TEST REPORT No. 399059

Customer

BAROS VISION Ltd.

Asenovgradsko Shose - 4000 PLOVDIV - Bulgaria

Item*

railing named

"RAILING SYSTEM BV9900Y side MOUNTING 88.4"

Activity

resistance to horizontal linear static load according to standard UNI 10806:1999 and resistance to dynamic load according to standards UNI 10807:1999, NF P01-013:1988 and UNI EN 14019:2016

Results

Test	Normative reference	Requirement	Result
horizontal linear static load	UNI 10807:1999	3,0 kN/m	**compliant**
dynamic load	UNI 10807:1999	300 mm	**compliant**
	NF P01-013:1988	1200 mm	**compliant**
	UNI EN 14019:2016	950 mm	**compliant**

(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 19 October 2022

Chief Executive Officer
(Dott. Nazario Giordano)

Firmato digitalmente da NAZARIO GIORDANO

Order:
93978

Item origin:
sampled and supplied by the customer

Identification of item received:
2022/2351/C dated 12 October 2022

Activity date:
12 October 2022

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

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Chief Test Technician:
Dott. Andrea Bruschi
Head of Security and Safety Laboratory:
Dott. Andrea Bruschi

Compiler: Francesca Manduchi
Reviewer: Dott. Andrea Bruschi

LAB N° 0021 L

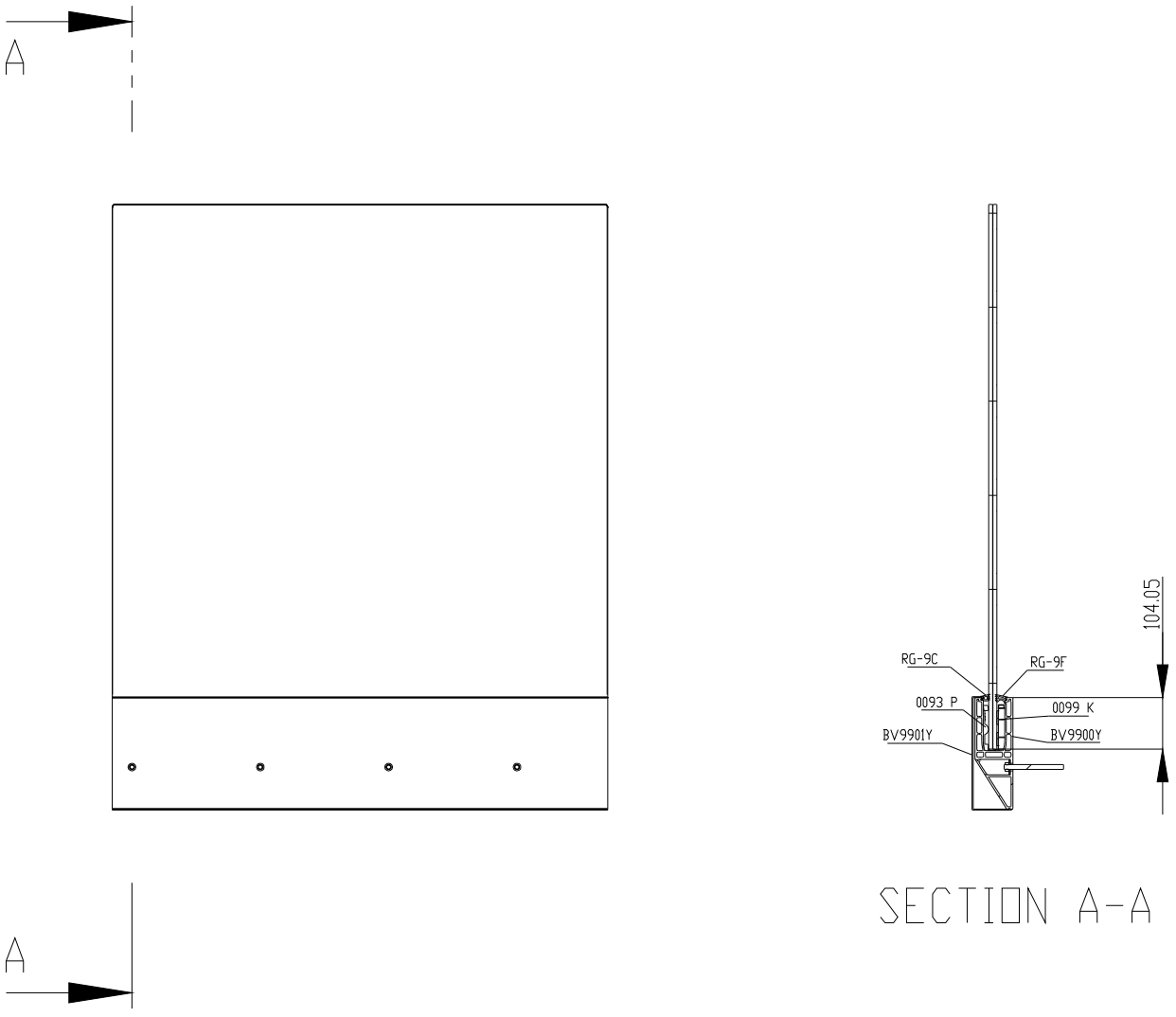
Description of item*

The item under examination consists of laminated tempered glass railing with aluminum structure, having the characteristics shown in the following table.

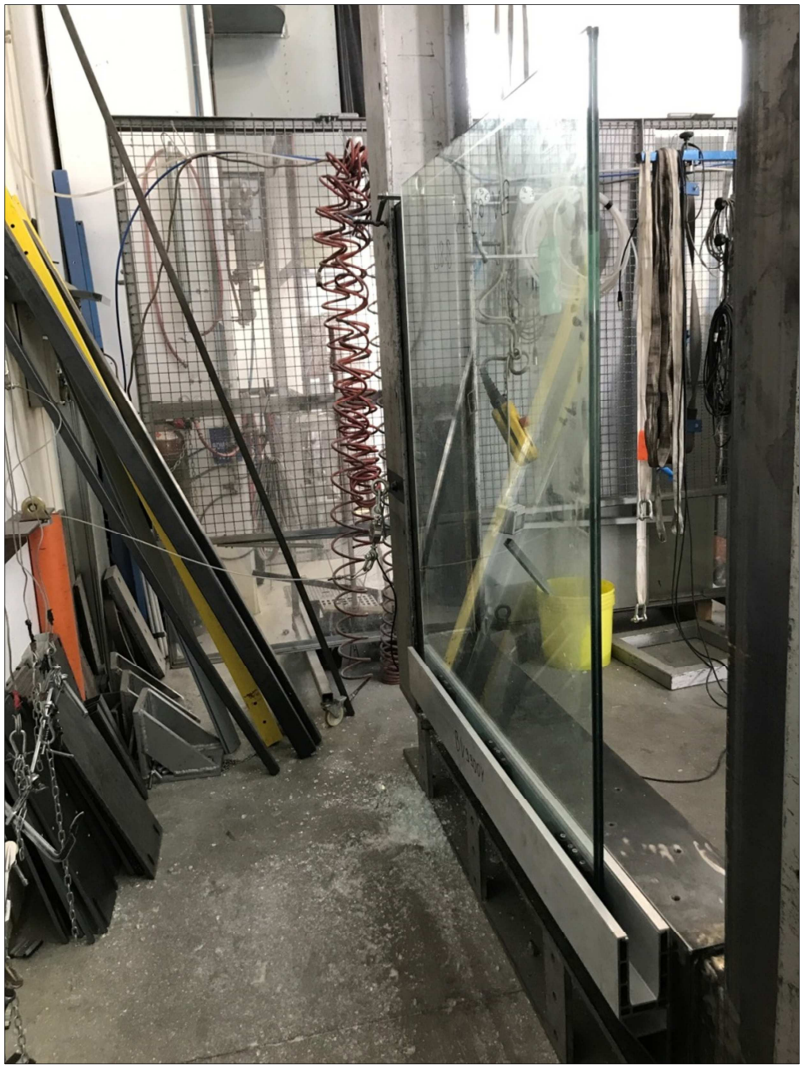
Overall width	1000 mm
Overall height from floor	1146 mm
Glass type	laminated glass 88.4 (tempered + 1,52 PVB + tempered)
Dimensions of glass	1000 mm × 1250 mm
Nominal thickness of glass	17,52 mm
Nominal section of aluminum profile	82 mm × 229 mm

Further details of item specifications can be seen in customer-supplied schematic drawing shown below.

