

1. Introduction

This report describes tests conducted at the test site of Q-railing Europe GmbH & Co.KG on Q-Line posts without handrail from Q-railing's catalogue, assembled as shown in this report.

The tests were done according to one or more of the following standards:

	Country	Standards
1	United Kingdom	BS-EN-1990, 1991, 1993, 1999, BSI 6180
2	Netherlands	NEN-EN-1990, 1991, 1993, 1999, NEN 2680
3	Germany	DIN- EN-1990, 1991, 1993, 1999, DIN 18008
4	Italy	UNI 10806: 1999/ UNI 10807:1999
5	Spain	CTE DB SE-AE, UNE 85-238-91 dynamic loads
6	Poland	PL-EN-1990, 1991, 1993, 1999
7	Denmark	DS-EN 1991-1-1 DK NA:2011
8	Austria	ÖNORM EN B 1991-1-1/ ÖNORM B 3716-3
9	Belgium	B03-004-2015- NBN S 23-002
10	France	NF-EN-1990, 1991, 1993, 1999 EN-10204/ NF P 01-013
11	Portugal	prNP004491_2009
12	Norway	NS-EN-1991-1-1:2002+NA:2008

2. Test arrangement

A barrier specimen was mounted on to a steel structure with a test rig from steel with sufficient strength to withstand loads applied to it.

The load was applied to the top of the glass at 1.1m design height.

Loads were measured with a load cell.

Digital clocks were used to measure the deflection of the barrier from its neutral position.

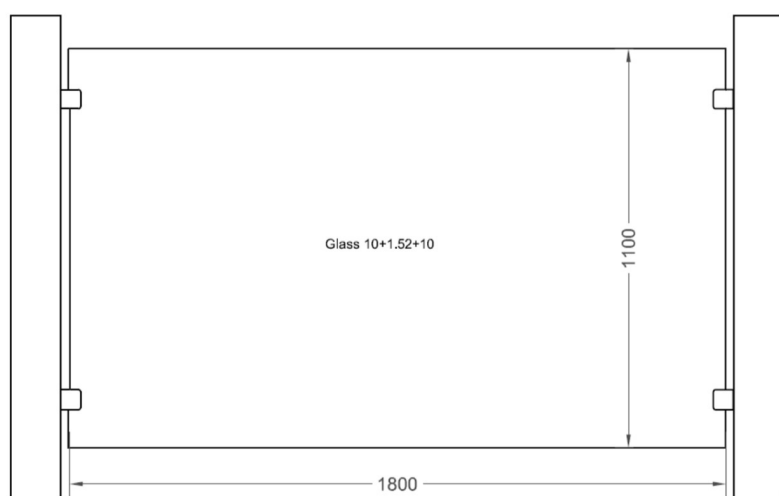
3. Materials

Hardware Description	art. number
a. Glass clamps: Mod 23	14.2322.000.12
b. Anchoring: M8 bolts	
c. Glass description	
- 21.52 x 1800 x 1100 laminated toughened glass.	
- 21.52 x 2500 x 1100 laminated toughened glass.	
- 21.52 x 3000 x 1100 laminated toughened glass.	

4. Arrangement of test assembly

Test assembly:

The glass was secured by security pins or security plates. One of these options should be taken to secure the glass.



For 1800 mm span
21.52 x 1800 x 1100 laminated toughened glass



For 2500 mm span
21.52 x 2500 x 1100 laminated toughened glass



For 3000 mm span
21.52 x 3000 x 1100 laminated toughened glass

5. Test results

Horizontal line load vs. deflection in the glass.

sheet	Glass mm. t.	Glass Dim. mm. w x H	system Width mm	System height mm	Line Load kN/m											
					0,36	0,40	0,50	0,60	0,74	0,80	1,00	1,50	1,60	1,70	2,00	3,00
					deflection (mm)											
1	(10-1.52-10)	1800 x 1100	1800	1100	3,1	3,2	4,4	5,5	6,4	6,6	8,3	12,3	13,9	14,1	17,1	24,9
2	(10-1.52-10)	2500 x 1100	2500	1100	6,5	6,9	11,1	13,2	17,0	20,3	24,0	32,8	36,4	37,3	43,0	
3	(10-1.52-10)	3000x1100	3000	1100	13,3	16,2	20,5	22,6	30,2	34,9	40,0	62,7	68,4	74,0	85,4	

Dynamic impact test results.

sheet	Glass mm. t.	Glass Dim. mm. w x H	system Width mm	System height mm	Impact
					mm
					900
1	(10-1.52-10)	1800 x 1100	1800	1100	Passed
2	(10-1.52-10)	2500 x 1100	2500	1100	Passed
3	(10-1.52-10)	3000x1100	3000	1100	Passed

6. Comments

Line Load test:

- The loading was applied to the top of the glass on a height of 1.10m above finished floor level and the deflection was measured at the middle top of the glass.
- The results of this test cover also the 19-mm thick mono glass, because the effective thickness of 10-1.52-10 mm glass is around 16 mm which is less than the 19 mm.

7. General overview line load test



