

## Test report

**Test report relating to a glass product according to European standard EN 12600, Pendulum test for flat glass, concerning the product marked as: Borosil 3.2 mm clear patterned, manufactured by: Gujarat Borosil Limited**

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Author(s)	M.J.R. Luppens
Client	Gujarat Borosil Limited Village Govali Tehsil Jhagadia District Bharuch 392001 State Gujarat India
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Head office Apeldoorn:  
Boogschutterstraat 11A  
P.O. Box 541  
7300 AM Apeldoorn  
The Netherlands  
Tel. +31 (0)88 888 7 888  
Fax +31 (0)88 888 7 879

Location Apeldoorn:  
Vissenstraat 6  
P.O. Box 541  
7300 AM Apeldoorn  
The Netherlands  
Tel. +31 (0)88 888 7 888  
Fax +31 (0)88 888 7 879

Location Enschede:  
Josink Esweg 10  
P.O. Box 337  
7500 AH Enschede  
The Netherlands  
Tel. +31 (0)88 888 7 888  
Fax +31 (0)88 888 7 859

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is a registered company at the  
Dutch Chamber of Commerce  
under number 27288788  
info@nl.tuv.com  
www.tuv.com/nl

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## 1 Introduction

### 1.1 Purpose

The tests have been performed in order to establish whether or not the product meets the requirements of the European standard EN 12600 [1].

### 1.2 Description of the samples

#### General

Name of the manufacturer	Gujarat Borosil Limited
Address of the manufacturer	Village Govali Tehsil Jhagadia District Bharuch 392001 State Gujarat India
Production plant of the samples	Village Govali Tehsil Jhagadia District Bharuch 392001 State Gujarat India
Production date	July 2011
Sampling date	July 2011
The product was marked as	Borosil 3.2 mm clear patterned
Dimensions of the samples	876 x 1938 mm

#### Specific

Nominal thicknesses	3.2 mm
Configuration	Clear patterned thermally toughened
Intermediate layer: type, thickness	N.A.
Applied films	N.A.

### 1.3 Sampling procedure

The test house, acting as notified test body, has had no influence on the selection of the samples.

### 1.4 Application

The request for testing was submitted by the manufacturer on August 3, 2011. Suborder number:1403015401.

### 1.5 Method of testing

All applicable tests have been performed according to the European standard EN 12600 [1].

### 1.6 Put out to contract

No tests were performed at third parties.

### 1.7 Privacy statement

Due to privacy reasons, the names of involved personnel that executed the tests, are not disclosed in the report. However, this information is available on internal work sheets, test forms etc. in the project file.

### **1.8 Notifications and accreditations**

TÜV Rheinland Nederland B.V. has been notified by the Dutch Ministry of Infrastructure and the Environment as Notified Test Body (number 1750) and Notified Certification Body (number 0336) for the European Construction Products Directive 89/106/EEC.

TÜV Rheinland Nederland B.V. has been accredited by the Dutch Accreditation Council (RvA) as ISO 17025 Test Laboratory (accreditation number L 484) and EN 45011 Certification Body (accreditation number C058).

TÜV Rheinland Nederland B.V. has been accredited as Technical Service (Laboratory) by RDW competent Administrative Department (Approval Authority) for the Netherlands to grant approvals as mentioned in Directive 70/156/etc. and the 1958 Agreement of the Economic Commission for Europe of the United Nations (UN-ECE) for glass as used in the automotive sector: ECE Regulation 43, safety glazing; EC Directive 92/22, Safety glass; EC Directive 2009/144, Glazing cat. T (accreditation number RDW-99050043 01).

### **1.9 Calibration of the test rig**

Date of the last calibration of the test rig according to annex B of EN 12600 [1]: 25 November 2009.

## 2 Test results

Test results after performing all applicable tests according to European standard EN 12600 [1].

Class	Drop height (mm)	Result test 1	Result test 2	Result test 3	Result test 4
3	190	No breakage	No breakage	No breakage	No breakage
2	450	Breakage 4b	Breakage 4b	Breakage 4b	Breakage 4b
1	1200	Breakage 4b	Breakage 4b	Breakage 4b	Breakage 4b

Average thickness of the 4 measurements	3.2 mm
Because of asymmetric composition: Impact side	Patterned side
Performance classification	1 (C) 3

### Explanation

#### EN 12600 § 6 Classification

##### 6.1 General

Glazing conforming to this European Standard is classified as follows:

- its performance under the impact test;
- the drop height at which breakage occurred;
- the drop height at which the product passed in accordance with a) of clause 4;
- the drop height at which the product passed in accordance with b) of clause 4;
- the mode of breakage of the material if it remains unbroken after the impact test.

##### 6.2 Drop height class

Glazing shall be classified as follows:

- Class 3: material that conforms to the requirements of clause 4 when tested by the method given in clause 5 at a drop height of 190 mm;
- Class 2: material that conforms to the requirements of clause 4 when tested by the method given in clause 5 at drop heights of 190 mm and 450 mm;
- Class 1: material that conforms to the requirements of clause 4 when tested by the method given in clause 5 at drop heights of 190 mm, 450 mm and 1 200 mm.

### 6.3 Mode of breakage

If all test pieces remain unbroken at the drop height appropriate to its intended drop height class, the mode of breakage shall be determined as per Annex C. The mode of breakage shall be described as follows:

- Type A: numerous cracks appear forming separate fragments with sharp edges, some of which are large (typical of annealed glass);
- Type B: numerous cracks appear, but the fragments hold together and do not separate (typical of laminated glass);
- Type C: disintegration occurs, leading to a large number of small particles that are relatively harmless (typical of toughened glass).

### Performance classification

The performance classification of a glass product shall be given as follows:

$\alpha$  ( $\beta$ )  $\varphi$

where

- $\alpha$  is the highest drop height class at which the product either did not break or broke in accordance with a) or b) of clause 4;
- $\beta$  is the mode of breakage;
- $\varphi$  is the highest drop height class at which the product either did not break or when broke, broke in accordance with a) of clause 4.

When a glass product breaks at a drop height of 190 mm and the breakage is not in accordance with a) of clause 4 then the value of  $\varphi$  quoted shall be zero.

### 3 Conclusion

The tested glass product, marked by the client or manufacturer as trade Borosil 3.2 mm clear patterned, manufactured by: Gujarat Borosil Limited, meets the applicable requirements as stated in the European standard EN 12600 [1] for a class: 1 (C) 3.

The test results exclusively relate to the tested objects.

#### Remark 1

When and if changes are made in production method and/or equipment, assessment according to this standard shall be reconsidered and re-tests shall be performed when the changes can lead to different specifications of the glass. The decision and responsibility lies at the manufacturer.

#### Remark 2

If no reference of the product description was supplied by the manufacturer, than that document shall be added to this test report by the manufacturer. It was to the manufacturer's responsibility that the samples delivered for initial type test are representative to the production and deviations from perfection were included in the delivered test samples.

## 4 References

- 1 European standard EN 12600:2002 (E),  
Glass in building – Pendulum test – Impact test method and classification for float glass,  
European Committee for Standardization, November 2002.



## 5 Signatures

<b>Author</b> Mr. M.J.R. Luppens	<b>Signature</b> 
<b>Specialist</b>	
<b>Peer review</b> Mr. R. De Bode	<b>Signature</b> 
<b>Specialist</b>	
<b>Approved by</b> Mr. A.J. Piers, B.Sc.	<b>Signature</b> 
<b>Manager Industrial Services</b>	

(This is the end of this report).