NATIONAL TEST REPORT
(BS 6180 : 2011)

EASY GLASS® HYBRID
WALL CONNECTION

TESTED GLASS: 8 MM MONOLOTIC AND 8,76 MM LAMINATED GLASS

TOTAL RAILING HEIGHT 1.100 MM

TEST REPORT

Lucideon Reference:	151935 (QT36365/1/SL)/Ref. 1/Supp1
Project Title:	Testing in Accordance with BS 6180:2011 Barriers in and About Buildings of Easy Glass Hybrid Wall Connector System
Client:	Q-railing Europe GmbH & Co.KG Marie-Curie-Strasse 8-14 Emmerich am Rhein D-46446 Germany
For the Attention of:	Mr Samuel Hanna
Author(s):	Miss Lisa Cobden
Report Date:	03 July, 2015
Purchase Order No.:	N/A
Work Location:	Lucideon UK

This report supersedes the report issued on 27.05.15.

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LSC/LMP/N15TRE12
03.07.15

1 INTRODUCTION

Lucideon were commissioned by the client, Q-railing Europe GmbH and Co KG, to carry out load testing in accordance with BS 6180:2011 Barriers in and about buildings, to allow their balustrade system to be classified for use in accordance with the Code of Practice included within the standard.

The testing was carried out at Q-railing Europe GmbH and Co KG's facilities at 8-14 Marie-Curie Straße 46446 Emmerich am Rhein Germany.

This report summarises the test results obtained during the test programme and does not provide interpretation of those results.

2 TEST SAMPLES

The wall and infill system tested was designated as Easy Glass Hybrid – Wall Connection System. The system incorporated two wall cap flanges and two cap rails of differing dimensions. The components incorporated within the systems were as follows:

Lower Channel MOD 6919
Wall Flange – 33 mm x 39 mm MOD 6505
Wall Flange – 65 mm x 40 mm MOD 6505
Cap Rail – 33 mm x 39 mm MOD 6920
Cap Rail – 65 mm x 40 mm MOD 6920.

The system is shown in the Figures 1-4 contained in the Appendix.

3 TEST PROGRAMME

A horizontal line load was applied to the system with the span between walls set at the following distances:

- Wall Mount Incorporating 33 mm x 39 mm Cap Rail
    - 1.6 m span between walls.
    - 1.8 m span between walls.
    - 2.2 m span between walls.
- Wall Mount Incorporating 65 mm x 40 mm Cap Rail
    - 1.8 m span between walls.
    - 2.0 m span between walls.
    - 2.5 m span between walls.

4 TEST METHOD

The channel was bolted to the top of a concrete block at 500 mm centres, with the block fixed to the floor of the test facility. Two restraining arms acted as the walls of the system with the wall cap flanges fixed to the arms.

An 8.76 mm laminated glass panel of appropriate length was fitted into the channel using an inlay and rubber seals. A cap rail was placed over the glass panel and fitted into the wall flange. (Fixing details for the systems are shown in Figures 1-2 contained in the Appendix).

A horizontal imposed line load was applied to the system at a height of 1.1 m above the datum level of the floor and the deflection measured at the top central point of the panel 1.1 m above the datum level of the floor. The load was applied via a hydraulic ram and measured using a calibrated load cell. Deflection was measured using a linear voltage displacement transducer (Plate 1 shows the general test set up).

5 RESULTS

The tests were carried out in accordance with the guidance given in BS 6180 Barriers in and about buildings – Code of Practice. The standard states that the maximum allowable deflection for a free standing glass protective barrier panel is 25 mm.

Table 2 of BS 6180 Barriers in and about buildings – Code of Practice categorises parapets, barriers and balustrades for areas of use depending on the loads they have achieved under testing.

The loads achieved by the Q-railing Europe GmbH and Co KG wall mount and infill system tested under horizontal imposed line load to the maximum deflection of 25 mm are given in Tables 1 and 2.

All figures quoted in the Tables contain no safety factors and are direct loads as achieved by the system under test conditions.

