

BS EN 4488:2013



BSI Standards Publication

Aerospace series — Non-metallic materials — Anaerobic polymerisable compounds — Threadlocking — Torque strength 2 Nm

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 4488:2013.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013. Published by BSI Standards Limited 2013

ISBN 978 0 580 80248 5

ICS 49.025.50

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2013.

Amendments issued since publication

Date	Text affected
------	---------------

EUROPEAN STANDARD

EN 4488

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2013

ICS 49.025.50

English Version

**Aerospace series - Non-metallic materials - Anaerobic
polymerisable compounds - Threadlocking - Torque strength 2
Nm**

Série aérospatiale - Matériaux non-métalliques - Composé
polymérisable anaérobie - Agent de freinage - Résistance
au couple de torsion 2 Nm

Luft- und Raumfahrt - Nichtmetallische Werkstoffe -
Anaerobe polymerisierbare Klebstoffe -
Schraubensicherung - Torsionsfestigkeit 2 Nm

This European Standard was approved by CEN on 10 November 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.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms, definitions, symbols and abbreviations	5
4 Requirements	6

Foreword

This document (EN 4488:2013) 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.

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.

Introduction

This standard is part of a 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 7000-7.

1 Scope

This European Standard specifies the requirements relating to anaerobic polymerisable threadlocking compounds having a torque strength of 2 Nm 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 3792, *Aerospace series — Anaerobic polymerisable compounds — Technical specification* ¹⁾

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1 Definition of subcase numbering

In the column “requirement” at the left hand side a subcase number is given. The definition 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	Condition 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).

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 Other definitions

See EN 3792.

3.2 Symbols and abbreviations

See EN 3792.

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	One part, threadlocking, anaerobic polymerisable compound
1.002	Formulation	Acrylic ester of a polyhydroxy compound
1.003	Form and method of production	Liquid
1.004	Technical specification	See EN 3792.
1.005	Grade	– 01 – 02
1.007	Colour	^a
1.010	Storage	Temperature < 25 °C, out of direct sunlight and in the presence of oxygen
1.011	Shelf life	Not less than 12 months under storage conditions
1.013	Processing condition	At least 24 h at (23 ± 2) °C
1.093	Quality assurance	See EN 3792.
1.094	Designation	See EN 4488 plus Grade.
1.097	Flashpoint	> 100 °C
1.098	Health and safety	See EN 3792.
1.999	Notes	^a Colour to be agreed between purchaser and supplier.

Table 2 — Requirements in the delivery condition

Characteristic number	Characteristic		Requirements		
2.007	Visual inspection	7	Correct colour (see Table 1)		
2.106	Cure rate	7	> 4 min		
2.106	Reactivity in contact with zinc	7	< 60 min		
2.106	Gel time – stability at 100 °C	7	> 10 min		
2.107	Viscosity	7	Grade	01	02
			$10^{-6} \text{ m}^2/\text{s}$	125 ± 25	500 ± 250
2.111	Fluorescence	7	Shall fluoresce		

Table 3 — Requirements as processed to characteristic number 1.013

Characteristic number	Characteristic		Requirements		
3.315	Torque strength	7	Grade	01	02
			Nm	2 ± 1	2 ± 1

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

Characteristic number	Characteristic		Requirements		
4.503	Effect of dry heat	5	2 h at – 55 °C	1 000 h at 100 °C	1 000 h at 150 °C
4.315	Torque strength	7	% of actual value when tested to characteristic number 3.315		
			> 150	> 95	> 60

Bibliography

- [1] EN 4385, *Aerospace series — Non-metallic materials — General organisation of standardisation — Links between types of standards*²
- [2] TR 7000-7, *Aerospace series — Non-metallic materials — Rules for drafting and presentation of material standards — Part 7: Anaerobic polymerisable compounds*³

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

³ Published as ASD-STAN Technical Report at the date of publication of this standard (www.asd-stan.org).

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

All the data, software and documentation set out in all British Standards and other BSI publications are the property of and copyrighted by BSI, or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. Details and advice can be obtained from the Copyright & Licensing Department.

Useful Contacts:

Customer Services

Tel: +44 845 086 9001

Email (orders): orders@bsigroup.com

Email (enquiries): cservices@bsigroup.com

Subscriptions

Tel: +44 845 086 9001

Email: subscriptions@bsigroup.com

Knowledge Centre

Tel: +44 20 8996 7004

Email: knowledgecentre@bsigroup.com

Copyright & Licensing

Tel: +44 20 8996 7070

Email: copyright@bsigroup.com



...making excellence a habit.™