

Test Report



Number	20-000272-PR01 (PB-H05-05-en-01)
Owner (Client)	ALUMINCO S.A. Megali Rahi 32011 Inofita Viotias Greece
Product	Safety Railings
Designation	Shipping name: Slim Line Side Mount
Details	Overall dimensions (W x H) 2050 mm x 1380 mm; Glass configuration TSG 10 mm / PVB-foil 1.52 mm / TSG 10 mm; Thickness 21.52 mm
Special features	Bottom-sided linear bearing
Order	Testing of Railing for safety against falling
Contents	The test report contains a total of 12 pages and annexes (11 pages).
Note	The test report shall only be published in its unabbreviated form. The "Guidance Sheet for the Use of ift Test Documents" ap- plies.

Ve-PB0-4390-en/ (01.10.2019

1 Execution

1.1 Sampling and product description

The following details have been presented to ift:

Sampler: ALUMINCO S.A., 32011 Inofita Viotias (Greece)

Evidence: ift Rosenheim did not receive a sampling report.

Date of delivery: 31.03.2020

Description: For product identification the specimen tested is described/represented in the Annex. Material specifications, item numbers and other company-specific descriptions are details provided by the client and will be checked for plausibility by ift.

Test specimen no.: 20-000272-PK01 / WE: 50425-001

1.2 Basic documents of the procedures

NF P 01-013:1988 - 08

Railings test - Methods and criteria

NF P 08-301:1991 - 01

Vertical building elements - Impact resistance tests - Impact bodies - Principle and general test procedures

1.3 Short description of the procedures

Static horizontal outward test according to NF P 01-013

The railings shall be subjected to a static horizontal outward force (F) at the level of the handrail. The force shall be applied progressively and without impact up to the maximum value specified and then maintained for a specific period. The test shall include three stages. In the first stage the application of a preliminary load is used to determine the starting point for the measurements. The second stage shall consist of forces which are normally applied to railings when in use, the third to forces to which railings will not normally be subjected and which is carried out in the nature of a safety test.

Point of application and magnitude of the load applied:

Taking into account the true height of the railings under test the force applied to the handrail shall be determined so as to create a moment at the anchorage points which is equal to the moment resulting from application of the loads 1m above the normal floor level. In the case of continuous railings this force shall be the product of the unit load and the length of the unit tested.

Testing of Railing for safety against falling

The values which are to be used shall be as follows:

- a. On private premises
 1. In the case of a length of floor ≥ 3.25 m: 0.4 kN/m
 2. In the case of a length of floor < 3.25 m: an overall load of 1.30 kN uniformly distributed over the length of the railing.
- b. In public places: 1.00 kN/m
- c. On grandstands: 1.70 kN/m
 except in line with the stairways serving the terraces or grandstands and the open ends of terraces for which the value of 1 kN/m shall apply.

The load (F) shall be applied at the top of the supporting bar over surfaces not exceeding 50 mm at three points located in line with the central support and at a distance of 0.4 L from each end upright, L being the distance between two successive uprights (see Fig. 1).

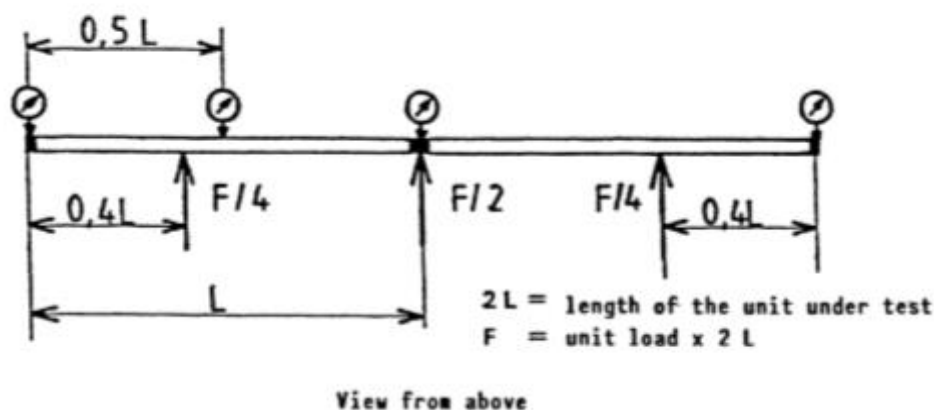


Fig. 1 Schematic diagram for the outward test

In the first stage a load corresponding to the operating load for which the railings are tested shall be applied for 3 minutes. After the load has been removed the detectors shall be reset to zero. The second stage is then held with the same operating load for 3 minutes and the deformation measured.

The safety load shall be obtained by applying an incremental coefficient of:

- 1.5 in the case of steel
- 1.7 in the case of aluminium alloys

to the operating load F

The safety load shall be applied for fifteen minutes and the deformation of the railings shall then be measured.

Once the load has been removed the residual deformation shall be determined following a waiting time of three minutes.