Tables 3 to 4 summarise the suitability of the tested systems in accordance with Table 2 of BS 6180:2011.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

Table 1 - Summary of Performance of Q-railing Europe GmbH and Co. KG Easy Glass Hybrid – Wall Connectors with 33 mm Cap Rail Tested under Horizontal Imposed Line Load

Cap Rail	Glass Span	Imposed Line Load at 25 mm Deflection (kN/m)	Working Line Load for System (kN/m)	Deflection at Working Line Load for System (mm)
33 mm x 39 mm Cap Rail	1.6 m	3.14	3.00	24.02
	1.8 m	1.68	1.50	22.95
	2.2 m	0.83	0.74	22.85

Table 2 - Summary of Performance of Q-railing Europe GmbH and Co. KG Easy Glass Hybrid – Wall Connectors with 65 mm Cap Rail Tested under Horizontal Imposed Line Load

Cap Rail	Glass Span	Imposed Line Load at 25 mm Deflection (kN/m)	Working Line Load for System (kN/m)	Deflection at Working Line Load for System (mm)
65 mm x 40 mm Cap Rail	1.8 m	3.13	3.00	23.91
	2.0 m	2.00	1.50	17.87
	2.5 m	0.89	0.74	21.02

Table 3 - Summary of Performance of Q-railing Europe GmbH and Co. KG Post and Infill System Tested under Point Loads

System	Description	Working Point Load for System (kN)	Deflection at Working Point Load for System (mm)
65 mm Cap Rail	500 mm span 8 mm Monolithic Glass	1.5	14.49
	900 mm span 8 mm Monolithic Glass	1.5	12.14
65 mm Cap Rail	500 mm span 8.76 mm Tempered Laminated Glass	1.5	15.13
	750 mm span 8.76 mm Tempered Laminated Glass	1.5	11.13
33 mm Cap Rail	500 mm span 8.76 mm Tempered Laminated Glass	1.5	16.57

Table 3 - Summary of Suitability of Q-railing Europe Systems in Accordance with Table 2 of BS 6180:2011

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Easy Glass Hybrid Wall Connectors 33 mm x 39 mm		
			1.6 m	1.8 m	2.2 m
Domestic and residential activities	(i) all areas within or serving exclusively one single family dwelling including stairs, landings, etc but excluding external balconies and edges of roofs	0.36	✓	✓	✓
	(ii) other residential, i.e. houses of multiple occupancy and balconies, including Juliette balconies and edges of roofs in single family dwellings	0.74	✓	✓	✓
Offices and work areas not included elsewhere, including storage areas	(iii) light access stairs and gangways not more than 600 mm wide	0.22	✓	✓	✓
	(iv) light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.36	✓	✓	✓
	(v) areas not susceptible to overcrowding in office and institutional buildings, also industrial and storage buildings except as given above	0.74	✓	✓	✓
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.50	✓	✓	X
Areas with tables or fixed seating	(vii) restaurants and bars	1.50	✓	✓	X
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) stairs, landings corridors ramps	0.74	✓	✓	✓
	(ix) external balconies including Juliette balconies and edges of roofs; footways and pavements within building cartilage adjacent to basement/sunken areas	0.74	✓	✓	✓

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Easy Glass Hybrid Wall Connectors 33 mm x 39 mm		
			1.6 m	1.8 m	2.2 m
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.50	✓	✓	X
	(xi) theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studios; footways or pavements greater than 3 m wide adjacent to sunken areas	3.00	✓	X	X
	(xii) grandstands and stadia	(Note 1)	-	-	-
Retail areas	(xiii) all retail areas including public areas of banks/building societies or betting shops	1.50	✓	✓	X
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	(Note 2)	X	X	X
	(xv) horizontal loads imposed by vehicles	(Note 2)	X	X	X

Table 4 - Summary of Suitability of Q-railing Europe Systems in Accordance with Table 2 of BS 6180:2011

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Easy Glass Hybrid Wall Connectors 65 mm x 40 mm		
			1.8 m	2.0 m	2.5 m
Domestic and residential activities	(i) all areas within or serving exclusively one single family dwelling including stairs, landings, etc but excluding external balconies and edges of roofs	0.36	✓	✓	✓
	(ii) other residential, i.e. houses of multiple occupancy and balconies, including Juliette balconies and edges of roofs in single family dwellings	0.74	✓	✓	✓

