EN 12150 - 2: 2004
Technical File

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Approval

The signatures below certify that this technical file has been reviewed and accepted, and demonstrates that the signatories are aware of all the requirements contained herein and are committed to ensuring their provision.

	Name	Signature	Position	Date
Prepared By				
Reviewed By				
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Amendment Record

This technical file is reviewed to ensure its continuing relevance to the systems and process that it describes. A record of contextual additions or omissions is given below:

Page No.	Context	Revision	Date

1. Introduction and Purpose

The purpose of this Technical File is to provide evidence that the thermally toughened soda lime silicate safety glass produced by RNG Consultancy, conforms to the requirements of EN 12150 - 2: 2004.

2. Requirements

The Construction Products Directive (CPD), require the manufacturer of thermally toughened soda lime silicate safety glass to create a technical file which should contain the information required to show that the product properly complies with the requirements of the directives which apply to it.

3. Normative References

This Technical File incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to be revisions of any of these publications apply to this Technical File only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

Reference	Title and Description
EN 12150 - 1: 2012	Glass in building - Thermally toughened soda lime silicate safety glass - Part 1: Definition and description.
EN 12150 - 2: 2004	Glass in building - Thermally toughened soda lime silicate safety glass - Part 2: Evaluation of conformity/Product Standard.
EN 12600: 2004	Glass in building - Pendulum test - Impact test method and classification for flat glass.
EN 1096 - 1: 2004	Glass in building - Coated glass - Part 1: Definitions and classification.
EN 572 - 2: 2004	Glass in building - Basic soda lime silicate glass products - Part 2: Float glass.
EN 410: 2004	Glass in building. Determination of luminous and solar characteristics of glazing.
EN 673: 2004	Glass in building. Determination of thermal transmittance (U value). Calculation method.

4. Additional Documents

The following additional documentation supports the manufacture of thermally toughened soda lime silicate safety glass to the requirements of EN 12150 - 1: 2012.

Title	Description
QMS-M-001	Quality Manual.
QMS-P-001	Document Control Procedure.
QMS-P-002	Record Control Procedure.
QMS-P-016	Control of Monitoring and Measurement Equipment Procedure.
QMS-P-019	Product Measurements - Toughened Glass Procedure.
QMS-P-025	Control of Non-Conformance Procedure.
QMS-P-026	Corrective Action Procedure.
QMS-P-027	Preventive Action Procedure.

5. Terms and Definitions

For the purposes of this Technical File the following definitions taken from EN 12150 - 1: 2012 and EN 12150 - 2: 2004 apply.

Term	Definition
thermally toughened soda lime silicate safety glass	Glass within which a permanent surface compressive stress has been induced by a controlled heating and cooling process in order to give it greatly increased resistance to mechanical and thermal stress and prescribed fragmentation characteristics.
enamelled thermally toughened soda lime silicate safety glass	Thermally toughened soda lime silicate safety glass which has a ceramic frit fired into the surface during the toughening process. After toughening the ceramic frit becomes an integral part of the glass.
opaque thermally toughened soda lime silicate safety glass	UK only. Thermally toughened soda lime silicate safety glass which has a ceramic frit fired into the surface during the toughening process. After toughening the ceramic frit becomes an integral part of the glass.
initial type testing	determination of the performance of a product (characteristic, durability), on the basis of either actual tests or other procedures (such as conventional, standardised, tabulated or general accepted values, standardised or recognised calculation methods and test reports that demonstrates compliance with EN 12150 - 2: 2004.
test report	document that covers the results of tests undertaken on a representative sample of the product from production or on a prototype design of the product.
product description	document that details the relevant parameters, e.g. process conditions, structure, etc., for defining a product that complies with the standard. It includes specific reference(s) to characteristics that are modified by the production process.

6. Product

6.1 Product Description

Thermally toughened soda lime silicate safety glass, manufactured to the requirements of EN 12150 - 1: 2012.

6.2 Intended Use

Intended to be used in buildings and construction works.

6.3 Initial Plan

Initially plan to produce thermally toughened soda lime silicate safety glass from the following basic glass products:

6.3.1 Clear Float Glass.

Thickness:	4mm, 6mm, 8mm, 10mm, 12mm, 15mm, 19mm.
Processing:	Rectangles and Shapes.

6.3.2 Clear Patterned Glass.

Thickness:	4mm, 6mm.
Processing:	Rectangles and Shapes.

6.3.3 Coated Float Glass (0.25 ≥ E > 0.1).

Processing:	Rectangles and Shapes.
Clear:	4mm, 6mm, 8mm, 10mm.

6.3.4 Coated Float Glass (0.1 ≥ E).

Processing:	Rectangles and Shapes.
Clear:	4mm, 6mm, 10mm.

