

TEST REPORT No. 369727

Customer

IŞILDAK İNŞ. TAAH. TIC. A. Ş.**Mutlukent Mahallesi 1986 cadde, 20 - 06810 Çayyolu ANKARA - Turkey**

Item*

glass railing named "Linera L2 10.10.2 PVB"

Activity

**resistance to horizontal static loading in accordance with
standard NF P01-013:1988 and resistance to dynamic
impact in accordance with standard NF P08-301:1991**

Results

Test	Use	Result
Outward horizontal static loading	Private (1,3 kN)	Compliant
	Public (1,0 kN/m)	Compliant
Dynamic impact NF P08-301:1991	//	Compliant

Order:
82530

Item origin:

sampled and supplied by the customer

Identification of item received:

2020/0193 dated 27 January 2020

Activity date:

3 February 2020

Activity site:

Istituto Giordano S.p.A. - Strada Erbosa Uno, 72 -
47043 Gatteo (FC) - Italy

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(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 26 February 2020

Chief Executive Officer

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The results relate only to the item examined, as received, and are valid only in the conditions in which the activity was carried out.

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Chief Test Technician:

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Description of item*

The item under examination consists of aluminum/glass railing having the following physical characteristics:

- measured overall width = 2005 mm
- measured overall height = 1100 mm

Each glass pane, width 1000 mm and thickness 21,52 mm, is made of:

- 10 mm tempered glass
- 4 PVB layer (4·0,38=1,52)
- 10 mm tempered glass.

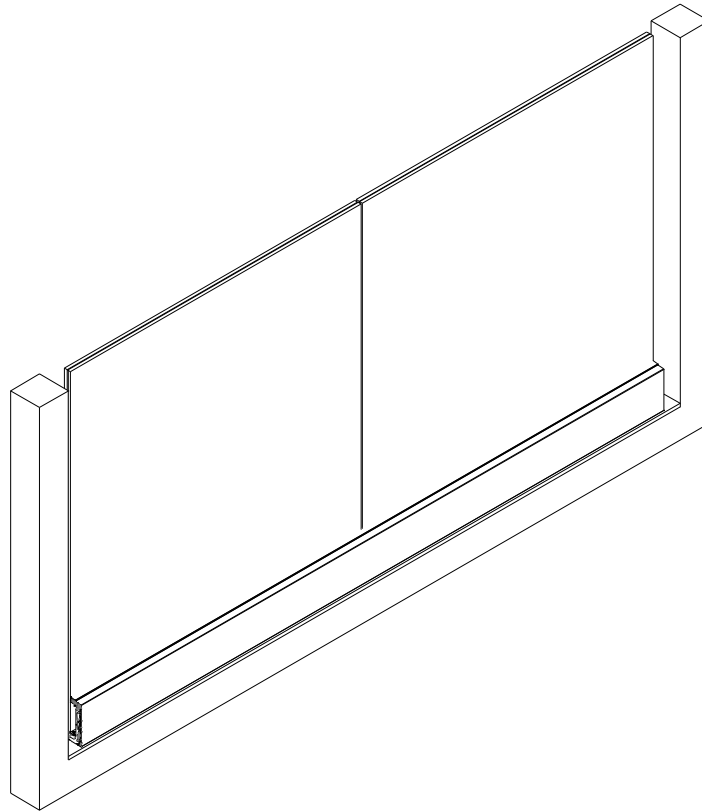
Further details of item specifications can be seen in the Customer-supplied component list and schematic drawings hereafter.