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Easy Glass Hybrid Wall Connectors 65 mm x 40 mm		
			1.8 m	2.0 m	2.5 m
Offices and work areas not included elsewhere, including storage areas	(iii) light access stairs and gangways not more than 600 mm wide	0.22	✓	✓	✓
	(iv) light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.36	✓	✓	✓
	(v) areas not susceptible to overcrowding in office and institutional buildings, also industrial and storage buildings except as given above	0.74	✓	✓	✓
Areas where people might congregate	(vi) areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.50	✓	✓	X
Areas with tables or fixed seating	(vii) restaurants and bars	1.50	✓	✓	X
Areas without obstacles for moving people and not susceptible to overcrowding	(viii) stairs, landings corridors ramps	0.74	✓	✓	✓
	(ix) external balconies including Juliette balconies and edges of roofs; footways and pavements within building cartilage adjacent to basement/sunken areas	0.74	✓	✓	✓
Areas susceptible to overcrowding	(x) footways or pavements less than 3 m wide adjacent to sunken areas	1.50	✓	✓	X
	(xi) theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studios; footways or pavements greater than 3 m wide adjacent to sunken areas	3.00	✓	X	X
	(xii) grandstands and stadia	(Note 1)	-	-	-
Retail areas	(xiii) all retail areas including public areas of banks/building societies or betting shops	1.50	✓	✓	X

Type of Occupancy for Part of the Building	Examples of Specific Use	Horizontal Uniformly Distributed Line Load (kN/m)	Easy Glass Hybrid Wall Connectors 65 mm x 40 mm		
			1.8 m	2.0 m	2.5 m
Vehicular	(xiv) pedestrian areas in car parks, including stairs, landings, ramps, edges of internal floors, footways, edges of roofs	(Note 2)	X	X	X
	(xv) horizontal loads imposed by vehicles	(Note 2)	X	X	X

Note 1 – See requirements of the appropriate certifying authority
Note 2 – Clause 8.1.1 of BS 6180:2011 states that "glass should not be used for vehicle protection barriers"