Testing of Railing for safety against falling

The value "a" of the permitted residual deformation after the safety load has been removed shall satisfy the following inequalities:

- if $\sigma_e < 1,1 \sigma_{eg}$ $a \leq \frac{8x}{1000}$
- if $1,3 \sigma_{eg} > e > 1,1 \sigma_{eg}$ $a \leq 0,008x * 1,1 \frac{\sigma_{eg}}{\sigma_e}$

x being the distance lying between the top of the handrail and the anchorage point for the railings (see Fig. 2),

σ_e being the elastic limit measured on the testpiece taken from the top part of the handrail of the railings tested, and

σ_{eg} being the minimum guaranteed elastic limit

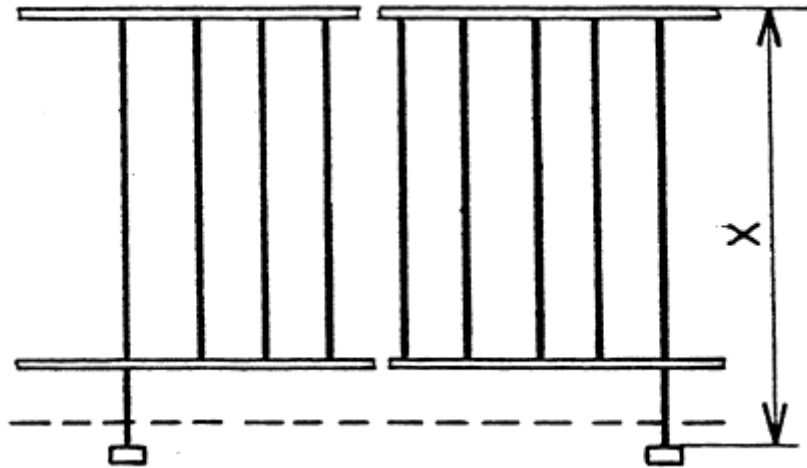


Fig. 2 Distance X

Static horizontal inward test according to NF P 01-013

This test consists of subjecting the railings unit to the effect of static horizontal force exerted on the handrail at the centre of the span between two uprights or two anchorages which is directed inwards.

The test shall consist of two stages:

In the first stage the application of a preliminary load of 0.2 kN per cross-member is used to determine the starting point for the measurements. The total load of 0.4 kN per cross-member or span shall be applied.

The force shall be applied at the top of the handrail halfway along each span. It shall be exerted horizontally, perpendicular to the handrail and inwards (see Fig. 3).

A gauge placed in line with the point of application of the force on the handrail shall be used to detect deformation. The preloading of 0.2 kN per span shall be applied and maintained for 3 minutes. The gauge shall be set to zero after the load has been removed.

Testing of Railing for safety against falling

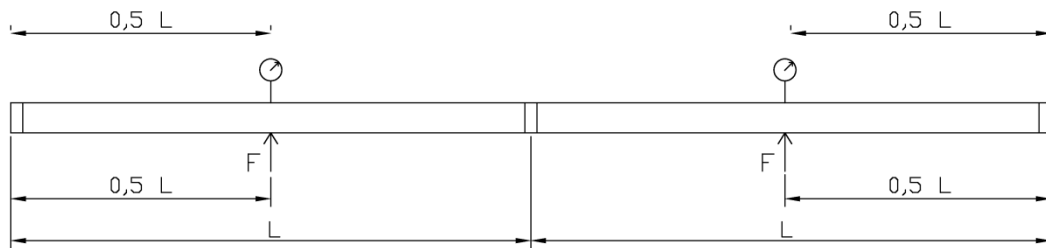


Fig. 3 Static horizontal inward test

The load of 0.4 kN on each span shall then be applied. The deformation of the handrail under the load shall be measured after it has been applied for 1 minute. The load shall then be removed and the residual deformation shall be measured.

The value “a” of the permitted residual deformation after removed shall satisfy the following inequality:

$$a \leq \frac{8x}{1000}$$

Static vertical test according to NF P 01-013

The railings unit shall be held by the feet of its uprights or attachment posts, lower attachment points or supports under conditions equivalent to the conditions of use.

The vertical load V exerted on the railings shall distributed equally and simultaneously on two points at the level of the handrail situated symmetrically between consecutive uprights and at a distance apart of 300 mm between axes (see Fig. 4)

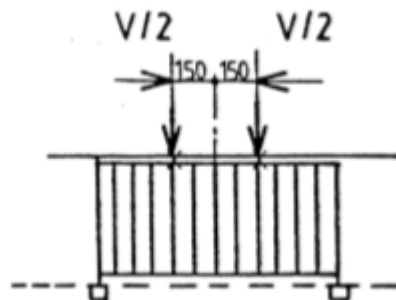


Fig. 4 vertical test



Testing of Railing for safety against falling

The test shall consist of two stages:

In the first stage the starting point for the measurements shall be determined after a vertical load of 0.20 kN has been applied. The load shall be removed without any waiting time. The starting point for measurements shall then be determined.

In the second stage a force of 1.00 kN shall be applied for fifteen minutes to the top of the handrail. Once the load has been removed the residual deformation shall be determined following a waiting time of three minutes.

The permitted residual deformation shall be a maximum of 3 mm regardless of the material

Pendulum Test according to NF P 08-301

The test shall consist of subjecting the railings unit to the effect of impacts represented conventionally by the pendulum impact of impacting bodies.

The test shall be carried out on the filling of the railing with a 50 kg soft body from a drop height of 1200 mm. The impact shall be applied to the geometrical centre of the infill unit under test in the part lying between the normal floor level and the handrail.

