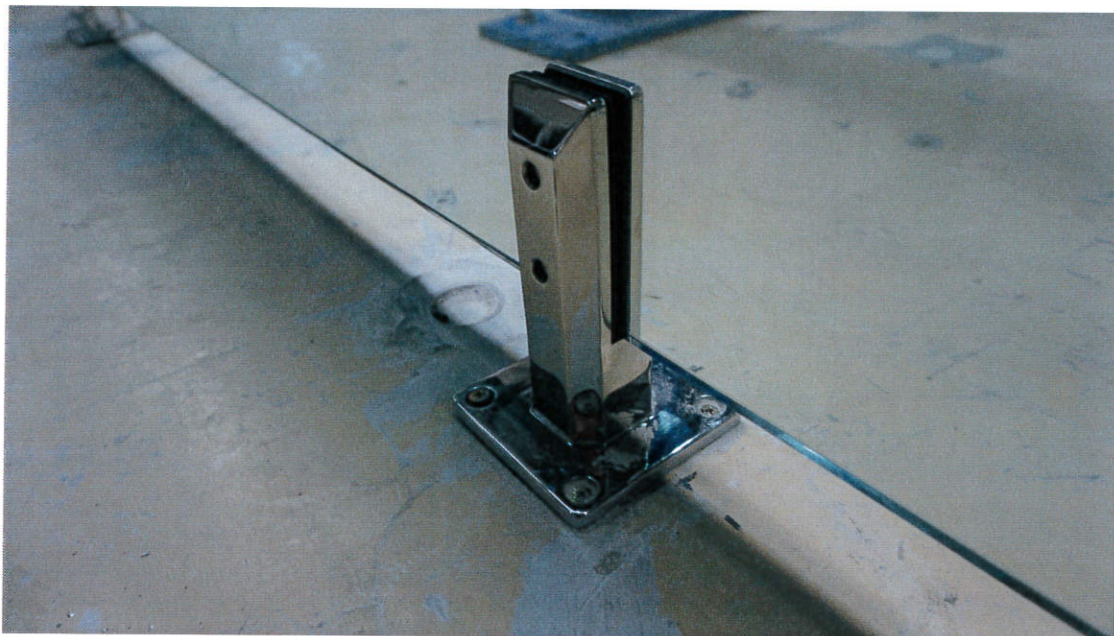


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# BALUSTRADE - GLASS

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WHOLESALE RACKING AUSTRALIA PTY LTD

SQUARE SPIGOT SURFACE MOUNT

TESTED BY  
AZUMA DESIGN PTY LTD

AZT0327.16

NATA ACCREDITED LABORATORY No. 15147

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The results of the tests, calibrations and/or measurements included  
in this document are traceable to Australian/national standards.

# 1 Test Standards

The product is tested to the following standard only

- *AS/NZS 1170.1 - 2002 Structural design actions - Permanent, imposed and other actions*

## 2 Test Sample Description

### 2.1 General

Model No./Name	Square 160 Surface Mount
Customer	Wholesale Racking Australia Pty Ltd
Address	23 Cylde St, Islington NSW 2296
Azuma Testing Number	AZT 0327.16
Date of Test	06/10/2016

### 2.2 Barrier

Glass Material	Toughened
Glass Thickness	12 mm
Glass Panel Size	Height = 1200 mm Width = 1700 mm
Overall Size	Height = 1265 mm Width = 1700 mm
Glass Installation Type	2 x spigot clamp using 2 x grub screws with plate
Gap between bottom of barrier and ground level	65 mm
Complies with AS 2208	Yes
Handrail Used	No
Spigot Spacing	1100 mm

## 2.3 Spigots

Material	Duplex 2205
Overall Size	49.3 mm (W) x 49.3 mm (L) x 160.7 mm (H)
Base Plate (if applicable)	Square 100 x 100 mm, 9 mm Thick
Drawing supplied	Yes
Fixing Method	6 mm x 75 mm Dyna Bolts

