

Test Report



Number	19-002756-PR01 (PB-A05-02-en-01)
Owner (Client)	ALUMINCO S.A. Megali Rahi 32011 Inofita Viotias Greece
Product	Glass Railing
Designation	Shipping name: L-Line F85-1B62 TOP MOUNT FIN
Details	Manufacturer ALUMINCO S.A., - Inofita Viotias; Material Laminated safety glass (LSG); Overall dimensions (W x H) 2110 mm x 1212 mm
Special features	
Order	Resistance to wind load
Contents	The test report contains a total of 9 pages and annexes (6 pages).
Note	The test report shall only be published in its unabbreviated form. The "Guidance Sheet for the Use of ift Test Documents" applies.

Ve-PB0-4390-er/ (01.12.2017



Resistance to wind load

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: 26.09.2019

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.: 19-002756-PK01 / WE: 49242-001

1.2 Basic documents *) of the procedures

EN 12211:2016 - 03

Windows and doors - Resistance to wind load - Test method

*) and the relevant national versions, e.g. DIN EN

1.3 Short description of the procedures

The tests were performed in accordance with the following sequence:

- Resistance to wind load
- Resistance to wind load - Safety test

Resistance to wind load

Resistance to wind load in accordance with EN 12211:2016-03

Resistance to wind load was tested in accordance with the standard and conducted in steps at negative pressure up to the test pressure p_1 . The test specimen was exposed to three pressure pulses $Dp_1 + 10\%$. This was followed by determination of the frontal deflection of test specimen for each pressure step when exposed to negative test pressure Dp_1 . Then the test specimen was subjected to 50 cycles at negative pressures of $-Dp_2 = Dp_1 - 50\%$.

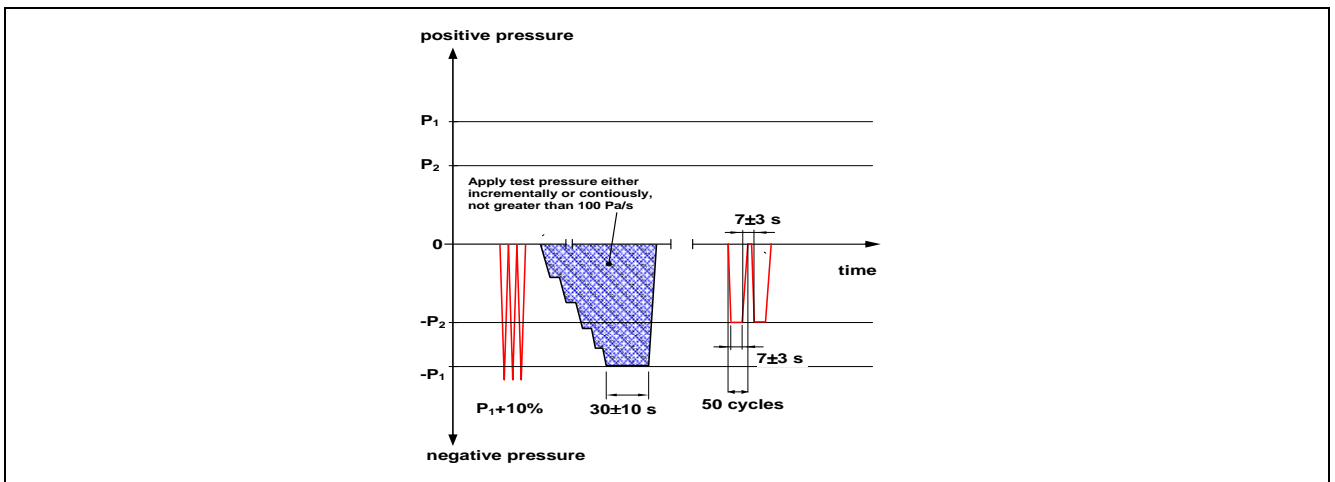


Illustration Test sequence for resistance to wind load - Deflection and alternating negative pressures

After the resistance to wind load at negative pressure, the resistance to wind load was tested in accordance with the standard and conducted in steps at positive pressure up to the test pressure p_1 . The test specimen was exposed to three pressure pulses $\Delta p_1 + 10\%$. This was followed by determination of the frontal deflection of test specimen for each pressure step when exposed to positive test pressure Δp_1 . Then the test specimen was subjected to 50 cycles at positive pressures of $+\Delta p_2 = \Delta p_1 - 50\%$.