CROSS SECTION SUPPLIED BY THE CUSTOMER



(*) according to that stated by the customer; Istituto Giordano declines all responsibility for the information and data provided by the customer that may influence the results.



Photograph of the item

Normative references

Standard	Title
UNI 10806:1999	Ringhiere, balaustre o parapetti prefabbricati - Determinazione della resistenza meccanica ai carichi statici distribuiti *(Prefabricated railing systems - Determination of the mechanical strength under distributed static loads)*
UNI 10807:1999	Ringhiere, balaustre o parapetti prefabbricati - Determinazione della resistenza meccanica ai carichi dinamici *(Prefabricated railing systems - Determination of the mechanical strength under dynamic load)*
NF P01-013:1988	Essais des garde-corps - Méthodes et critères *(Railing tests - Methods and criteria)*
UNI EN 14019:2016	Facciate continue - Resistenza all'urto - Requisiti prestazionali *(Curtain walling - Impact resistance - Performance requirements)*

Apparatus

Description	In-house identification code
steel frame simulating actual installation of the item on the floor	EDI048
pneumatic equipment for the simulation of the static load	//
3 Gefran digital displacement transducers "PZ-34-S150", range of measurement 0-150 mm	FT451/1, FT451/2, FT451/3
AEP Transducers load cell "TS" with digital indicator "DFI", range of measurement 100-1000 N	EDI104
Borletti digital electronic gauge "CDEP15", range of measurement 0-150 mm and resolution 0,01 mm	EDI066
Mitutoyo Corporation digital meter "TD-S551D1 216-452", range of measurement 0-5,5 m	FT364
steel frame simulating actual installation of the item on the floor	EDI048
soft body consisting of spheroconical bag, diameter 0,40 m and height 0,60 m, filled with hardened glass beads, diameter 3 mm, until reaching a total mass of 50 kg	EDI062
Istituto Giordano double pneumatic impactor complying with standard UNI EN 12600:2004 "Vetro per edilizia - Prova del pendolo - Metodo della prova di impatto e classificazione per il vetro piano" *("Glass in building - Pendulum test - Impact test method and classification for flat glass")*, total mass 50 kg	EDI012
Würth telescopic measuring rod "mEssfix", range of measurement 0-5000 mm and resolution 0,1 mm	EDI083

Method

Test was carried out using detailed internal procedure PP083 in its current revision at testing date.
The bottom side of the item was side fixed to the steel frame simulating the actual installation of the item.

Procedure

Normative reference	Activity	Description/parameters
UNI 10806:1999	resistance to horizontal linear static load	The three digital displacement transducers were positioned on the item in order to read the relative displacement of the upper edge of the glazing, two at the ends and one in the middle between them. In particular it has been carried out the following test sequence: – pre-load equal to 50 % of the load defined by the customer; – removal of the preload and detection of the initial position of the edge of the plate; – application of the load in a progressive manner with a time ≥5 s, with deformations under load recording after 15 min; – load removal and registration of residual deformation after 5 min.
UNI 10807:1999	resistance to dynamic load	All impacts were made by releasing the impactors so that they fall from a specified height with a pendulum movement and without initial velocity. The impactors were hung by an inextensible pendulum wire of negligible mass so that when at rest they made contact with the point of intended impact. After each impact, the impactors were prevented from hitting the item again after bouncing.
NF P01-013:1988		
UNI EN 14019:2016		