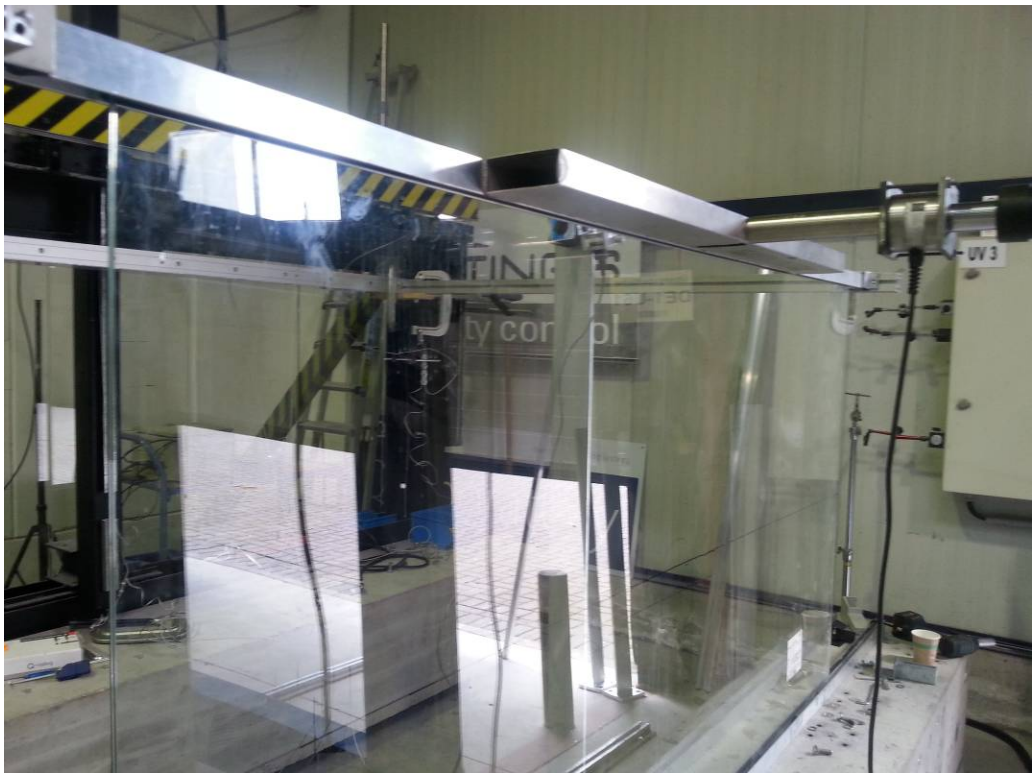
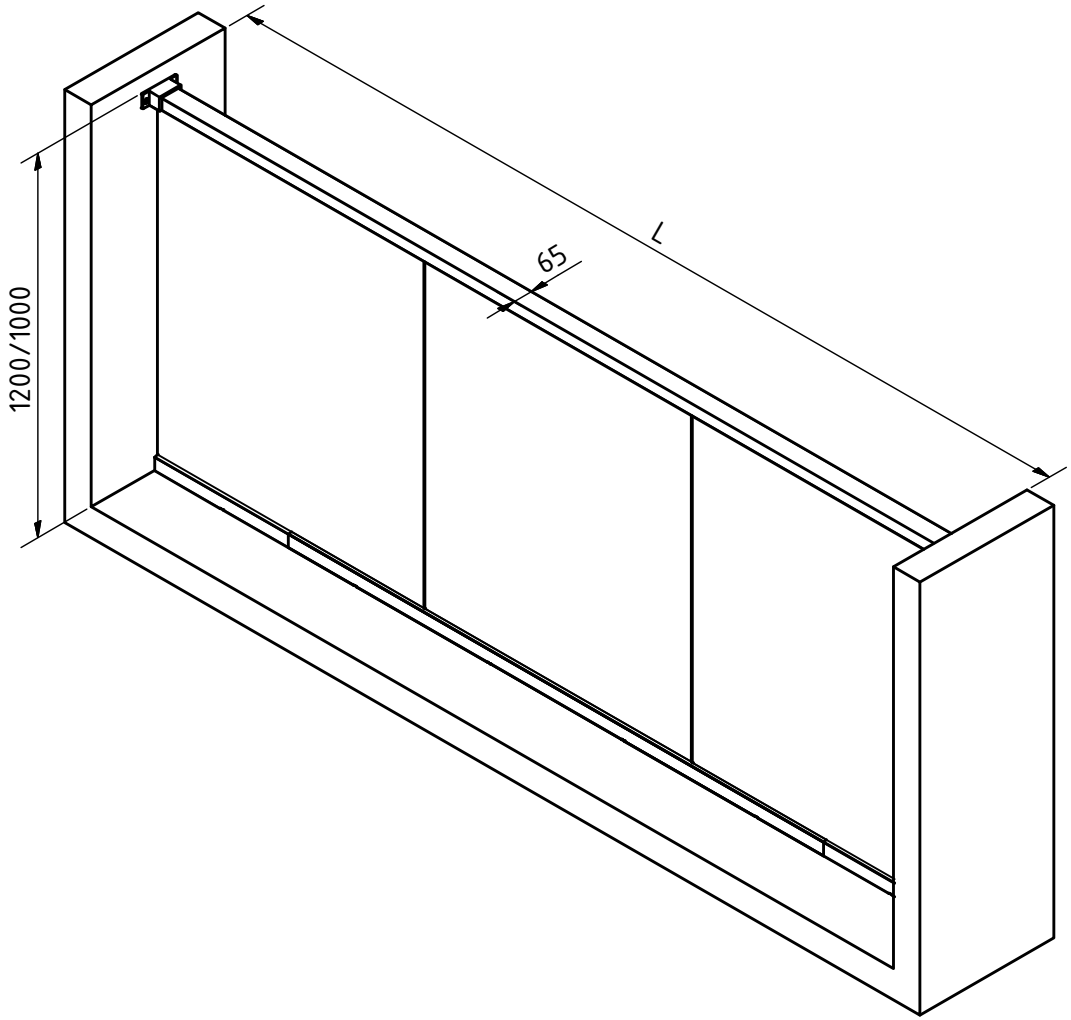