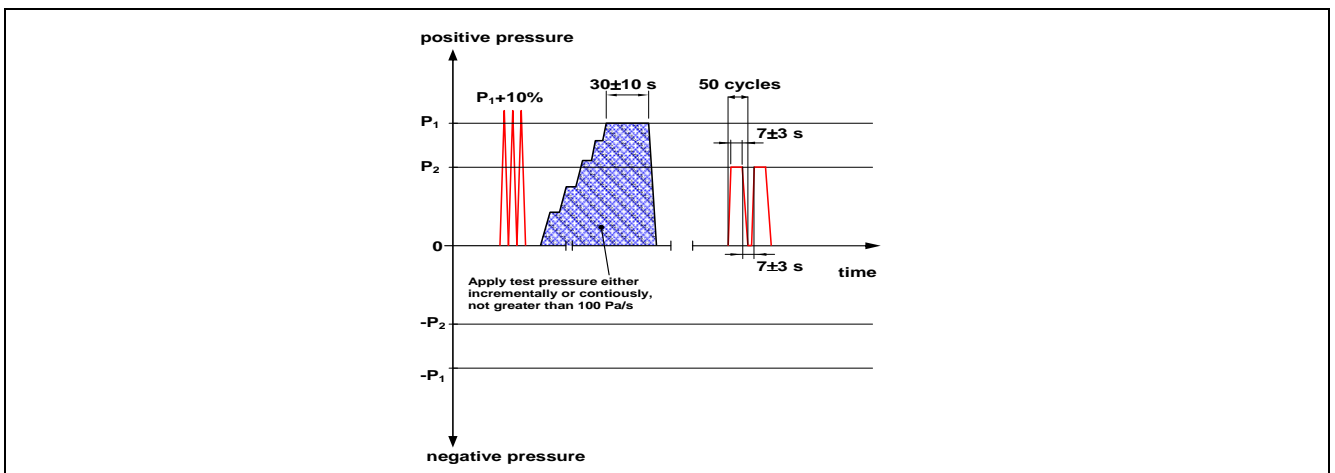


Illustration Test sequence for resistance to wind load - Deflection and alternating positive pressures

Resistance to wind load

Resistance to wind load - Safety test in accordance with EN 12211:2016-03

The wind resistance test (safety test) was conducted at negative pressure and positive pressure in accordance with EN 12211 up to test pressure $\Delta p_3 = \Delta p_1 + 50\%$.

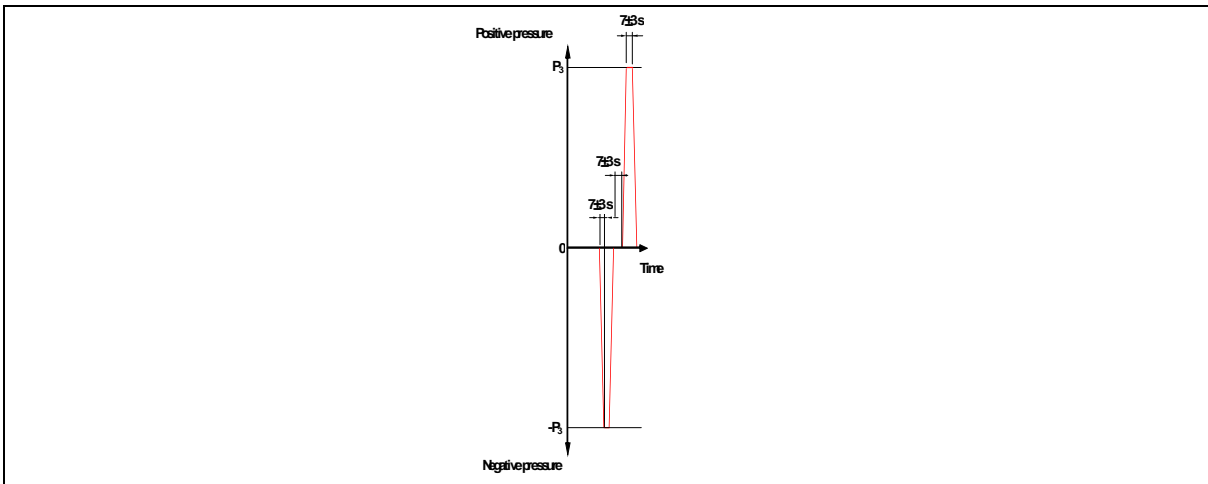


Illustration Test sequence for resistance to wind load - safety test

Resistance to wind load

2 " " Detailed results

Resistance to wind load in accordance with EN 12211:2016-03

Project-No.	19-002756-PR01
Basis	EN 12211:2016-03 Windows and doors - Resistance to wind load - Test method
Test equipment	EPst/026691 - Window and facade test rig
Test specimen	Glass Railing
Test specimen No.	49242-001
Date of test	26.09.2019
Test engineer in charge	Dimitrios Moustakidis
Test engineer	Dimitrios Moustakidis