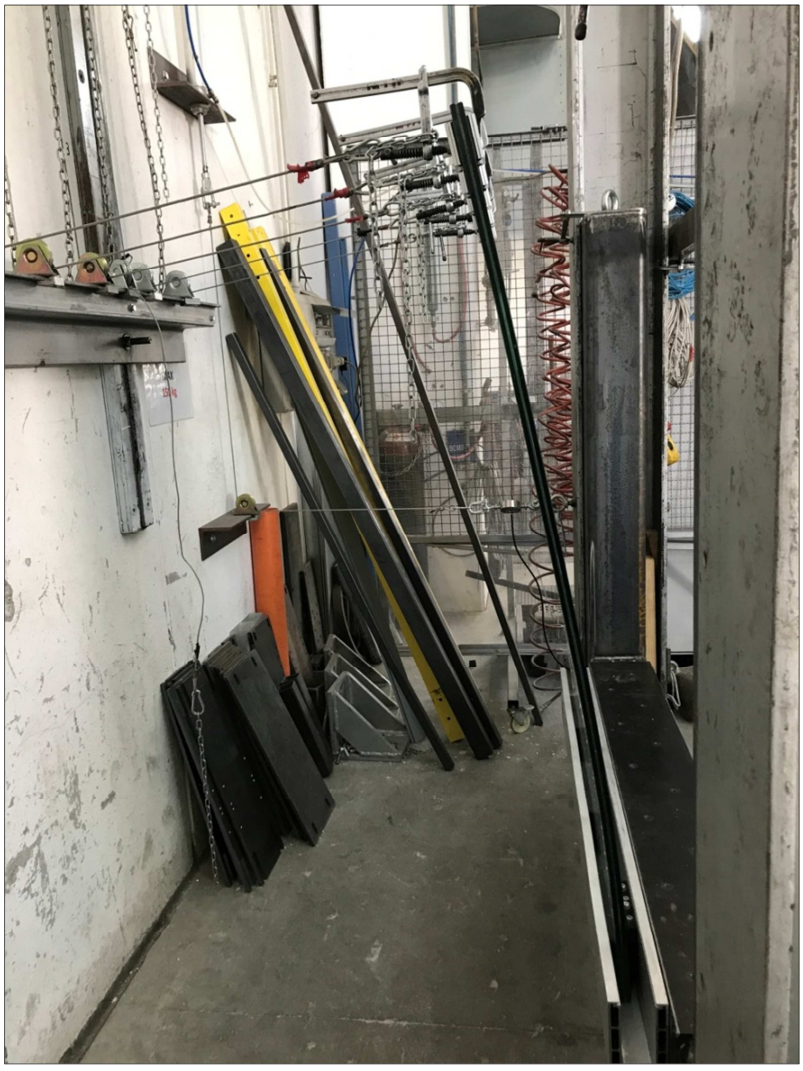
Environmental conditions

Temperature	(20 ± 2) °C
Relative humidity	(60 ± 5) %

Results

Resistance to horizontal linear static load

Applied load	Deflection whilst loaded at the point of measure			Permanent deflection at the point of measure			Result
	A	B	C	A	B	C	
[kN/m]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
3,0	290	288	295	35	36	38	no damage



Photograph of the item undergoing horizontal linear static load

Resistance to dynamic load

Standard	Impact area	Drop height [mm]	Nominal energy [J]	Result
UNI 10807:1999	centre of glazing	300	150	no damage
	border of glazing			
NF P01-013:1988	centre of glazing	1200	600	no damage
	border of glazing			
UNI EN 14019:2016	centre of infill	950	466	no damage
	border of glazing			

Photograph of the item after impact on the border of the glazing according to standard NF P01-013:1988

Photograph of the item after impact on the centre of the glazing according to standard UNI EN 14019:2016

Findings

Test	Normative reference	Requirement	Result*
horizontal linear static load	UNI 10807:1999	3,0 kN/m	**compliant**
dynamic load	UNI 10807:1999	300 mm	**compliant**
	NF P01-013:1988	1200 mm	**compliant**
	UNI EN 14019:2016	950 mm	**compliant**

(*) the compliance has been determined on the basis of values obtained by measurements during testing in line with clause 4.2.1 "Decision Rules" of ILAC-G8:09/2019 "Guidelines on Decision Rules and Statements of Conformity", having satisfied the requirements on measurements and equipment defined in the reference normative.

Chief Test Technician
(Dott. Andrea Bruschi)

Head of
Security and Safety Laboratory
(Dott. Andrea Bruschi)