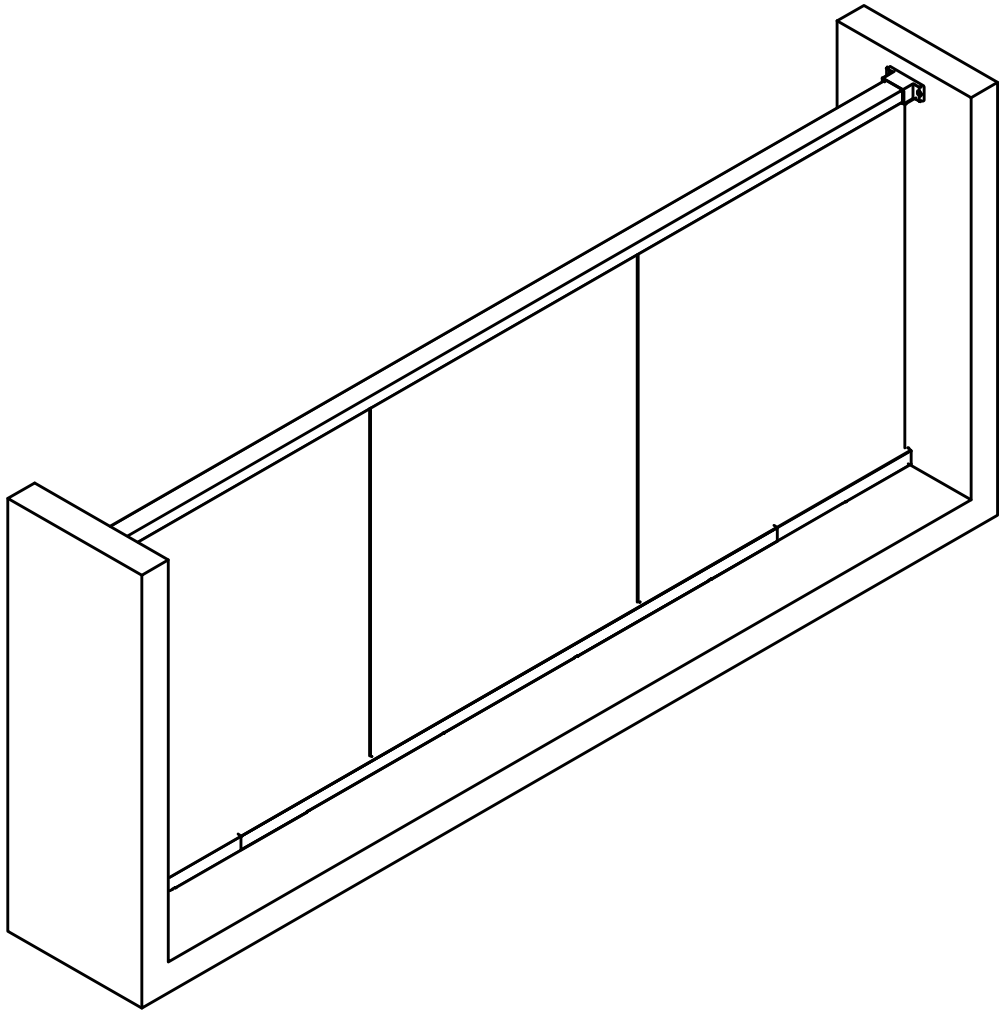