The pendulum test is considered passed if no parts dangerous to persons fall into the traffic route.

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Testing of Railing for safety against falling



2 Detailed results

Static horizontal outward test according NF P 01-013, Chapter 2.2.1

Project-No.	20-000272-PR01
Basis	NF P 01-013:1988-08 Railings test - Methods and criteria
Test equipment	Pst/022070 - Einbruchprüfstand - Multidoor Groß Pst/020619 - Geländerprüfstand
Test specimen	Slim Line Side Mount
Test specimen No.	50425-001
Date of test	07.04.2020
Test engineer in charge	Stefan Hehn
Test engineer	Stefan Hehn

Implementation of tests

Deviations There have been no deviations from the test method as specified in the standard/basis.

Ambient conditions

Temperature 22.6 °C Air humidity 48.3 %

The ambient conditions are in accordance with the standard/basis requirements.

Measurement data/Results

Test procedure according NF P 01-013, Chapter 2.2.1.2.1

3b) On public premises: 1.0 kN/m

- Test sample: 2L = 2000 mm
F = 2.0 kN

- Test under safety load:
Factor 1.7 in the case of aluminium alloys
F = 3.4 kN

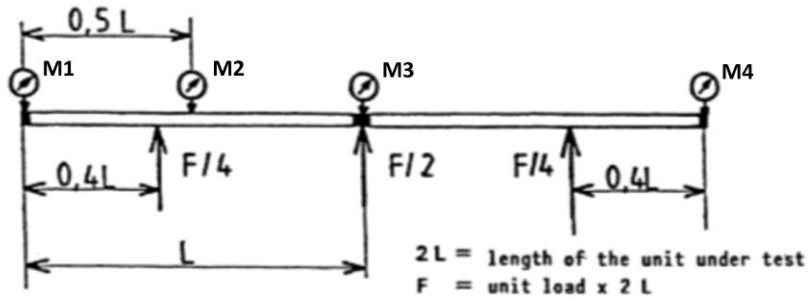
- Requirement for the deformation according NF P 01-013, Chapter 2.2.1.2.4

$$a \leq \frac{8x}{1000}$$

$$a \leq 9.6 \text{ mm}$$



Testing of Railing for safety against falling



Load F [kN]		Time [min.]	Deformation (a) removed Load [mm]				Requirement
			M1	M2	M3	M4	
1st stage	2.0	3	set to zero	set to zero	set to zero	set to zero	no requirement
2nd stage	2.0	3	0.0	1.0	0.0	0.0	no requirement
safety test	3.4	15	12.0	12.0	10.0	9.0	no requirement
without load		3	8.0	9.0	9.0	8.0	≤ 9.6 mm



Testing of Railing for safety against falling

Static horizontal inwards test according NF P 01-013, Chapter 2.2.2

Project-No.	20-000272-PR01
Basis	NF P 01-013:1988-08 Railings test - Methods and criteria
Test equipment	Pst/022070 - Einbruchprüfstand - Multidoor Groß Pst/020619 - Geländerprüfstand
Test specimen	Slim Line Side Mount
Test specimen No.	50425-001
Date of test	07.04.2020
Test engineer in charge	Stefan Hehn
Test engineer	Stefan Hehn

Implementation of tests
 Deviations There have been no deviations from the test method as specified in the standard/basis.

Ambient conditions Temperature 22.6 °C Air humidity 48.3 %
 The ambient conditions are in accordance with the standard/basis requirements.

Measurement data/Results

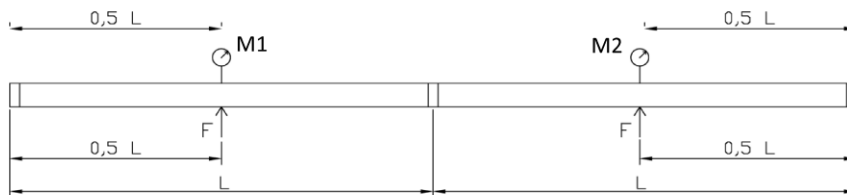
Requirement for the deformation according NF P 01-013, Chapter 2.2.2.3

$$a \leq \frac{15x}{1000}$$

x = the distance lying between the top of the handrail and the anchorage point of the railings

x = 1200 mm

a ≤ 18 mm



Load F [kN]	Time [min.]	Deformation (a) removed Load [mm]		Requirement
		M1	M2	
0.2	3	set to zero	set to zero	no requirement
0.4	1	7.0	7.0	≤ 18 mm

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Testing of Railing for safety against falling

Static vertical test according NF P 01-013, Chapter 2.2.3

Project-No. 20-000272-PR01
Basis NF P 01-013:1988-08
Railings test - Methods and criteria
Test equipment Pst/022070 - Einbruchprüfstand - Multidoor Groß
Pst/020619 - Geländerprüfstand
Test specimen Slim Line Side Mount
Test specimen No. 50425-001
Date of test 07.04.2020
Test engineer in charge Stefan Hehn
Test engineer Stefan Hehn

Implementation of tests Deviations

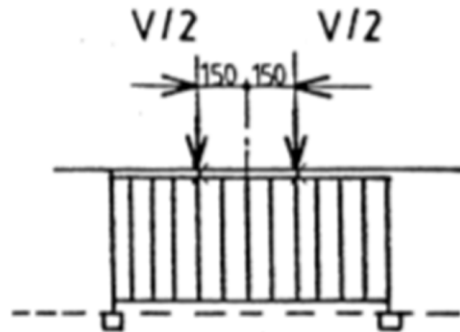
There have been no deviations from the test method as specified in the standard/basis.

