

BS EN 3861:2013



BSI Standards Publication

Aerospace series — Non-metallic materials — Glass transparencies — Material standard — Thermally tempered soda lime float glass

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee ACE/65, Non-metallic materials for aerospace purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

**Aerospace series - Non-metallic materials - Glass
transparencies - Material standard - Thermally tempered soda
lime float glass**

Série aérospatiale - Matériaux non-métalliques -
Transparents en verre - Norme de matériaux - Feuilles de
verre sodo calcique flotté trempées thermiquement

Luft- und Raumfahrt - Nichtmetallische Werkstoffe -
Transparente Glaswerkstoffe - Werkstoffnorm - Thermisch
vorgespanntes Kalk-Natron-Floatglas

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Foreword

This document (EN 3861:2013) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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Introduction

This standard is part of the series of EN non-metallic materials standards for aerospace applications. The general organisation of this series is described in EN 4385. This standard is a level 3 document as defined in EN 4385. It has been prepared in accordance with TR 7000-5.

1 Scope

This European Standard specifies the requirements relating to universally available and high light transmission, thermally tempered float glass plies, for aerospace applications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 3001, *Aerospace series — Tempered float glass plies for aircraft applications — Technical specification* ¹⁾

EN 4385, *Aerospace series — Non-metallic materials — General organisation of standardisation — Links between types of standards* ¹⁾

TR 7000-5, *Aerospace series — Non-metallic materials — Rules for the drafting and presentation of material standards — Part 5: Glass transparencies* ²⁾

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of this document the following definitions apply:

3.1.1 Definition of subcase numbering

In the column “requirement” at the left hand side a subcase number is given. The meaning of these subcase numbers is as follows:

Subcase number	Definition
–	Technical specification
1	Test method
2	Frequency of testing
3	Sample type
4	Test piece definition
5	Conditioning of test piece
6	Testing condition
7	Acceptance criteria

1) Published as ASD-STAN Prestandard at the date of publication of this standard (www.asd-stan.org).

2) Published as ASD-STAN Technical Report at the date of publication of this standard (www.asd-stan.org).

Note 1 to entry: The absence of a subcase indicates that the necessary information is given in Table 1 of this standard, e.g. in the reference to the technical standard (characteristic 1.004).

All the necessary information which does not appear is to be found in the referenced technical specification or the relevant test method.

Note 2 to entry: In this material standard, batch acceptance test titles and subcases 7 acceptance criteria are highlighted in the form of a bold frame and bold characters to show that they are mandatory for routine acceptance of the material.

3.1.2 Type A

Universally available float glass

3.1.3 Type B

High light transmission float glass

3.1.4 Other definitions

See EN 3001.

4 Requirements

The required characteristics are given in:

- Table 1 — General requirements
- Table 2 — Requirements in the delivery condition
- Table 3 — Requirements as processed to characteristic number 1.013
- Table 4 — Environmental testing requirements as processed to characteristic number 1.013

Table 1 — General requirements

Characteristic number	Characteristic	Requirements				
1.001	Material description	Glass transparency				
1.002	Formulation	Soda-lime glass, see EN 3001.				
1.003	Form and method of production	Thermally tempered float glass				
1.004	Technical specification	See EN 3001.				
1.005	Grade	A03	A04	A05	A06	A08
	Type	A	A	A	A	A
	Thickness mm	$0 < t \leq 3$	$3 < t \leq 4$	$4 < t \leq 5$	$5 < t \leq 6$	$6 < t \leq 8$
	Grade	A10	A12	A15	A19	B08
	Type	A	A	A	A	B
	Thickness mm	$8 < t \leq 10$	$10 < t \leq 12$	$12 < t \leq 15$	$15 < t \leq 19$	$0 < t \leq 8$
1.010	Storage	Suitable conditions, avoiding surface condensation				
1.011	Shelf life	Not applicable				
1.013	Processing condition	Supplied in final condition of use				
1.093	Quality assurance	See EN 3001.				
1.094	Designation	EN 3861 + grade (according to 1.005)				
1.098	Health and safety	See EN 3001.				
1.999	Notes					

Table 2 — Requirements in the delivery condition

Characteristic number	Characteristic	Requirements						
2.110	Dimensional tolerance	7	See EN 3001.					
2.110	Flatness	7	mm/m	See EN 3001.				
2.111	Light transmission — all types	6	Visible range					
		7	%	A03	A04	A05	A06	A08
				> 89	> 88,2	> 87,3	> 86,4	> 84,6
		7	%	A10	A12	A15	A19	B08
> 82,8	> 81,2			> 78,2	> 74,9	> 90,5		
2.111	Light transmission — type B glass	6	At 800 nm					
		7	%	B08				
				> 80,7				
2.111	Optical distortion	7	See EN 3001.					
3.111	Refractive index	7	n	1,52 ± 0,01				
2.111	Haze	7	%	≤ 1				
2.111	Optical defects	7	See EN 3001.					
2.301	Density	7	g/cm ³	2,50 ± 0,02				
2.303	Linear expansion	7	10 ⁻⁷ /K	88,5 ± 3,5				
2.308	Surface compression stress	7	MPa	Shall comply with the limits agreed during product qualification.				
2.311	Modulus of rupture	7	MPa	Shall comply with the limits agreed during product qualification.				
2.999	Notes							

Table 3 — Requirements as processed to characteristic number 1.013

No requirement - refer to Table 2

Table 4 — Environmental testing requirements as processed to characteristic number 1.013

No requirement

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