Plate 1 - Generic Test Arrangement Line Load

Plate 2 - Generic View of Easy Glass Hybrid Wall Connector System

Plate 3 - Generic View of Easy Glass Hybrid Wall Connector System





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	Date	Name
Drawn	10.12.2014	LKA
Checked		

General tolerance according

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Material:

Finish:

Product line:

Description: EG Hybrid wall connection, with 65mm caprail

Drawing no.:

Sheet: 1 / 2

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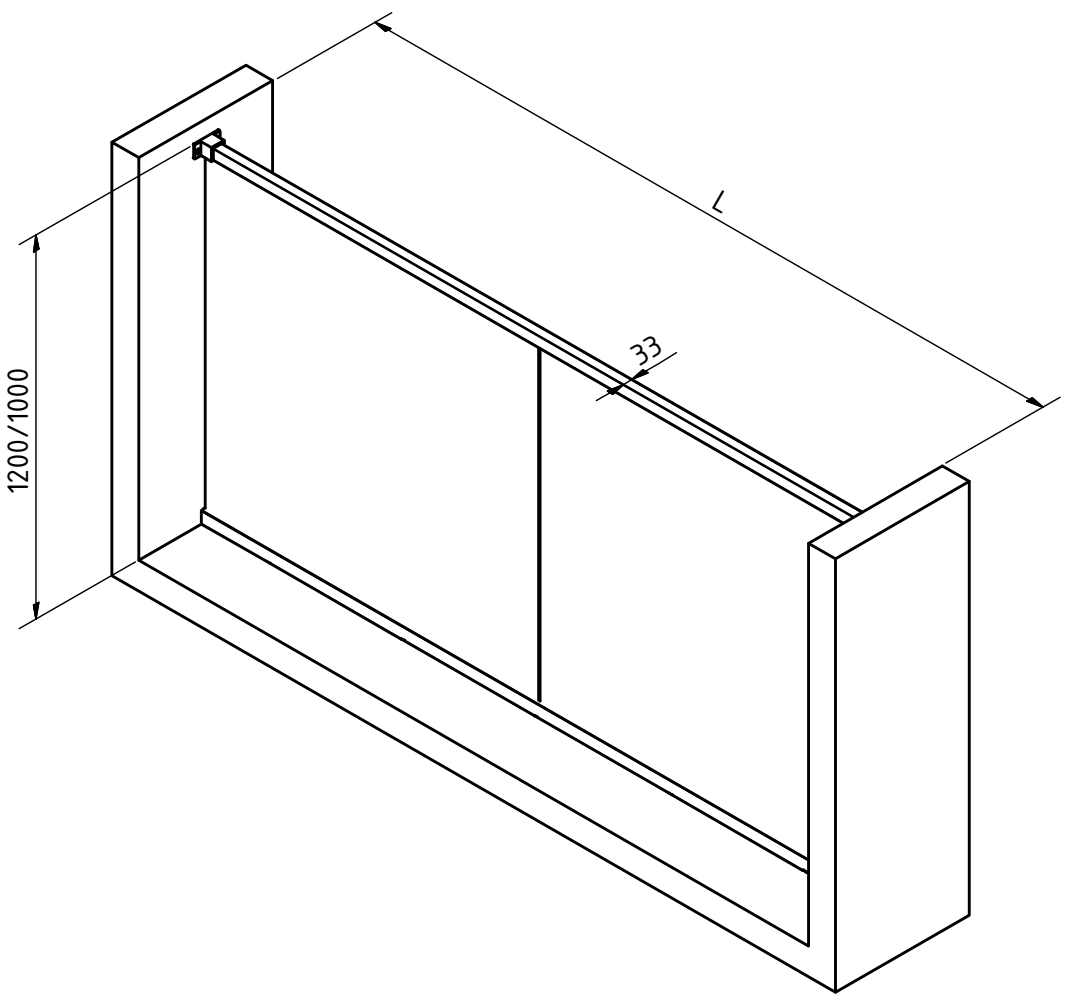