Implementation of tests

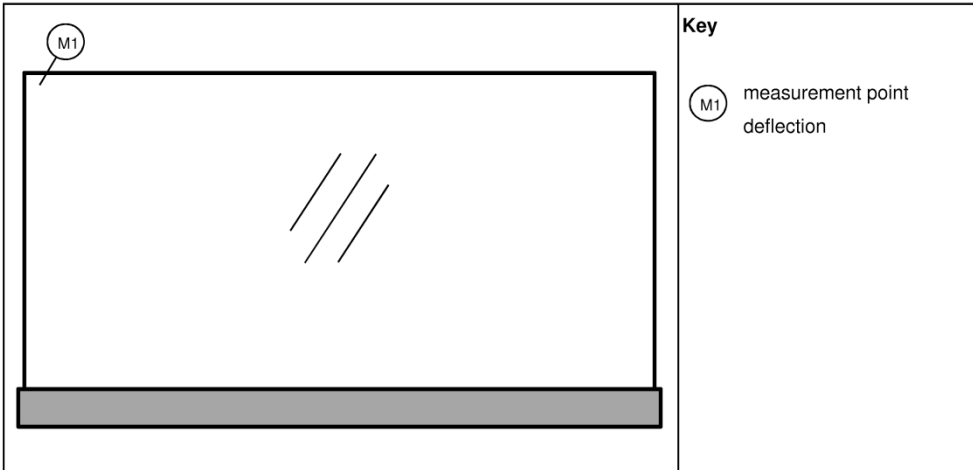
Deviations

There have been the following deviations from the test method specified in the standard/basis:
Only Negative Wind Pressure have been tested in accordance with clients request

Ambient conditions

Temperature 26,9 °C Air humidity 54 % Air pressure 998,4 hPa
The ambient conditions are in accordance with the standard/basis requirements.

Measurement data/Results



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Resistance to wind load

Maximum test pressure: ± 2000 Pa 3 pressure pulses of 2200 Pa

Table: Measured results of frontal deflection in mm at negative / positive wind pressures

Measured results of frontal deflection in mm		Positive wind pressure	Negative wind pressure
	Pa		2000
M1 in mm		55	55

Table: Permanent deformation measured at 0 Pa after 60 seconds

		Positive pressure	Negative pressure
Permanent deflection	M1 in mm	2	4

Key

p_1, p_2 Test pressure
 M1, M2, M3 Frontal dislodgement at measurement points M1, M2, M3
 f_{rel} Frontal deflection
 l Effective span

Dynamic wind loads (negative / positive pressures)**Table:** pressure pulses

p_2 in Pa	1000	-1000
passed	✓	✓

50 cycles at + 1000 Pa

50 cycles at - 1000 Pa

Malfunctions at test specimen

At the test specimen were no malfunctions detected.

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Resistance to wind load

Resistance to wind load - Safety test in accordance with EN 12211:2016-03

Project-No. 19-002756-PR01
Basis EN 12211:2016-03
Windows and doors - Resistance to wind load - Test method
Test equipment EPst/026691 - Window and facade test rig
Test specimen Glass Railing
Test specimen No. 49242-001
Date of test 26.09.2019
Test engineer in charge Dimitrios Moustakidis
Test engineer Dimitrios Moustakidis

