

# Test Report

Report No	262/7059721	This report consists of 13 pages
Client	Preedy Glass & Sons Ltd Stanley Works Coronation Road Park Royal London NW10 7PQ	
Authority & date	Quotation Acceptance Form Reference No. 84258, dated 16 March 2007	
Items tested	Clear toughened glass	
Specification	BS EN 12150: Part 1: 2000 clause 8 only BS EN 1288: Part 3: 2000 limited clauses only  Type testing	
Results	<b>See summary on page 3</b>	
Prepared by	M Kelly	(Senior Technician)
Authorized by	G Wackett	(Senior Engineer)
Issue Date	21 April 2008	
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of PS062 'General conditions relating to acceptance of testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Managing Director, BSI Product Services, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.	



## TEST AND EXAMINATION OF GLASS FOR BUILDING

### INTRODUCTION

At the request of Preedy Glass & Sons Ltd the glass samples, detailed below and submitted by Preedy Glass & Sons Ltd, were tested to the applicable requirements of BS EN 12150: Part 1: 2000 and BS EN 1288: Part 3: 2000 as indicated on the following pages of this report. This request was made on Quotation acceptance form reference 84258, dated 16 March 2007 and identified under the Equipment Record No 10089476

All references in this test report to the identity of the product, sampling information and the specimens tested are based upon information supplied by the manufacturer.

The results detailed in this test Report apply only to the particular samples tested and to the specific tests carried out. This Report does not indicate, provide or imply any measure of Approval, Certification, Supervision or Control of Surveillance by BSI to this or any related product.

Date samples received 31 March 2008

Date samples tested 8 April 2008 to 11 April 2008

### TEST ITEMS

All test specimens had dimensions of nominally 1100mm x 360mm, and were manufactured before 31 March 2008

4mm Clear toughened glass  
5mm Clear toughened glass  
6mm Clear toughened glass  
8mm Clear toughened glass  
10mm Clear toughened glass  
12mm Clear toughened glass  
15mm Clear toughened glass  
19mm Clear toughened glass  
25mm Clear toughened glass

### SUMMARY OF RESULTS

See Report text

**TEST PROCEDURE****BS EN 12150: Part 1: 2000****Clause Requirements****8 Fragmentation Test**

The glass specimens were allowed to condition for a minimum of 4 hours at ambient temperature prior to testing.

Each sample was measured for length and width then impacted using a pointed steel tool at a point 13mm in, and at the mid-point of, the longest edge in order to count the particles within a 50 x 50mm area. The results were recorded and assessed against the requirements of clauses 8.5 and 8.6

**4mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1100	360
Specimen 2	1100	360
Specimen 3	1100	360
Specimen 4	1100	360
Specimen 5	1098	360

<b>Particle Count</b>	<b>Specified</b>	<b>Actual</b>
Specimen 1	40 min	110
Specimen 2	40 min	136
Specimen 3	40 min	124
Specimen 4	40 min	108
Specimen 5	40 min	78

**Particle Length**

Specimen 1	100 max	15
Specimen 2	100 max	15
Specimen 3	100 max	19
Specimen 4	100 max	15
Specimen 5	100 max	18

**TEST PROCEDURE (CONTINUED)**

BS EN 12150: Part 1: 2000

**Clause      Requirements****8              Fragmentation Test (continued)****5mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1100	360
Specimen 2	1100	360
Specimen 3	1100	360
Specimen 4	1099	360
Specimen 5	1100	360

<b>Particle Count</b>	<b>Specified</b>	<b>Actual</b>
Specimen 1	40 min	147
Specimen 2	40 min	130
Specimen 3	40 min	133
Specimen 4	40 min	120
Specimen 5	40 min	131

**Particle Length**

Specimen 1	100 max	8
Specimen 2	100 max	12
Specimen 3	100 max	10
Specimen 4	100 max	10
Specimen 5	100 max	12

**TEST PROCEDURE (CONTINUED)****BS EN 12150: Part 1: 2000****Clause Requirements****8 Fragmentation Test (continued)****6mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1100	360
Specimen 2	1100	360
Specimen 3	1100	360
Specimen 4	1100	360
Specimen 5	1100	360

	<b>Specified</b>	<b>Actual</b>
<b>Particle Count</b>		
Specimen 1	40 min	93
Specimen 2	40 min	100
Specimen 3	40 min	114
Specimen 4	40 min	99
Specimen 5	40 min	88

