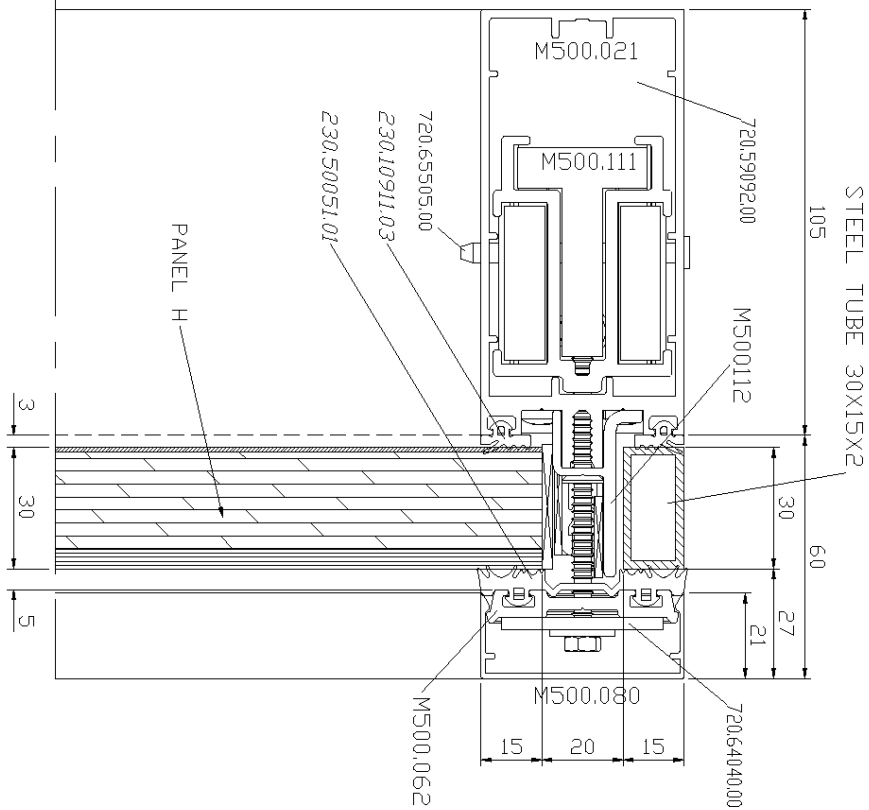
Specimen Sections III.1

Specimen for (I $\rightarrow$ O) testing
Ift Nr. 11-000323-PR01

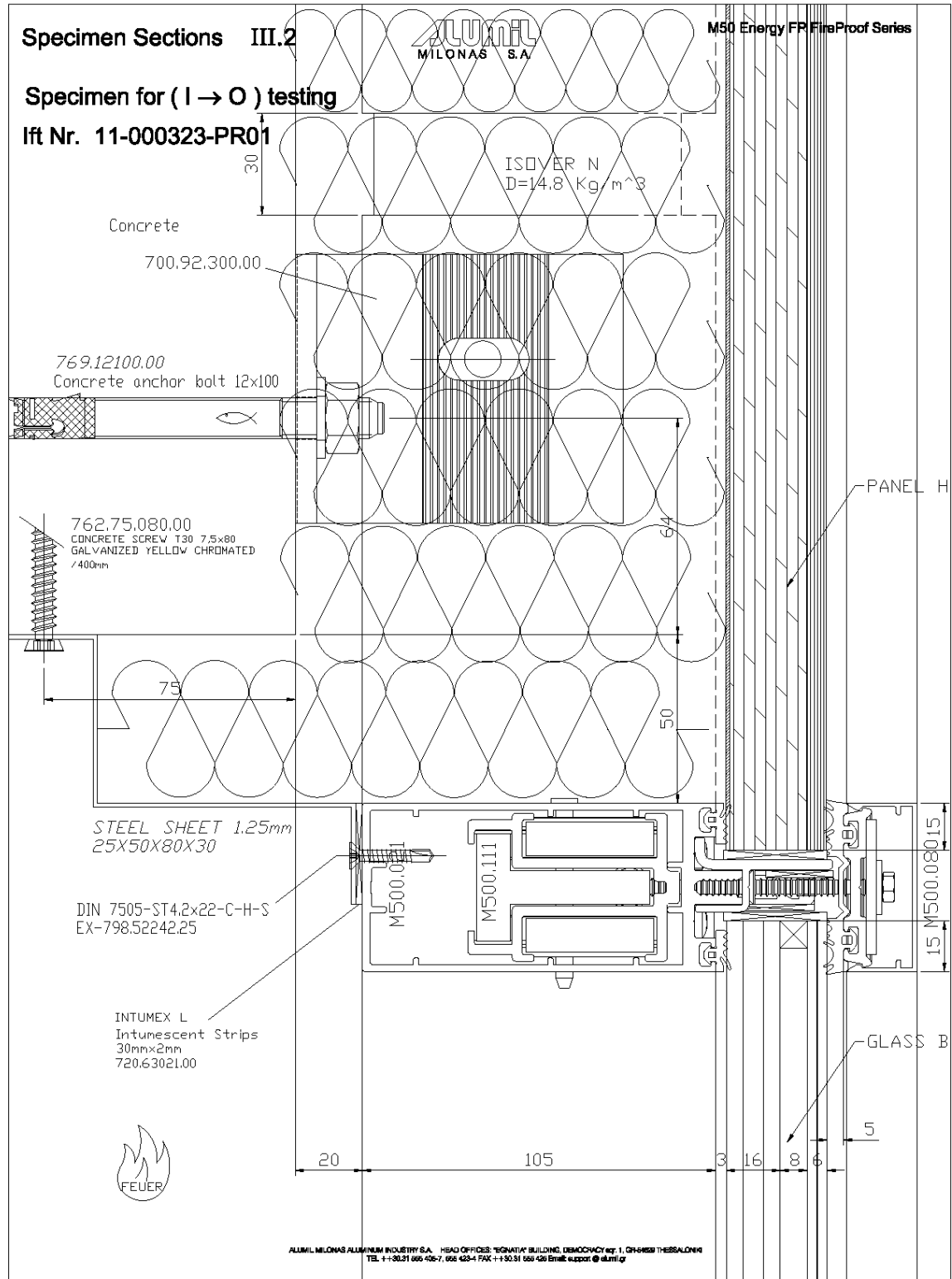
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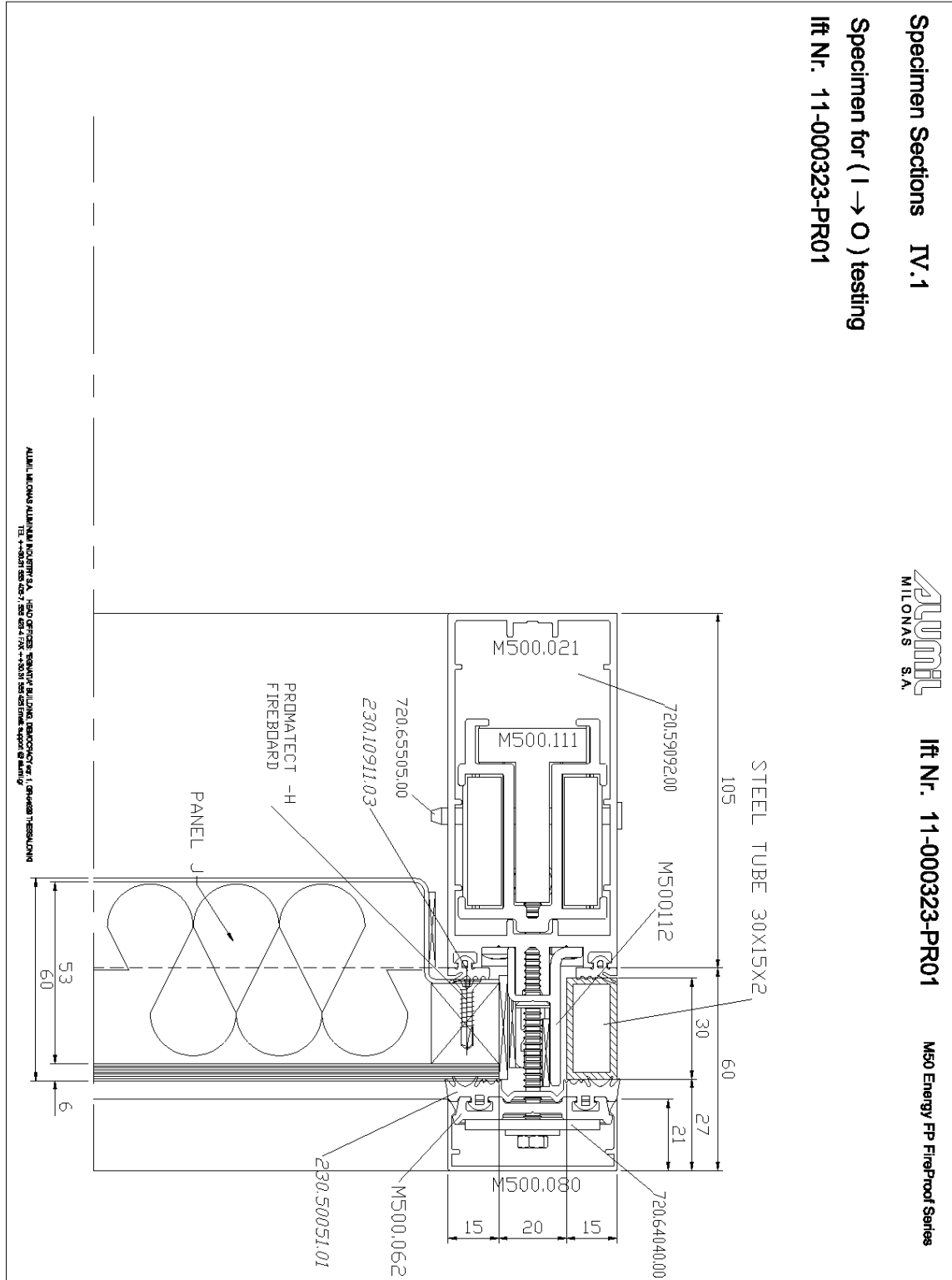
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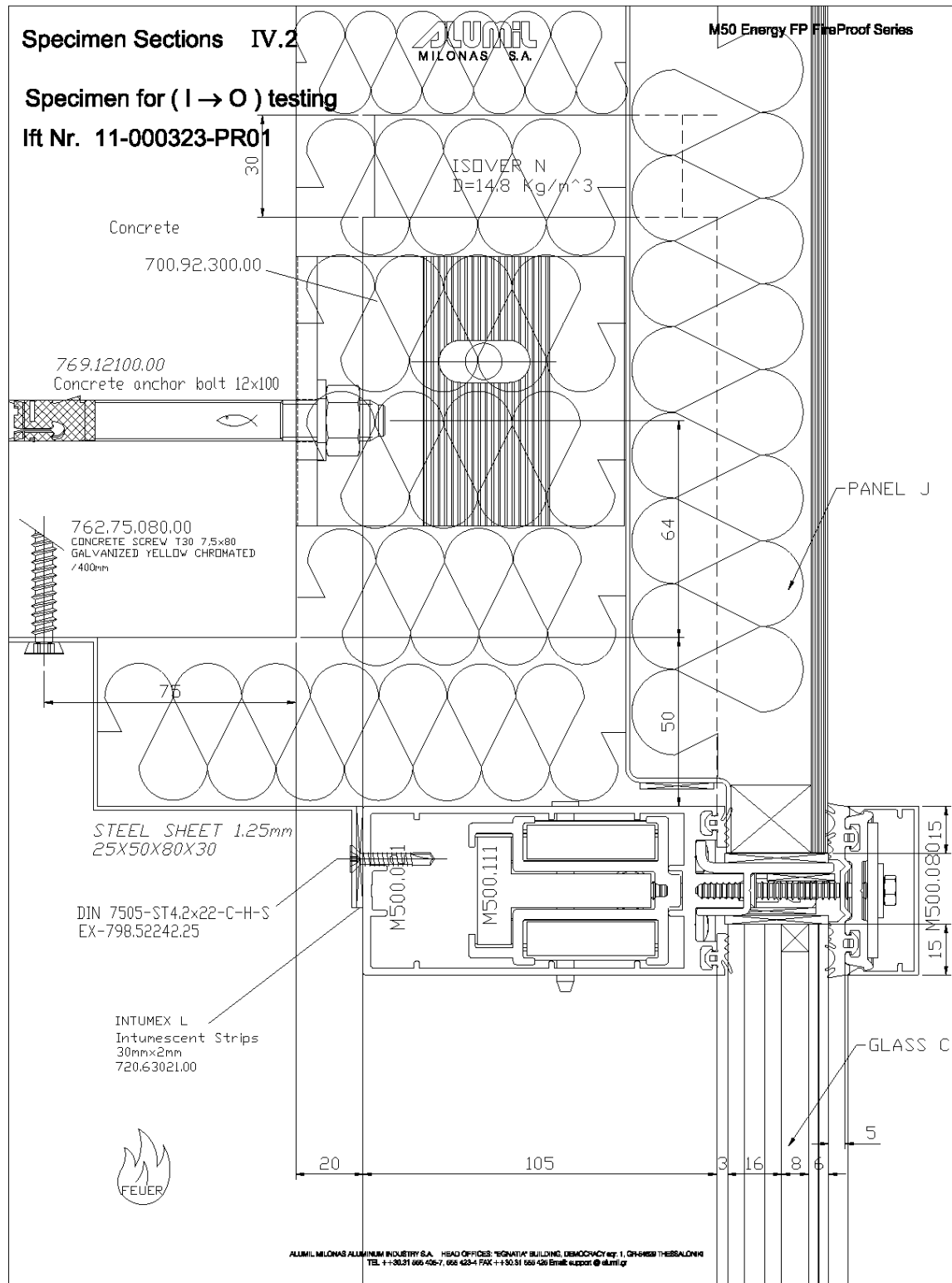
Specimen for (I $\rightarrow$ O) testing
Ift Nr. 11-000323-PR01

