

## NF P01-013 Testing Report

Report Number KNFP010132103  
Revision Number -

Issue Date 26.03.2021  
Revision Date -

**Customer** : KOZZA RAILING SYSTEMS

**Report Number** : KNFP010132103

**Name and definition of the sample** : KE 100 -Railing

**Manufacturer** : BESAN METAL İNŞ. TAAH. SAN. VE DIŞ TIC. LTD STI.  
Ziya Gökalp.A-1 Blok, Bıksan Sanayi Sitesi 25-28,34490 İkitelli  
OSB/BAŞAKŞEHİR/İSTANBUL

**Production Date** : 2021

**Test Date** : 25.03.2021 – 26.03.2021

**Procedure** : NF P01-013:1998-08 Railings tests - Determination Of The  
Mechanical Strength Under Distributed Static Loads and  
Determination Of The Mechanical Strength Under Dynamic Loads

Testing and / or measurement results, the expanded measurement uncertainty (in case of) an integral part of this certificate and the test methods given in the following pages. Test results can only belong to the given samples.



Date

31.03.2021

Responsible Person

Emrullah YANMAZ

Approved by

Fecri TEKEŞ

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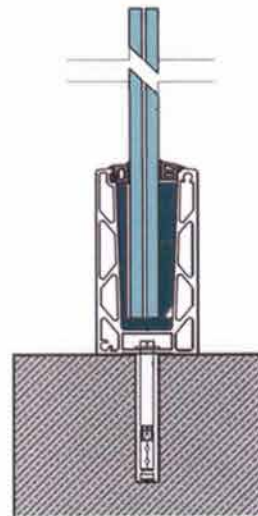
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### Sample Description

The railing system consists of the parts listed below.  
Total length:1000mm  
Height:1200mm

| MODEL – KE 100 |   |  |          |
|----------------|---|--|----------|
| NO             | DESCRIPTION OF GOODS                                | RAW MATERIALS  | Quantity |
| 1              | 10+1,52+10 mm GLASS                                 | 10+1.52+10 GRINDING + LAMINATED GLASS (1200 Height x 1000 Width x 21.52 Thickness) | 2        |
| 2              | 8+1,52+8 mm GLASS                                   | 8+1.52+8 GRINDING + LAMINATED GLASS (1200 Height x 1000 Width x 17.52 Thickness)   | 2        |
| 3              | 6+1,52+6 mm GLASS                                   | 6+1.52+6 GRINDING + LAMINATED GLASS (1200 Height x 1000 Width x 13.52 Thickness)   | 2        |
| 4              | KE 100 Balustrade Profile (1 Meter)                 | Aluminum 6063 T6   | 6        |
| 5              | M10 Anchors   | Total of 3 anchors for 1 meter with an interval of 300mm                           | 18       |
| 6              | Green Installation Plastics for 10+1,52+10 mm Glass | ABS HI121H Plastik mechanism to ensure the perpendicularity of glass.              | 8        |
| 7              | Blue Installation Plastics for 8+1,52+8 mm Glass    | ABS HI121H Plastik mechanism to ensure the perpendicularity of glass.              | 8        |
| 8              | Red Installation Plastics for 6+1,52+6 mm Glass     | ABS HI121H Plastik mechanism to ensure the perpendicularity of glass.              | 8        |
| 11             | Compression and outside rubber                      | Total of 2 pieces (each one has a length of 1 meter) for each profile.             | 12       |

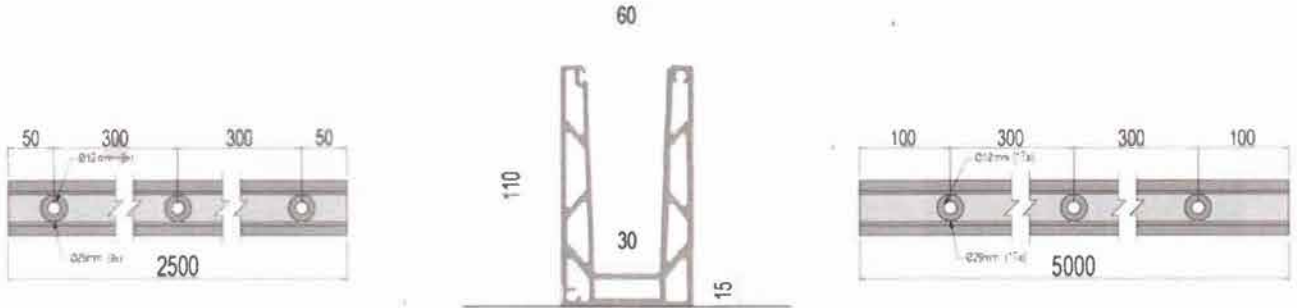
### Sample schematic drawing of the product