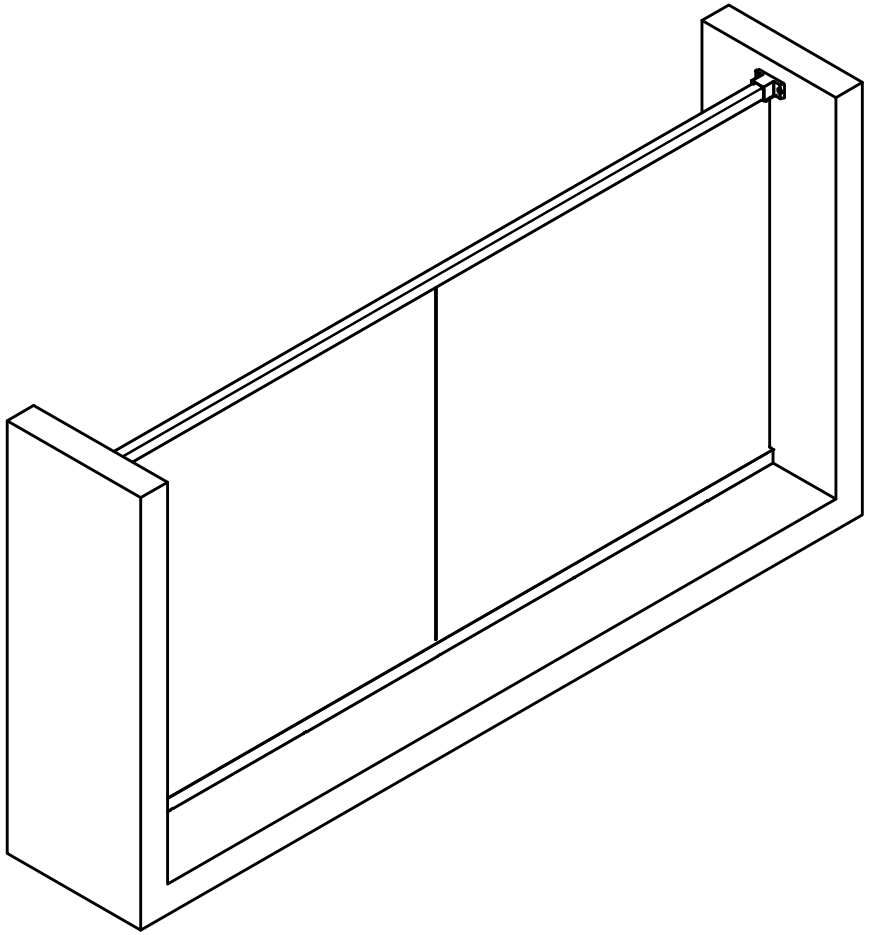

Q-railing

	Date	Name
Drawn	10.12.2014	LKA
Checked		

General tolerance according

Scale: 1 : 20 | Weight: N/A | Rev.No.: 0

Material:

Finish:

Product line:

Description: EG Hybrid wall connection- with 33mm caprail

Drawing no.:

Sheet: 2 / 2

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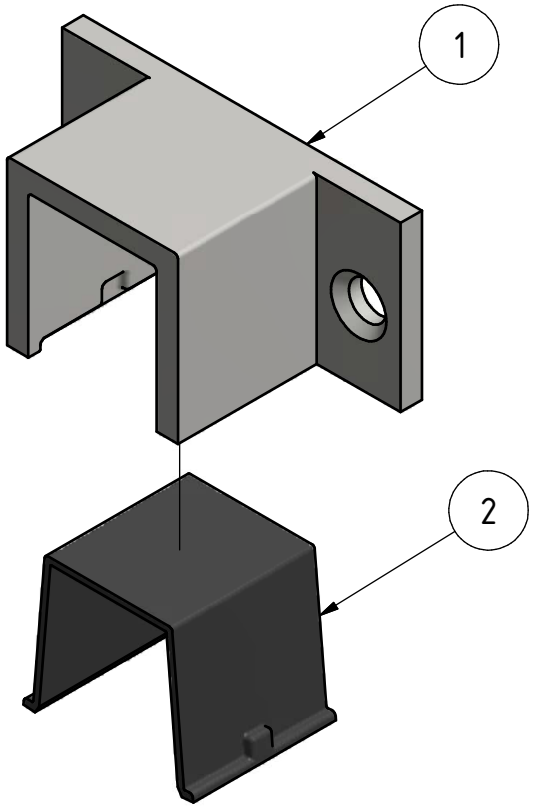
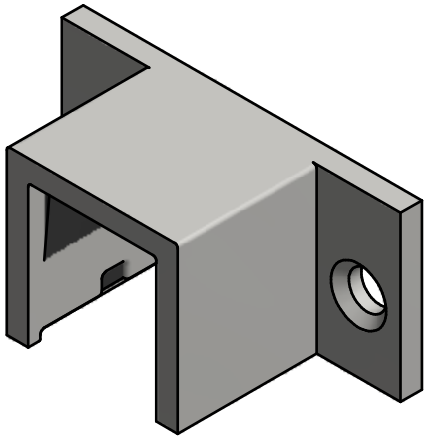
Exploded view