	<b>Specified</b>	<b>Actual</b>
<b>Particle Length</b>		
Specimen 1	100 max	12
Specimen 2	100 max	15
Specimen 3	100 max	11
Specimen 4	100 max	15
Specimen 5	100 max	13

**TEST PROCEDURE (CONTINUED)****BS EN 12150: Part 1: 2000****Clause Requirements****8 Fragmentation Test (continued)****8mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1100	360
Specimen 2	1100	360
Specimen 3	1100	360
Specimen 4	1100	360
Specimen 5	1100	360

<b>Particle Count</b>	<b>Specified</b>	<b>Actual</b>
Specimen 1	40 min	87
Specimen 2	40 min	88
Specimen 3	40 min	77
Specimen 4	40 min	86
Specimen 5	40 min	100

**Particle Length**

Specimen 1	100 max	12
Specimen 2	100 max	13
Specimen 3	100 max	13
Specimen 4	100 max	15
Specimen 5	100 max	10

**TEST PROCEDURE (CONTINUED)**

BS EN 12150: Part 1: 2000

Clause      Requirements

8            Fragmentation Test (continued)

**10mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1102	360
Specimen 2	1101	361
Specimen 3	1100	362
Specimen 4	1099	362
Specimen 5	1099	359

	<b>Specified</b>	<b>Actual</b>
<b>Particle Count</b>		
Specimen 1	40 min	65
Specimen 2	40 min	59
Specimen 3	40 min	59
Specimen 4	40 min	66
Specimen 5	40 min	80

**Particle Length**

Specimen 1	100 max	16
Specimen 2	100 max	16
Specimen 3	100 max	15
Specimen 4	100 max	15
Specimen 5	100 max	15

**TEST PROCEDURE (CONTINUED)****BS EN 12150: Part 1: 2000****Clause      Requirements****8              Fragmentation Test (continued)****12mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1100	359
Specimen 2	1098	360
Specimen 3	1100	361
Specimen 4	1101	361
Specimen 5	1100	360

	<b>Specified</b>	<b>Actual</b>
<b>Particle Count</b>		
Specimen 1	40 min	63
Specimen 2	40 min	66
Specimen 3	40 min	60
Specimen 4	40 min	62
Specimen 5	40 min	66

	<b>Specified</b>	<b>Actual</b>
<b>Particle Length</b>		
Specimen 1	100 max	17
Specimen 2	100 max	12
Specimen 3	100 max	13
Specimen 4	100 max	14
Specimen 5	100 max	15

**TEST PROCEDURE (CONTINUED)****BS EN 12150: Part 1: 2000****Clause Requirements****8 Fragmentation Test (continued)****15mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1102	362
Specimen 2	1103	363
Specimen 3	1102	363
Specimen 4	1103	363
Specimen 5	1102	362

<b>Particle Count</b>	<b>Specified</b>	<b>Actual</b>
Specimen 1	30 min	55
Specimen 2	30 min	57
Specimen 3	30 min	59
Specimen 4	30 min	67
Specimen 5	30 min	58

**Particle Length**

Specimen 1	100 max	16
Specimen 2	100 max	11
Specimen 3	100 max	18
Specimen 4	100 max	13
Specimen 5	100 max	15

**TEST PROCEDURE (CONTINUED)****BS EN 12150: Part 1: 2000****Clause Requirements****8 Fragmentation Test (continued)****19mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1101	361
Specimen 2	1105	365
Specimen 3	1102	363
Specimen 4	1102	362
Specimen 5	1099	363

	<b>Specified</b>	<b>Actual</b>
<b>Particle Count</b>		
Specimen 1	30 min	56
Specimen 2	30 min	57
Specimen 3	30 min	43
Specimen 4	30 min	62
Specimen 5	30 min	54

	<b>Specified</b>	<b>Actual</b>
<b>Particle Length</b>		
Specimen 1	100 max	16
Specimen 2	100 max	18
Specimen 3	100 max	15
Specimen 4	100 max	15
Specimen 5	100 max	14

**TEST PROCEDURE (CONTINUED)**

BS EN 12150: Part 1: 2000

Clause Requirements

8 Fragmentation Test (continued)

**25mm Clear toughened**

	<b>Length (mm)</b>	<b>Width (mm)</b>
Specimen 1	1100	360
Specimen 2	1100	360
Specimen 3	1100	360
Specimen 4	1100	360
Specimen 5	1099	361