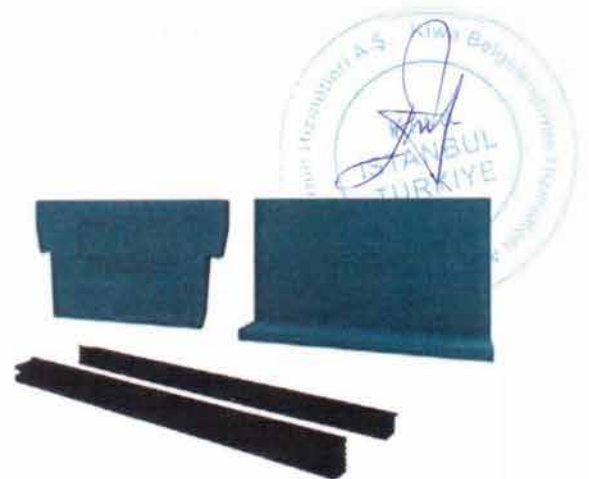
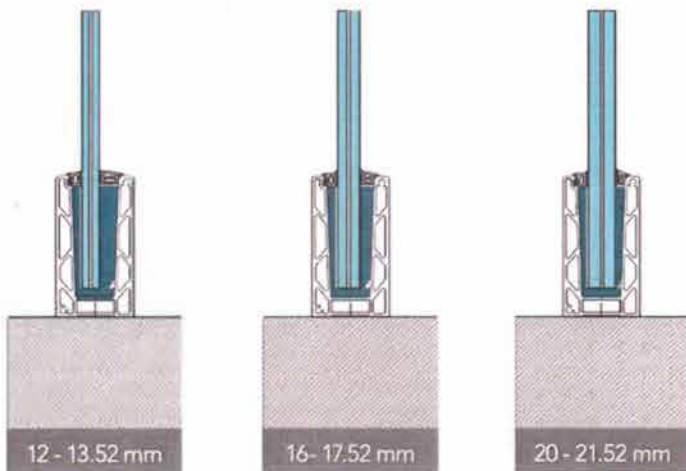
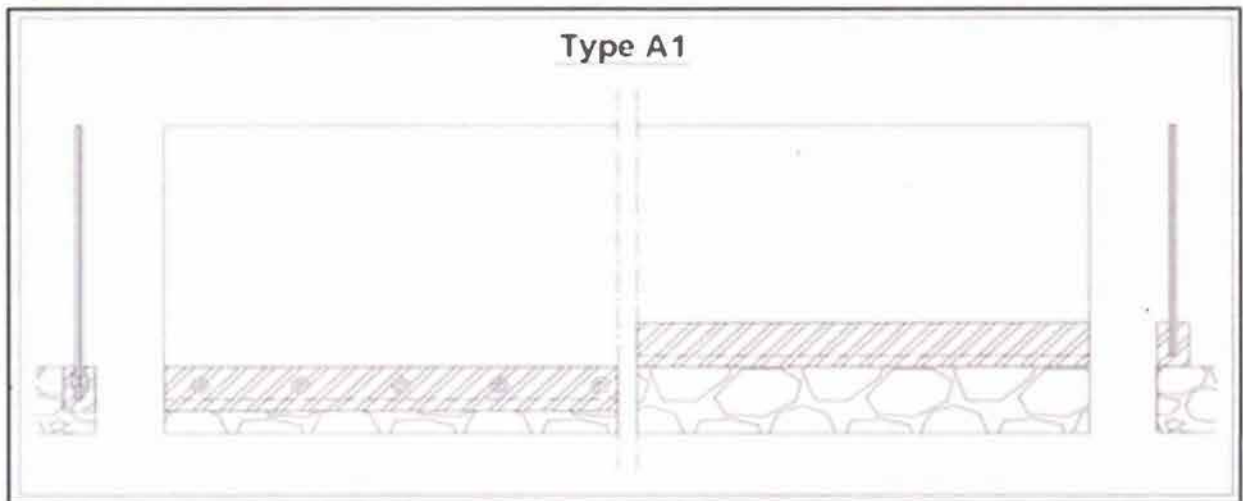
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KE 100 Balustrade profile were tested for three glass thicknesses (13.52mm, 17.52mm and 21.52mm)