Customer-supplied component list

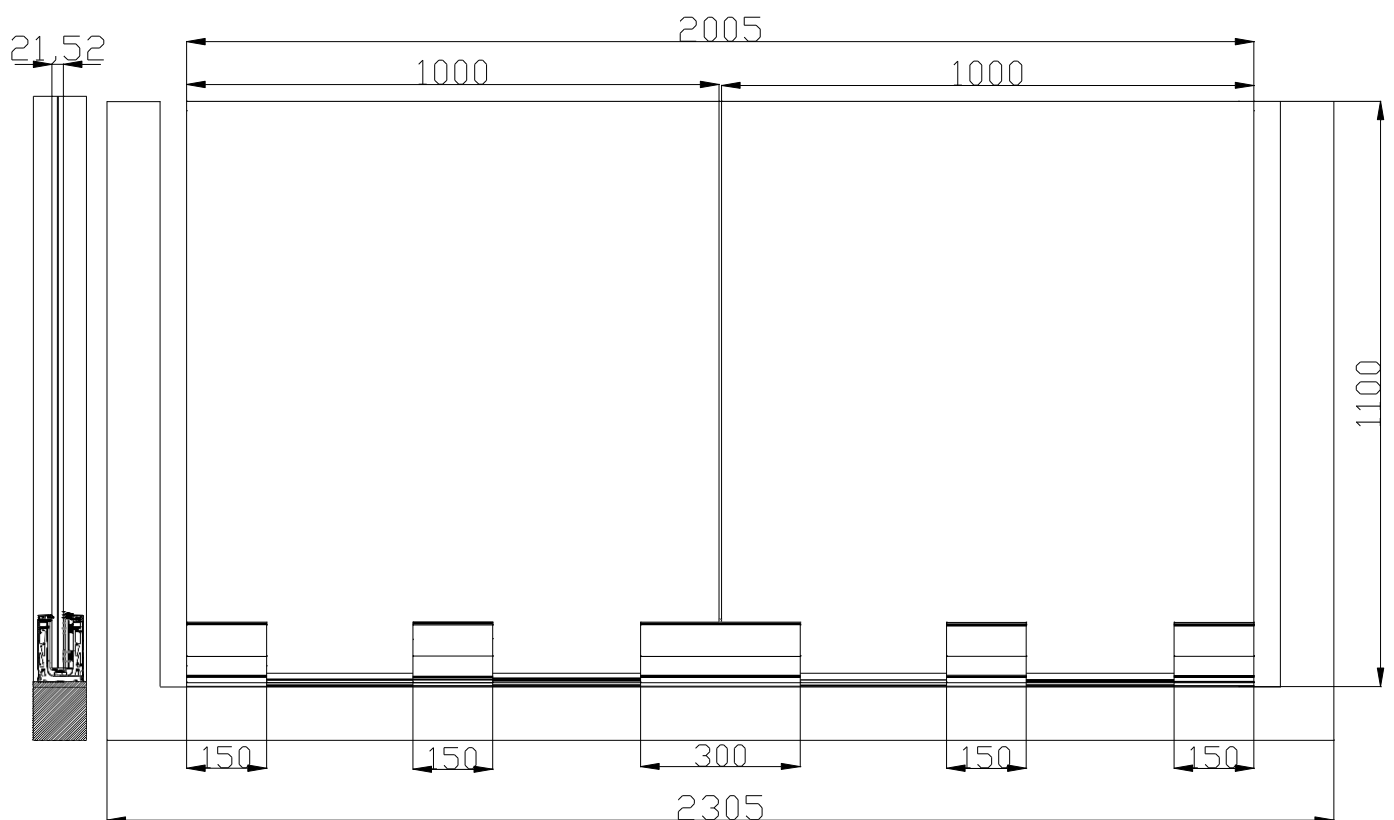
Code	Description	Material
B20022	Glass base shoe set 15 cm/30 cm	aluminum 6063-T5
B2002301	Side cladding profile	aluminum 6063-T5
B8502460	Glass alignment profile	aluminum 6063-T5
B8502457	Glass pushing apparatus	plastic
B8502458	Glass pushing wedge	plastic
TS8509004	M8 Flange Nut	galvanized metal
B8504124	M8 hexagon head bolt 8 mm	galvanized metal
B8502455	Alignment wedge	plastic
B8505201	Gasket	rubber
B8505401	Gasket	rubber
B8502463	M12 flat washer	galvanized metal
B8502465	M12 hexagon head bolt 100 mm	galvanized metal

(*) according to that stated by the customer, apart from characteristics specifically stated to be measurements. Istituto Giordano declines all responsibility for the information and data provided by the customer that may influence the results.