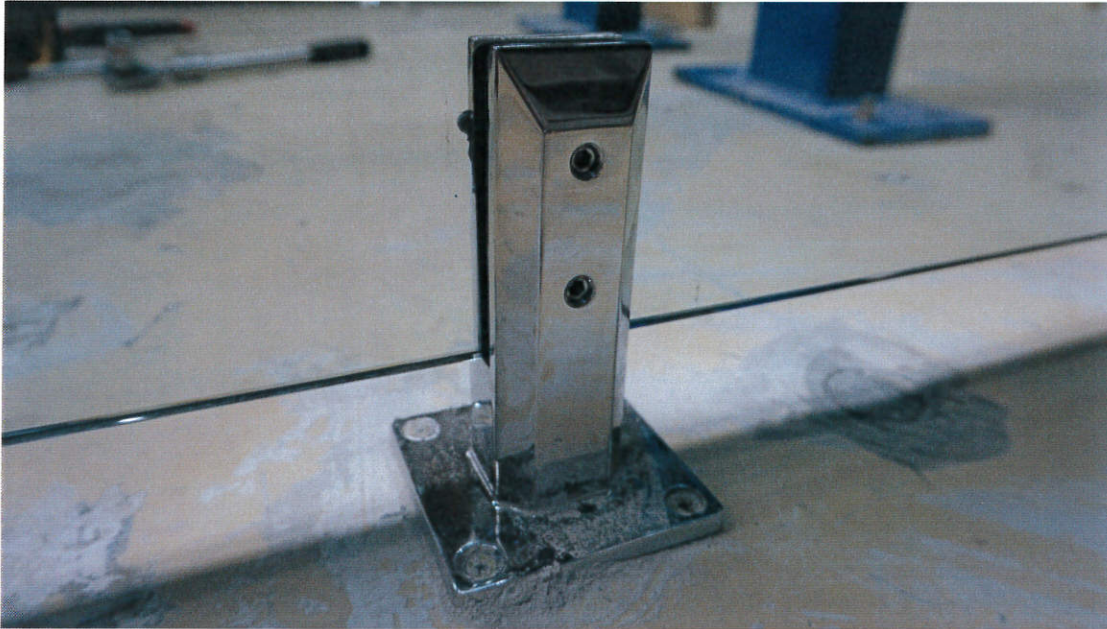


Figure 1: Spigot

### 3 Minimum Imposed Actions for Barriers

#### 3.1 Concentrated Load

##### 3.1.1 Procedure

From AS 1170.1 - 2002 - Subsection 3.6 Barriers - Table 3.3 Minimum imposed actions for Barriers.

1. Set the hydraulic ram to push on the handrail at the centerline between the two fixed points.
2. Record a datum from the center of the push area to a fixed point.
3. Smoothly increase the force acting on the side of the rail until the test force is equal to 600 N.
4. Hold the test force for 1 minute.
5. Record the deflection.
6. Remove the test force and after 2 minutes record the permanent deflection reading.

##### 3.1.2 Results

Direction	Load Applied	Datum (mm)	Reading after load removed (mm)	Permanent Deflection (mm)
Outwards	600 N	449 mm	450 mm	1 mm
Downwards	600 N	507 mm	507 mm	0 mm

### 3.1.3 Pass/Fail Criteria

The following maximum deflection limits apply to this product:

$$\frac{Span}{60} = \frac{1700}{60} = 28.33mm \quad (1)$$

This value is only applicable while it remains less than 30 mm, otherwise 30 mm is maximum allowable deflection.

Criteria	Observation	Result
<b>Outwards</b>		
Deflection no more than 28.33 mm after load is removed	1 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
<b>Notes:</b> Nil		
<b>Downwards</b>		
Deflection no more than 28.33 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
<b>Notes:</b> Nil		

### 3.1.4 Pictures



Figure 2: Outwards Push



Figure 3: Outwards Push - Bend



Figure 4: Downwards Push

## 3.2 Uniformly Distributed Load - VERTICAL

### 3.2.1 Procedure

From AS 1170.1 - 2002 - Subsection 3.6 Barriers - Table 3.3 Minimum imposed actions for Barriers.

1. Set the hydraulic ram to push on the handrail at the centerline between the two fixed points.
2. Record a datum from the center of the push area to a fixed point.
3. Smoothly increase the force acting on the side of the rail until the test force is equal to 600 N.
4. Hold the test force for 1 minute.
5. Record the deflection.
6. Remove the test force and after 2 minutes record the permanent deflection reading.