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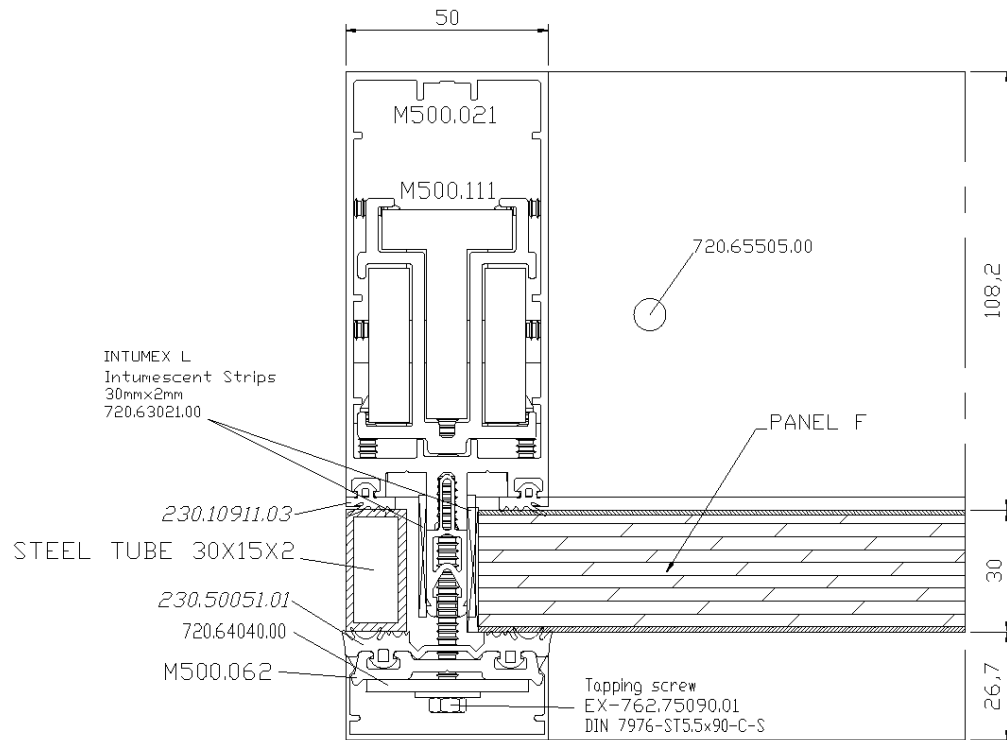
Specimen Sections V.1



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Specimen for (I $\rightarrow$ O) testing

Ift Nr. 11-000323-PR01



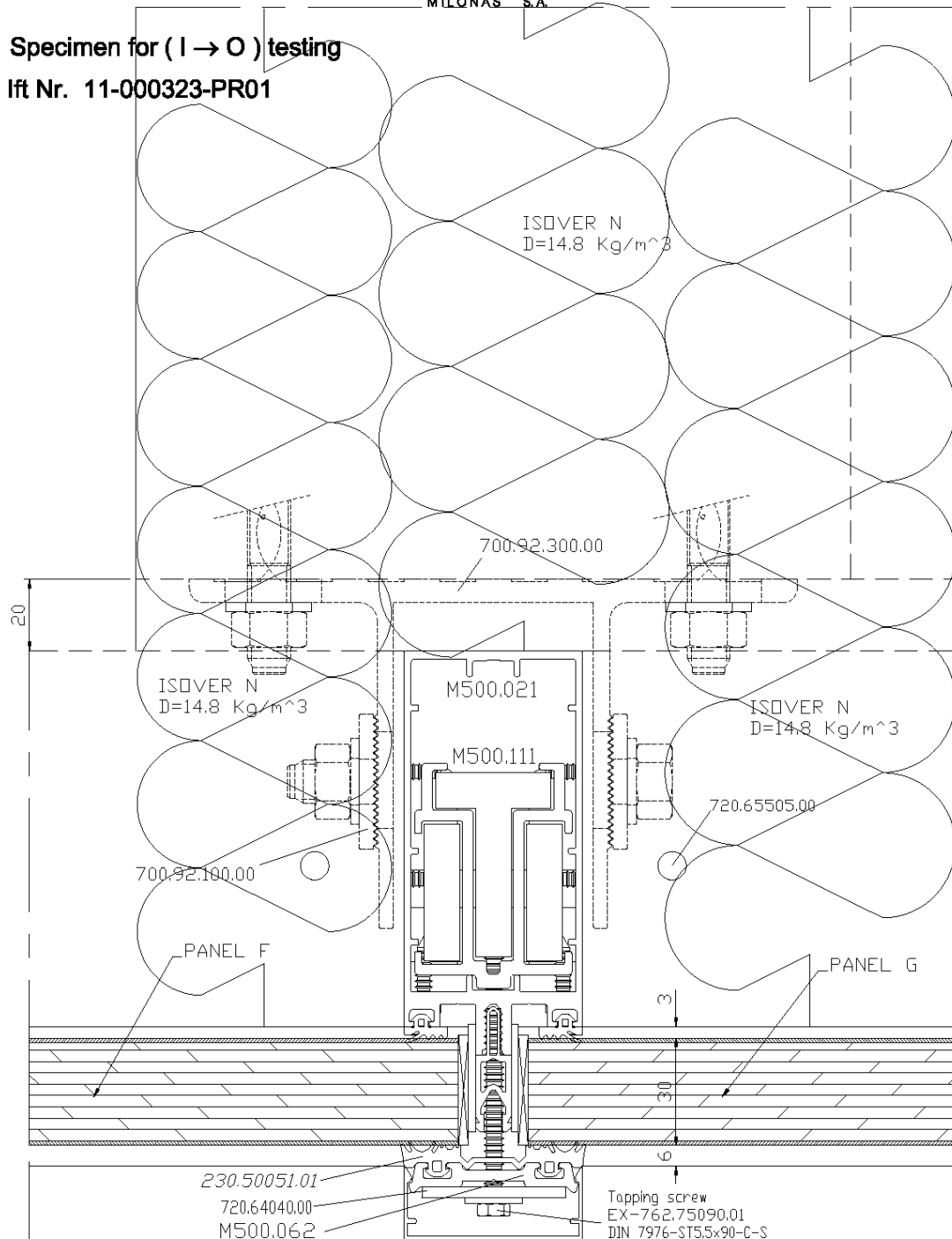
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TEL: ++3021 666 426-7, 666 423-4 FAX: ++3021 666 426 Email: support@alumil.gr

Specimen Sections V.2

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Specimen for (I → O) testing
Ift Nr. 11-000323-PR01



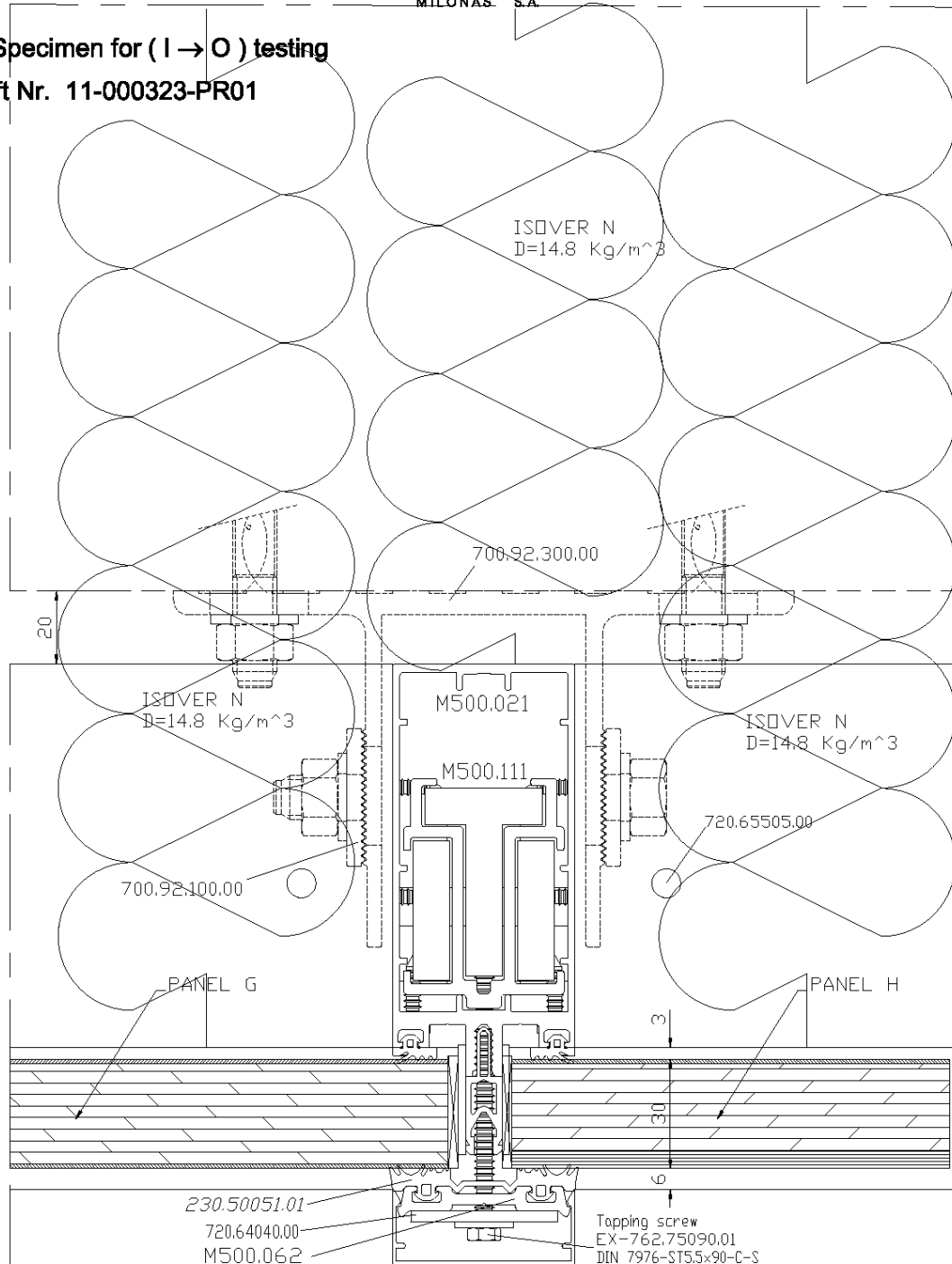
Specimen Sections V.3

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Specimen for (I → O) testing

