



**SLOVENSKI STANDARD**  
**SIST EN 2840:2014**

**01-januar-2014**

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**Aeronavtika - Akrilonitril-butadien kavčuk (NBR) - Odporen proti mineralnim oljem  
- Trdota 50 IRHD**

Aerospace series - Acrylonitrile-butadiene rubber (NBR) - Mineral oil resistant - Hardness  
50 IRHD

Luft- und Raumfahrt - Acrylnitril-Butadien-Elastomer (NBR) - Beständig gegen Mineralöle  
- Härte 50 IRHD

Série aérospatiale - Élastomère acrylonitrile butadiène (NBR) - Résistant aux huiles  
minérales - Dureté 50 DIDC

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**Ta slovenski standard je istoveten z: EN 2840:2013**

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**ICS:**

49.025.40      Guma in polimerni materiali      Rubber and plastics

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 2840**

February 2013

ICS 49.025.40

English Version

**Aerospace series - Acrylonitrile-butadiene rubber (NBR) -  
Mineral oil resistant - Hardness 50 IRHD**

Série aérospatiale - Élastomère acrylonitrile butadiène  
(NBR) - Résistant aux huiles minérales - Dureté 50 DIDC

Luft- und Raumfahrt - Acrylnitril-Butadien-Elastomer (NBR)  
- Beständig gegen Mineralöle - Härte 50 IRHD

This European Standard was approved by CEN on 27 October 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 2840:2013) 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 August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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**EN 2840:2013 (E)****1 Scope**

This European Standard specifies the properties of acrylonitrile-butadiene rubber (NBR) <sup>1)</sup>, mineral oil resistant, hardness 50 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 latices — Nomenclature*

ISO 1817, *Rubber, vulcanized — 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 hydraulic fluids and lubricants is required.

**3.3 Temperature range**

- Continuous service : from – 40 °C to 120 °C
- Intermittent service : from – 40 °C to 150 °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 Properties	2 Units	3 Requirements
1	Hardness	IRHD	50 <sup>+5</sup> <sub>-4</sub> <sup>a</sup>
2	—	—	—
3	Density	Mg/m <sup>3</sup>	a, b
4	—	—	—
5	Tensile strength	MPa	10 min. <sup>a</sup>
6	—	—	—
7	Elongation at break	%	400 min. <sup>a</sup>
8	—	—	—
9	Modulus at ... % strain	MPa	—
10	—	—	—
11	Tear strength	N/mm	—
12	—	—	—
13	Resistance to low temperatures TR 10	°C	– 25 max.
14	Crystallization	Point	—
15	Compression set		—
15.1	After 24 h to 125 °C	%	35 max. <sup>a</sup>
15.2	After 70 h to 125 °C		40 max.
16		—	—
17	Ozone resistance Ozone concentration : ( ... ± 0.2 ) 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	—	—	—

<sup>a</sup> Test for batch accepted.  
<sup>b</sup> The value determined for each batch shall not differ from that determined at qualification by more than 0,02 Mg/m<sup>3</sup>.

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 –15 <sup>a</sup>	+25 +5 <sup>a</sup>
4		Mass	%	–	–	–
5		Tensile strength	%	– 10 <sup>a</sup>	– 10	– 10
6		Elongation at break	%	– 45 <sup>a</sup>	– 40	– 30
7		Hardness	IRHD	– 12 0 <sup>a</sup>	+ 20 0	0 – 15
8	–	–	–	–	–	

<sup>a</sup> Test for batch acceptance.

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## 5 Designation

EXAMPLE

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## 6 Technical specification

See EN 3207.