

BS EN 3697:2013



BSI Standards Publication

**Aerospace series —
Acrylonitrile-butadiene rubber
(NBR) — Low temperature
resistant — Hardness 60 IRHD**

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National foreword

This British Standard is the UK implementation of EN 3697:2013.

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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EN 3697

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English Version

Aerospace series - Acrylonitrile-butadiene rubber (NBR) - Low temperature resistant - Hardness 60 IRHD

Série aérospatiale - Série aérospatiale - Élastomère acrylonitrile butadiène (NBR) - Résistant aux basses températures - Dureté 60 DIDC

Luft- und Raumfahrt - Acrylnitril-Butadien-Elastomer (NBR) - Beständig gegen niedrige Temperaturen - Härte 60 IRHD

This European Standard was approved by CEN on 21 November 2012.

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Foreword

This document (EN 3697:2013) 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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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1 Scope

This European Standard specifies the properties of acrylonitrile-butadiene rubber (NBR) ¹⁾, low temperature resistant, hardness 60 IRHD, 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 3207, *Aerospace series — Rubber compounds — Technical specification*

ISO 1629, *Rubber and lattices — Nomenclature*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

3 Application of the material

3.1 General

The suitability of the material for a specific application shall be determined by complementary tests carried out on the finished product as the properties specified in this standard are obtained from standard test specimens.

3.2 Typical use

For applications where resistance to petroleum based fuels and lubricants is required together with resistance to low temperatures.

3.3 Temperature range

— Continuous service : from – 45 °C to 110 °C;

— Intermittent service : from – 45 °C to 130 °C.

4 Properties

See Table 1 and Table 2 according to EN 3207.

For qualification, all tests shall be performed.

For batch acceptance, the tests identified with footnote "a" in Table 1 and Table 2 shall be performed.

¹⁾ Symbol as per ISO 1629.

Table 1 — Test methods

Line	Column		
	1	2	3
	Properties	Units	Requirements
1	Hardness	IRHD	60 ^{+ 5} _{- 4} ^a
2	—	—	—
3	Density	Mg/m ³	a, b
4	—	—	—
5	Tensile strength	MPa	11 min. ^a
6	—	—	—
7	Elongation at break	%	200 min. ^a
8	—	—	—
9	Modulus at 100 % strain	MPa	2,5 min.
10	—	—	—
11	Tear strength	N/mm	—
12	—	—	—
13	Resistance to low temperatures TR 10	°C	– 45 max.
14	Crystallization	Point	—
15	Compression set		—
15.1	After 24 h to 125 °C	%	45 max. ^a
15.2	After ... h to ... °C		—
16	—	—	—
17	Ozone resistance Ozone concentration : (... ± ...) pphm Elongation of test piece : ... % Time : ... h Temperature : ... °C	—	—
18	—	—	—
19	Corrosion and adhesion on metals Time : 168 h Temperature : 100 °C	—	no corrosion no adhesion
20	Corrosion and adhesion on metals		
20.1	Time : ... h Temperature : ... °C Humidity : ... %	—	—
20.2	Time : ... h Temperature : ... °C Humidity : ... %		
21	—	—	—
22	—	—	—
23	—	—	—
24	—	—	—
25	—	—	—
26	—	—	—
27	—	—	—
28	—	—	—
29	—	—	—
30	—	—	—

^a Test for batch accepted.
^b The value determined for each batch shall not differ from that determined at qualification by more than 0,02 Mg/m³.

Table 2 — Tests

Line	Column					
	1	2	3	4	5	
1	Test media	–	Air	Oil No. 1, see ISO 1817	Oil No. 3, see ISO 1817	
2	Conditions of exposure in test media	Units	70 h/125 °C	70 h/125 °C	70 h/125 °C	
3	Permitted variation of the properties compared to the initial value	Volume	%	–	0 –20 ^a	+20 +5 ^a
4		Mass	%	–	–	–
5		Tensile strength	%	± 15	–	– 35
6		Elongation at break	%	– 50	–	– 40
7		Hardness	IRHD	+ 15	–	– 15
8	–	–	–	–	–	

^a Test for batch acceptance.

5 Designation

EXAMPLE

Description block

RUBBER

Identity block

EN3697

Number of this standard

6 Technical specification

See EN 3207.

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