

**TEST REPORT No. 370576**

Customer

**GÜRSAN ALUMINIUM Ltd. Co.**

Akçaburgaz Mahallesi Alkop Sanayi Sitesi B-7 - Blok No.15-16 - 34522 ESENYURT - İstanbul - Turkey

Item\*

**railing named****“ALURAIL FLORA CROCUS 8030 TOP WITH PICKETS”**

Activity

**horizontal linear static loading in accordance with  
standard UNI 10806:1999 and DM Infrastrutture  
17 January 2018, and 50 kg soft body dynamic loading in  
accordance with standard NF P01-013:1988**

Results

Activity	Normative reference	Requirement	Result
horizontal linear static load	DM Infrastrutture 17 January 2018	2,0 kN/m	<b>compliant</b>
dynamic load	NF P01-013:1988	589 J	<b>compliant</b>

(\*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 24 March 2020

Chief Executive Officer

Order:  
82978

Item origin:

sampled and supplied by the customer

Identification of item received:

2020/0418/F dated 19 February 2020

Activity date

27 February 2020

Activity site:

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

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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:

Dott. Andrea Bruschi

Head of Security and Safety Laboratory:

Dott. Andrea Bruschi

Compiler: Dott. Marina Bonito

Reviewer: Dott. Andrea Bruschi

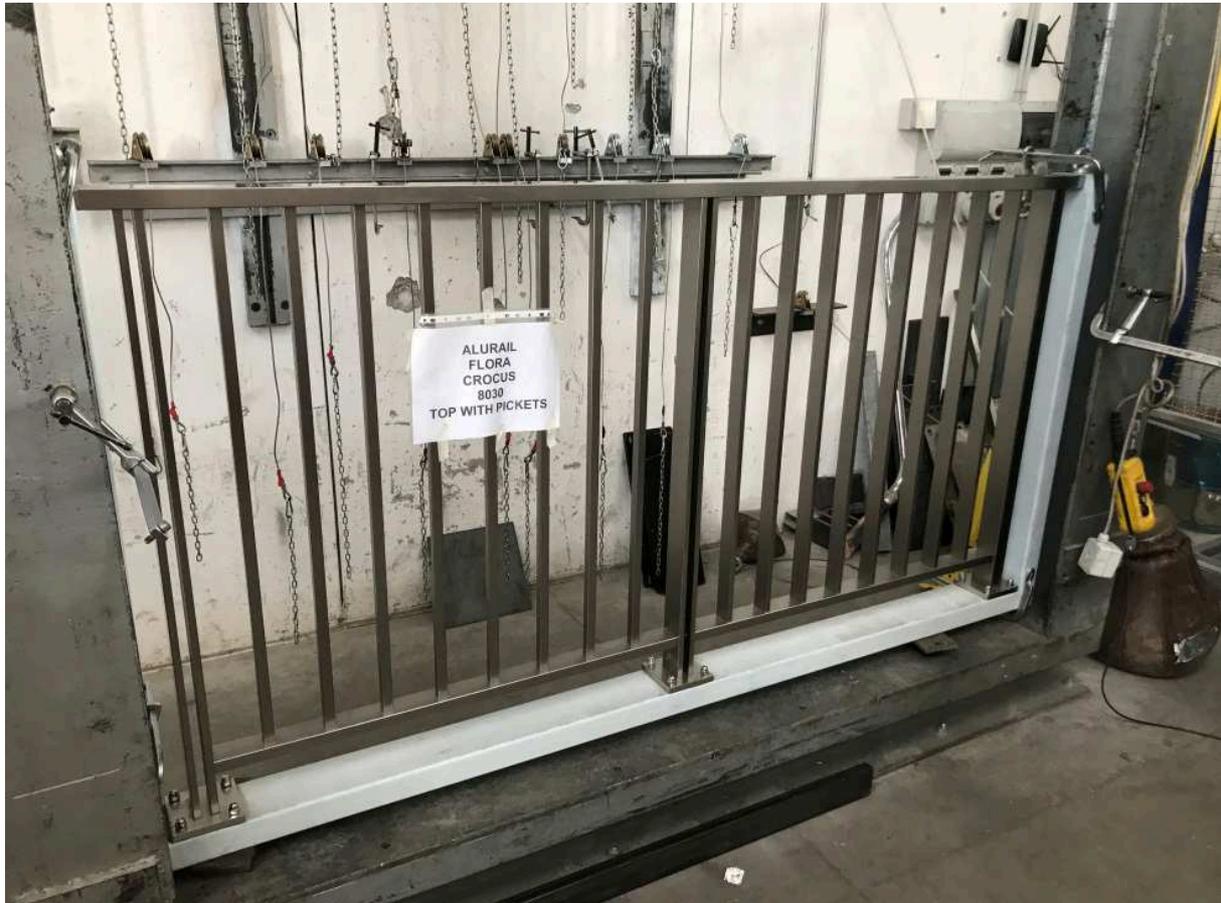
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**Description of item\***

The item under evaluation consists of a aluminum railing, having the characteristics shown in the following table.