6.4 Future Development

Future developments may possibly include:

6.4.1 Clear Float Glass.

Thickness:	3mm, 5mm.
Processing:	Edgework and Holes.

6.4.2 Clear Patterned Glass.

Thickness:	None.
Processing:	Edgework and Holes.

6.4.3 Coated Float Glass (0.25 ≥ E > 0.1).

Processing:	Edgework and Holes.
Clear:	None
Future Colours:	Blue, Green.

6.4.4 Coated Float Glass (0.1 ≥ E).

Processing:	Holes.
Clear:	8mm.
Future Colours:	Green.

6.5.1 Essential Characteristics - Clear Float Glass.

Essential Characteristics	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	15mm	19mm	25mm
Resistance to Fire:		NPD		NPD	NPD	NPD	NPD	NPD	NPD	
Reaction to Fire:		A1		A1	A1	A1	A1	A1	A1	
External Fire Behavior:		NPD		NPD	NPD	NPD	NPD	NPD	NPD	
Bullet Resistance:		NPD		NPD	NPD	NPD	NPD	NPD	NPD	
Bullet Resistance:		NPD		NPD	NPD	NPD	NPD	NPD	NPD	
Explosion Resistance:		NPD		NPD	NPD	NPD	NPD	NPD	NPD	
Burglar Resistance:		NPD		NPD	NPD	NPD	NPD	NPD	NPD	
Pendulum body impact resistance:		1(C)2		1(C)1	1(C)1	1(C)1	1(C)1	1(C)1	1(C)1	
Resistance to sudden temperature change and temperature differentials:		200K		200K	200K	200K	200K	200K	200K	
Direct airborne sound reduction (C,Ctr) dB:		29(-2,-3)		31(-2,-3)	32(-2,-3)	33(-2,-3)	34(0,-2)	NPD	NPD	
Thermal properties – U value W/(m²K):		5.8		5.7	5.6	5.6	5.5	5.4	5.3	
Light properties: tv. / pv. / p'v:		90/8/8		89/8/8	88/8/8	87/8/8	87/8/8	85/8/8	84/7/7	
Solar properties : te / pe / p'e:		84/8/8		82/7/7	79/7/7	76/7/7	73/7/7	70/7/7	66/7/7	

6.5.2 Essential Characteristics - Clear Patterned Glass.

Essential Characteristics	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	14mm	15mm	19mm
Resistance to Fire:		NPD		NPD						
Reaction to Fire:		A1		A1						
External Fire Behavior:		NPD		NPD						
Bullet Resistance:		NPD		NPD						
Bullet Resistance:		NPD		NPD						
Explosion Resistance:		NPD		NPD						
Burglar Resistance:		NPD		NPD						
Pendulum body impact resistance:		1(C)2		1(C)1						
Resistance to sudden temperature change and temperature differentials:		200K		200K						
Direct airborne sound reduction (C,Ctr) dB:		29(-2,-3)		31(-2,-3)						
Thermal properties – U value W/(m²K):		5.8		5.7						
Light properties: tv. / pv. / p'v:		88/8/8		86/8/8						
Solar properties : te / pe / p'e:		78/7/7		73/7/7						

6.5.3 Essential Characteristics - Clear Coated Float Glass (0.25 ≥ E > 0.1).

Essential Characteristics	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	15mm	19mm	25mm
Resistance to Fire:		NPD		NPD	NPD	NPD				
Reaction to Fire:		A1		A1	A1	A1				
External Fire Behavior:		NPD		NPD	NPD	NPD				
Bullet Resistance:		NPD		NPD	NPD	NPD				
Bullet Resistance:		NPD		NPD	NPD	NPD				
Explosion Resistance:		NPD		NPD	NPD	NPD				
Burglar Resistance:		NPD		NPD	NPD	NPD				
Pendulum body impact resistance:		1(C)2		1(C)1	1(C)1	1(C)1				
Resistance to sudden temperature change and temperature differentials:		200K		200K	200K	200K				
Direct airborne sound reduction (C,Ctr) dB:		29(-2,-3)		31(-2,-3)	32(-2,-3)	33(-2,-3)				
Thermal properties – U value W/(m²K):		NPD		NPD	NPD	NPD				
Light properties: tv. / pv. / p'v:		85/4/6		84/4/6	83/4/6	84/4/6				
Solar properties : te / pe / p'e:		63/20/15		60/20/15	58/20/13	58/20/13				