### 3.2.2 Calculation

The required uniformly distributed load for the glass panel is the imposed action multiplied by the width of the product:

$$\text{RequiredForce}(N) = \text{ImposedAction}(N/m) * \text{WidthofthePanel}(m) \quad (2)$$

Note: Width used in the above equation was 1700 mm.

### 3.2.3 Results

Uniformly Distributed Load	Load Applied	Datum (mm)	Reading after load removed (mm)	Permanent Deflection (mm)
350 N/m	595 N	434 mm	434 mm	0 mm
750 N/m	1275 N	434 mm	434 mm	0 mm



### 3.2.4 Pass/Fail Criteria

The following maximum deflection limits apply to this product:

$$\frac{Span}{60} = \frac{1700}{60} = 28.33mm \quad (3)$$

This value is only applicable while it remains less than 30 mm, otherwise 30 mm is maximum allowable deflection.

Criteria	Result	Pass/Fail
<b>350 N/m (595 N)</b>		
Deflection no more than 28.33 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
<b>Notes: Not Tested</b>		
<b>750 N/m (1275 N)</b>		
Deflection no more than 28.33 mm after load is removed	0 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
<b>Notes: Nil</b>		
<b>Total Deflection</b>	0 mm	Pass



Figure 5: Vertical Uniform Distributed Load

### 3.3 Uniformly Distributed Load - HORIZONTAL

#### 3.3.1 Procedure

From AS 1170.1 - 2002 - Subsection 3.6 Barriers - Table 3.3 Minimum imposed actions for Barriers.

1. Set the hydraulic ram to push on the handrail at the centerline between the two fixed points.
2. Record a datum from the center of the push area to a fixed point.
3. Smoothly increase the force acting on the side of the rail until the test force is equal to 600 N.
4. Hold the test force for 1 minute.
5. Record the deflection.
6. Remove the test force and after 2 minutes record the permanent deflection reading.

#### 3.3.2 Calculation

The required uniformly distributed load for the glass panel is the imposed action multiplied by the width of the product:

$$\text{Required Force}(N) = \text{Imposed Action}(N/m) * \text{Width of the Panel}(m) \quad (4)$$

Note: Width used in the above equation was 1700 mm.

#### 3.3.3 Results

Uniformly Distributed Load	Load Applied	Datum (mm)	Reading after load removed (mm)	Permanent Deflection (mm)
350 N/m	595 N	450 mm	451 mm	1 mm
750 N/m	1275 N	N/A	N/A	N/A
1500 N/m	2400 N	N/A	N/A	N/A
3000 N/m	4800 N	N/A	N/A	N/A

### 3.3.4 Pass/Fail Criteria

The following maximum deflection limits apply to this product:

$$\frac{Span}{60} = \frac{1700}{60} = 28.33mm \quad (5)$$

This value is only applicable while it remains less than 30 mm, otherwise 30 mm is maximum allowable deflection.

Criteria	Result	Pass/Fail
<b>350 N/m (595 N)</b>		
Deflection no more than 28.33 mm after load is removed	1 mm	Pass
Any damage, signs of breakage or fracture observed	Nil	Pass
<b>Notes: Nil</b>		
<b>750 N/m (1275 N)</b>		
Deflection no more than 28.33 mm after load is removed	N/A	Not Tested
Any damage, signs of breakage or fracture observed	N/A	Not Tested
<b>Notes: Nil</b>		
<b>1500 N/m (2550 N)</b>		
Deflection no more than 28.33 mm after load is removed	N/A	Not Tested
Any damage, signs of breakage or fracture observed	N/A	Not Tested
<b>Notes: Nil</b>		
<b>3000 N/m (5100 N)</b>		
Deflection no more than 28.33 mm after load is removed	N/A	Not Tested
Any damage, signs of breakage or fracture observed	N/A	Not Tested
<b>Notes: Nil</b>		
<b>Total Deflection at 350 N/m Rating</b>	1 mm	Pass