Ift Nr. 11-000323-PR01



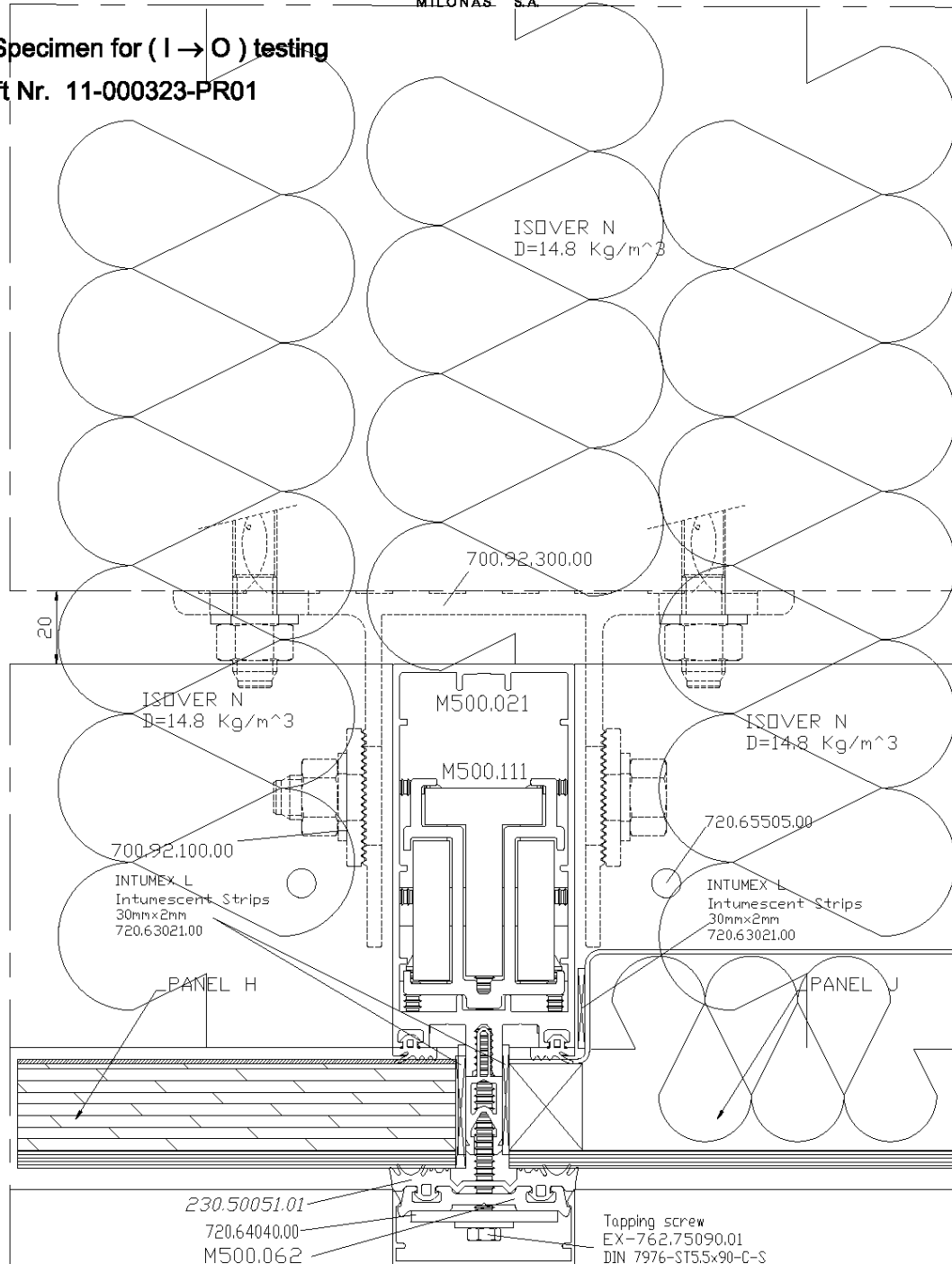
Specimen Sections V.4

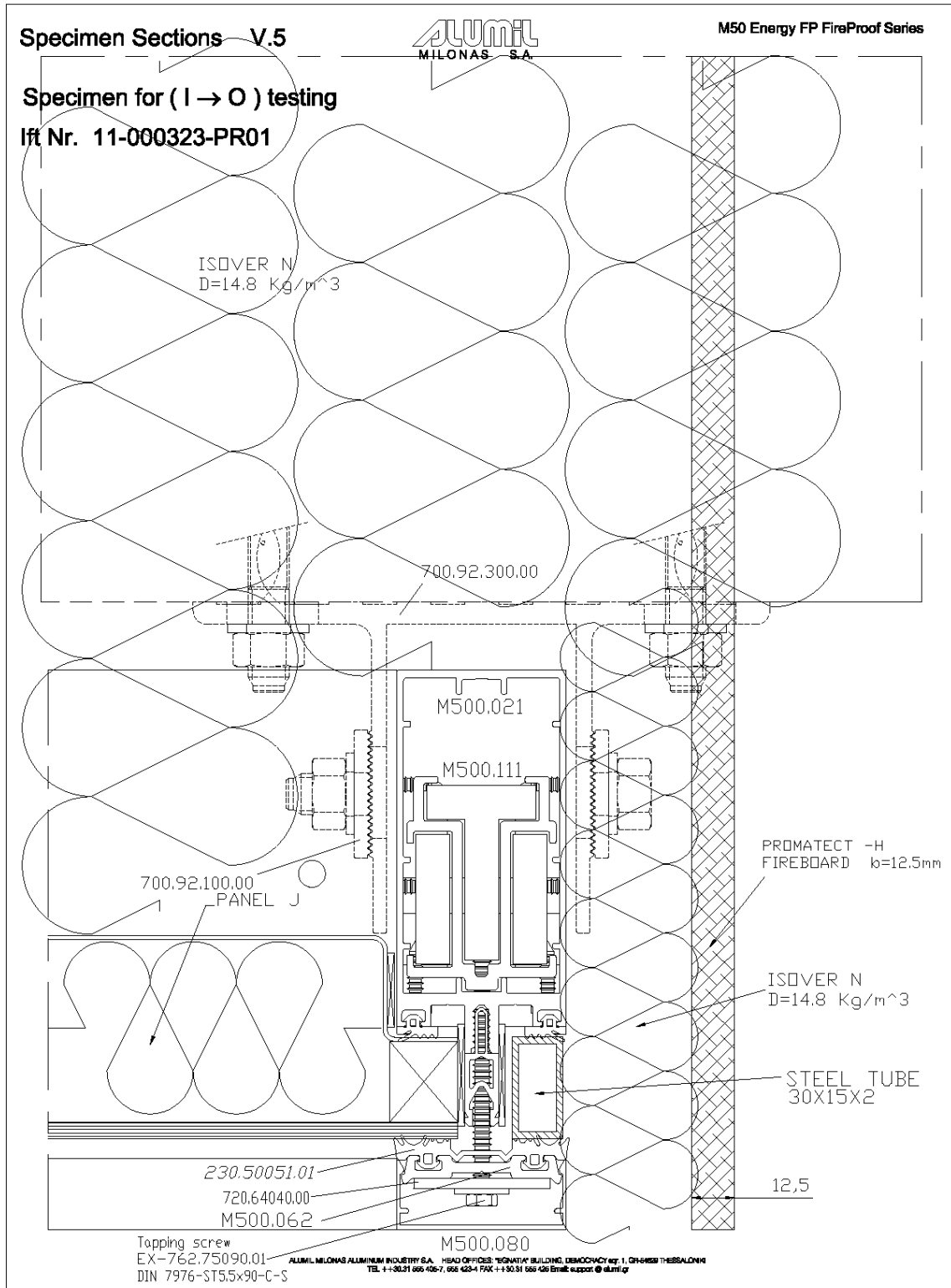
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M50 Energy FP FireProof Series

Specimen for (I → O) testing

Ift Nr. 11-000323-PR01





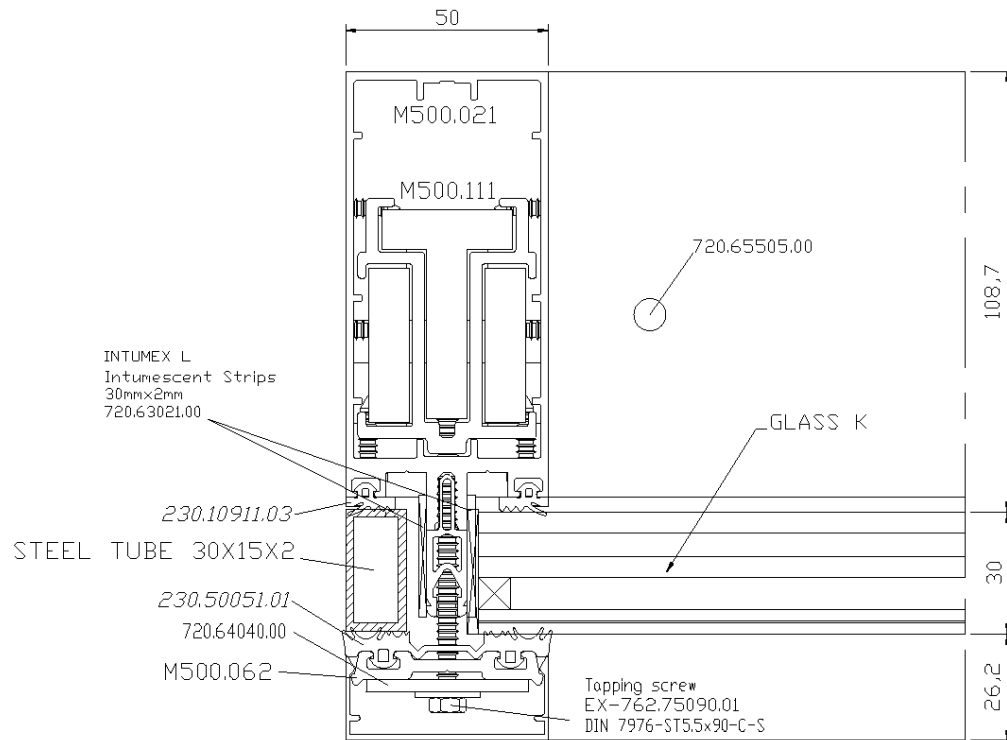
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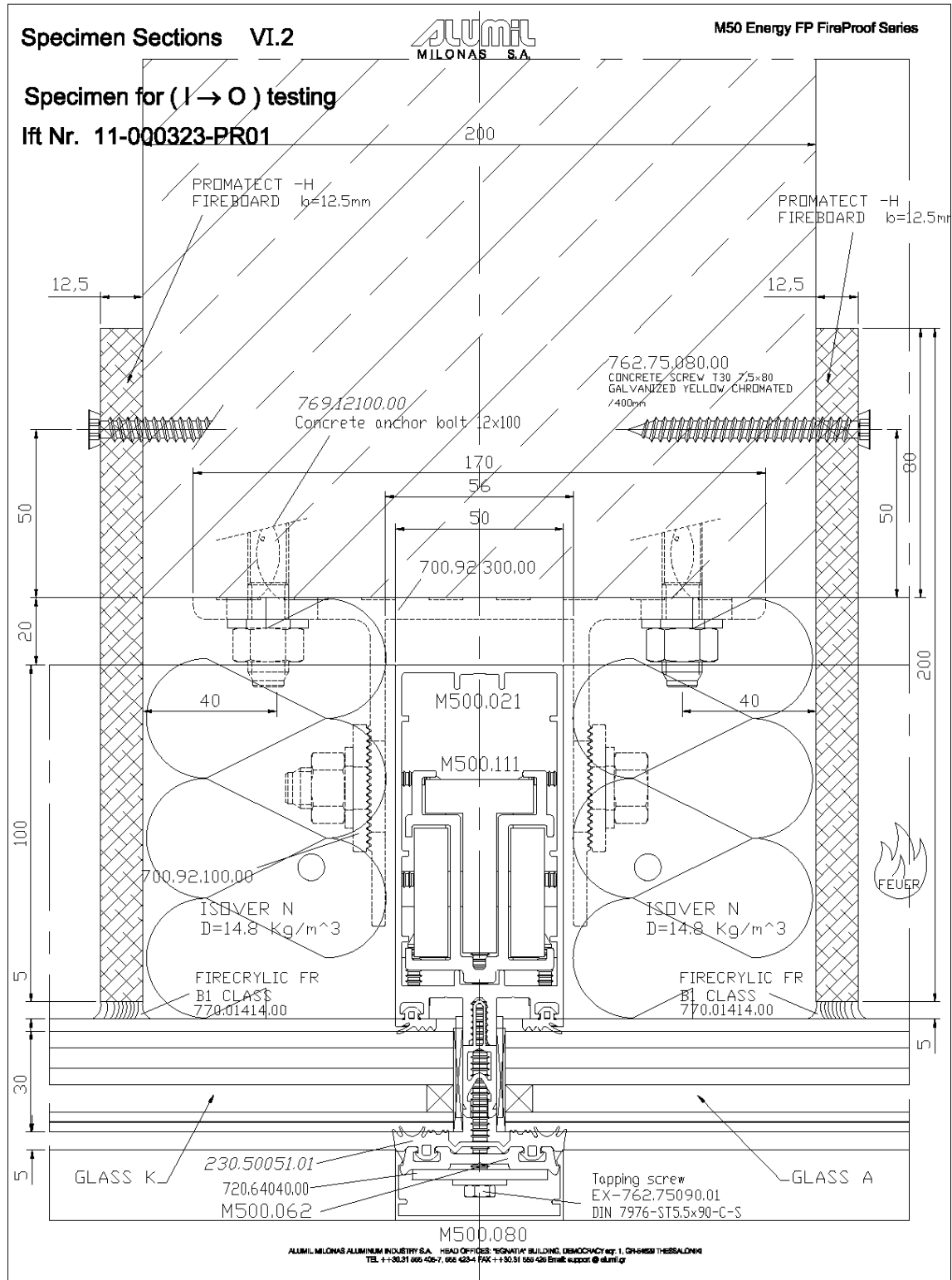
M50 Energy FP FireProof Series

Specimen for (I → O) testing

Ift Nr. 11-000323-PR01



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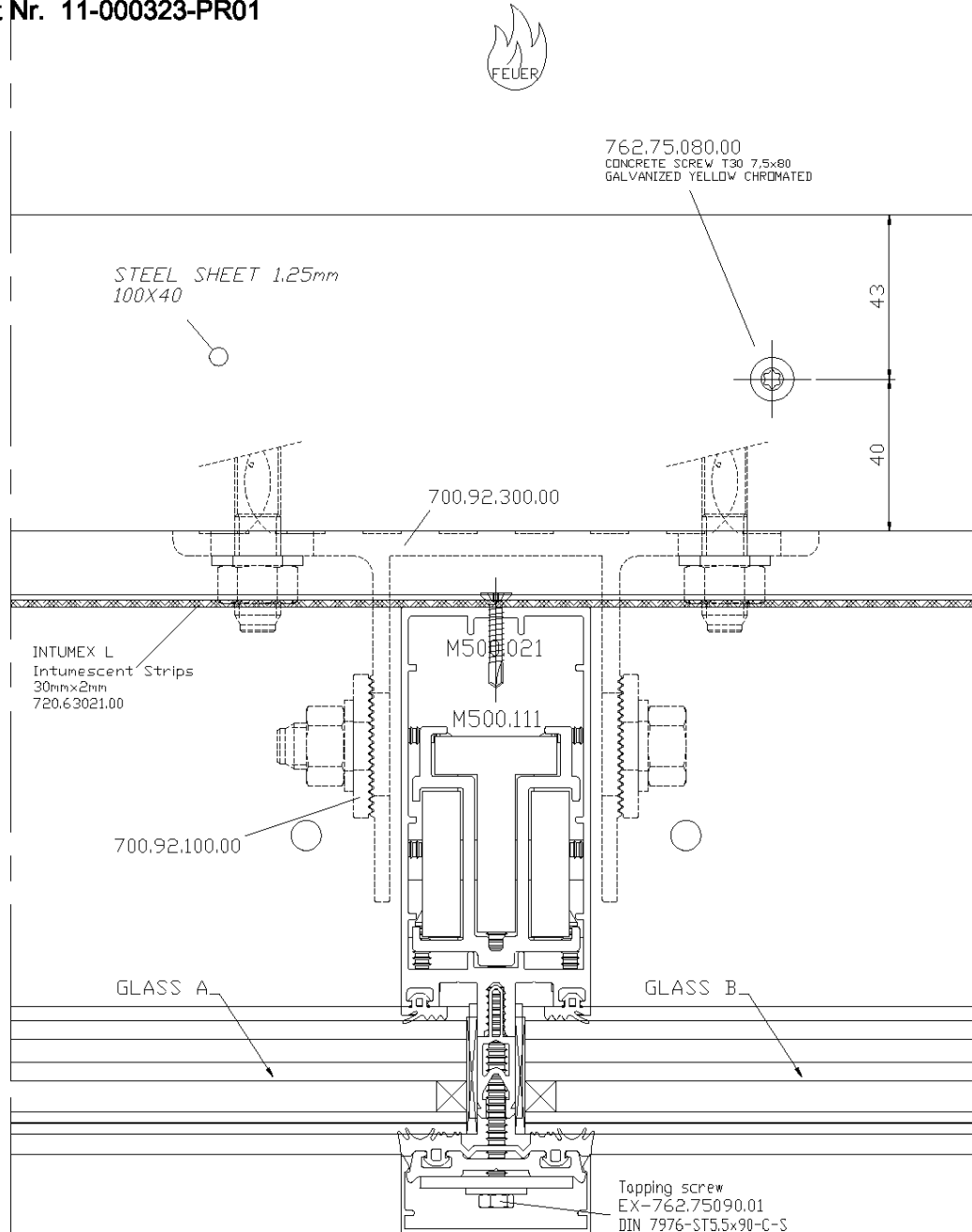
Specimen Sections VI.3