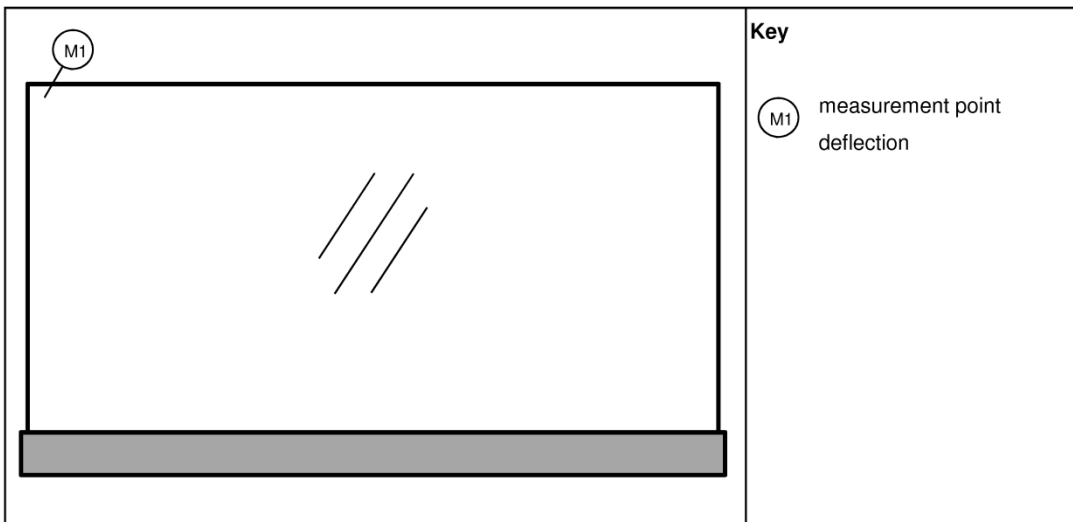
Implementation of tests
Deviations

There have been the following deviations from the test method specified in the standard/basis:
According to clients request the Safety Test were tested at 3000 Pa and only in negative direction

Ambient conditions Temperature 28 °C Air humidity 49 % Atmospheric pressure 998 hPa

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

Measurement data/Results



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Resistance to wind load



Safety test

Table: Measured results of frontal deflection in mm at negative / positive wind pressures

Measured results of frontal deflection in mm		Positive wind pressure	Negative wind pressure
	Pa	3000	-3000
	M1 in mm	108	119

Table: Permanent deformation measured at 0 Pa after 60 seconds

		Positive pressure	Negative pressure
Permanent deflection	M1 in mm	33	46

Key

p_1, p_2 Test pressure

M1, M2, M3 Frontal dislodgement at measurement points M1, M2, M3

Safety test passed at up to + 3000 Pa.

Safety test passed at up to - 3000 Pa.

Malfunctions at test specimen

At the test specimen were no malfunctions detected.

Comments

No damage at test up to + 5000 Pa with permanent deformation 33 mm

Resistance to wind load

3 Summary

3.1 Result

All measured values and findings during the test were recorded in the measuring data sheet, see item "Detailed results".

3.2 Instructions for use

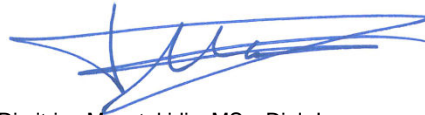
This test/evaluation does not allow any statement to be made on further characteristics of the present structure regarding performance and quality, in particular the effects of weathering and ageing.

The test was performed in accordance with the standard with the deviations shown in the "Detailed results" and the details for identification of the test specimen are complete.

ift Rosenheim
14.10.2019



Thomas Stefan, Dipl.-Ing. (FH)
Head of Testing Department
Building Component Testing



Dimitrios Moustakidis, MSc, Dipl.-Ing.
Operating Testing Officer
Building Component Testing

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Die Beschreibung des geprüften Probekörpers dient der normkonformen Identifizierung des Produkttyps, für den die festgestellten Werte gelten. Alternativ zur vorgegebenen tabellarischen Datenerfassung kann die Beschreibung auch in Form von technischen Zeichnungen, Verarbeitungsrichtlinien, Stücklisten etc. erfolgen. Zusätzliche Produktdetails bitte ergänzen.

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

* Mindestangaben
 * minimum details

Alle Maßangaben in mm
 All dimensions in mm

Nicht Zutreffendes bitte löschen.
 Please delete non-appropriate.

Wareneingang-Nr.: 49242-001
 ID of goods received :

ift Mitarbeiter: mod
 ift staff member :

Eigenschaft Characteristic	Angaben des Auftraggebers (unverändert) Information provided by client (unchanged)
Produkt / Bauart / Komponente Product / design / component	Glass railing
Hersteller Manufacturer	ALUMINCO SA
Bezeichnung / Typ / Art.-Nr. Designation / type / item no.	L-Line F85-1B62 TOP MOUNT FIN
Außenmaß Overall dimensions	2,110 mm x 1,212 mm
Material Material	Aluminium / Glass
Leiste Cover strip	
Bezeichnung / Typ / Art.-Nr. Designation / type / item no.	F85-1B62
Hersteller Manufacturer	ALUMINCO S.A.
Material Material	Aluminium
Abmessung (B x H) Dimensions (W x H)	150 mm x 130 mm
Besonderheit Special feature	E0F85-0474 – Plastic wedge for glass tempered laminated 21.52 mm E0F85-0486 – POM Plastic cylindrical wedge for glass temp. Lamin. 21.52 mm F85-577 – Plastic shim E0F85-0483 – Middle carriage E0F85-585/586 – Side carriage
Verglasung Glazing	
Hersteller Manufacturer	VAS GLASS – Vasiliou Glass Technologies