Ambient conditions

Temperature 22.6 °C Air humidity 48.3 %

The ambient conditions are in accordance with the standard/basis requirements.

Measurement data/Results



Requirement for the deformation according NF P 01-013, Chapter 2.2.3.5

$a \leq 3 \text{ mm}$

Load V [kN]	Time [min.]	Deformation (a) removed Load [mm]	Requirement
0.2	0	set to zero	no requirement
1.0	15	0.0	no requirement
without load	3	0.0	$\leq 3 \text{ mm}$

Testing of Railing for safety against falling

Dynamic method of testign railings according NF P 01-013

Project-No. 20-000272-PR01
 Basis NF P 01-013:1988-08
 Railings test - Methods and criteria
 NF P 08-301:1991-01
 Vertical building elements - Impact resistance tests - Impact bodies - Principle and general test procedures
 Test equipment Pst/021702 - Pendelschlag fahrbar m. Gummirad s. A. 2 2658
 PstA/020292 - Zwillingreifen nach EN 12600
 Pst/022070 - Einbruchprüfstand - Multidoor Groß
 Zub/029198 - Glaskugelsack
 Test specimen Slim Line Side Mount
 Test specimen No. 50425-001
 Date of test 08.04.2020
 Test engineer in charge Stefan Hehn
 Test engineer Stefan Hehn

Implementation of tests
 Deviations There have been no deviations from the test method as specified in the standard/basis.

Ambient conditions Temperature 22,6 °C Air humidity 48,3 %
 The ambient conditions are in accordance with the standard/basis requirements.

Measurement data/Results

schematic representation of the specimen and the point of impact



Pendulum	Drop height in mm	point of impact on the attack side	Remark
1	1200	P1	Sealing profile slipped out on attack side; no danger from falling parts
2	1200	P2	Sealing profile slipped out on attack side; no danger from falling parts
3*	900	P1	Glass breakage on the outside; no danger from falling parts
4*	900	P2	No damage incurred; no danger from falling parts

*) Pendulum impact with 50kg twin tyres



Testing of Railing for safety against falling

3 Summary

3.1 Result

The test results are shown in the measuring data sheet, see item "Detailed results".

3.2 Instructions for use

The result can be transferred to smaller dimensions - provided that the other construction and materials used are unchanged and consistent processing is ensured.

This test/evaluation does not allow any statement to be made on further characteristics of the present structure regarding performance and quality, in particular the effects of weathering and ageing and possible pre-vious defects.

The test was performed according to standard and the details for identification of the test specimen are complete.

ift Rosenheim
30.04.2020

A handwritten signature in blue ink, appearing to read 'F. Zirbel'.

Frank Zirbel, Dipl.-Ing. (FH)
Head of Testing Department
Security/Safety Testing

A handwritten signature in blue ink, appearing to read 'Stefan Hehn'.

Stefan Hehn, Dipl.-Ing. (FH)
Operating Testing Officer
Security/Safety Testing

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Die Angaben sind Voraussetzung für die Erstellung eines ift-Nachweises. Nur bei Angabe aller in diesem Dokument angeforderten Daten ist ggf. eine nachträgliche Gutachtliche Stellungnahme möglich. Alle Angaben des Auftraggebers werden vom ift auf Plausibilität geprüft; ggf. festgestellte Abweichungen und/oder ergänzende Feststellungen werden dokumentiert.

The description of the specimen to be tested serves to identify, in conformity with the standards, the product type, for which the values determined will apply. Alternatively to the specified tabulated data collection, the description may also be made by technical drawings, processing instructions, parts lists, etc. Please supplement additional product details.

The details are the precondition for issuing the "ift-Nachweis". Only upon provision of all requested data subsequently requested Expert Statements may be issued. All details provided by the client will be checked for plausibility by ift, any deviations observed and/or additional findings will be documented.

Wareneingang-Nr.: 50425
ID of goods received :

ift Mitarbeiter: Stefan Hehn
ift staff member :

Alle Maßangaben in mm
All dimensions in mm

Nicht Zutreffendes bitte löschen.
Please delete non-appropriate.

Eigenschaft Characteristic	Angaben des Auftraggebers (unverändert) Information provided by client (unchanged)
Produkt / Bauart / Komponente Product / design / component	Safety Railings
Hersteller Manufacturer	ALUMINCO
Bezeichnung / Typ / Art.-Nr. Designation / type / item no.	Slim Line Side Mount
Außenmaß (BxH) Overall dimensions (WxH)	2050 mm x 1380 mm
Material Material	Aluminium-Profil; Laminated safety glass
Besonderheiten Special features	Bottom-sided linear bearing with profile item-no.: F85-1B69
Verglasung Glazing	
Hersteller Manufacturer	Information is stored at the ift
Lieferbezeichnung / Typ / Art.-Nr. Designation / type / item no.	Tempered Laminated Glass
Abmessung (B x H) Dimensions (W x H)	1000 mm x 1300 mm
Gesamtdicke Thickness	21.52 mm
Aufbau Configuration	10 mm TSG / 1.52 mm PVB / 10 mm TSG
Einbau Glas Incorporation glazing	2 laminated glass; one-sided linear bearing; U-profile at the bottom of the aluminium profile; F85-594
Glaseinstand Edge cover	100 mm
Verklotzung Blocking	Plastic wedge F85-576; at a distance of 60 mm from the outside and further in a grid of 200 mm