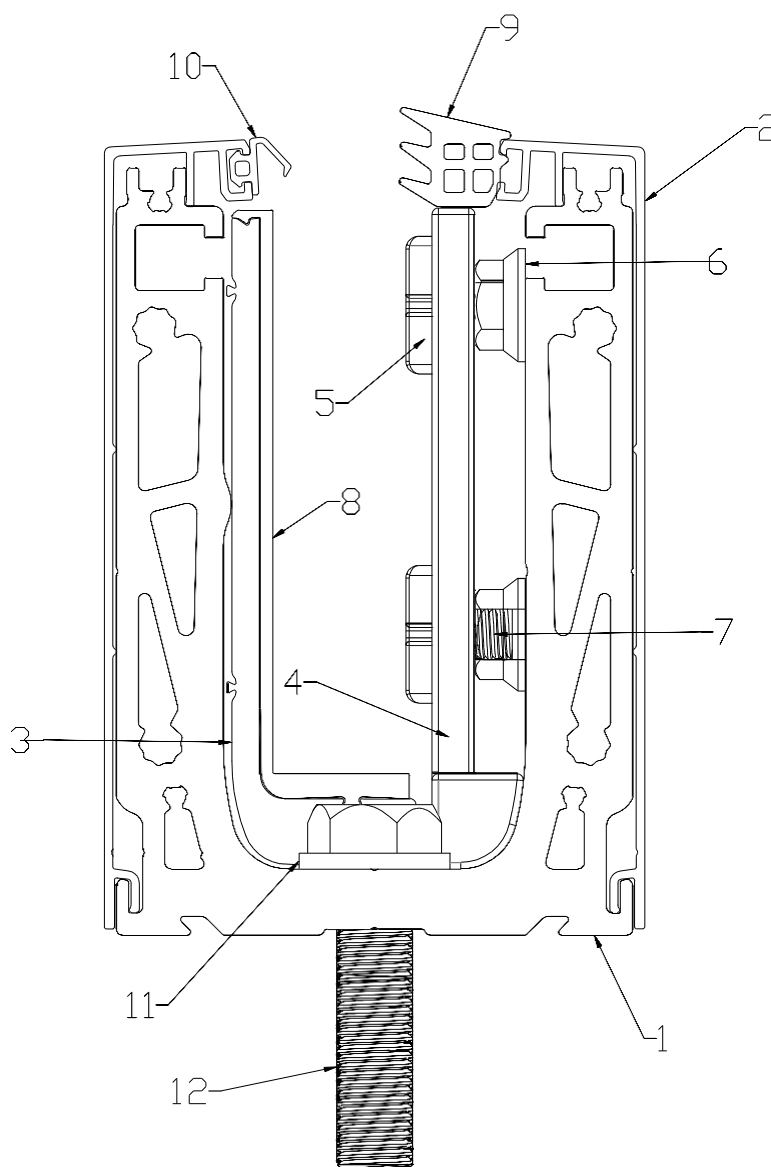
AXONOMETRY



ELEVATION AND VERTICAL SECTION



BASE AND ASSEMBLY DETAILS



Key

Symbol	Description
1	Glass base shoe set 15 cm/30 cm
2	Side cladding profile
3	Glass alignment profile
4	Glass pushing apparatus
5	Glass pushing wedge
6	M8 Flange Nut
7	M8 hexagon head bolt 8 mm
8	Alignment wedge
9	Gasket
10	Gasket
11	M12 flat washer
12	M12 hexagon head bolt 100 mm



Photograph of the item

Normative references

Standard	Title
NF P01-013:1988	Essais des garde-corps - Méthodes et critères (<i>Railing tests - Methods and criteria</i>)
NF P08-301:1991	Ouvrages verticaux des constructions - Essais de résistance aux chocs - Corps de chocs - Principe et modalités générales des essais de choc (<i>Vertical building elements - Impact resistance tests - Impact bodies - Principle and general test procedures</i>)

Apparatus

Description	In-house identification code
3 GEFRA S.p.A. electronic displacement transducer model "PZ-34-S150" for measuring deflection	FT451/1, FT451/2 FT451/3
AEP Transducers 100 kg load cell	EDI107
steel frame simulating actual installation of the sample on the floor	EDI048
metric ruler	EDI083
digital thermo-hygrometer	EDI111
impactor, overall mass 50 kg, complying with standard UNI EN 12600:2004 "Vetro per edilizia - Prova del pendolo - Metodo della prova di impatto e classificazione per il vetro piano" (<i>"Glass in building - Pendulum test - Impact test method and classification for flat glass"</i>)	EDI012

Method

The item was secured just to the floor.