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M50 Energy FP FireProof Series

Specimen for (I → O) testing

Ift Nr. 11-000323-PR01



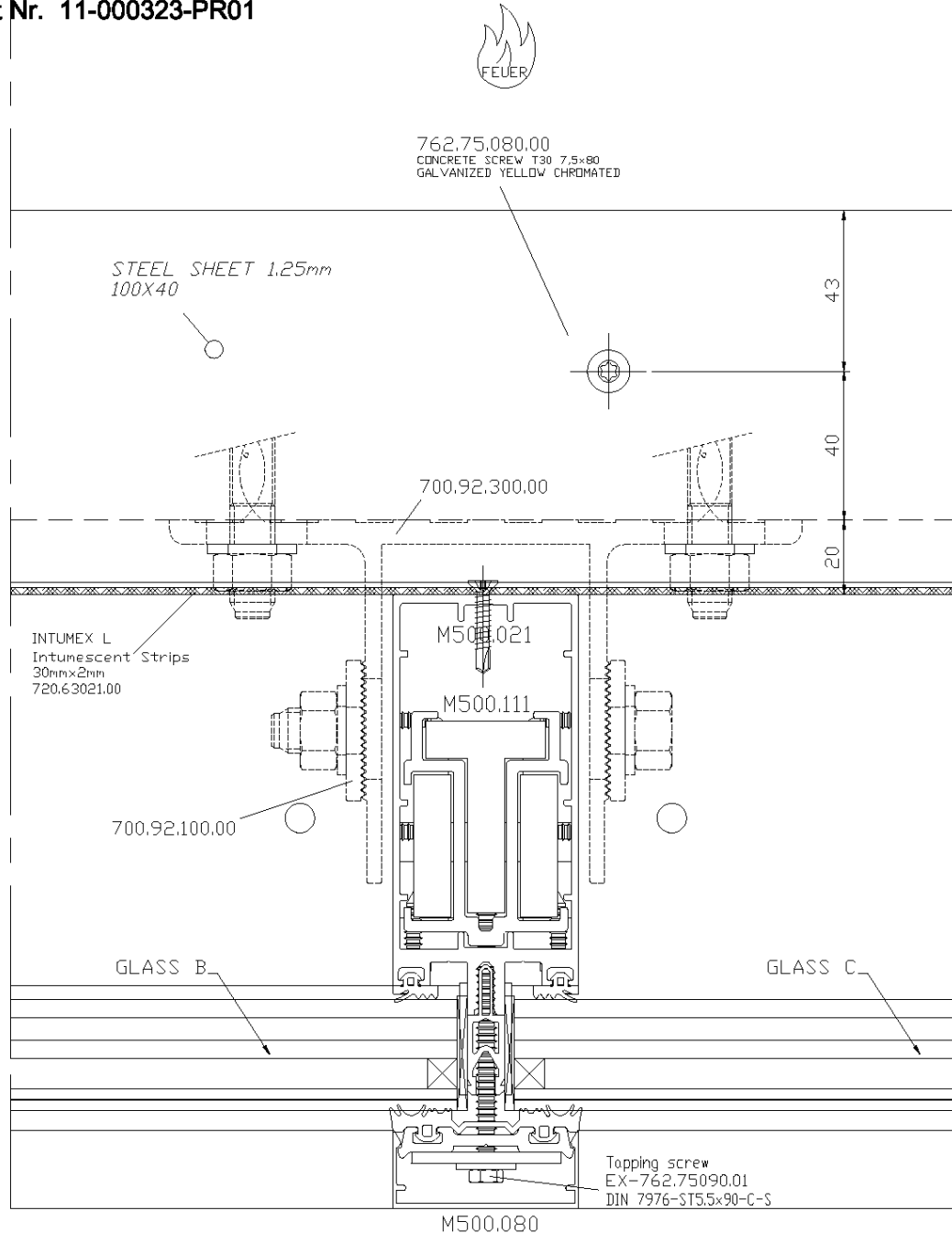
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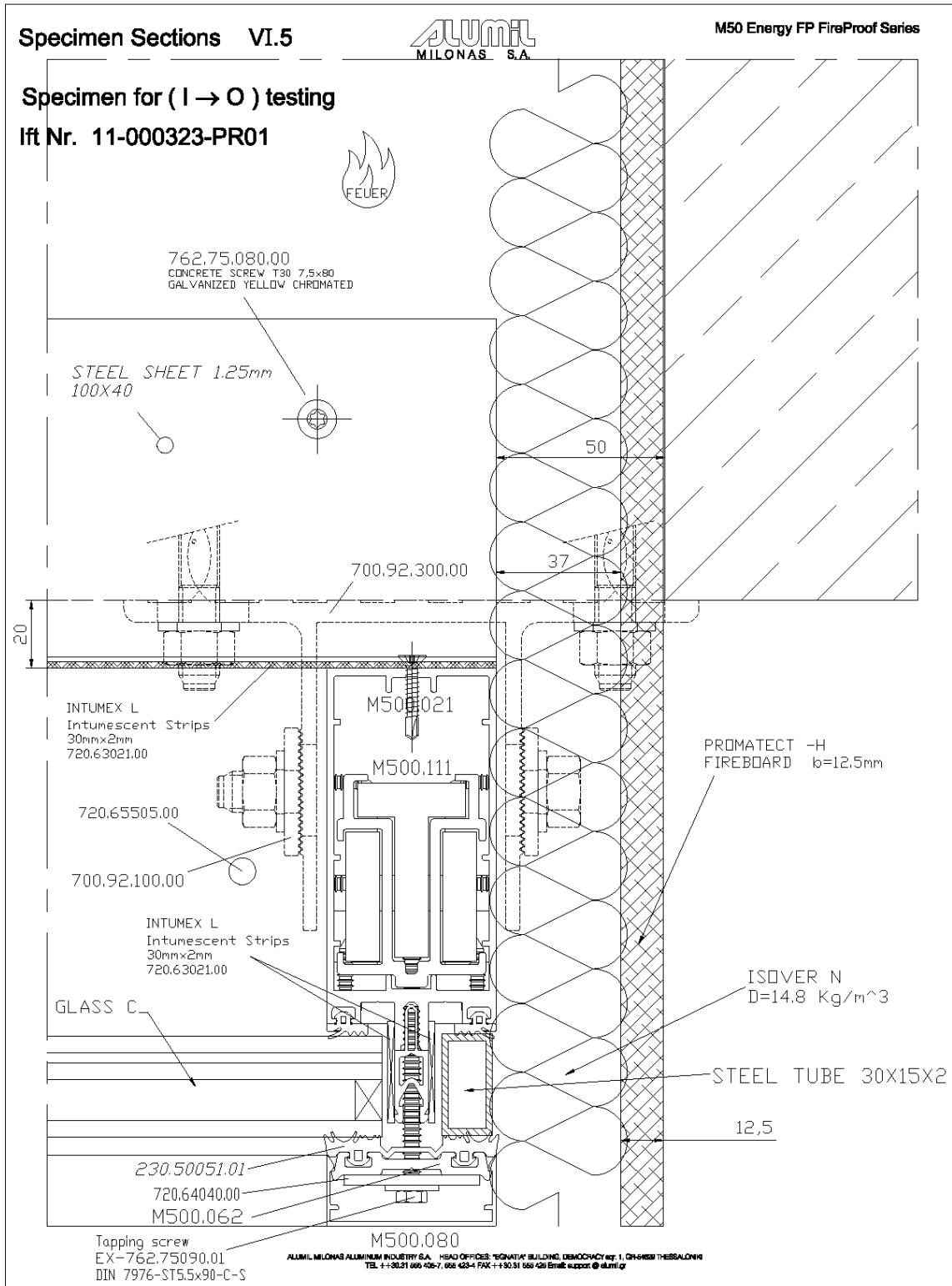
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M50 Energy FP FireProof Series