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Eigenschaft Characteristic	Angaben des Auftraggebers (unverändert) Information provided by client (unchanged)
Lieferbezeichnung / Typ / Art.-Nr. Designation / type / item no.	10+10 with 4PVB (SGP_ Saint Gobain Interlayer)
Abmessung (B x H) Dimensions (W x H)	2,100 mm x 1,182 mm
Gesamtdicke Thickness	21.52 mm
Aufbau Configuration	10 mm / 1.52 mm PVB (SGP) / 10 mm
Glaseinstand Edge cover	99 mm
Folie (VSG) Film (LSG)	
Hersteller Manufacturer	SAINT GOBAIN
Material Material	SGP
Gesamtdicke Total thickness	1.52 mm
Aufbau Configuration	4 PVB
Verglasungsdichtung außen External glazing gasket	
Hersteller Manufacturer	PROFIS SA PLASTICS
Lieferbezeichnung / Typ / Art.-Nr. Designation / type / item no.	E0F85-0477
Material Material	EPDM
Verglasungsdichtung innen Internal glazing gasket	
Hersteller Manufacturer	PROFIS SA PLASTICS
Lieferbezeichnung / Typ / Art.-Nr. Designation / type / item no.	E0F85-0478
Material Material	EPDM
Glashalteleiste Glazing bead	
Typ Type	F85-1K61
Befestigung Fixing method/fasteners	Clamped

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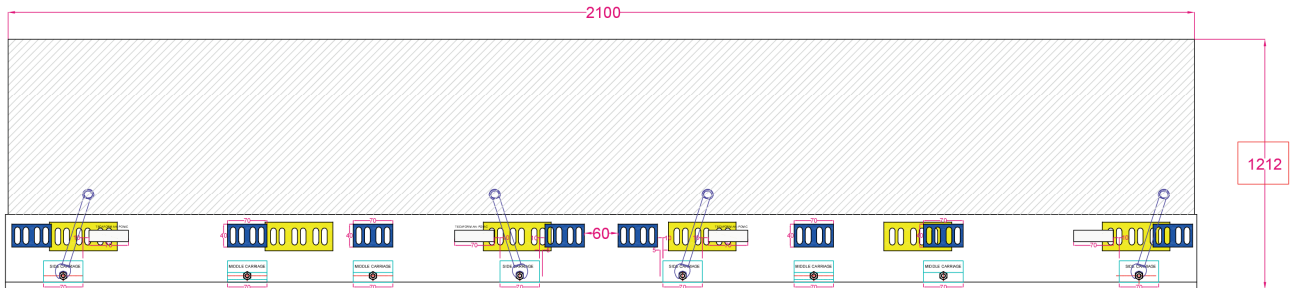


Eigenschaft Characteristic	Angaben des Auftraggebers (unverändert) Information provided by client (unchanged)
Anschluss an die Tragkonstruktion Fixing to the support structure	
Befestigungsmittel Fasteners	
Schraubentyp Screw type	* DIN 933_INOX_ M14x40 HEX MACHINE SCREW with DIN 985_INOX_ HEX LOCKNUT_M14
Schraubenanzahl Number of screws	* 9
Schraubendimension Screw dimensions	* M14 x 40 mm
Befestigungsmittelabstände Fasteners spaced	* 250 mm

