

TEST REPORT No. 370572

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 LOTUS 8015 TOP”**

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 | compliant |
| dynamic load | NF P01-013:1988 | 589 J | compliant |

(*) 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/C dated 19 February 2020

Activity date

26 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.

| | |
|--------------------------------|---------|
| Width | 2015 mm |
| Height from floor level | 1100 mm |

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



Item photograph

Normative references

| Document/standard | Title |
|---|---|
| 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 GEFRA "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"> – a preload of 50 % of the specified test load was gradually applied horizontally towards the outside and maintained for 5; – preload removal and linear displacement transducer reset – 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 – measurement of deflection whilst loaded and gradual removal of the whole load – measurement of residual deformation after a waiting of at least 5 min |
| 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 | (18 ± 2) °C |
| Relative humidity | (55 ± 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 | 42 | 47 | 45 | 1 | 1 | 2 | no damage impairing item functionality |



Photograph of the item before horizontal linear static loading

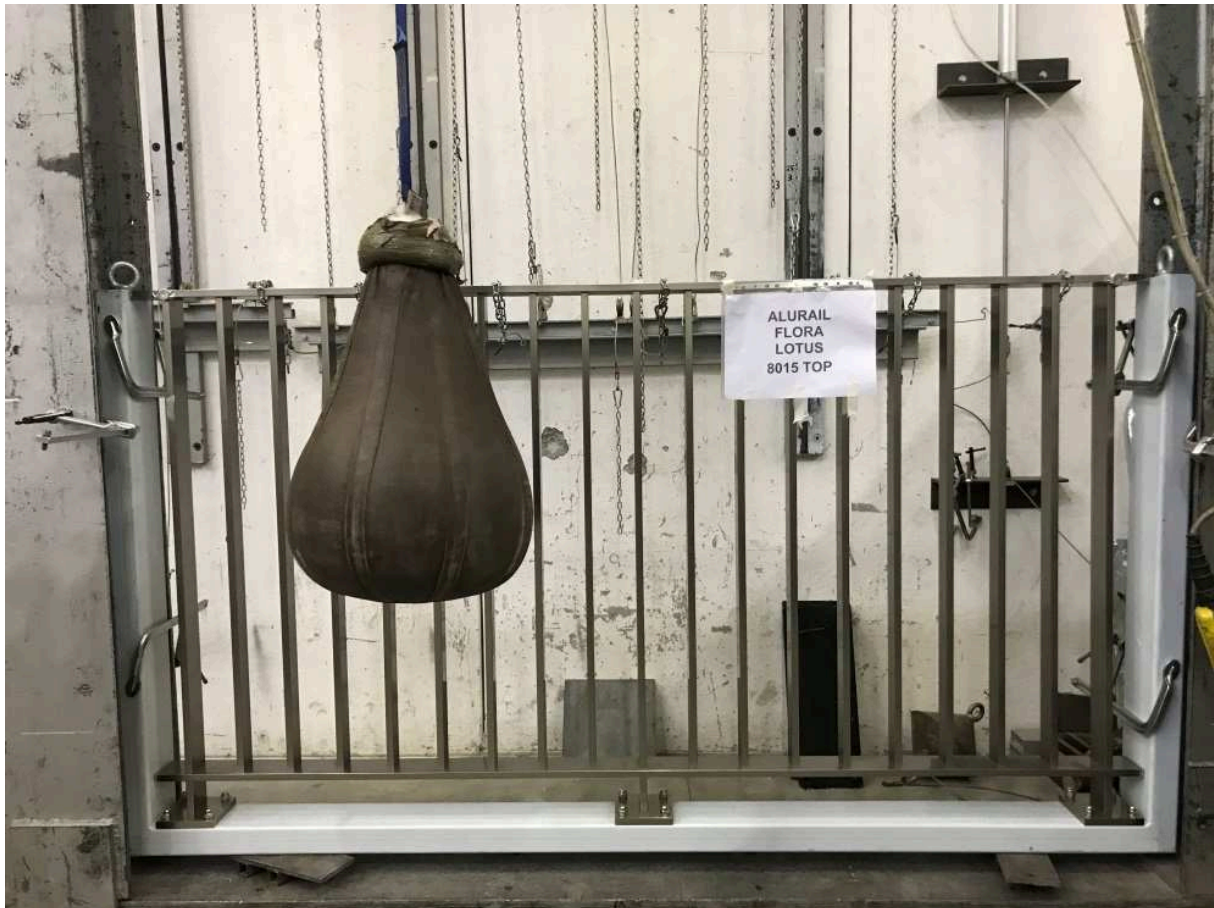
Resistance to dynamic impact

| Impact area | Drop height [m] | Energy [J] | Result |
|------------------|--------------------|---------------|------------|
| infilling centre | 1,2 | 589 | 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 P01-013:1988.

No sample performance loss compared to design specifications was witnessed.