Specimen for (I → O) testing

Ift Nr. 11-000323-PR01





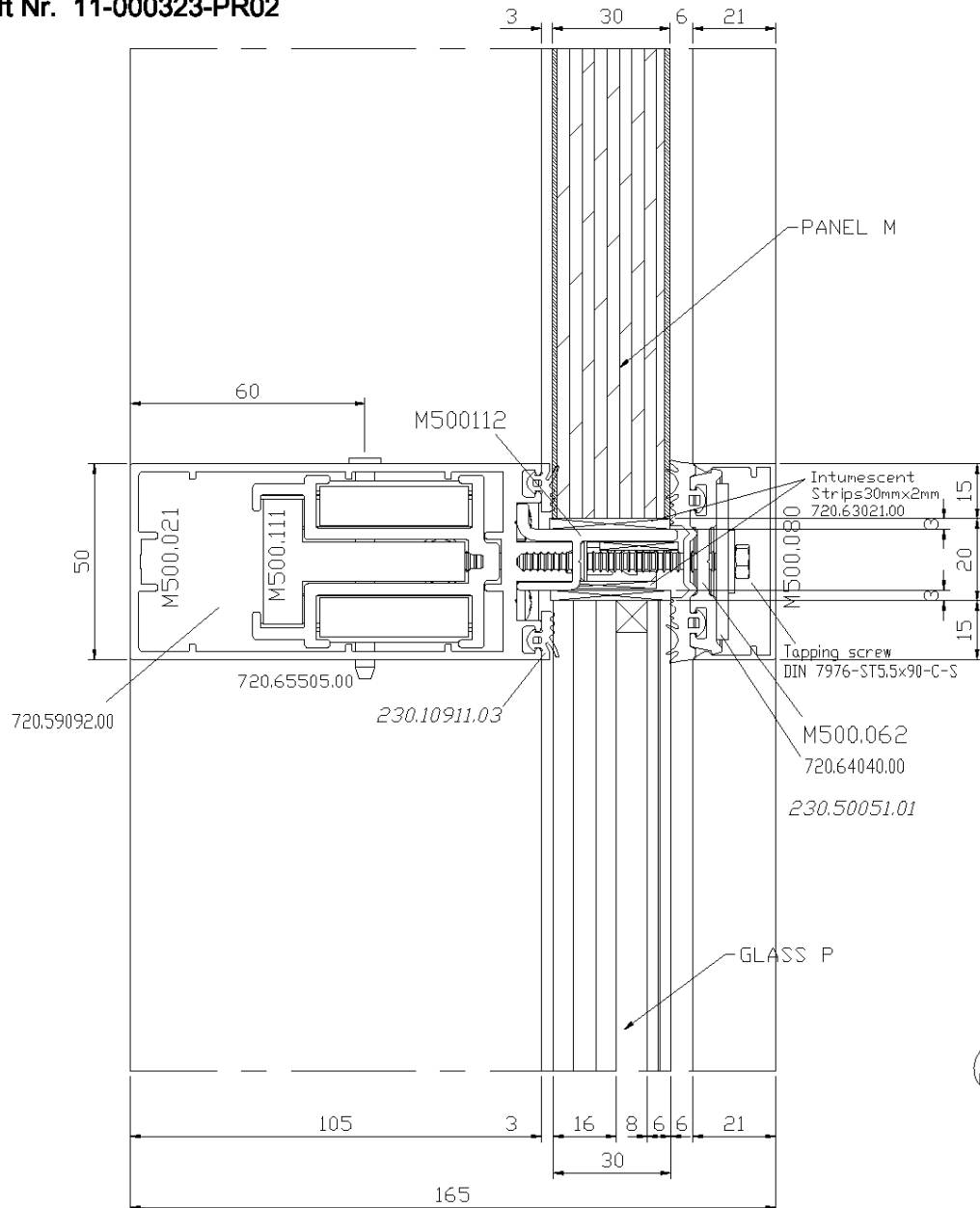
Specimen Sections I.2



M50 Energy FP FireProof Series

Specimen for (O → I) testing

Ift Nr. 11-000323-PR02



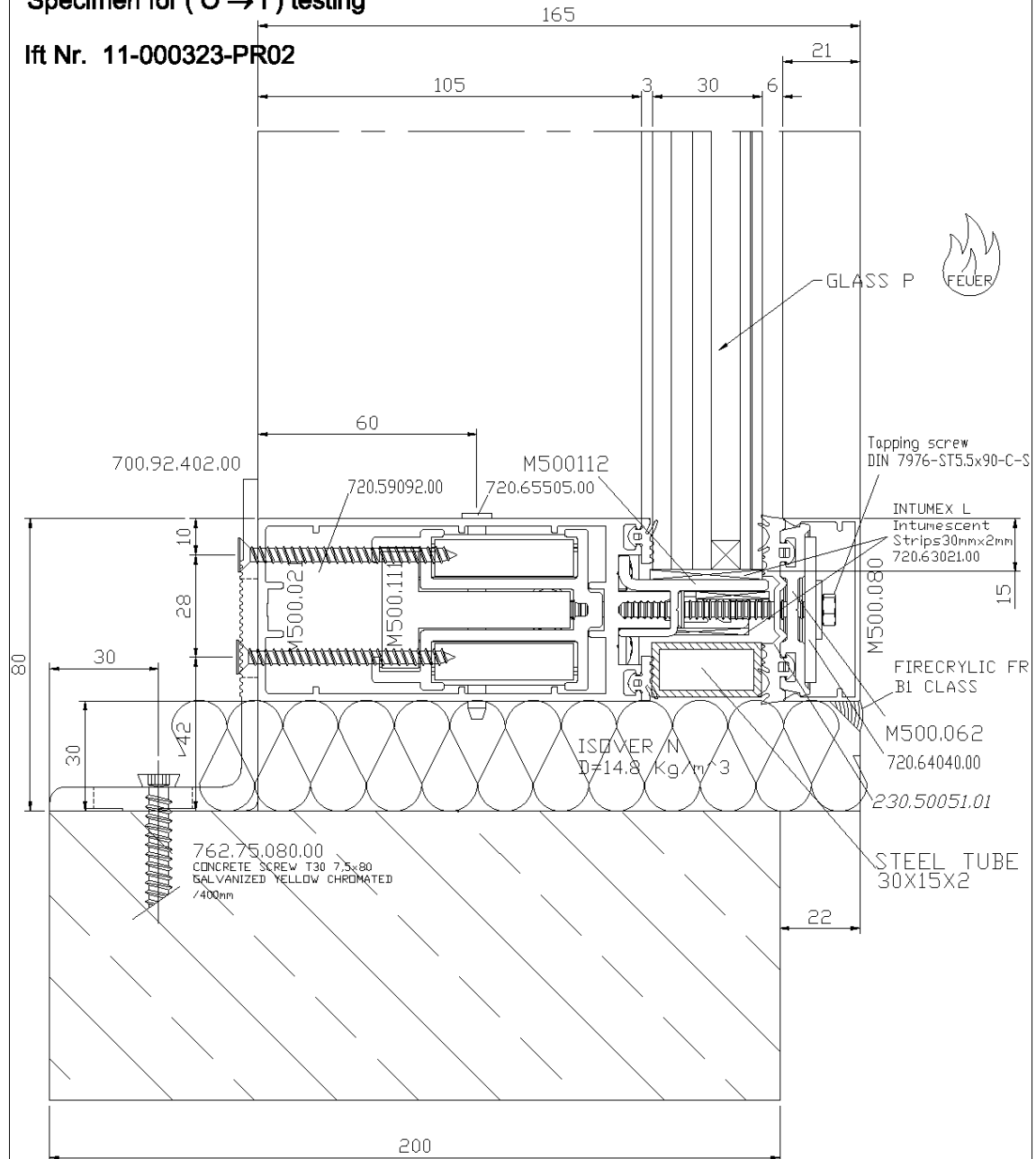
Specimen Sections I.3



M50 Energy FP FireProof Series

Specimen for (O → I) testing

Ift Nr. 11-000323-PR02



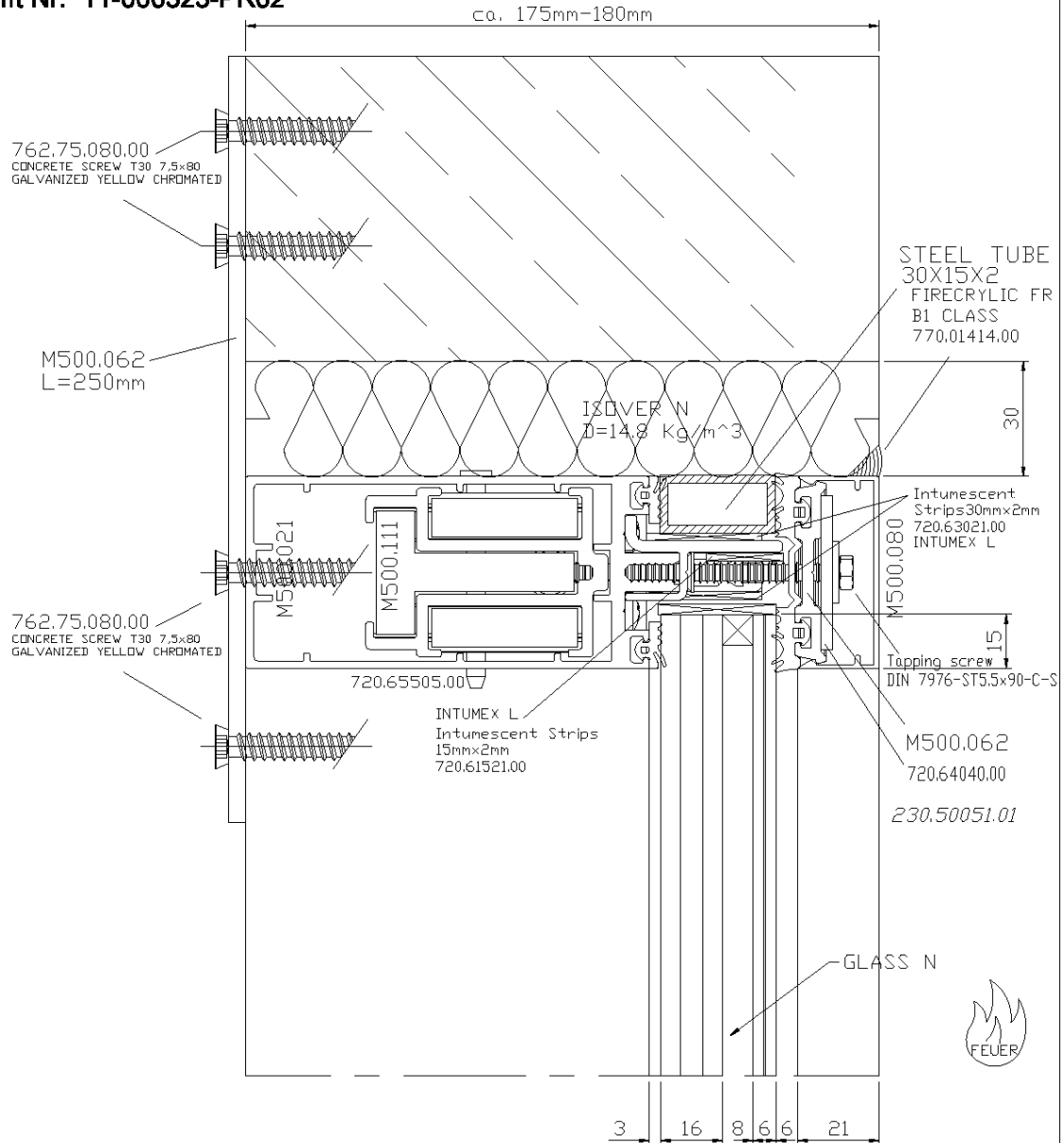
Specimen Sections II.1



M50 Energy FP FireProof Series

Specimen for (O → I) testing

Ift Nr. 11-000323-PR02



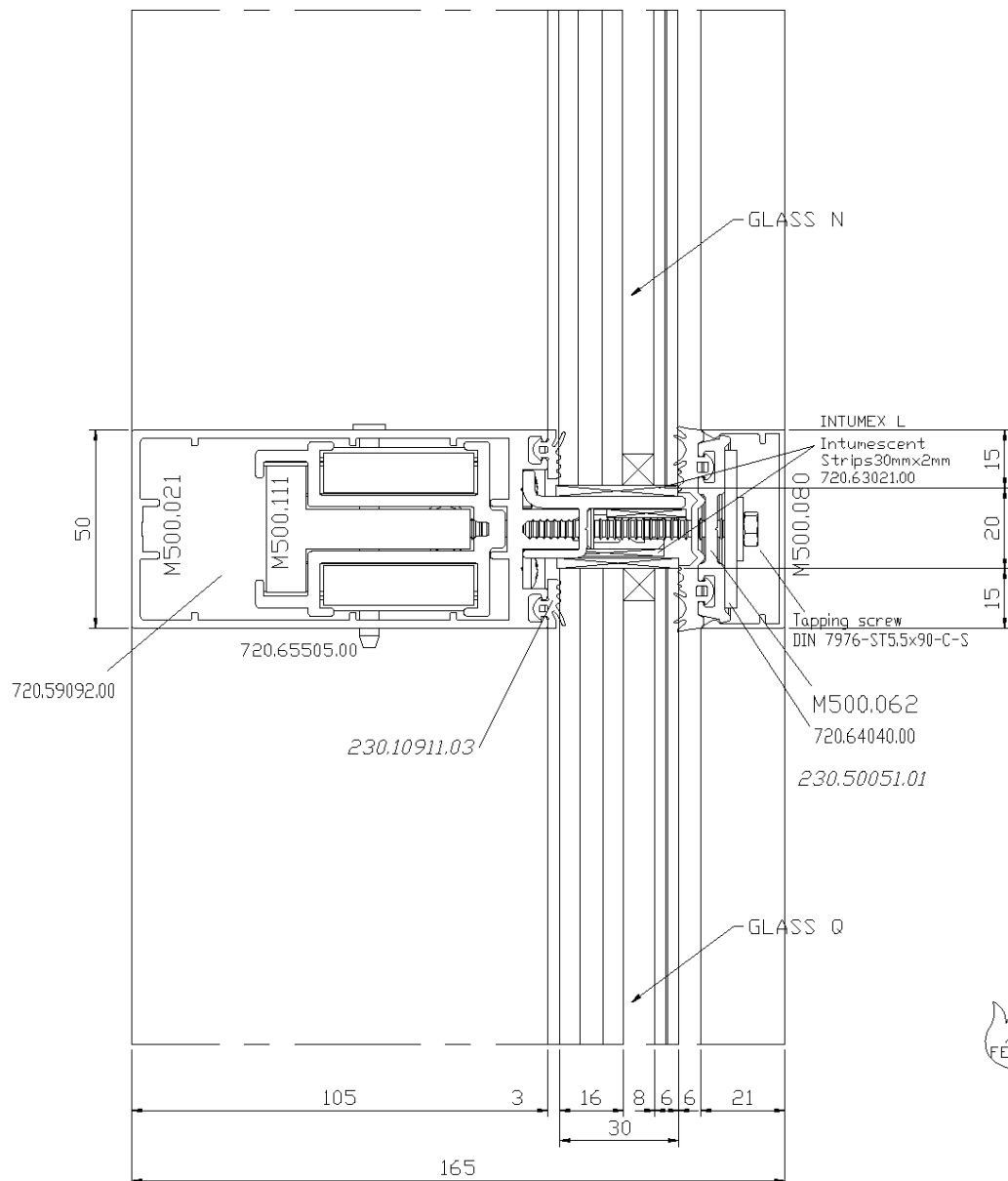
Specimen Sections II.2



M50 Energy FP FireProof Series

Specimen for ($O \rightarrow I$) testing