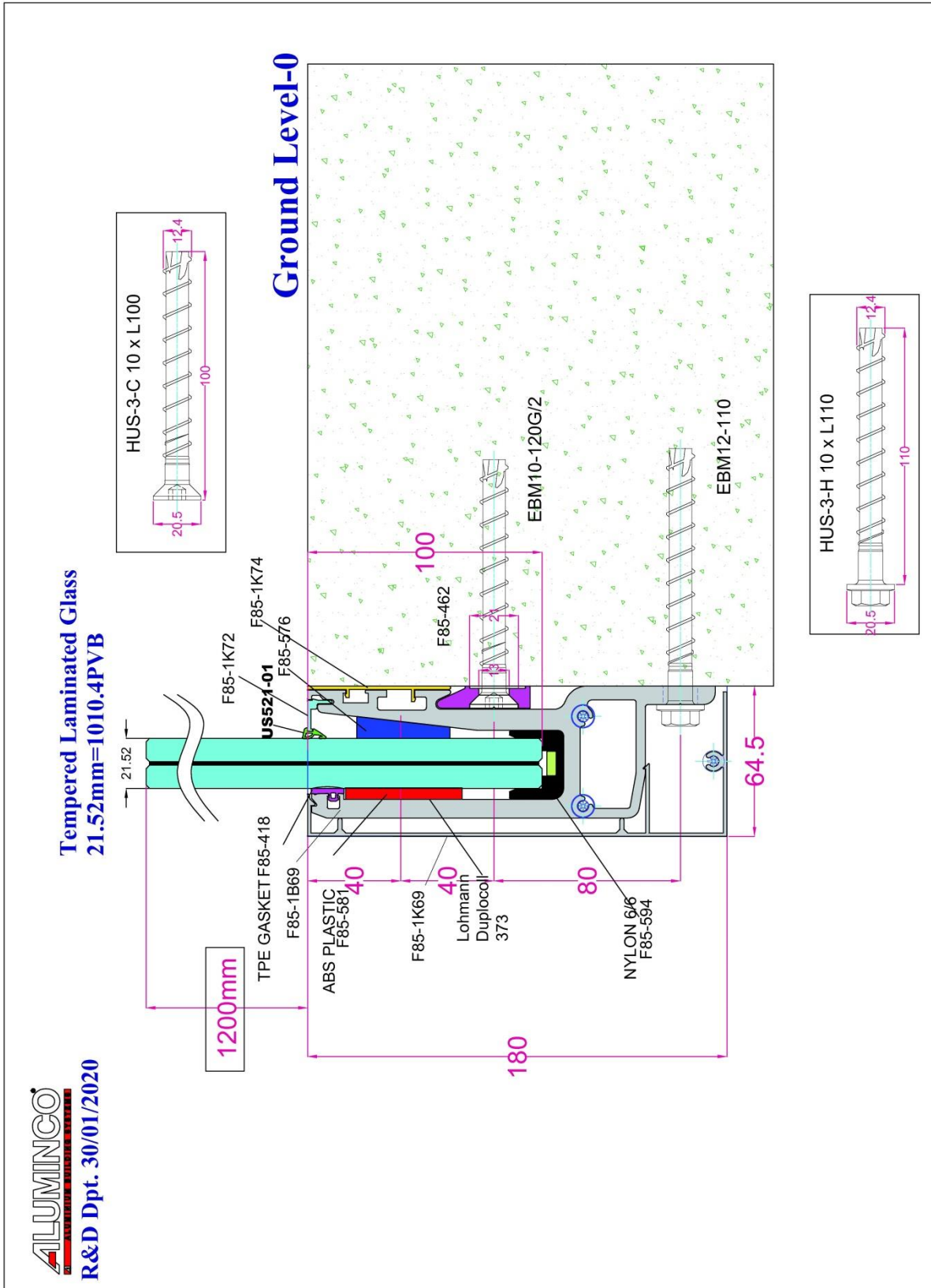
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Folie (VSG) Film (LSG)	
Hersteller Manufacturer	Information is stored at the ift
Material Material	PVB
Gesamtdicke Total thickness	1.52 mm
Aufbau Configuration	4 x 0,38 mm
Verglasungsdichtung außen External glazing gasket	
Hersteller Manufacturer	-
Lieferbezeichnung / Typ / Art.-Nr. Designation / type / item no.	Item-No.: F85-418
Material Material	TPE
Verglasungsdichtung innen Internal glazing gasket	
Hersteller Manufacturer	-
Lieferbezeichnung / Typ / Art.-Nr. Designation / type / item no.	Item-No.: US521-01
Material Material	-
Anschluss an die Tragkonstruktion Fixing to the support structure	
Hersteller Manufacturer	Würth
Material Material	Stainless Steel A2
Schraubenanzahl / -typ / -dimension Number of screws / type / dimensions	HUS-3-C 10 x L120 HUS-3-H 12 x L120
Anzahl Number	HUS-3-C 10 x L120 8 St. HUS-3-H 12 x L120 8 St.
Ankerabstand Anchor distance	320 mm
Abstand von der Ecke Distance from corner	160 mm