	<b>Specified</b>	<b>Actual</b>
<b>Particle Count</b>		
Specimen 1	- min +	48
Specimen 2	- min +	46
Specimen 3	- min +	49
Specimen 4	- min +	50
Specimen 5	- min +	42

	<b>Specified</b>	<b>Actual</b>
<b>Particle Length</b>		
Specimen 1	100 max	8
Specimen 2	100 max	7
Specimen 3	100 max	9
Specimen 4	100 max	7
Specimen 5	100 max	10

+ No assessment criteria stated in BS EN 12150: Part 1: 2000 for 25mm thick glass

**TEST PROCEDURE****BS EN 1288: Part 3: 2000****Clause Requirements****7 Procedure****7.1 Measuring width and thickness of each specimen**

The glass specimens were allowed to condition for a minimum of 4 hours at ambient temperature prior to testing.

The specimens were measured in accordance with clause 7.1

**Clear toughened**

	<b>Specified</b>	<b>Actual</b>
Mean width, B (mm)		
4	360 ±5	360
4	360 ±5	360
5	360 ±5	360
5	360 ±5	361
10	360 ±5	360
10	360 ±5	360
19	360 ±5	362
19	360 ±5	363
25	360 ±5	360
25	360 ±5	361

## Mean thickness, h (mm)

4	4 ±0.2	3.85
4	4 ±0.2	3.90
5	5 ±0.2	4.85
5	5 ±0.2	4.85
10	10 ±0.3	10.00
10	10 ±0.3	10.05
19	19 ±1	18.35
19	19 ±1	18.30
25	25 ±1	24.40
25	25 ±1	24.50

**TEST PROCEDURE (CONTINUED)****BS EN 1288: Part 3: 2000**

Clause	Requirements
7	Procedure (continued)
7.2	Bending test

The specimens were tested in accordance with clause 7.2 and the bending strengths were calculated in accordance with clause 8

**Clear toughened  
Arrissed edge**

Sample Thickness	Side Under Test	Origin of failure	Time taken to failure (s)	Bending Strength (N/mm <sup>2</sup> )
4 mm	-	Edge	91	181.531
4 mm	-	Edge	90.5	184.160
5 mm	-	Edge	78.2	162.578
5 mm	-	Edge	92.7	187.216
10 mm	-	Edge	90.8	202.983
10 mm	-	Edge	90	199.896
19 mm	-	Edge	106.6	216.412
19 mm	-	Edge	93.6	188.485
25 mm	-	Edge	91.1	173.618
25 mm	-	Edge	129.2	249.841

The minimum strength specified in BS EN 12150: Part 1: 2000, clause 9.4 is 120N/mm<sup>2</sup>

# Test Report

Report No 262/7103292 This Report consists of 5 pages

Client Preedy Glass & Sons Limited  
Stanley Works  
Coronation Road  
Park Royal  
London  
NW10 7PQ

Authority & date Quotation Acceptance form reference 84258 dated 16 March 2008

Items tested 4mm Clear toughened glass  
12mm Clear toughened glass  
19mm Clear toughened glass

Specification BS EN 12600:2002 - Glass in Building - Pendulum test  
Direct commission testing

Results Pass

Prepared by M Kelly  (Senior Technician)

Authorized by G Wackett  (Senior Engineer)

Issue Date 21 April 2008

Conditions of issue



This Test Report is issued subject to the conditions stated in current issue of PS082 'General conditions relating to acceptance of testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Managing Director, BSI Product Services, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.

**TEST AND EXAMINATION OF GLASS IN BUILDING - PENDULUM TEST****INTRODUCTION**

At the request of Preddy Glass & Sons Limited, the glass samples, detailed below, were tested and assessed to the requirements of BS EN 12600:2002, as indicated on the following pages of this Report. This request was made in a Purchase Order from the Client reference 4198 dated 31 March 2008 - Equipment Record No 10091513. It is emphasized that assessments were not made against other clauses of the Specification.