Ift Nr. 11-000323-PR02



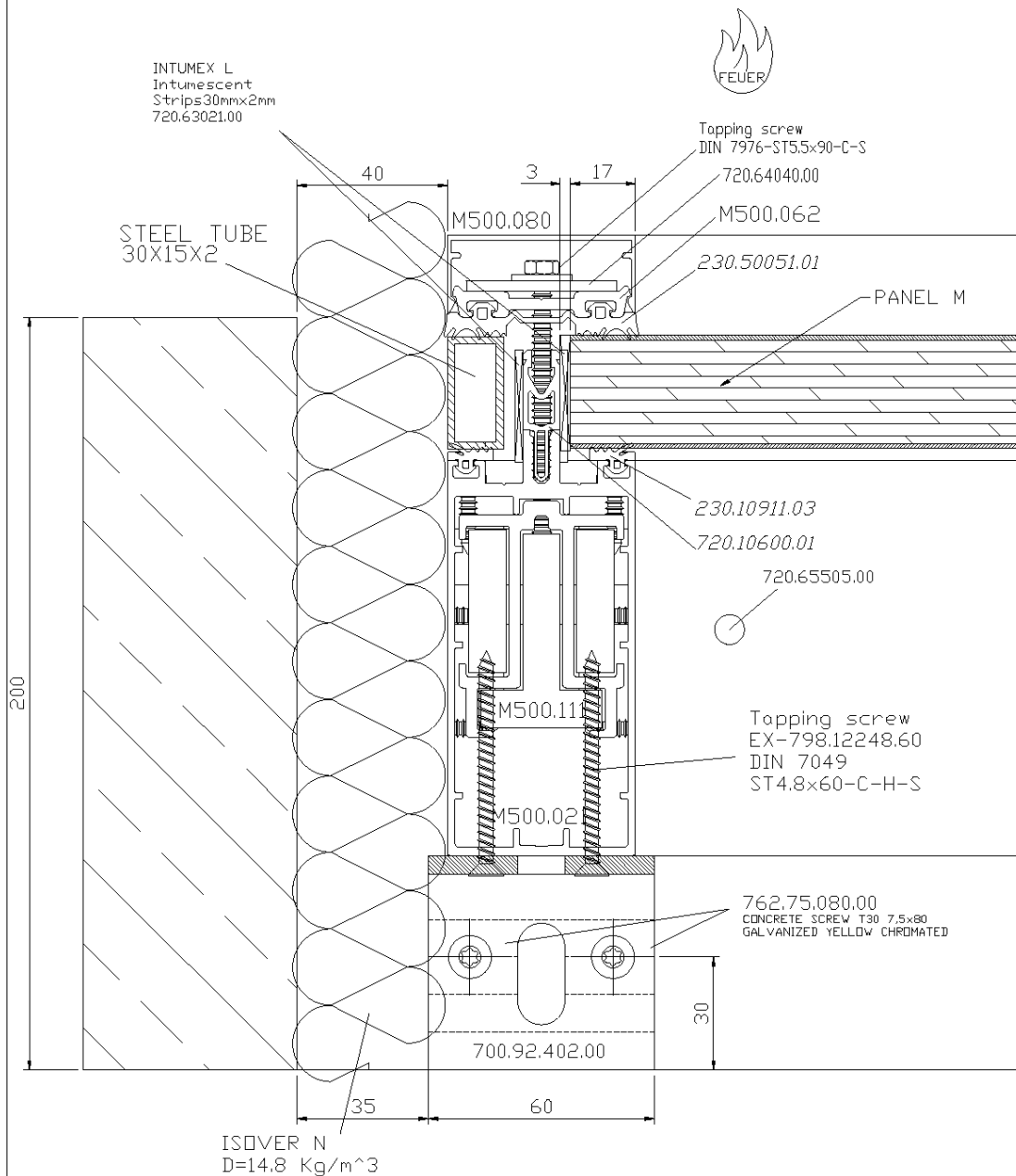
Specimen Sections III.1



M50 Energy FP FireProof Series

Specimen for (O → I) testing

Ift Nr. 11-000323-PR02



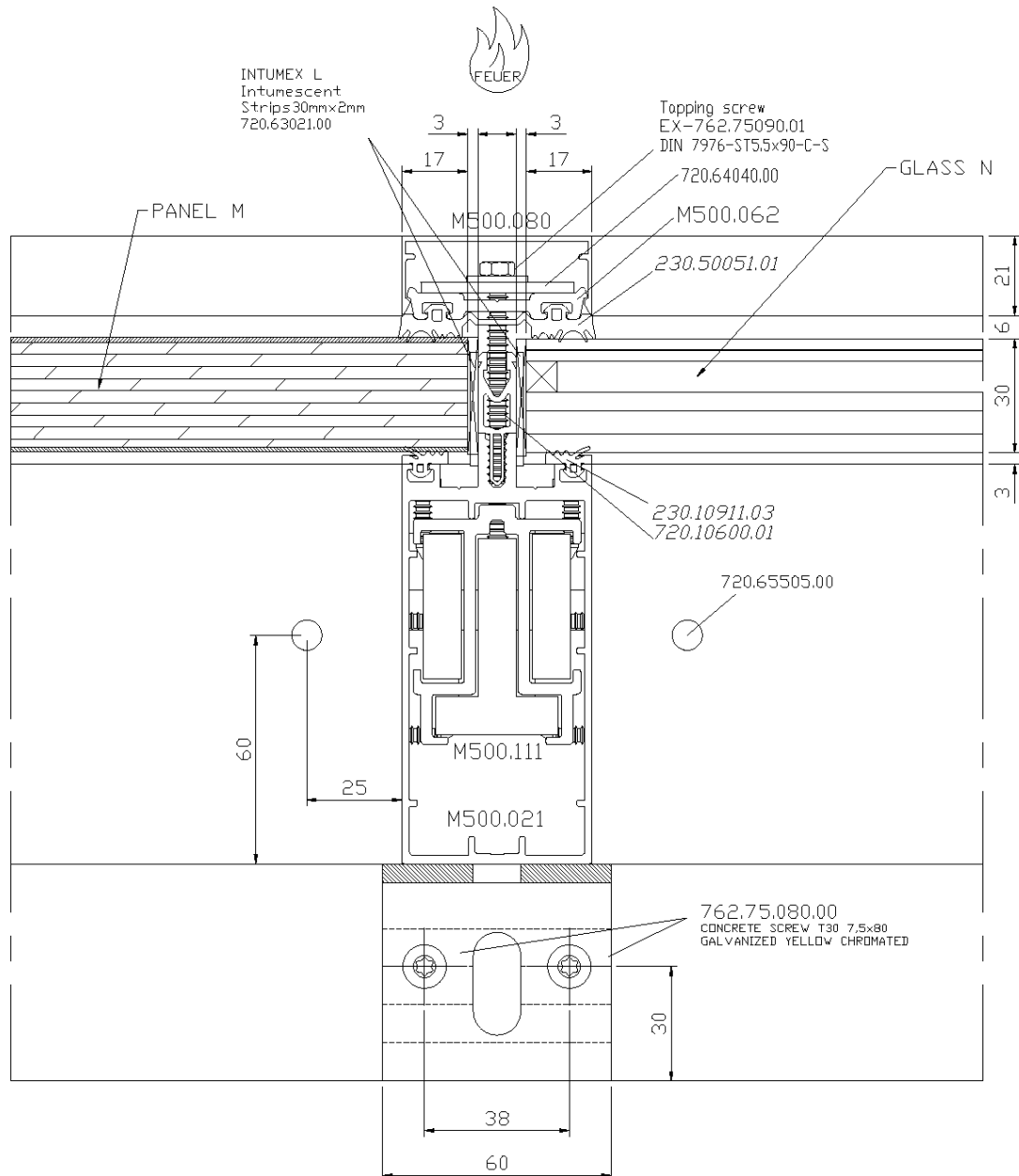
Specimen Sections III.2



M50 Energy FP FireProof Series

Specimen for (O → I) testing

Ift Nr. 11-000323-PR02



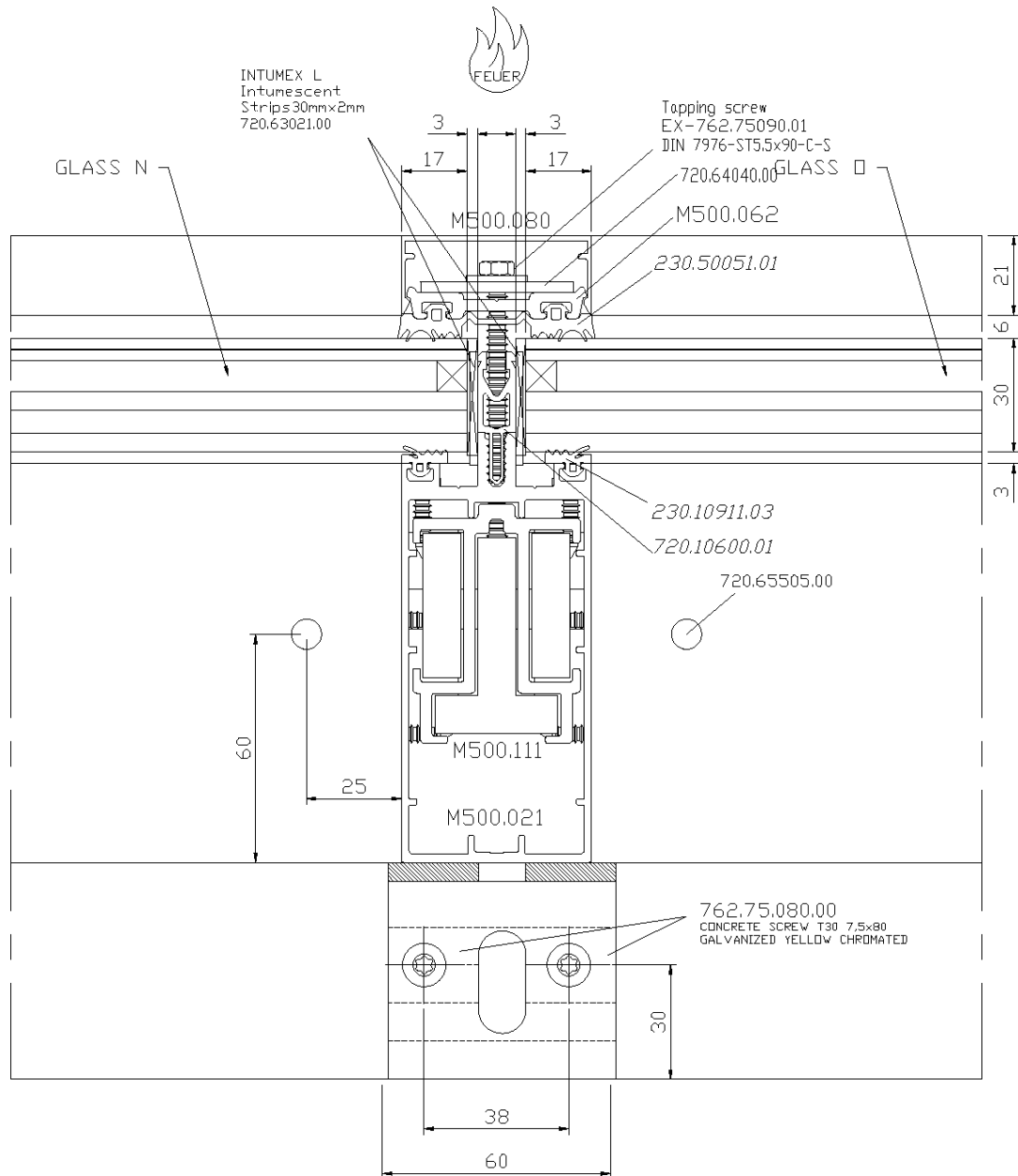
Specimen Sections III.3



M50 Energy FP FireProof Series

Specimen for (O → I) testing

Ift Nr. 11-000323-PR02



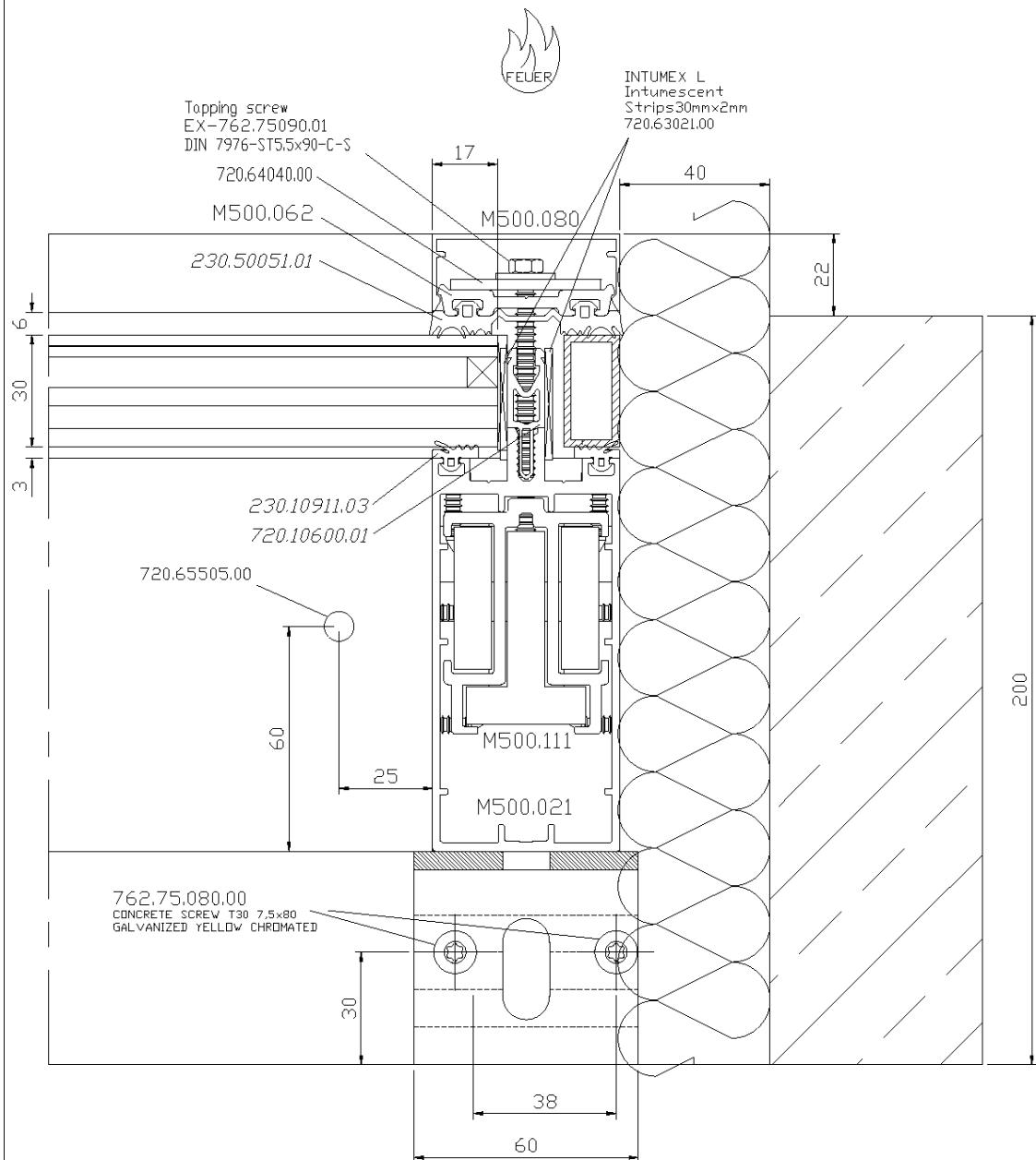
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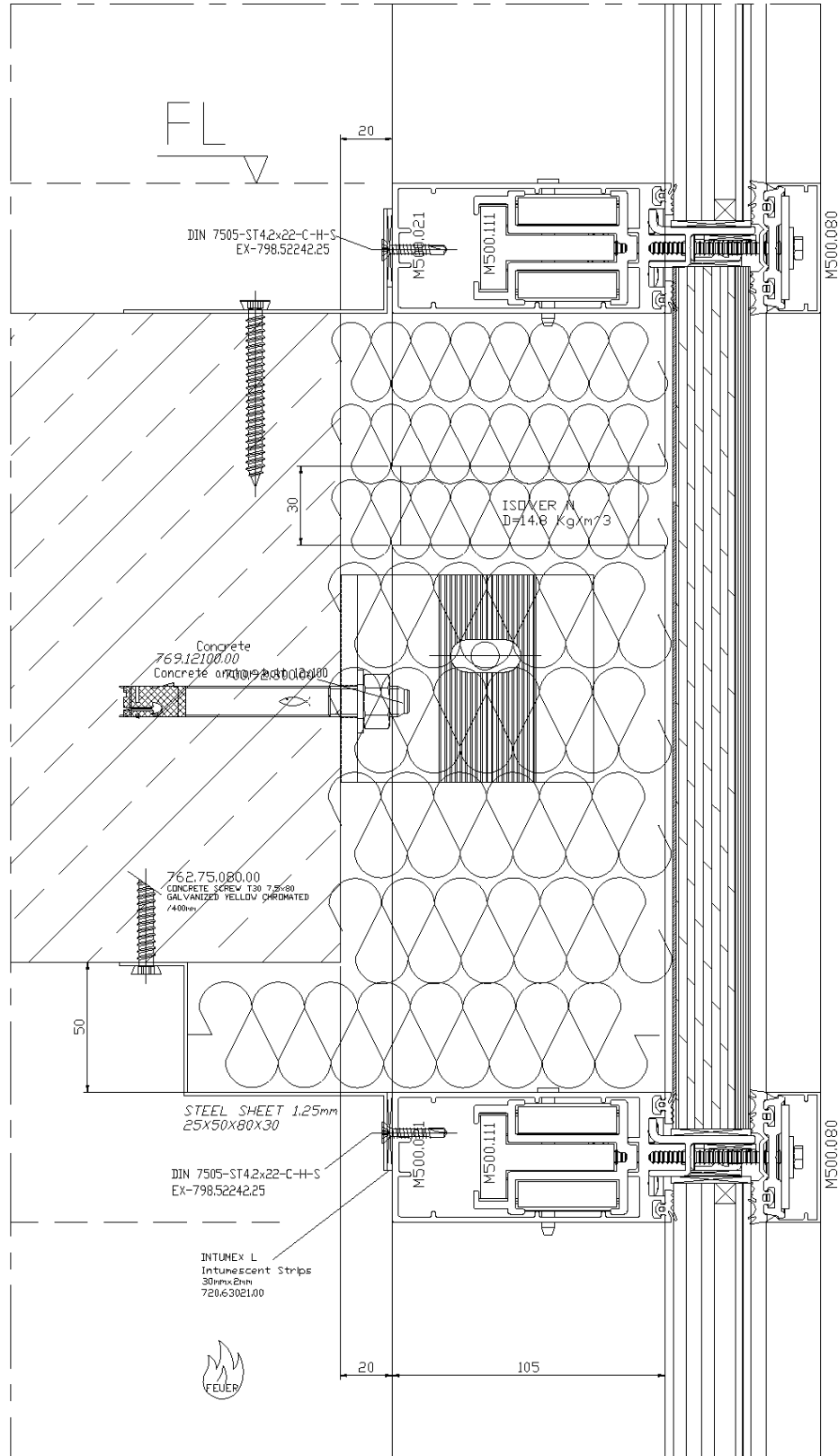