Procedure

Normative reference	Activity	Description
clause 2.2.1.2 of standard NF P01-013	horizontal static loading	the item was subjected to uniformly distributed load over three points, using this sequence – preload applied gradually until reaching the preset value and maintained for 3 min – load removal setting the gauges back to zero – horizontal static load applied gradually until reaching the preset value and maintained for 60 s following which deflection whilst loaded was measured – removal of load and recording of permanent deflection after 3 min – horizontal static safety load, with 1,7 aluminum coefficient, applied and maintained for 5 min, following which deflection whilst loaded was measured; – removal of safety load and recording of permanent deflection after 3 min – verification of permissible permanent deflection “a”, in mm, using the following equation: $a \leq \frac{8 \oplus X}{1000}$ where: X = height of sample from fixing point, in mm.
clause 4.5 of standard NF P08-301:1991	dynamic loading with large soft body impact M 50	energy of 600 J (0,50 kN × 1,20 m) All impacts were made by releasing the impactor from a specified height with a pendulum movement and without initial velocity. The impactor was hung by an inextensible pendulum wire of negligible mass so that when at rest it made contact with the point of intended impact. After each impact, the impactor was prevented from hitting the sample again after bouncing
//	failure load	horizontal static load applied gradually until failure

Environmental conditions

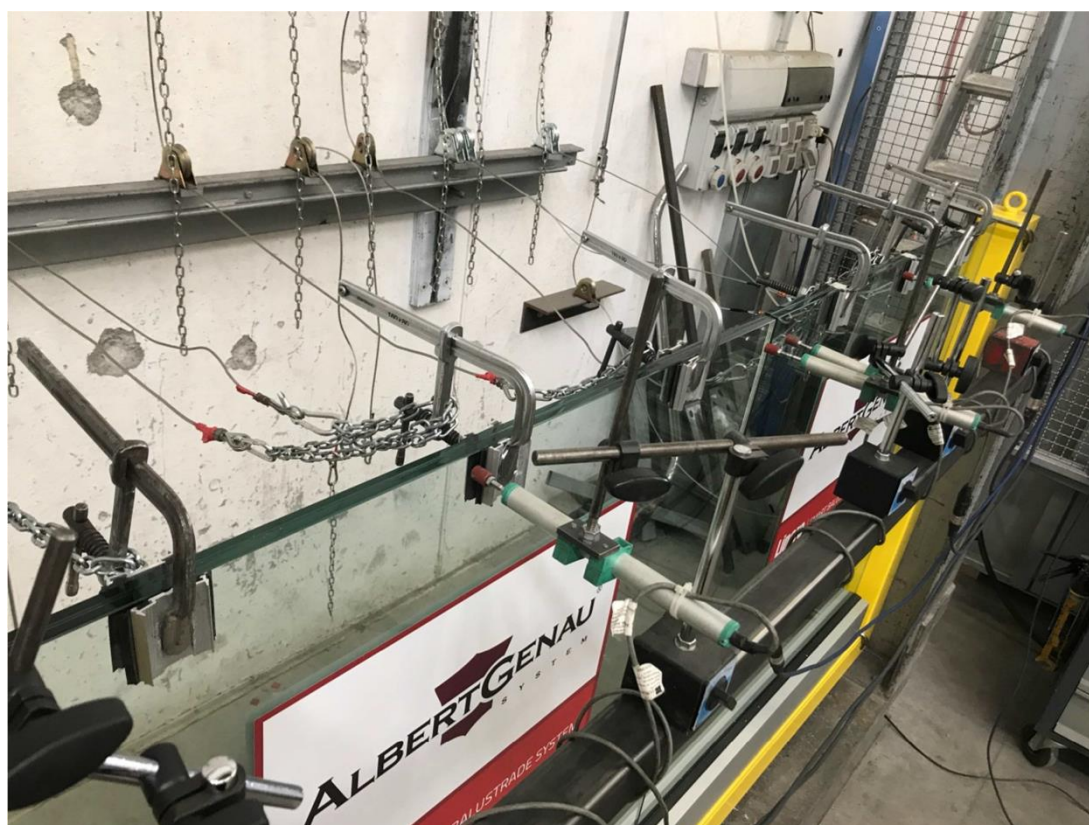
Temperature	(16 ± 1) °C
Relative humidity	(57 ± 5) %