The results detailed in this Report apply only to the particular sample tested and to the specific tests carried out. This Report does not indicate, provide or imply any measure of Approval, Certification, Supervision or Control of Surveillance by BSI to this or any related product

Date tested: 16 April 2008

Date samples received: 11 April 2008

Date of the last calibration of the test rig: 25 October 2005

**TEST ITEMS**

- A) 12 off 4mm Symmetric clear toughened glass 1938 x 876mm
- B) 6 off 6mm Symmetric clear toughened glass 1937 x 876mm
- C) 5 off 19mm Symmetric clear toughened glass 1938 x 876mm

**SUMMARY OF RESULTS**

The test samples were tested to the method described in BS EN12600:2002.

The results of which are as follows:

TEST ITEMS	CLASS	ASSESSMENT
A), B) & C)	3 (190mm)	Pass
A), B) & C)	2 (450mm)	Pass
A), B) & C)	1 (1200mm)	Pass

TEST ITEMS	PERFORMANCE CLASSIFICATION	
	Modified	Unmodified
A), B & C)	1(C)1 +	

- + 1 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.
- C is the mode of breakage
- 1 is the highest drop height class at which the product either did not break or when broke, broke in accordance with a) clause

**TEST AND EXAMINATION****ITEM A****CLAUSE****5 IMPACT****5.3 Impact test**

Type	- Symmetric clear toughened glass 1938 x 876mm
Thickness	- 4.00mm Nominal
Weight equivalent to 8500mm <sup>2</sup>	- 62.4g
Tyre pressure	- 50.75±2.9psi +

+ Tyre pressures verified prior to and after the impacting of each glass type

Sample No	Impact No	Result of Impact	Particle Wt (g)	Assessment
<b><u>Drop height 190mm</u></b>				
1	1	No breakage	-	Pass
2	4	No breakage	-	Pass
3	7	No breakage	-	Pass
4	10	No breakage	-	Pass
<b><u>Drop height 450mm</u></b>				
1	2	No breakage	-	Pass
2	5	No breakage	-	Pass
3	8	No breakage	-	Pass
4	11	No breakage	-	Pass
<b><u>Drop height 1200mm</u></b>				
1	3	No breakage	-	Pass
2	6	No breakage	-	Pass
3	9	No breakage	-	Pass
4	12	No breakage	-	Pass

**TEST AND EXAMINATION****ITEM B****CLAUSE****5 IMPACT****5.3 Impact test**

Type	-	Symmetric clear toughened glass 1937 x 876mm
Thickness	-	12.00mm Nominal
Weight equivalent to 6500mm <sup>2</sup>	-	197.9g
Tyre pressure	-	50.75±2.9psi +

+ Tyre pressures verified prior to and after the impacting of each glass type

Sample No	Impact No	Result of Impact	Particle Wt (g)	Assessment
<b><u>Drop height 190mm</u></b>				
1	1	No breakage	-	Pass
2	4	No breakage	-	Pass
3	7	No breakage	-	Pass
4	10	No breakage	-	Pass
<b><u>Drop height 450mm</u></b>				
1	2	No breakage	-	Pass
2	5	No breakage	-	Pass
3	8	No breakage	-	Pass
4	11	No breakage	-	Pass
<b><u>Drop height 1200mm</u></b>				
1	3	No breakage	-	Pass
2	6	No breakage	-	Pass
3	9	No breakage	-	Pass
4	12	No breakage	-	Pass

## TEST AND EXAMINATION

## ITEM C

## CLAUSE

5 IMPACT

5.3 Impact test

Type - Symmetric clear toughened glass 1938 x 876mm  
 Thickness - 19.00mm Nominal  
 Weight equivalent to 6500mm<sup>2</sup> - 300.1g  
 Tyre pressure - 50.75±2.9psi +

+ Tyre pressures verified prior to and after the impacting of each glass type

Sample No	Impact No	Result of Impact	Particle Wt (g)	Assessment
<b><u>Drop height 190mm</u></b>				
1	1	No breakage	-	Pass
2	4	No breakage	-	Pass
3	7	No breakage	-	Pass
4	10	No breakage	-	Pass
<b><u>Drop height 450mm</u></b>				
1	2	No breakage	-	Pass
2	5	No breakage	-	Pass
3	8	No breakage	-	Pass
4	11	No breakage	-	Pass
<b><u>Drop height 1200mm</u></b>				
1	3	No breakage	-	Pass
2	6	No breakage	-	Pass
3	9	No breakage	-	Pass
4	12	No breakage	-	Pass