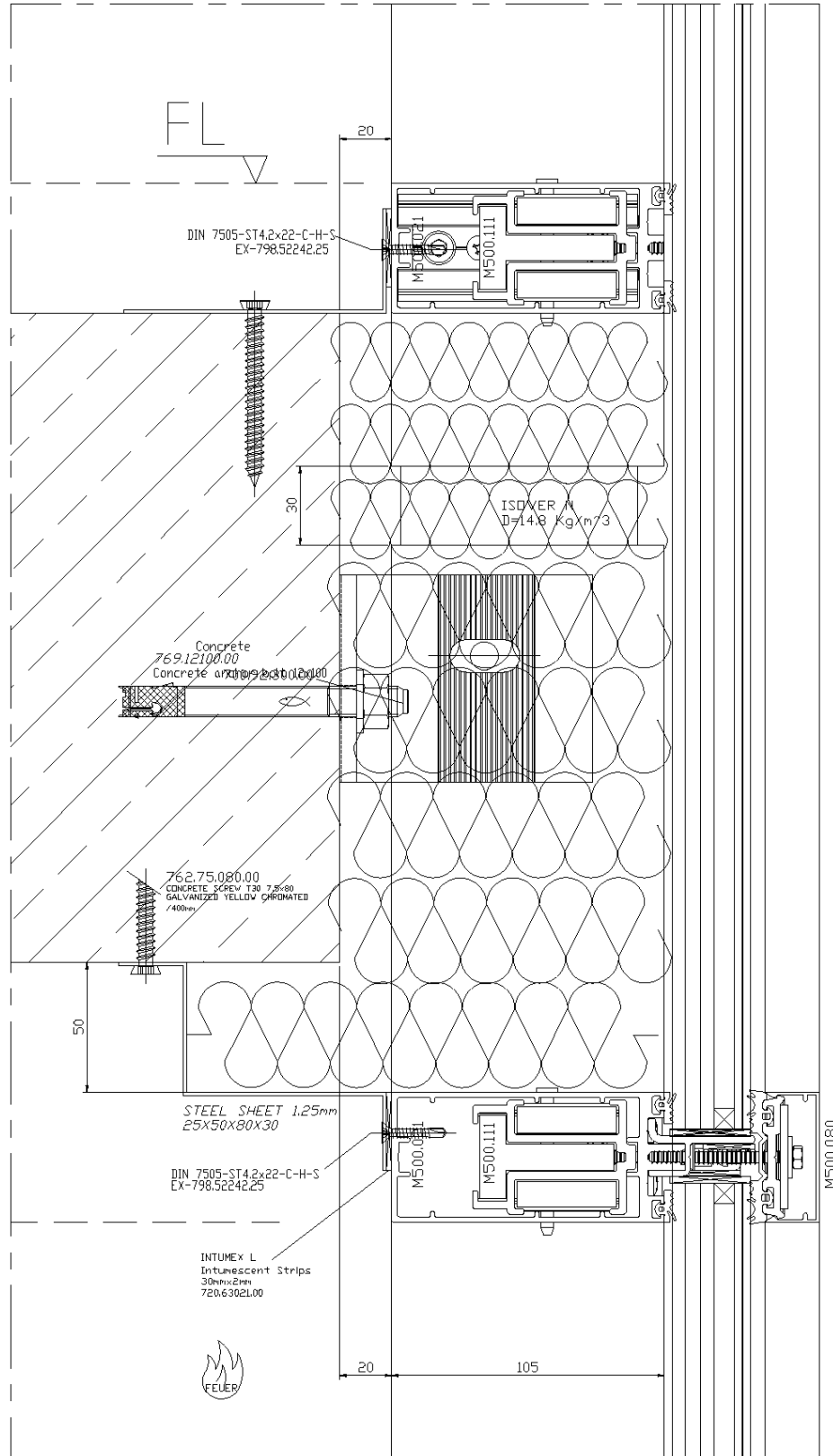
M50 Energy FP FireProof Series

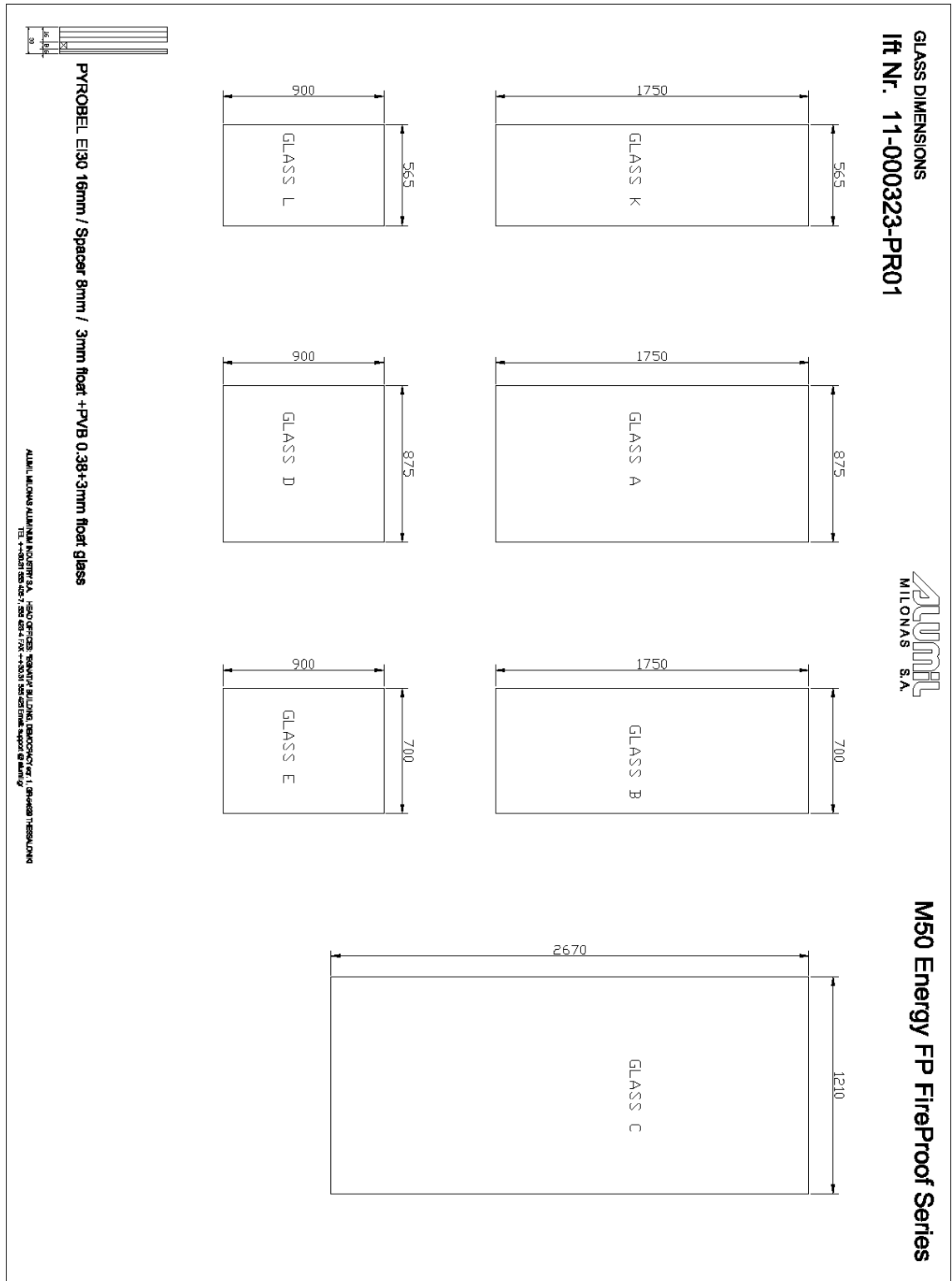
Specimen for (O → I) testing

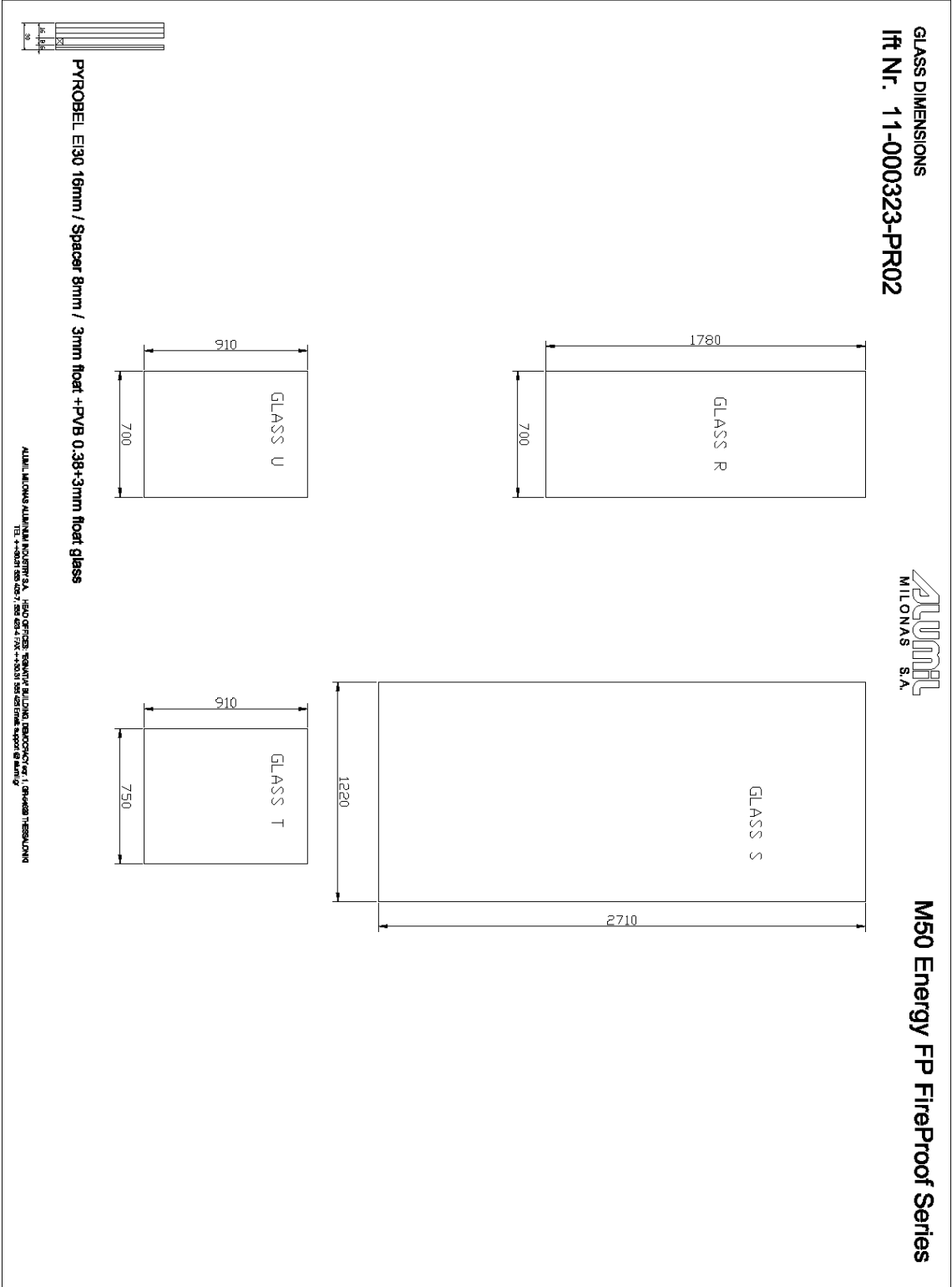
Ift Nr. 11-000323-PR02









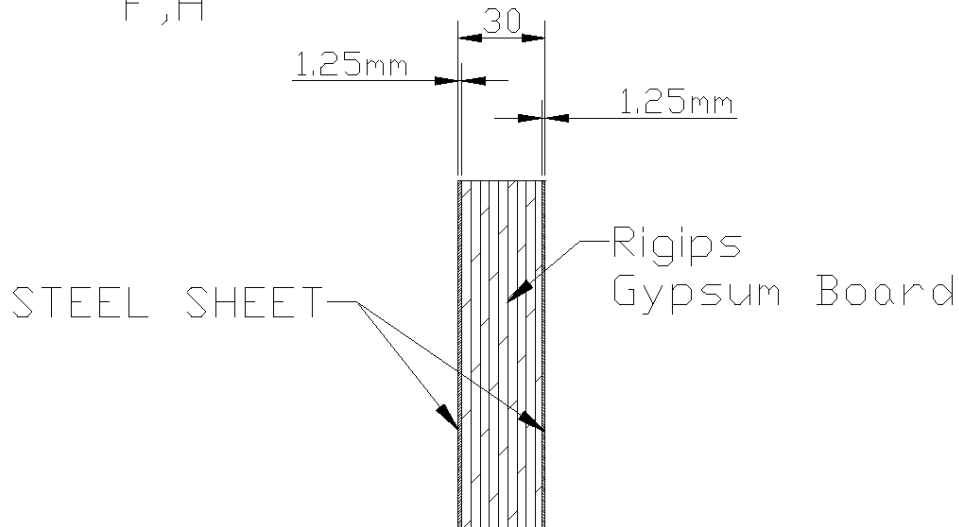


**PANEL DIMENSIONS
AND CONSTRUCTION TYPES**

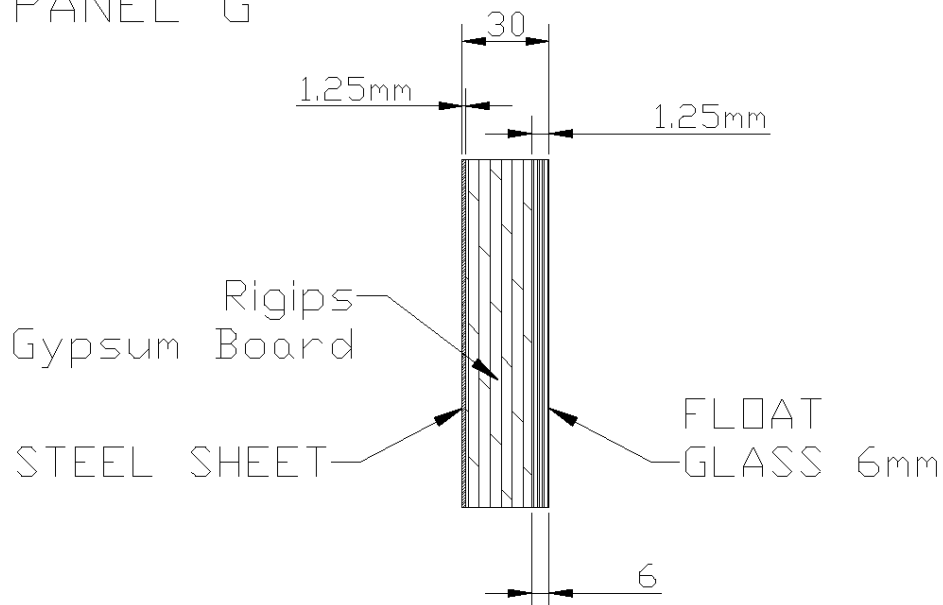
ALUMIL
MILONAS S.A.

Ift Nr. 11-000323-PR01
M50 Energy FP FireProof Series

PANEL
F,H



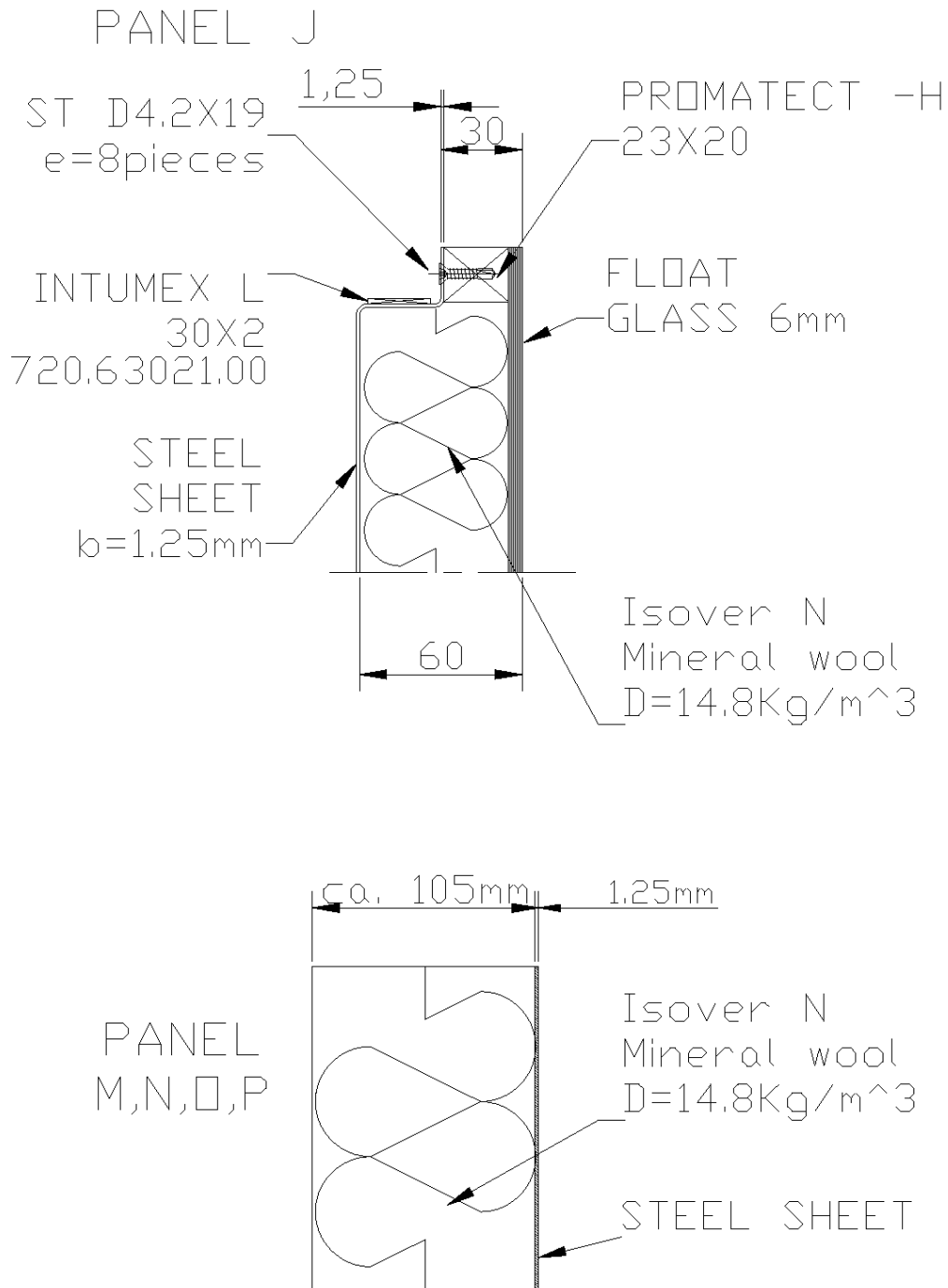
PANEL G



