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TNO report

TQS-RAP-07-2414

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Noval Glass Group LTD
EN 12600 Pendulum test
Thermally toughened soda lime silicate safety
glass (3; 4; 5; 6 and 8 mm)

Date	September 24, 2007
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Project number	E07.0768
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1 Introduction

Noval Glass Group LTD has commissioned TNO Quality Services BV with initial type testing according to the EN12600.

It is to the manufacturer's responsibility that the samples delivered for initial type test are representative to the production and that normal production variations are included in the test samples. If any changes in applied materials or other deviation of the system description are introduced, the validity of this initial type test report shall be evaluated on validity. This could mean new tests or additional tests. According to the rules this decision and full responsibility belongs to the manufacturer. The system description is the base document for this evaluation.

For any other manufacturer this initial type test (ITT) report is not automatically valid. The manufacturer for this ITT report is defined as Noval Glass Group LTD.

TNO is a fully Notified Test Laboratory for EN tests for the CPD guideline 89/106/EEG under Lab.no. 1750 at the Technical Committee of the European Commission in Brussels. This report has been issued under this reference.

The following chapters describe the tested configuration(s), the results and the conclusions.

2 Experimental

2.1 Delivered samples and materials

The following samples were delivered for the Pendulum test - Impact test method and classification for flat glass (EN 12600):

Production plant of the samples (j) : Noval Glass Group LTD
Production date : 23-09-2007
Commercial product name (k) : TT soda lime silicate safety glass (EN12150)
Type and nominal thickness (a) : Thermally toughened soda lime silicate glass, 3; 4; 5; 6 and 8 mm
Dimensions of the test pieces (b) : $876 \pm \text{mm}$ by $1938 \pm 5 \text{ mm}$
Intermediate layer (configuration) (l) : n.a.
Applied films (clamped) (f) : n.a.

2.2 Testing Laboratory information

Testing laboratory (g) : China Global Safety Certification Center
Guanzhuang, Chaoyang District, Beijing
P.R.China 100024
Zip code 100024
China
Notified Test Laboratory number (h) : CGSC is working under the responsibility of
TNO Quality Services BV Not. Lab 1750
(CPD guideline 89/106/EEG)
Calibration of test ridge (e) : 11-06-2005

2.3 Test Results

All samples have been tested by the China Safety Global Certification Center (CSGC) which is an approved test body and appointed by Certification and Accreditation of the P.R China (CNCA) and accredited by China National Accreditation Board for Certifiers (CNAB).

3 mm:

Testing date (i) : September 2007
Average thickness : 2.9 mm

Drop height [mm]	Test 1 result	Test 2 result	Test 3 result	Test 4 result
190	no breakage	no breakage	no breakage	no breakage
450	breakage < 4b	breakage < 4b	breakage < 4b	no breakage
1200	breakage < 4b	breakage < 4b	breakage < 4b	breakage < 4b

Classification (d) : 1(C)3

4 mm:

Testing date (i) : September 2007
 Average thickness : 3.9 mm

Drop height [mm]	Test 1 result	Test 2 result	Test 3 result	Test 4 result
190	no breakage	no breakage	no breakage	no breakage
450	no breakage	no breakage	no breakage	no breakage
1200	no breakage	no breakage	breakage < 4b	no breakage

Classification (d) : **1(C)3**

5 mm:

Testing date (i) : September 2007
 Average thickness : 4.9 mm

Drop height [mm]	Test 1 result	Test 2 result	Test 3 result	Test 4 result
190	no breakage	no breakage	no breakage	no breakage
450	no breakage	no breakage	no breakage	no breakage
1200	breakage < 4b	breakage < 4b	breakage < 4b	no breakage

Classification (d) : **1(C)2**

6 mm:

Testing date (i) : September 2007
 Average thickness : 5.9 mm

Drop height [mm]	Test 1 result	Test 2 result	Test 3 result	Test 4 result
190	no breakage	no breakage	no breakage	no breakage
450	no breakage	no breakage	no breakage	no breakage
1200	no breakage	no breakage	breakage < 4b	no breakage

Classification (d) : **1(C)2**

8 mm:

Testing date (i) : September 2007
 Average thickness : 7.9 mm

Drop height [mm]	Test 1 result	Test 2 result	Test 3 result	Test 4 result
190	no breakage	no breakage	no breakage	no breakage
450	no breakage	no breakage	no breakage	no breakage
1200	no breakage	no breakage	no breakage	no breakage

Classification (d) : **1(C)1**

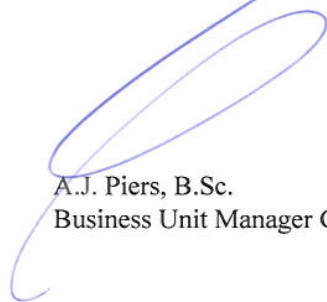
3 Signature

Eindhoven, September 2007



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TNO Quality Services BV



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Business Unit Manager Glass



TNO Quality Services BV
P.O. Box 6235
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The Netherlands
Lab.no. 1750

Summary of report

Date: 9-24-2007

EN 12600
Pendulum test – Impact test method and classification
for flat glass

for details, see test report

Producer: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Under responsibility of: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Product:
Thermally toughened soda lime silicate safety glass
(3 mm)

Test Result:

1(C)3

The tested samples are complying with the requirements of EN12600.

Signature:

L. van der Ven - le Comte
Project leader

A.J. Piers
Programme leader



TNO Quality Services BV
P.O. Box 6235
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The Netherlands
Lab.no. 1750

Summary of report

Date: 9-24-2007

EN 12600
Pendulum test – Impact test method and classification
for flat glass

for details, see test report

Producer: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Under responsibility of: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Product:
Thermally toughened soda lime silicate safety glass
(4 mm)

Test Result:

1(C)3

The tested samples are complying with the requirements of EN12600.

Signature:

L. van der Ven - le Comte
Project leader

A.J. Piers
Programme leader



TNO Quality Services BV
P.O. Box 6235
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Lab.no. 1750

Summary of report

Date: 9-24-2007

EN 12600
Pendulum test – Impact test method and classification
for flat glass

for details, see test report

Producer: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Under responsibility of: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Product:
Thermally toughened soda lime silicate safety glass
(5 mm)

Test Result:

1(C)2

The tested samples are complying with the requirements of EN12600.

Signature:

A blue ink signature of L. van der Ven - le Comte.

L. van der Ven - le Comte
Project leader

A blue ink signature of A.J. Piers.

A.J. Piers
Programme leader



TNO Quality Services BV
P.O. Box 6235
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Lab.no. 1750

Summary of report

Date: 9-24-2007

EN 12600
Pendulum test – Impact test method and classification
for flat glass

for details, see test report

Producer: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Under responsibility of: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Product:
Thermally toughened soda lime silicate safety glass
(6 mm)

Test Result:

1(C)2

The tested samples are complying with the requirements of EN12600.

Signature:

L. van der Ven - le Comte
Project leader

A.J. Piers
Programme leader



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Lab.no. 1750

Summary of report

Date: 9-24-2007

EN 12600
Pendulum test – Impact test method and classification
for flat glass

for details, see test report

Producer: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Under responsibility of: Noval Glass Group LTD
No.33 Shandong Road, Qingdao P.R.China

Product:
Thermally toughened soda lime silicate safety glass
(8 mm)

Test Result:

1(C)1

The tested samples are complying with the requirements of EN12600.

Signature:

L. van der Ven - le Comte
Project leader

A.J. Piers
Programme leader