<b>Width</b>	2139 mm
<b>Height from floor level</b>	1100 mm

Further details of item specifications can be seen in customer-supplied schematic drawing in annex "A".



**Item photograph**

**Normative references**

<b>Document/standard</b>	<b>Title</b>
DM Infrastrutture dated 17 January 2018	Aggiornamento delle "Norme tecniche per le costruzioni" ( <i>Update of "Technical standards for construction"</i> )
UNI 10806:1999	Ringhiere, balaustre o parapetti prefabbricati - Determinazione della resistenza meccanica ai carichi statici distribuiti ( <i>Prefabricated railing systems - Determination of the mechanical strength under uniform static load</i> )
NF P01-013:1988	Essais des garde-corps. Méthodes et critères ( <i>Railings test. Methods and criteria</i> )

(\*) 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.

## Apparatus

Description	In-house identification code
test rig simulating the actual mounting of the item on the floor slab	EDI048
3 GEFRAN "PZ-34-S150" linear displacement transducers, measuring range 0-150 mm	FT451/1, FT451/2 and FT451/3
AEP Transducers "TS" load cell and DFI (digital force indicator), range 100-1000 N	EDI104
BORLETTI "CDEP15" digital calliper gauge, range 0-150 mm and resolution 0,01 mm	EDI066
MITUTOYO CORPORATION "TD-S551D1 216-452" digital tape measure, full scale 5,5 m	FT364
LA CROSSE TECHNOLOGY "WS8009" digital thermo-hygrometer	EDI111
ISTITUTO GIORDANO sphero-conical bag, diameter 400 mm and height 600 mm, filled with hardened solid glass spheres, diameter 3 mm, total mass 50 kg	EDI062
WÜRTH "mEssfix" telescopic measuring rod with range of up to 5 m and resolution 0,1 mm	EDI083

## Method

Just the underside of the item was fixed to the test rig in order to reproduce actual installation conditions.

## Procedure

Normative reference	Activity	Description
UNI 10806:1999 and table 3.1.II D.M. Infrastrutture 17 January 2018	uniformly-distributed horizontal linear static load	<p>It was applied the method specified by standard UNI 10806:1999, although using the load values in table 3.1.II of D.M. Infrastrutture 17 January 2018</p> <p>Three linear displacement transducers were positioned on the item in order to measure the relative displacement of the handrail, two at the ends of the item and one at the midpoint between them, with the following procedure:</p> <ul style="list-style-type: none"> <li>– a preload of 50 % of the specified test load was gradually applied horizontally towards the outside and maintained for 5;</li> <li>– preload removal and linear displacement transducer reset</li> <li>– a gradually increasing load was applied for a period of not less than 5 s until reaching the test load and then maintained for at least 15 min</li> <li>– measurement of deflection whilst loaded and gradual removal of the whole load</li> <li>– measurement of residual deformation after a waiting of at least 5 min</li> </ul>
NF P01-013:1988	dynamic load	<p>The impact was made by releasing the impactor so that it would fall from a specified height with a pendulum movement and without initial velocity.</p> <p>The impactor has been suspended by an inextensible cable, of negligible mass, in such a way that in the resting position it would come into contact with the intended point of impact. After the impact, the impactor was prevented from hitting back the object after bouncing.</p>