Results

Outward horizontal static loading

Destination	Required load	Applied load	Deflection whilst loaded	Permanent deflection	Allowed permanent deflection "a"	Result
		[kN]	[mm]	[mm]	[mm]	
public use	1 kN/m	2	48,4	2,8	//	//
	1,7 kN/m*	3,4*	86,0	7,8	≤8,8	pass

(*) safety load considered with aluminum coefficient 1,7



Photograph of the sample during resistance to horizontal static loading test

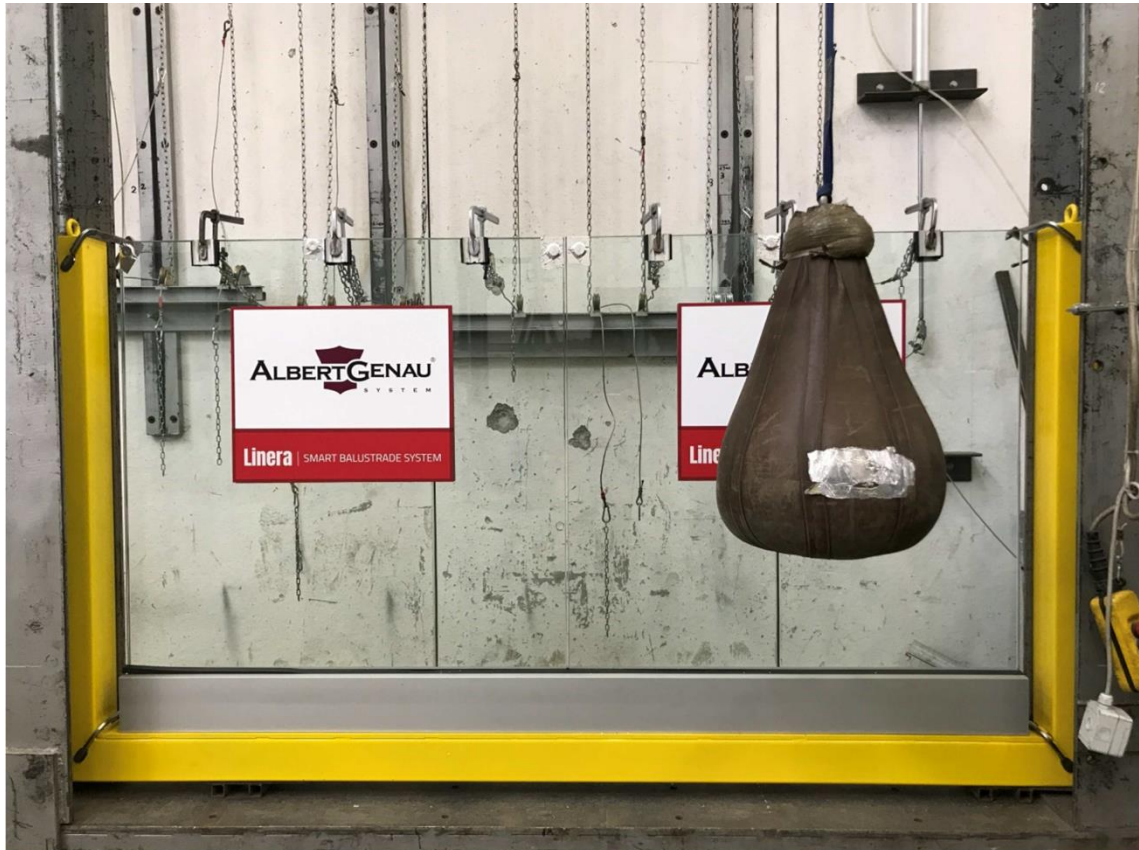
Dynamic loading in accordance with standard NF P08-301:1991

Impact area	Drop height [m]	Energy [J]	Result
centre of infill	1,2	600	no damage*

(*) No falling fragments that could cause personal injury were found below.

No gaps were formed between the bars of sufficient size to allow the passage of the gauge specified in figure 7 of standard NF P01-013.

No sample performance loss compared to design specifications was witnessed.



Photograph of the sample after impact

Findings

Test	Use	Result
Outward horizontal static loading	Private (1,3 kN)	Compliant
	Public (1,0 kN/m)	Compliant
Dynamic impact NF P08-301:1991	//	Compliant

Chief Test Technician
(Dott. Andrea Bruschi)



Head of Security and Safety
Laboratory
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