### 3.3.5 Pictures

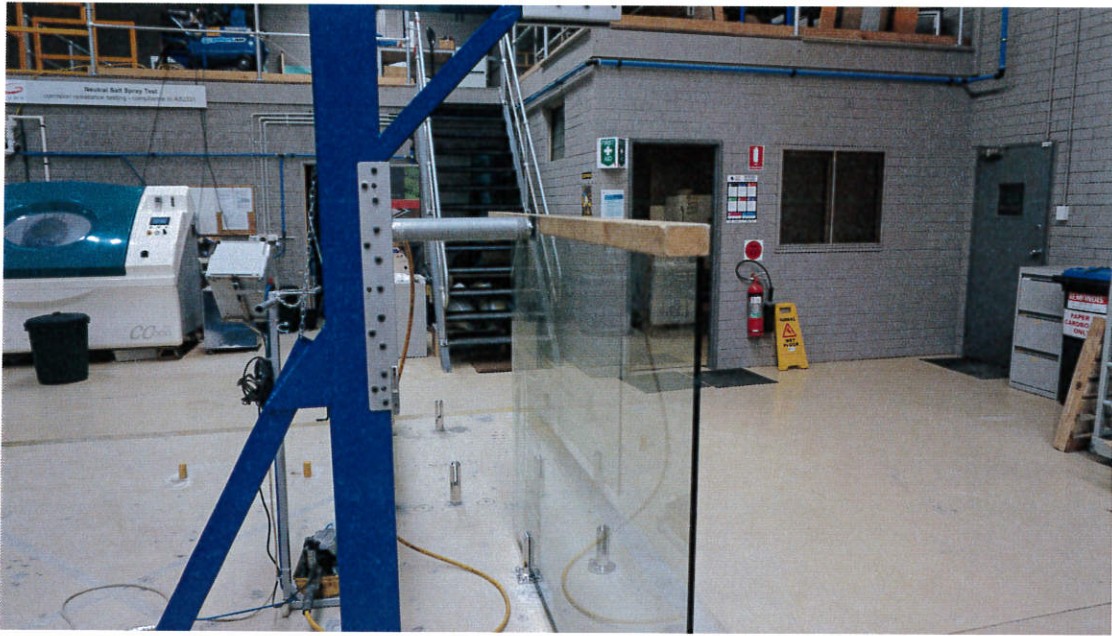


Figure 6: Horizontal Uniform Load - 350 N/m

## 4 Conclusion and Signatories

### 4.1 Conclusion

From the results achieved the sample is deemed to satisfy the loading requirements as per table 3.3 of AS1170.1- 2002 for the following classification:

- for a Category 'A' Domestic and residential activities - All areas within or serving exclusively one dwelling including stairs, landings, etc. but excluding external balconies and edges of roofs;
- for a Category 'B, E' Offices and work areas not included elsewhere including storage areas - Fixed platforms, walkways, stairways and ladders for access (see NOTE 2).

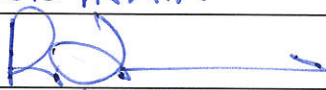
**NOTE:** All classifications with equal or lower load specifications may be applied to this sample. For more information as to their specific use please see table 3.3 of AS1170.1 - 2002.

**NOTE 2:** This usage (under B,E) is for access to and safe working places normally used by operating, inspection, maintenance and servicing personnel.