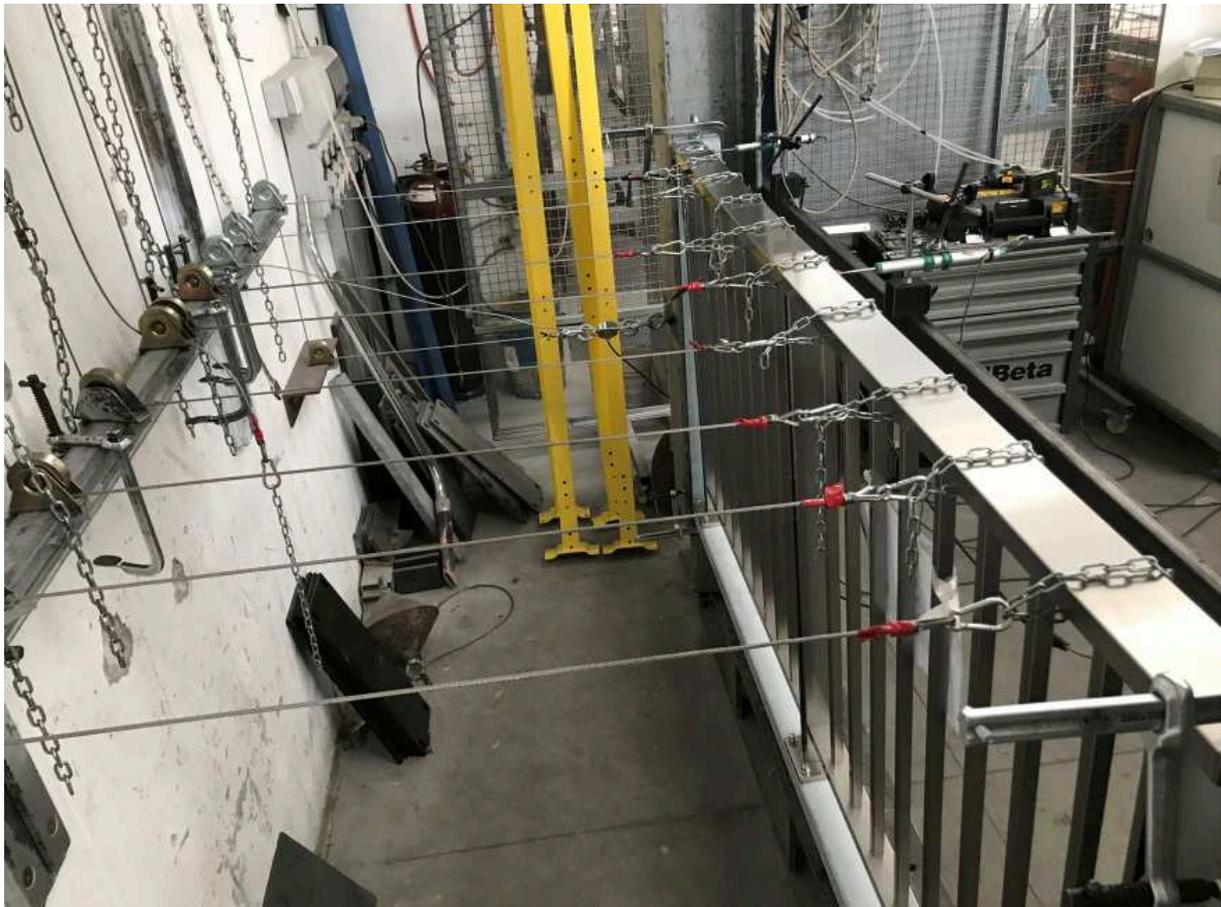
### Environmental conditions

Atmospheric pressure	(1010 ± 5) mbar
Temperature	(16 ± 2) °C
Relative humidity	(45 ± 5) %

### Results

#### Horizontal linear static loading

Applied load per unit area [kN/m]	Deflection under load at the measure point			Residual deformation at the measure point			Effect
	A [mm]	B [mm]	C [mm]	A [mm]	B [mm]	C [mm]	
2,0	34	38	31	1	1	1	no damage impairing item functionality



Photograph of the item subjected to linear static loading

### Resistance to dynamic impact

Impact area	Drop height [m]	Energy [J]	Result
infilling centre	1,2	589	slight deformation not impairing item functionality*

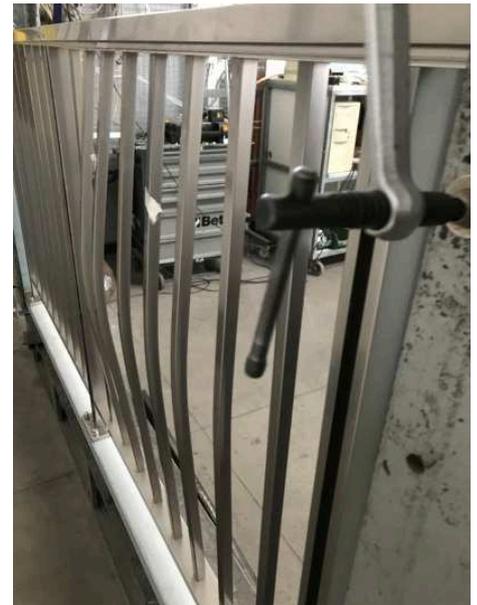
(\*) No falling fragments that could cause personal injury were found below.