**PANEL DIMENSIONS
 AND CONSTRUCTION TYPES**

ALUMIL
 MILONAS S.A.

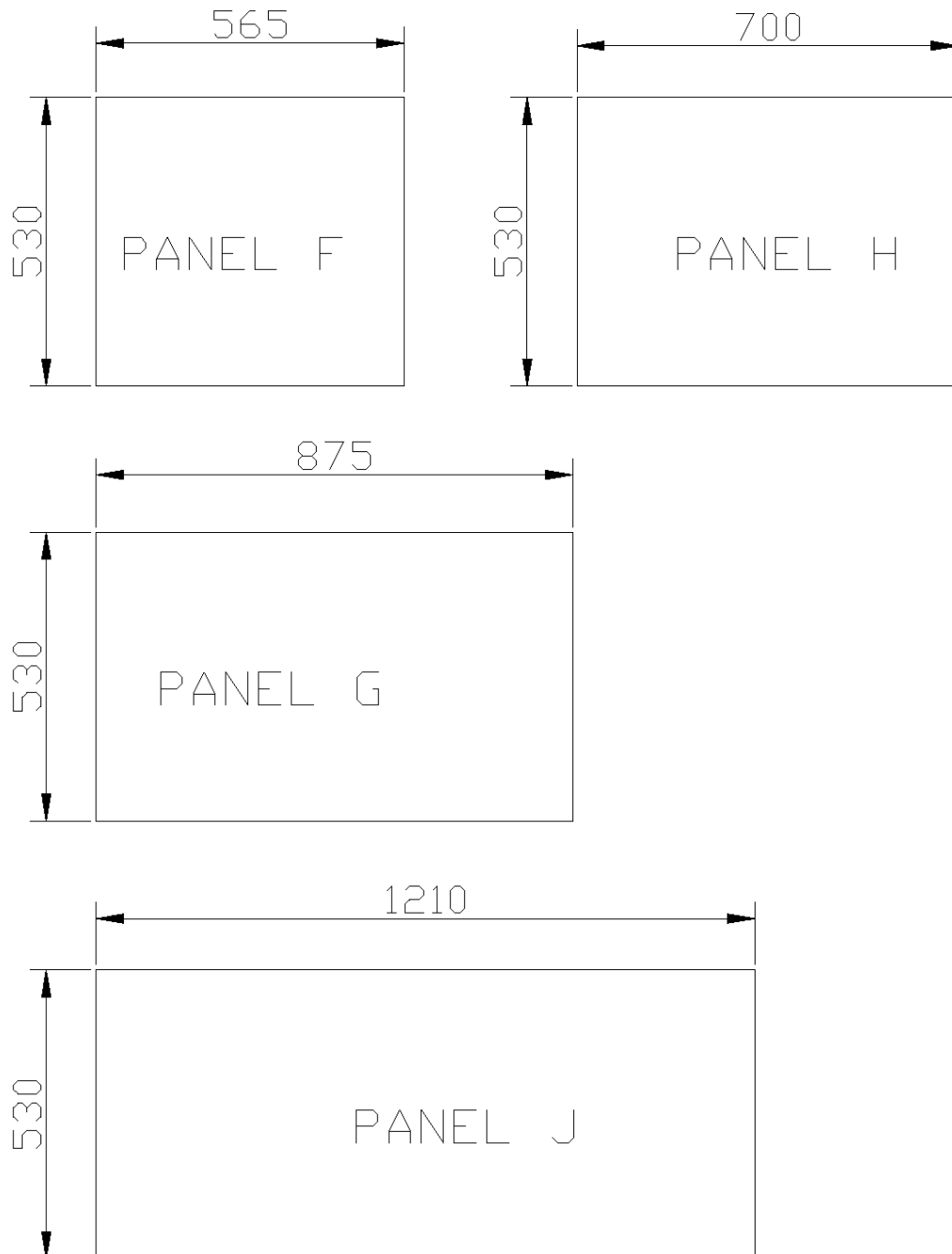
Ift Nr. 11-000323-PR01
 M50 Energy FP FireProof Series



**PANEL DIMENSIONS
AND CONSTRUCTION TYPES**

ALUMIL
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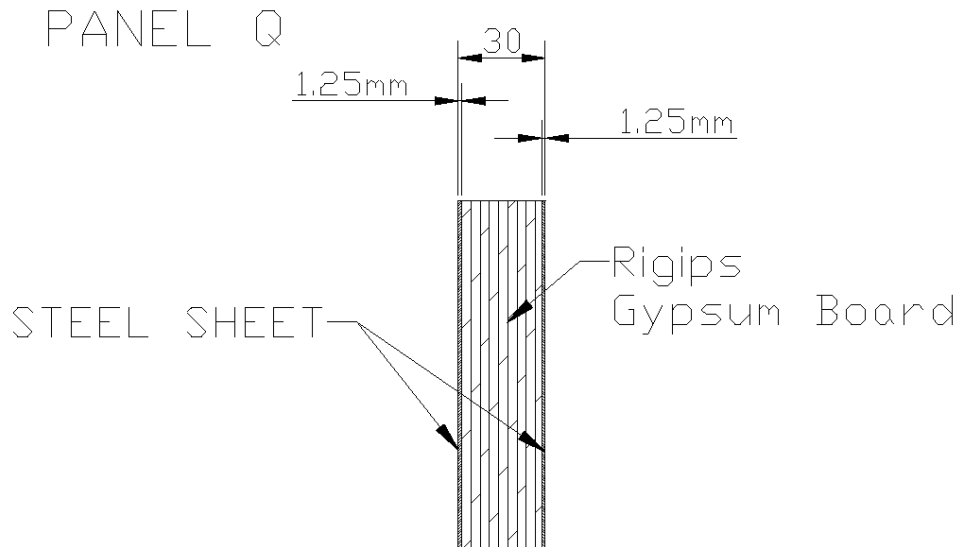
Ift Nr. 11-000323-PR01
M50 Energy FP FireProof Series



**PANEL DIMENSIONS
AND CONSTRUCTION TYPES**

ALUMIL
MILONAS S.A.

Ift Nr. 11-000323-PR02
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