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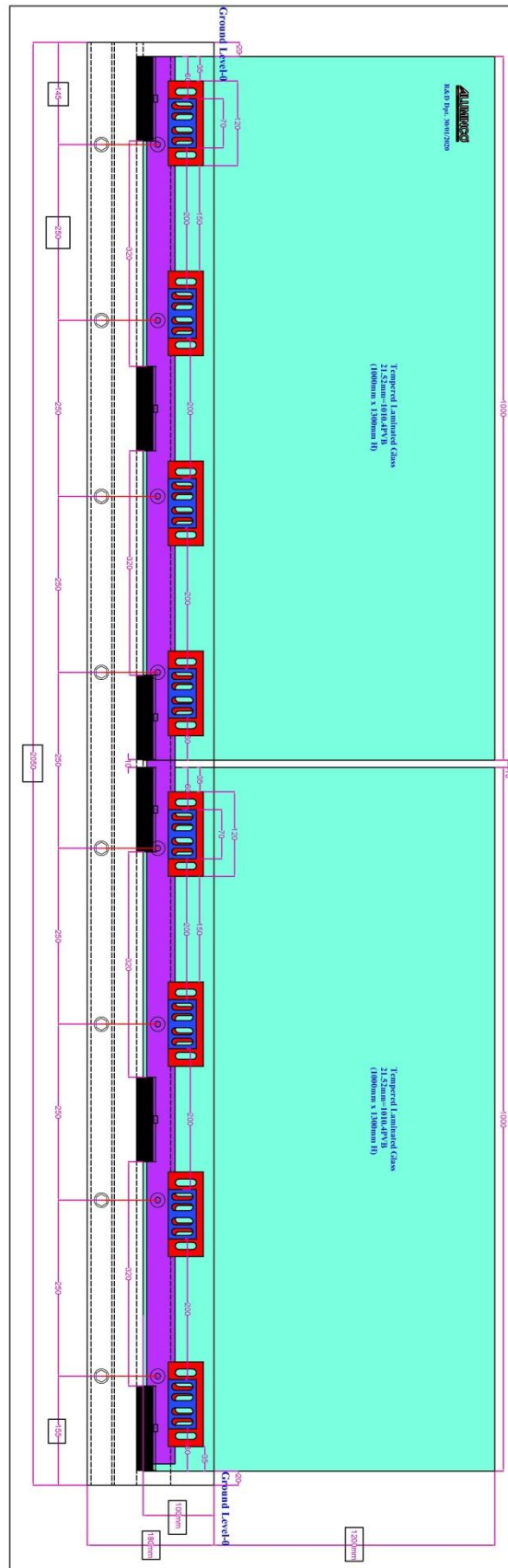
owner (client) ALUMINCO S.A., 32011 Inofita Viotias (Greece)



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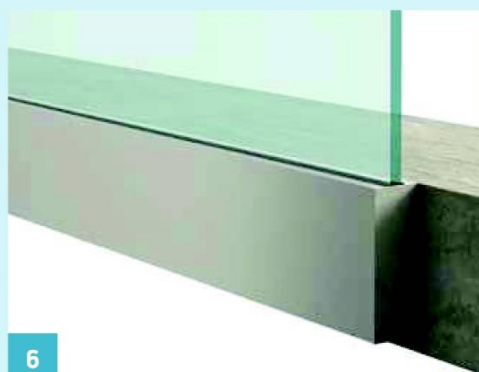
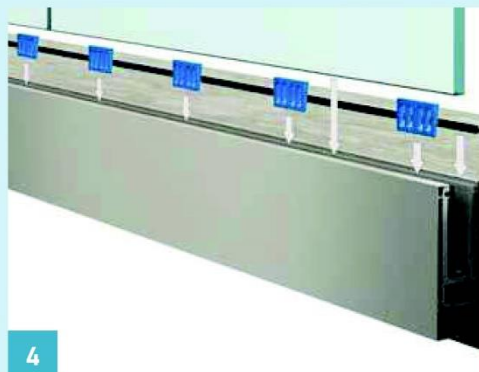
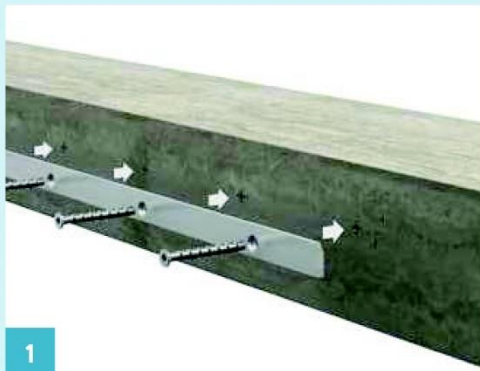
owner (client) ALUMINCO S.A., 32011 Inofita Viotias (Greece)