No gaps were formed between the bars of sufficient size to allow the passage of the gauge specified in figure 7 of standard NF P01-013:1988.

No sample performance loss compared to design specifications was witnessed.



Item photographs after the impact



Deformation detail

### Findings

Activity	Normative reference	Requirement	Result*
horizontal linear static load	DM Infrastrutture 17 January 2018	2,0 kN/m	<b>compliant</b>
dynamic load	NF P01-013:1988	589 J	<b>compliant</b>

(\*) compliance with normative requirements determined on the basis of values obtained by measurement, in line with clause 2.6 of ILAC-G8:03/2009 "Guidelines on the Reporting of Compliance with Specification", having met the requirements specified in the reference standards regarding measurements and equipment.

Chief Test Technician  
(Dott. Andrea Bruschi)

*Andrea Bruschi*

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

*Andrea Bruschi*

**ANNEX "A"**  
**TO TEST REPORT No. 370576**

Customer

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**Akçaburgaz Mahallesi Alkop Sanayi Sitesi B-7 - Blok No.15-16 - 34522 ESENYURT - İstanbul - Turkey**

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**railing named**

**"ALURAIL FLORA CROCUS 8030 TOP WITH PICKETS"**

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**technical documentation**

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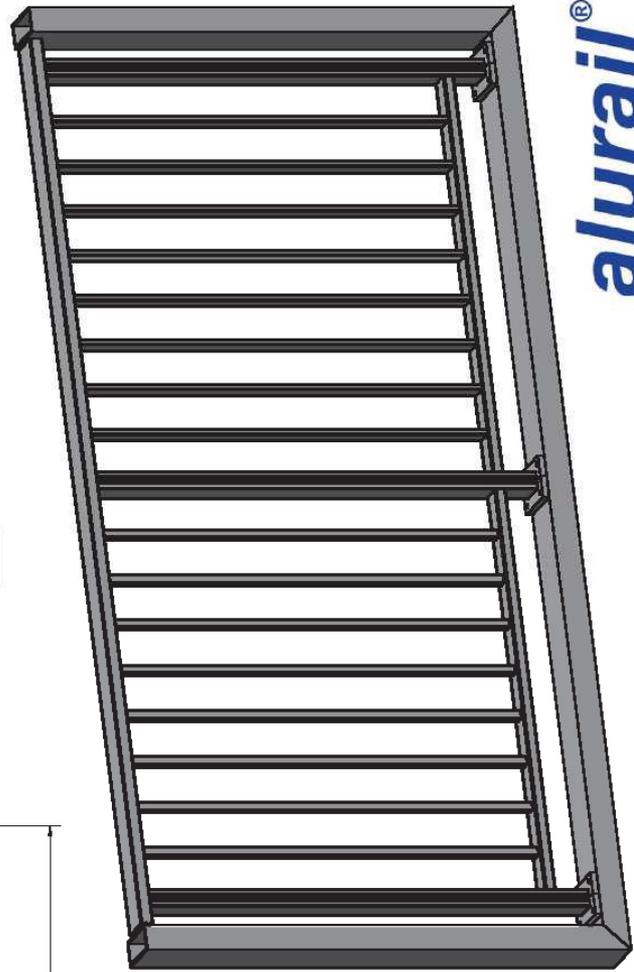
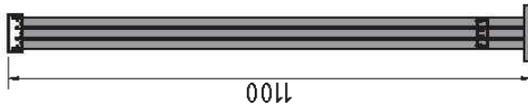
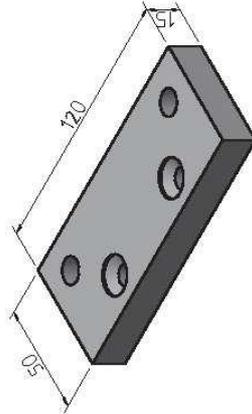
(\*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 24 March 2020

This annex consists of 2 pages.

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ALURAIL FLORA  
CROCUS 8030  
TOP WITH PICKETS



**alurail**<sup>®</sup>  
KORKULUK SISTEMLERİ / RAILING SYSTEMS