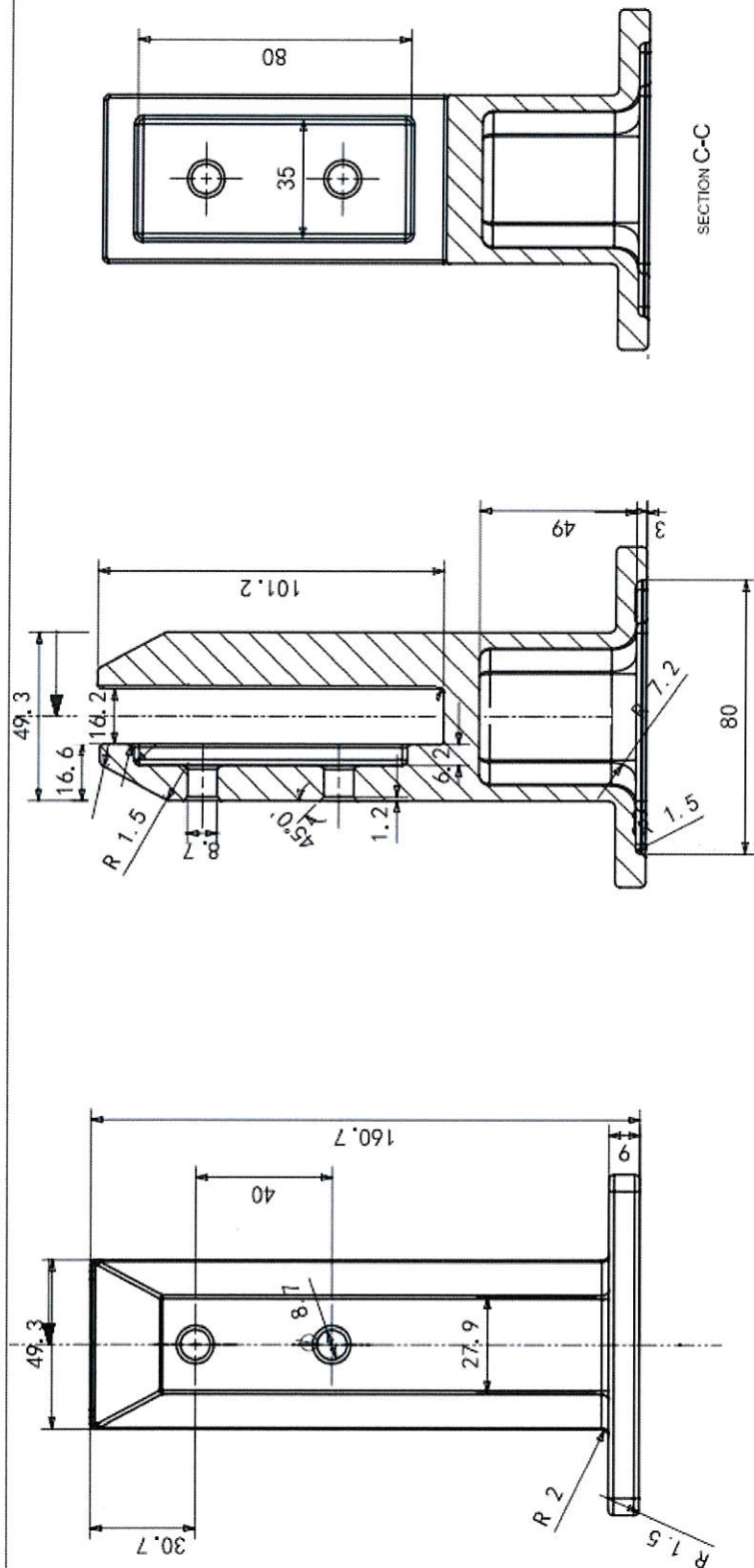
### 4.2 Signatories

Tested By: ROB IRWIN

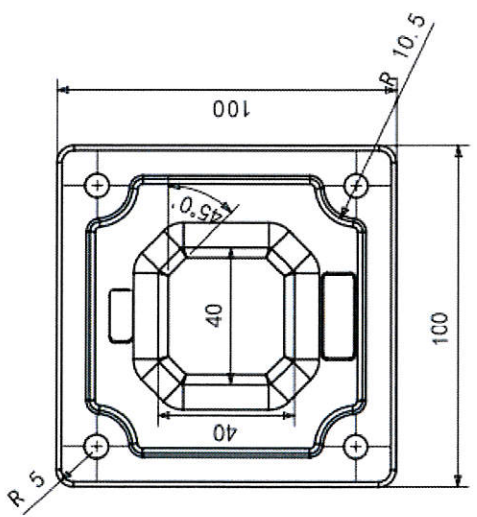
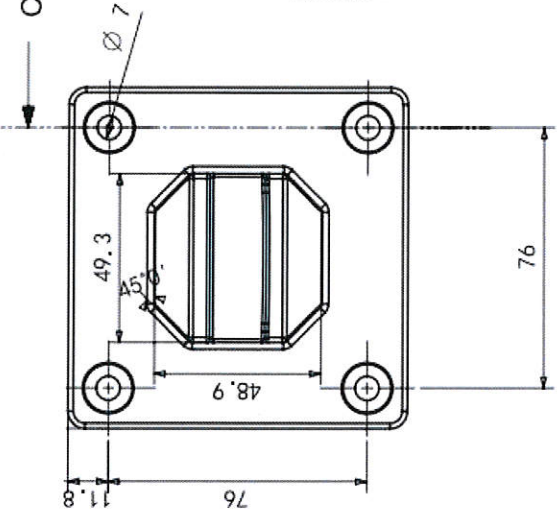
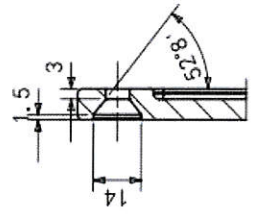
Signatory Name: ROB IRWIN