Slim•line SIDE MOUNT

Σύστημα πλάγιας στήριξης υαλοπίνακα

Στάδια τοποθέτησης / Supporting base assembly



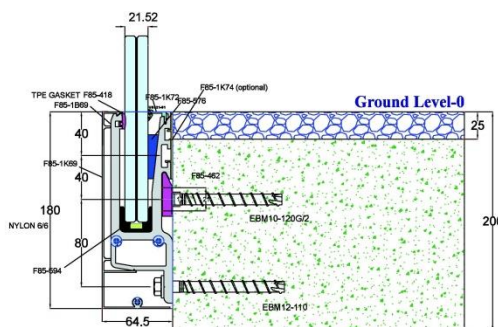
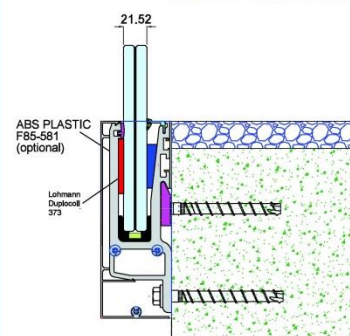
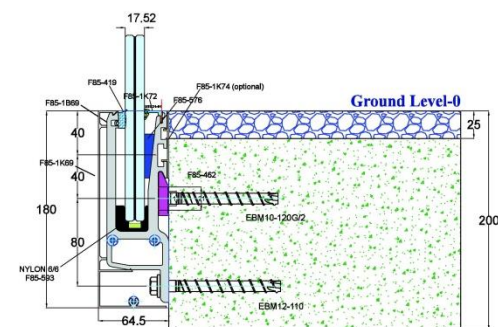
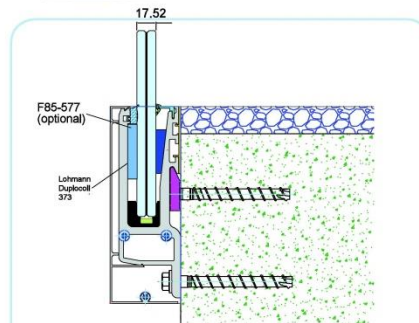
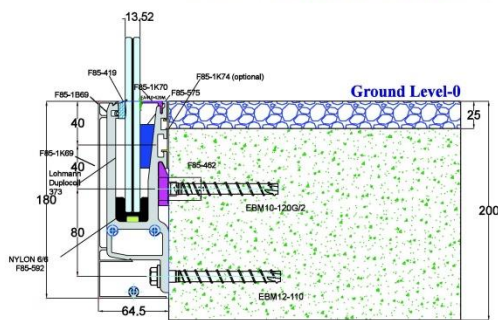
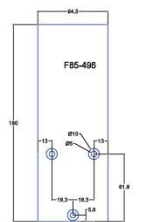
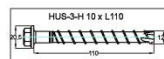
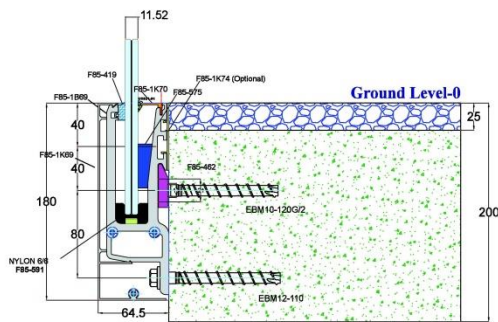
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Τεχνικά
χαρακτηριστικά
Technical
specifications

Slim•line

SIDE MOUNT

Fascia mount system



Προαιρετική χρήση σφηνών αντιστήριξης για αυξημένη αντοχή.

Οι σφήνες αντιστήριξης F85-577 και F85-581 είναι συμβατές με όλους τους τύπους τζαμιών του συστήματος, ενδείκνυται κυρίως για τους τύπους 8.8.4 και 10.10.4 όπου οι απαιτήσεις για αυξημένη αντοχή είναι υψηλότερες.

Optional use of counter-balance wedges for increased load resistance.

Counter-balance wedges F85-577 and F85-581 are compatible with every type of the system's glazing, especially for types 8.8.4 and 10.10.4 where increased load resistance is required.

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Τεχνικά χαρακτηριστικά
Technical specifications

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owner (client) ALUMINCO S.A., 32011 Inofita Viotias (Greece)



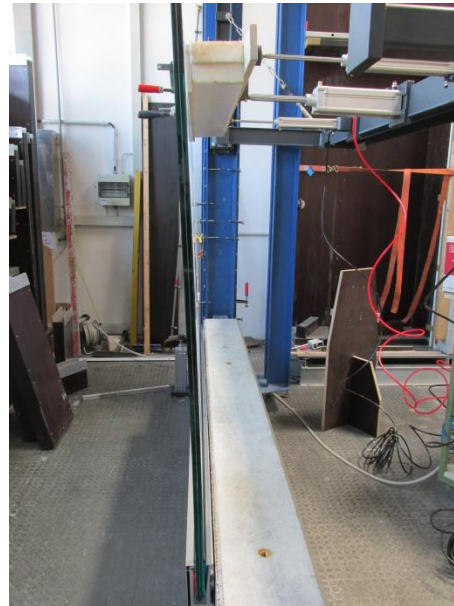
Picture 1 Static outward test - Test sample



