

BS EN 4526:2013



BSI Standards Publication

**Aerospace series — Metallic
materials — Test methods —
Sharp edge-notch tensile
testing for sheet and strip**

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 4526:2013.

The UK participation in its preparation was entrusted by Technical Committee ACE/61, Metallic materials for aerospace purposes, to Subcommittee ACE/61-/6, Mechanical Testing of 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 59071 9

ICS 49.025.05; 49.025.15

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

Amd. No.	Date	Text affected
----------	------	---------------

EUROPEAN STANDARD

EN 4526

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2013

ICS 49.025.05; 49.025.15

English Version

Aerospace series - Metallic materials - Test methods - Sharp edge-notch tensile testing for sheet and strip

Série aérospatiale - Matériaux métalliques - Méthodes d'essais - Essai de traction sur éprouvette à bord entaillé pour tôles et bandes

Luft- und Raumfahrt - Metallische Werkstoffe - Prüfverfahren - Zugversuch an Spitzkerbproben von Blechen und Bändern

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 and symbols	5
4 Health and safety	5
5 Principle	5
6 Testing requirements	6
7 Test report	7

Foreword

This document (EN 4526:2013) 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 the series of EN metallic material standards for aerospace applications. The general organisation of this series is described in EN 4258.

1 Scope

This European Standard specifies the requirements for sharp edge-notch tensile testing for sheet and strip for aerospace applications.

It shall be applied when referred to in the EN Technical Specification or material standard unless otherwise specified on the drawing, order or inspection schedule.

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 2002-001, *Aerospace series — Metallic materials — Test methods — Part 001: Tensile testing at ambient temperature*

EN 4258, *Aerospace series — Metallic materials — General organization of standardization — Links between types of EN standards and their use*

EN 4259, *Aerospace series — Metallic materials — Definition of general terms* ¹⁾

ASTM E338-91, *Sharp notch tension testing of high strength sheet materials* ²⁾

3 Terms, definitions and symbols

For the purposes of this document, the terms, definitions and symbols given in EN 4259 apply.

4 Health and safety

Resources, test pieces, test samples, test materials, test equipment and test procedures shall comply with the current health and safety regulations/laws of the countries where the test is to be carried out.

Where materials and/or reagents which may be hazardous to health are specified, appropriate precautions in conformity with local regulations and/or laws shall be taken.

5 Principle

A test piece with a sharp machined notch is tested in tension to determine the maximum force (or load, P) that can be withstood. The ratio of sharp notch strength to 0,2 % proof stress is used as a comparative index of fracture toughness.

The test method is restricted to those materials (e.g. aluminium and magnesium alloys) in which the required sharp notch may be machined.

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

2) Published by ASTM National (US) American Society for Testing and Materials (<http://www.astm.org/>)

6 Testing requirements

6.1 Resources

6.1.1 Equipment/plant

See EN 2002-001 for ambient temperature tests.

6.1.2 Materials/Reagents

The following materials/reagents may be suitable:

- degreasing fluids;
- recording paper;
- means of electronic recording, if appropriate.

6.1.3 Qualification of personnel

Testing to the requirements of this test method shall only be undertaken and/or supervised by personnel who have demonstrated their competence by a suitable education and appropriate training and experience.

6.2 Test samples/Test pieces

A machined sharp edge-notch specimen in accordance with ASTM E338-91 shall be used.

6.3 Testing procedure

6.3.1 General

See ASTM E338-91 and EN 2002-001.

6.3.2 Temperature of test

The test shall be carried out at $10\text{ °C} \leq \theta \leq 35\text{ °C}$, unless otherwise specified. In cases of dispute, the test shall be performed at $\theta = 23\text{ °C} \pm 5\text{ °C}$.

6.4 Expression of results

See ASTM E338-91.

7 Test report

All results shall be in written form and the test report shall include, when relevant, at least the following information:

- reference to this standard;
- any other information relevant to the test method (e.g. test conditions, test equipment, test procedure, verification, ...);
- identification and traceability to the semi-finished product to be tested in accordance with the technical specifications;
- identification and traceability of test samples taken from the semi-finished product (e.g. location, orientation, size);
- identification and traceability of test pieces taken from the test samples (e.g. number, preparation, method, conditioning, use/method of mechanical straightening of coiled strip).

In certain cases, the test piece may be the test sample:

- expression of results (e.g. individual values or mean values, units, if fracture outside middle third of gauge length, use of an extensometer to measure elongation after fracture, unusual features in the fracture surface, ...);
- recorded plots/graphs, when necessary;
- date of test;
- traceability of individual performing the test;
- any incident which may have affected the results;
- any deviation from the test method standard.

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.™