Assembled view



PARTS LIST				
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2	1	19301933900	0	

Q-railing

Scale: 2: 3 | Weight: 369 g | Rev.No.: 0

Material:

Finish:

Product line: Easy Glass Thin

	Date	Name
Drawn	28-8-2014	GMK
Checked	26-9-2014	MVN

Description: Wall flange

General tolerance according

Drawing no.: 11650533915

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REV	DESCRIPTION	DRAWN	DATE
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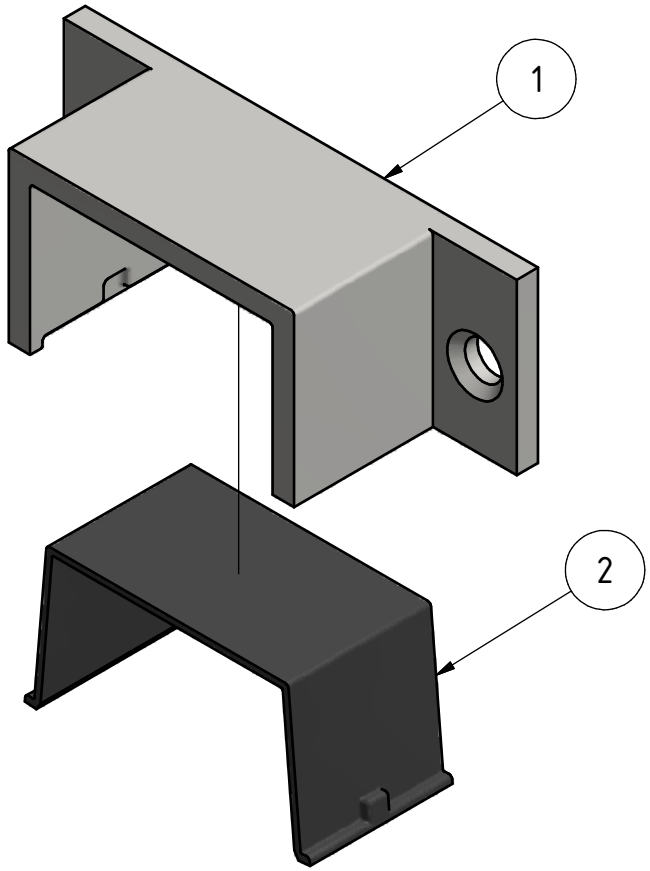
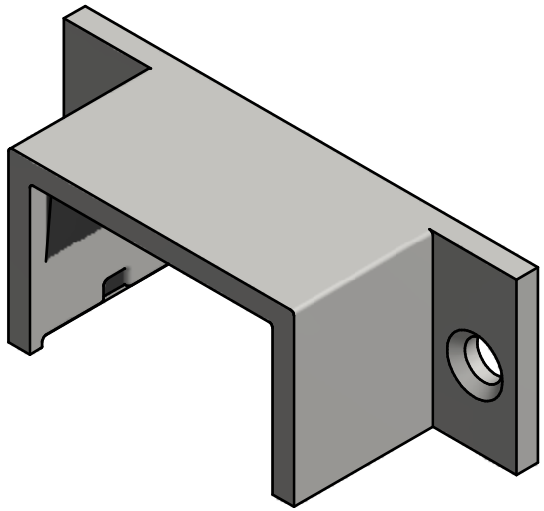
Exploded view



Assembled view



PARTS LIST				
ITEM	QTY	PART NUMBER	REV.	DESCRIPTION
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2	1	19301965400	0	

REV	DESCRIPTION	DRAWN	DATE
0			

Q-railing

Scale: 2: 3 | Weight: 449 g | Rev.No.: 0

Material:

Finish:

Product line: Easy Glass Thin

	Date	Name
Drawn	22/09/2014	GMK
Checked	26/09/2014	MVN

Description: Wall flange

General tolerance according

Drawing no.: 11650565415

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GOOD LUCK WITH
YOUR INSTALLATION!

VIEL ERFOLG MIT
IHRER MONTAGE!

SUCCES MET
DE INSTALLATIE!

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