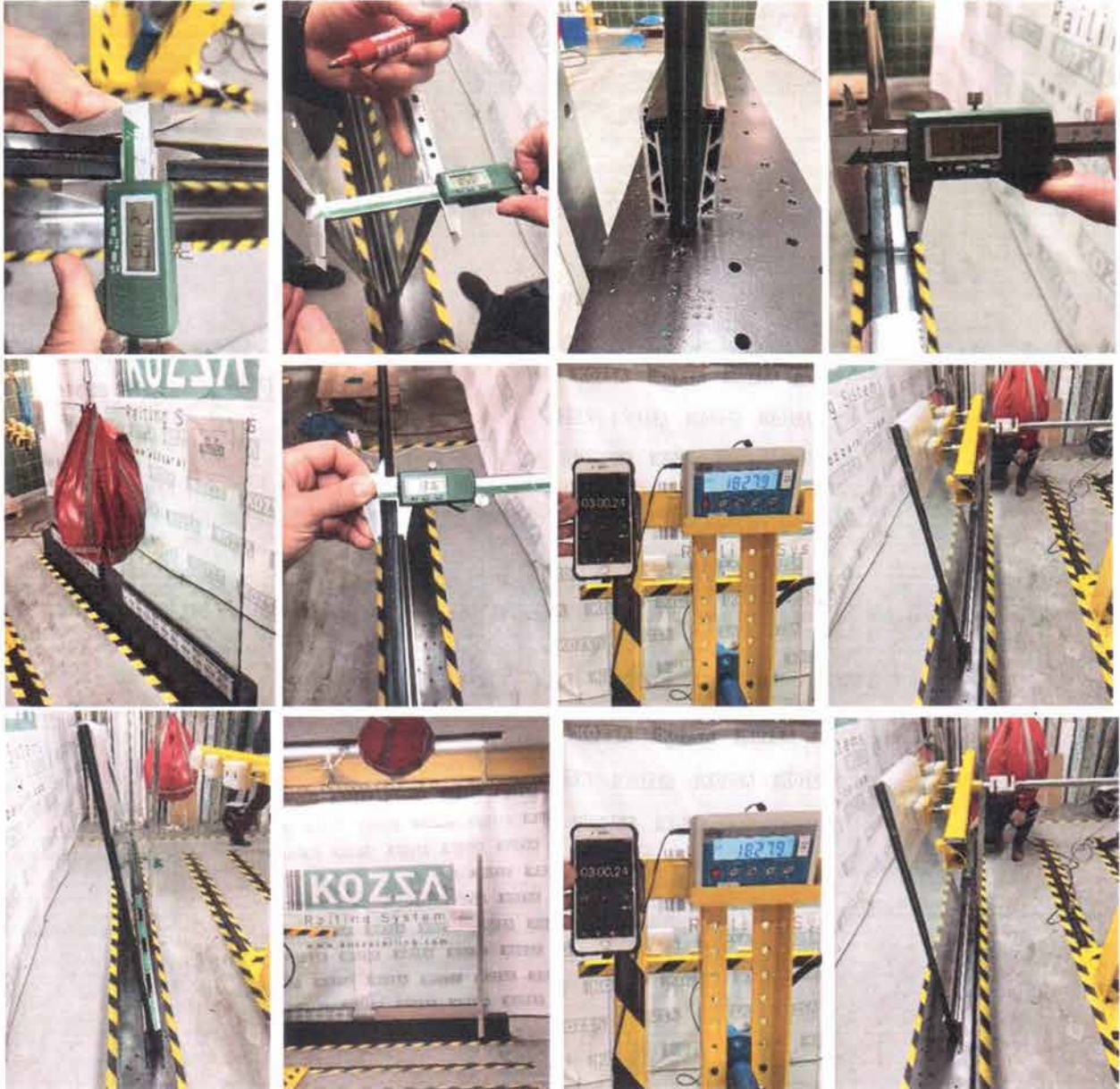


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### Test Photos



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### Test Equipments

| Equipment       | Serial Number        | Certificate No    | Traceability |
|-----------------|----------------------|-------------------|--------------|
| Fixing unit     | Besan Test Ünitesi   | -                 | BESAN        |
| Load cell       | Radwag / 457379      | -                 | -            |
| Digital Caliper | Insize / X1203202332 | 20104141-10/02-21 | AB-0214-K    |
| Meter           | Fisko / 20           | 20104142-10/02-21 | AB-0214-K    |
| Thermometer     | Life Net / HTC-2     | 20104143-10/02-21 | AB-0214-K    |

### Determination Of The Mechanical Strength Under Distributed Static Loads Test method

According to NF P01-013:1998-08 standard, the product is mounted on 2 places on the flat surface to test according to the actual usage area of the product. Reference points for product relocatability have been set. A load unit was prepared to apply a horizontal load to the product at 20 cm intervals 3 points.

The intended use of the product is for public buildings;

As a step 1, 1700N/m load was applied to the product for 3 minutes as a preload. We observed changes in the product.

As a second step 2400N/m load was applied to the product. We observed changes in the product.

Verification of maximum permanent set "a" after removal of safety load using the following equation:

$$a = \frac{8 \cdot X}{1000}$$

where: X= height of sample for fixing point;