6.5.4 Essential Characteristics - Clear Coated Float Glass (0.1 ≥ E).

Essential Characteristics	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	15mm	19mm	25mm
Resistance to Fire:		NPD		NPD		NPD				
Reaction to Fire:		A1		A1		A1				
External Fire Behavior:		NPD		NPD		NPD				
Bullet Resistance:		NPD		NPD		NPD				
Bullet Resistance:		NPD		NPD		NPD				
Explosion Resistance:		NPD		NPD		NPD				
Burglar Resistance:		NPD		NPD		NPD				
Pendulum body impact resistance:		1(C)2		1(C)1		1(C)1				
Resistance to sudden temperature change and temperature differentials:		200K		200K		200K				
Direct airborne sound reduction (C,Ctr) dB:		29(-2,-3)		31(-2,-3)		33(-2,-3)				
Thermal properties – U value W/(m²K):		NPD		NPD		NPD				
Light properties: tv. / pv. / p'v:		76/60/5		76/5/5		75/5/5				
Solar properties : te / pe / p'e:		44/37/30		42/37/26		41/37/23				

6.6.1 Initial Type Test - Clear Float Glass.

Initial Type Test	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	15mm	19mm	25mm
Mechanical Strength 1:		Pass		Pass	Pass	Pass	Pass	Pass	Pass	
Mechanical Strength 2:		Pass		Pass	Pass	Pass	Pass	Pass	Pass	
Fragmentation 1:		61		72	74	67	66	61	55	
Fragmentation 2:		63		74	78	62	62	59	57	
Fragmentation 3:		61		76	71	63	61	64	61	
Fragmentation 4:		64		75	75	64	63	61	59	
Fragmentation 5:		62		73	72	65	64	59	62	

6.6.2 Initial Type Test - Clear Patterned Glass.

Initial Type Test	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	14mm	15mm	19mm
Mechanical Strength 1:		Pass		Pass						
Mechanical Strength 2:		Pass		Pass						
Fragmentation 1:		66		64						
Fragmentation 2:		61		65						
Fragmentation 3:		65		61						
Fragmentation 4:		63		66						
Fragmentation 5:		66		62						

6.6.3 Initial Type Test - Blue Coated Float Glass (0.25 ≥ E > 0.1).

Initial Type Test	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	15mm	19mm	25mm
Mechanical Strength 1:		Pass		Pass	Pass	Pass				
Mechanical Strength 2:		Pass		Pass	Pass	Pass				
Fragmentation 1:		66		74	79	77				
Fragmentation 2:		64		75	71	80				
Fragmentation 3:		62		71	66	79				
Fragmentation 4:		63		76	69	74				
Fragmentation 5:		66		72	75	75				

6.6.4 Initial Type Test - Blue Coated Float Glass (0.1 ≥ E).

Initial Type Test	Thickness									
	3mm	4mm	5mm	6mm	8mm	10mm	12mm	15mm	19mm	25mm
Mechanical Strength 1:		Pass		Pass		Pass				
Mechanical Strength 2:		Pass		Pass		Pass				
Fragmentation 1:		55		75		75				
Fragmentation 2:		61		76		74				
Fragmentation 3:		59		74		72				
Fragmentation 4:		58		78		76				
Fragmentation 5:		62		71		71				

7. Factory Production Control

The Factory Production Control system used by RNG Consultancy, has been achieve through the implementation of GGF.Quality CEN. The software system integrates with our production procedures listed in section 4 above and is ISO 9001 compliant. GGF.Quality CEN aligns with the current appropriate hEN's and though it's database can be subsequently updated when future ammended hEN's are released.

The EN 12150 module and our documented procedures, meet the the requirements of EN 12150 - 2: 2004 Table 1 for:

a. Section 1: Incoming Material.

b. Section 2: Production Control.

c. Section 3: Product Control.

Inspection data is entered and tested against the appropriate clauses of EN 12150 - 1: 2012. The results are recorded within the database and a test report is produced. For traceability purposes each test report incorporates the following:

a. Unique record number.

b. Inspectors name.

c. Date time stamp.

Though use of the archive system, records and test reports can be maintaned and stored for the minimum required period of one year.

8. Equipment

Ser No.	Description
1	4 Point Proxy Bend Test Rig
2	Strainoptics, Inc - Laser GASP
3	Strainoptics, Inc - RWG-I/M Roller-Wave Gauge
4	Soft Solutions GMBH - Cullet Scanner (Automatic Fragment Counter)
5	Taper Gauge 0 to 11mm
6	1500mm Straight Edge
7	2 x Wooden Blocks - 100mm x 100mm x 200mm
8	Calibrated Tape Measure - 0 to 5m
9	300mm Straight Edge
10	Feeler Gauge - 0.05mm to 1mm

9. Additional Information

In this section you can add additional information to the technical file which may include but not limited to the following:

1. Product branding.

2. Future capital equipment purchases that will further improve product conformity.

3. Company "Quality Policy”

4. Quality Management System (QMS)

5. Document Management System (DMS)

6. Record Management System (RMS)

etc.