Signatory Signature: 

Date: 6/10/16



SECTION C-C



**NATA Accredited Laboratory**  
 Number: 15147

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Checked by:



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SAI Global hereby grants:

## Shandong Yaohua Glass Co., Ltd.

No. 7 Kaiyuan Road, Licheng Area, Jinan City, Shandong China

### StandardsMark Licence

Manufactured to:

**AS/NZS 2208:1996 - Safety glazing materials in buildings**

"the StandardsMark Licensee" the right to use the STANDARDSMARK as shown below only in respect of the goods described and detailed in the Schedule which are produced by the Licensee or on behalf of the Licensee\* and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.

**Licence No: SMK40107**

**Issued : 3 June 2013**

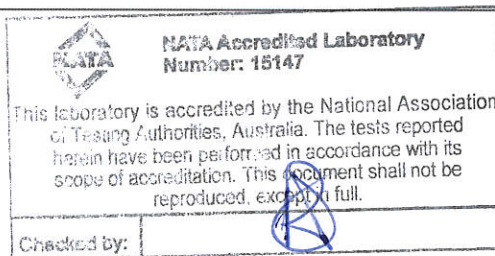
**Expires : 2 June 2018**

**Originally Certified : 3 June 2013**

**Current Certification : 3 June 2013**

Paul Butcher  
Global Head – Assurance Services

Samer Chaouk  
Head of Policy, Risk and Certification



\* For details of manufacture, refer to the licensee

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SAI Global hereby grants:

## Shandong Yaohua Glass Co., Ltd.

No. 7 Kaiyuan Road, Licheng Area, Jinan City, Shandong China

StandardsMark Licence

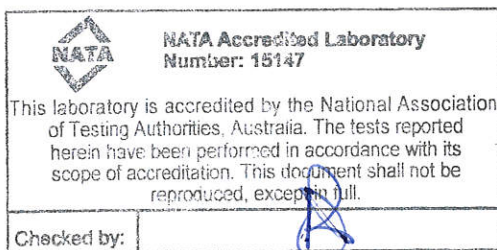
Manufactured to:

**AS/NZS 2208:1996 - Safety glazing materials in buildings**

Model identification of the goods on which the STANDARDSMARK may be used:

Description	Type of Safety Glass	Glass Thickness Range (mm)	Colours	Grade	Interlayer Thickness	Furnace / Laminating Line	Maximum Loading / Laminated Size	Interlayer Manufacture	Date Endorsed
Flat-Plain	Heat Strengthened Laminated	8 - 16	clear, grey, bronze, green, ultra clear	A	0.38mm, 0.76mm, 1.52mm	Line 1	2440mm x 3660mm	DuPont, Decent	29 May 2013
Flat-Plain	Laminated	6 - 16	clear, grey, bronze, green, ultra clear	A	0.38mm, 0.76mm, 1.52mm	Line 1	2440mm x 3660mm	DuPont, Decent	29 May 2013
Flat-Plain	Toughened	4 - 19	clear, grey, bronze, green, ultra clear	A		Furnace 1	2440mm x 4800mm		29 May 2013
Flat-Plain	Toughened Laminated	8 - 16	clear, grey, bronze, green, ultra clear	A	0.38mm, 0.76mm, 1.52mm	Line 1	2440mm x 3660mm	DuPont, Decent	29 May 2013

End of Record



Licence No: SMK40107

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