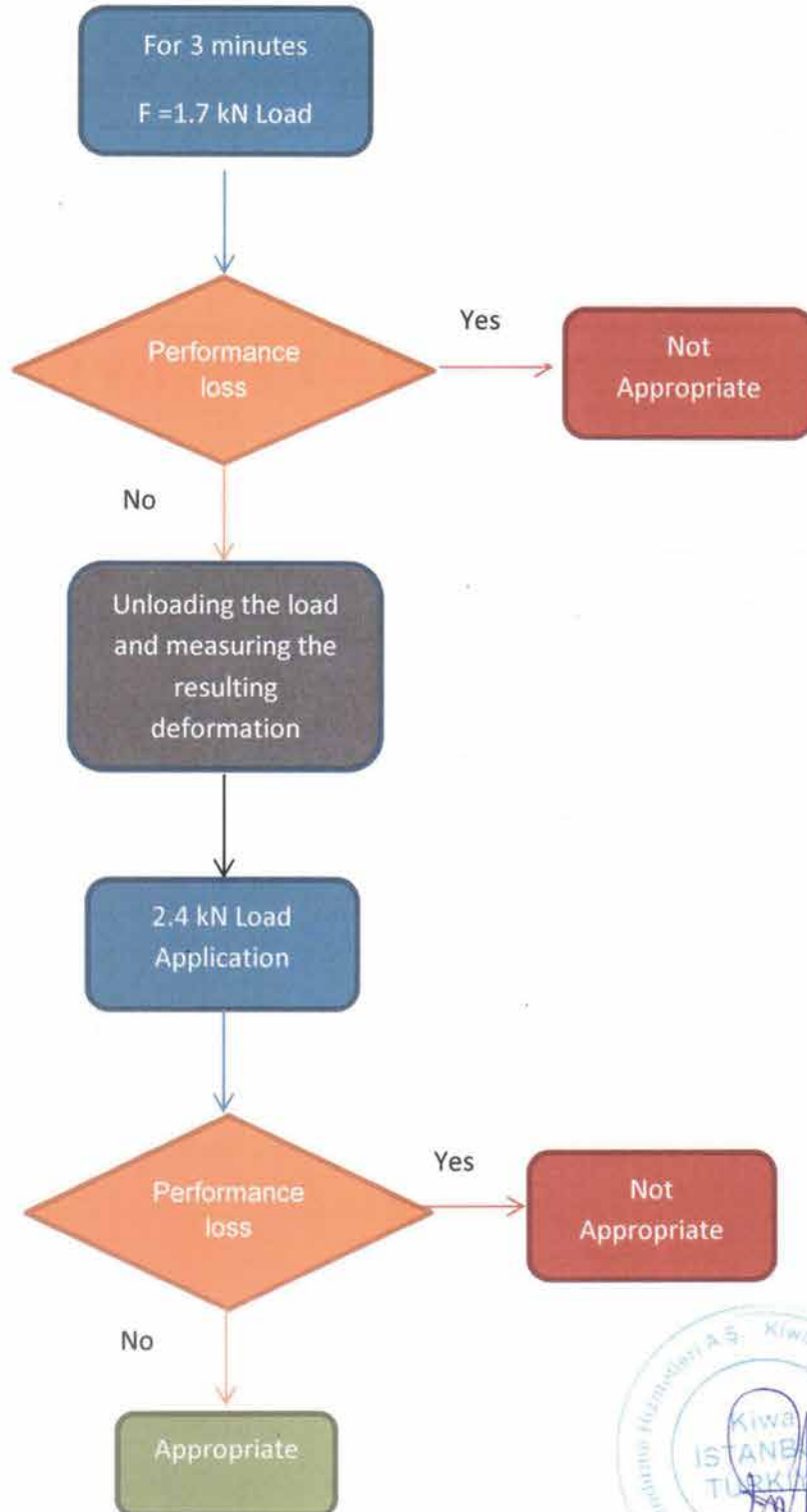


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## Test Flow Chart





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| Classes | Special For Usage Areas                            | Pe Load   |
|---------|--|-----------|
| A       | Housing, apartment                                 | 0,6 kN/ml |
| B       | Offices  | 0,6 kN/ml |
| C1      | Meeting place equipped with tables                 | 0,6 kN/ml |
| C2      | Meeting place with fixed seats                     | 1,0 kN/ml |
| C3      | Barrier-free meeting place                         | 1,0 kN/ml |
| C4      | Meeting place that allows sportive activities      | 1,0 kN/ml |
| C5      | Meeting place that accepts large numbers of crowds | 3,0 kN/ml |
| D       | Commercial   | 1,0 kN/ml |

### Environmental conditions during the test.

|                     |             |
|---------------------|-------------|
| Ambient temperature | (17 ± 4) °C |
| Relative humidity   | (22 ± 5) %  |

### Test Results

| Load type  | Load amount | Standby time | Glass thickness(mm) | Deformation amount of glass(mm) | Result (1) |           |
|------------|-------------|--------------|---------------------|---------------------------------|------------|-----------|
| Full load  | 2400N/m     | -            | 21,52               | -                               | 4          | Compliant |
|            | 2400N/m     | -            | 17,52               | -                               | 4          | Compliant |
|            | 2400N/m     | -            | 13,52               | -                               | 4          | Compliant |
| Front load | 1700N/m     | 3 dk/min     | 21,52               | 67,4                            | 4          | Compliant |
|            | 1700N/m     | 3 dk/min     | 17,52               | 17,48                           | 4          | Compliant |
|            | 1700N/m     | 3 dk/min     | 13,52               | 139,69                          | 4          | Compliant |
| Max Load.  | 2400N/m     | -            | 21,52               | -                               | 4          | Compliant |
|            | 2469,6N/m   | -            | 17,52               | -                               | 4          | Compliant |
|            | 2125,9N/m   | -            | 13,52               | -                               | 4          | Compliant |

#### (1) Result:

- 1) The loss of performance in the product is appropriate
- 2) Performance loss in the product Not suitable
- 3) Broken glass has been observed.
- 4) It has been observed that there is no breakage in the glass