Item photograph after the impact

Findings

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

(*) 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 Technicain
(Dott. Andrea Bruschi)

Andrea Bruschi

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

Andrea Bruschi

ANNEX "A"
TO TEST REPORT No. 370572

Customer

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"ALURAIL FLORA LOTUS 8015 TOP"

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technical documentation

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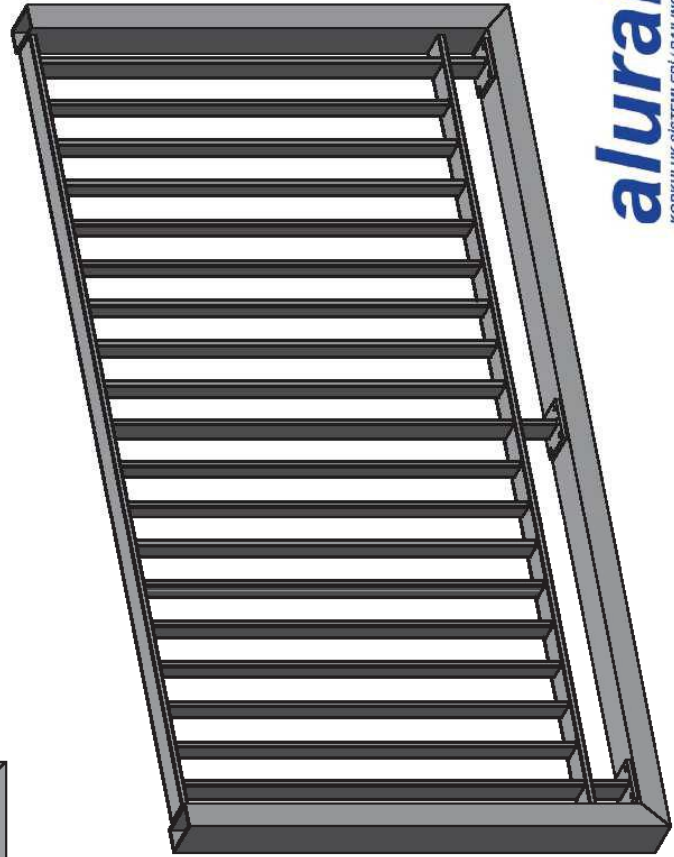
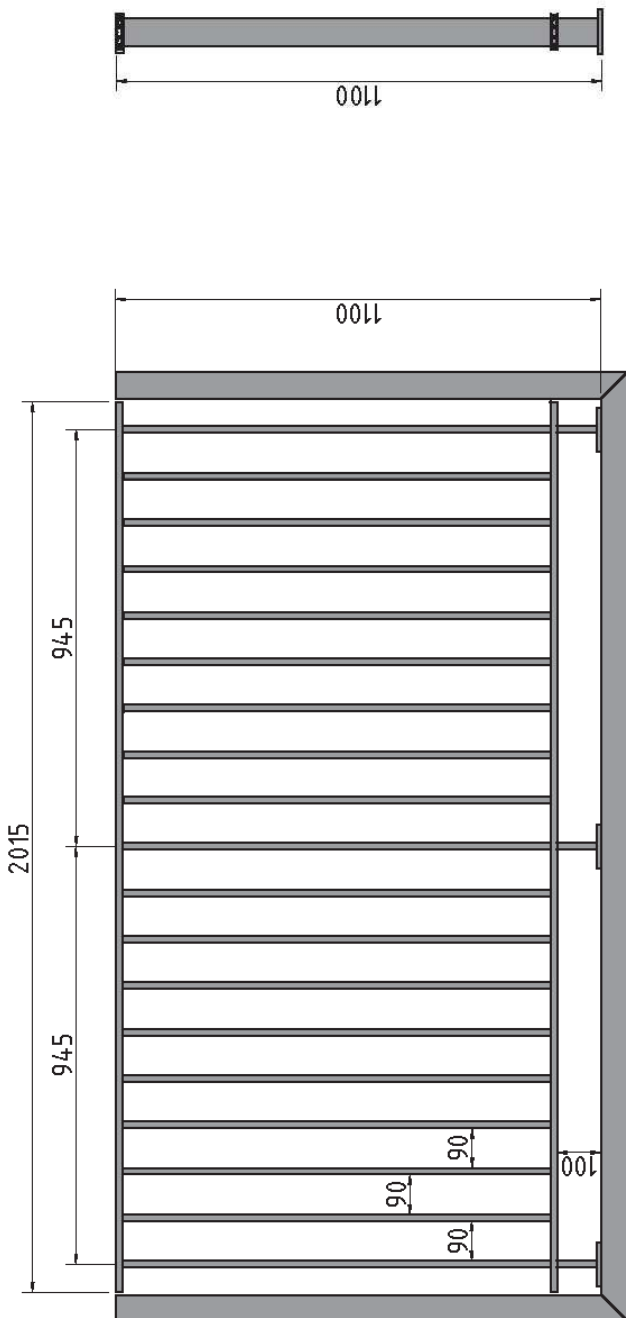
(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 24 March 2020

This annex consists of 2 pages.

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ALURAIL FLORA
LOTUS 8015 TOP



alurail[®]
KORKULUK SISTEMLERİ / RAILING SYSTEMS