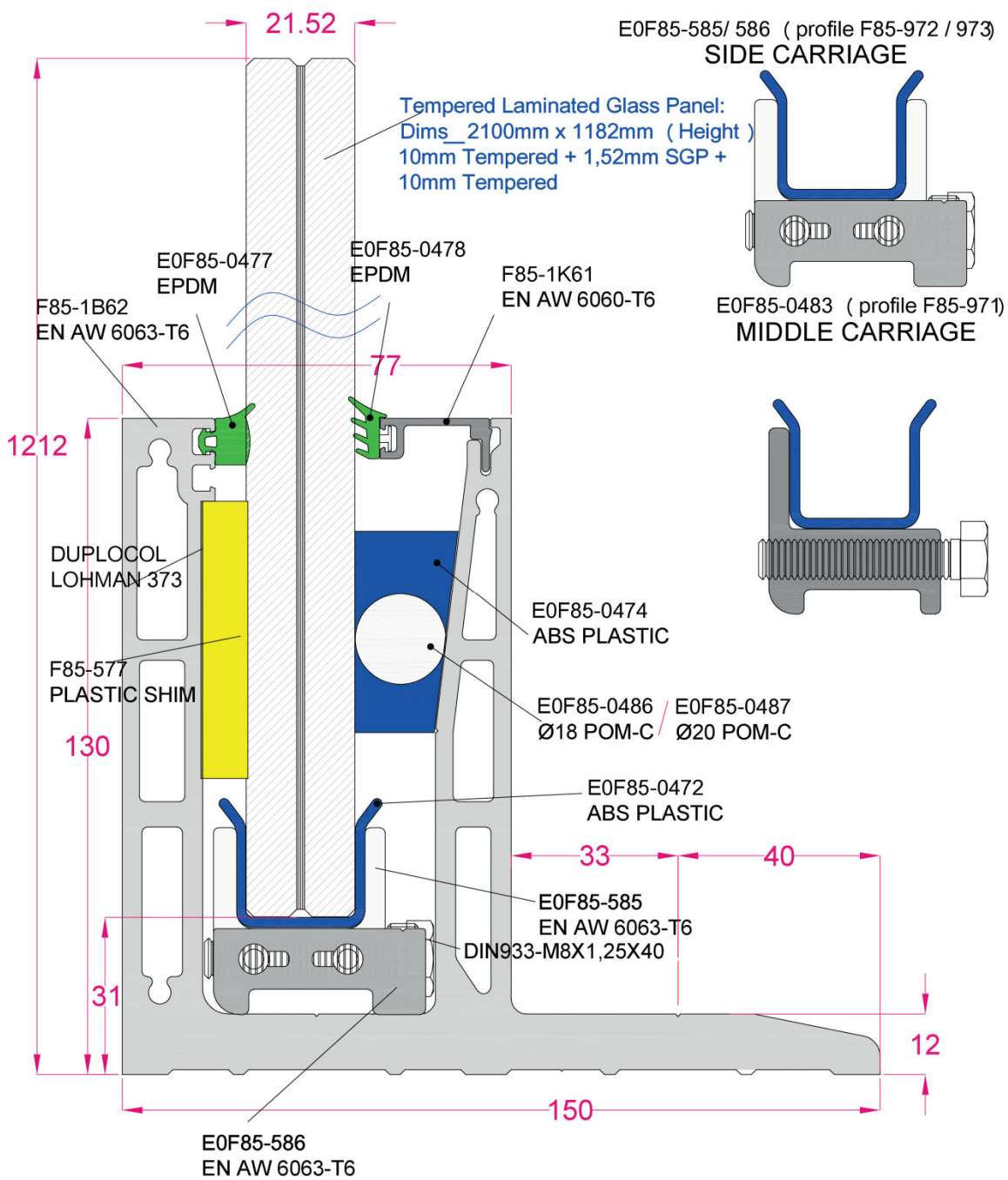
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Picture 1 View



Picture 2 Vertical section

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Picture 1 Test specimen



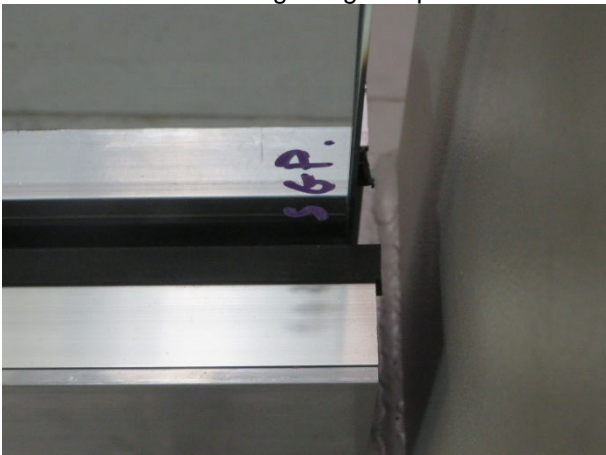
Picture 2 Test specimen with applied film



Picture 3 Corner of glazing at top



Picture 4 Corner of glazing at bottom



Picture 5 Corner of glazing at bottom



Picture 6 Glazing in Aluminium profile

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Picture 7 Corner of test specimen



Picture 8 Mounting of test specimen



Picture 9 Mounting of test specimen