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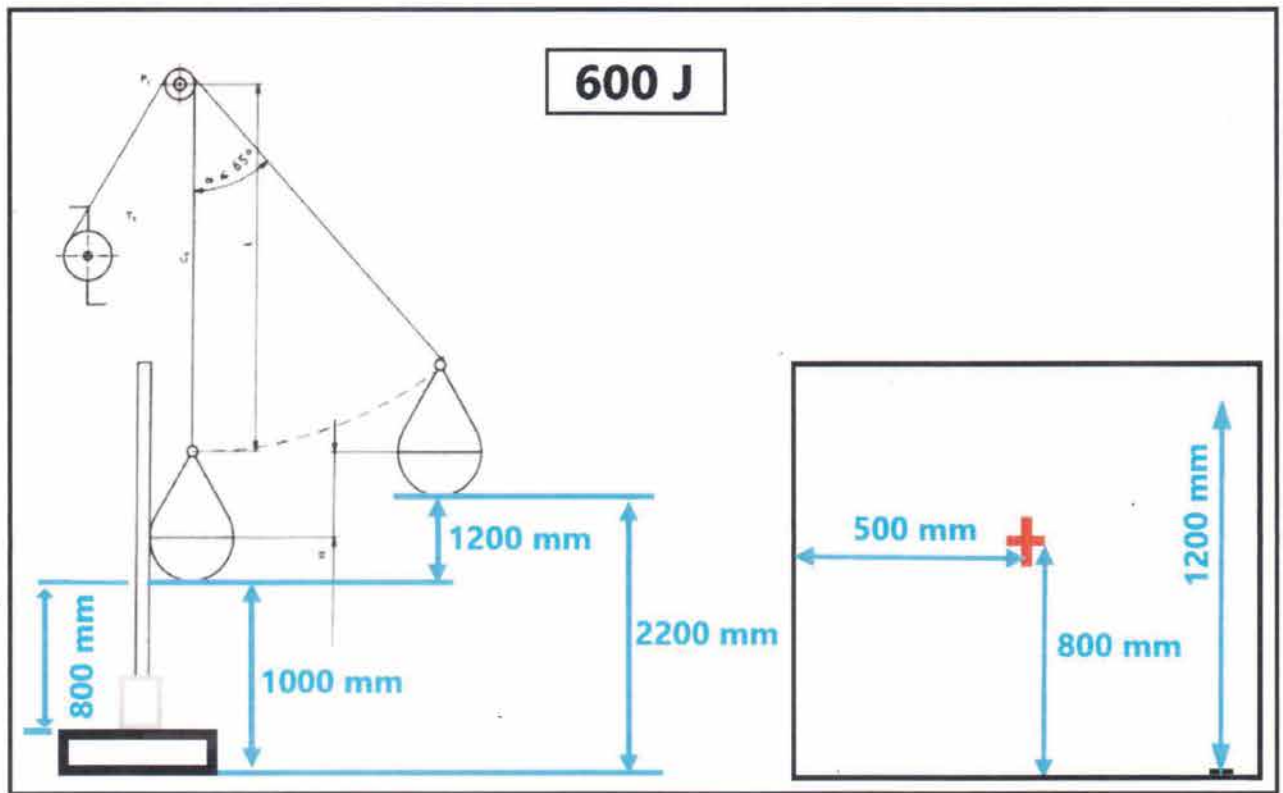
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### Determination Of The Mechanical Strength Under Dynamic Loads Test method

According to NF P01-013:1998-08 standard, the product is mounted on 2 places on the flat surface to test according to the actual usage area of the product. Reference points for product relocatability have been set.

The field of use is publicly determined product;

The product was released from the height of 1200 mm, with a diameter of 40 cm and a weight of 50 kg, filled with glass balls with a diameter of 3 mm, and the resulting changes in the resultant impact were observed.





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### Environmental conditions during the test.

|                     |             |
|---------------------|-------------|
| Ambient temperature | (11 ± 4) °C |
| Relative humidity   | (43 ± 5) %  |

### Test Results

| Impact area | Drop height | Glass thickness(mm) | Energy | Deformation amount of glass(mm) | Result (1) |           |
|-------------|-------------|---------------------|--------|---------------------------------|------------|-----------|
| Midpoint    | 1200mm      | 21,52               | 600J   | 73,74 mm                        | 4          | Compliant |
|             | 1200mm      | 17,52               | 600J   | 36,39                           | 4          | Compliant |
|             | 1200mm      | 13,52               | 600J   | 78,82                           | 4          | Compliant |

#### (1) Result:

- 1) The loss of performance in the product is appropriate
- 2) Performance loss in the product Not suitable
- 3) Broken glass has been observed.
- 4) It has been observed that there is no breakage in the glass

| Test                                | Use    | Result    |
|-------------------------------------|--------|-----------|
| Dynamic impact with 50 kg soft body | Public | Compliant |

The tests on the above referenced products are performed in the established test rigs of KOZZA RAILING SYSTEMS who are in the address of Ziya Gökalp.A-1 Blok, Bıksan Sanayi Sitesi 25-28,34490 İkitelli OSB / Başakşehir / İstanbul / Türkiye by assembling the products on these test rigs.

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