Picture 2 Static outward test - Test with 1.0 kN/m



Picture 3 Static outward test - Test with 1.0 kN/m



Picture 4 Static outward test - safety test 1.7 kN/m

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Picture 5 Static inward test - Test sample



Picture 6 Static inward test - Test with 0.2 kN/m



Picture 7 Static inward test - Test with 0.4 kN/m



Picture 8 Static vertical test

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Picture 9 Pendulum test - Test sample



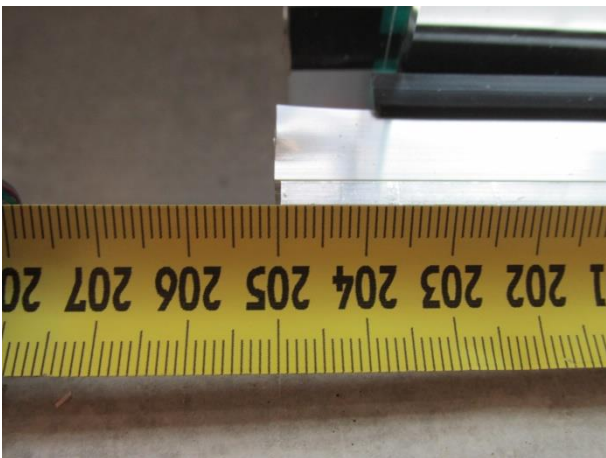
Picture 10 Pendulum test - dimension of Aluminium Profile



Picture 11 Pendulum test - dimensions of LSG



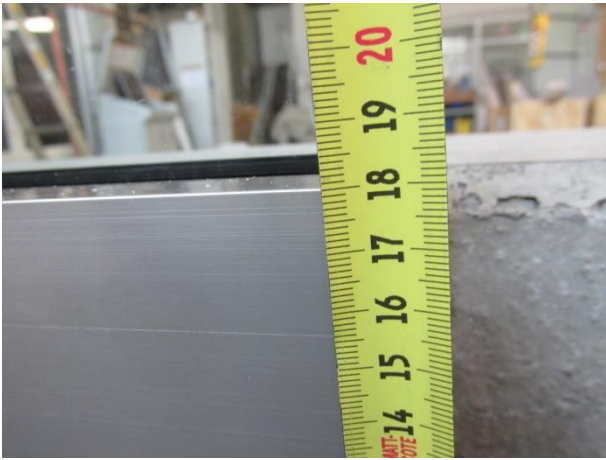
Picture 12 Pendulum test - dimensions of LSG



Picture 13 Pendulum test - dimension of Aluminium Profile



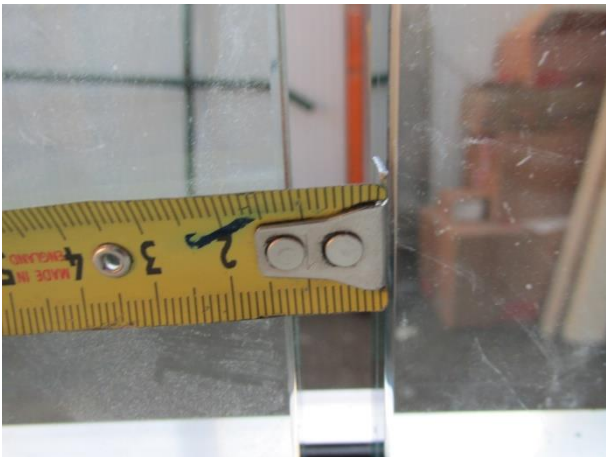
Picture 14 Pendulum test - dimension of Aluminium Profile



Picture 15 Pendulum test - dimension of Aluminium Profile



Picture 16 Pendulum test - Glass inlet



Picture 17 Pendulum test - Distance between the glasses



Picture 18 Pendulum test - P1 before testing



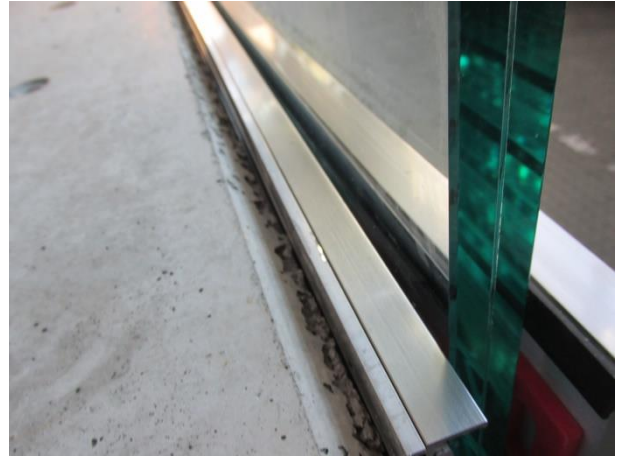
Picture 19 Pendulum test - P1 after testing



Picture 20 Pendulum test - P2 before testing



Picture 21 Pendulum test - P2 after testing



Picture 22 Pendulum test - Sealing profile slipped out



Picture 23 Pendulum test - P1 before testing with twin tyres



Picture 24 Pendulum test - P1 after testing with twin tyres



Picture 25 Pendulum test - P2 before testing with twin tyres



Picture 26 Pendulum test - P2 after testing with twin tyres