



SLOVENSKI STANDARD

SIST EN 2157-2:2001

01-januar-2001

Aerospace series - Steel - Forging stock and forgings - Technical specification - Part 2: Forging stock

Aerospace series - Steel - Forging stock and forgings - Technical specification - Part 2: Forging stock

Luft- und Raumfahrt - Stahl - Schmiedevormaterial und Schmiedestücke - Technische Lieferbedingungen - Teil 2: Schmiedevormaterial

Série aérospatiale - Acier - Produits destinés à la forge - Pièces forgées et pièces matricées - Spécification technique - Produits destinés à la forge

<https://standards.iteh.ai/catalog/standards/sist/0ff519c-2017-497c-8a2d-ad4eacaba3fb/sist-en-2157-2-2001>

Ta slovenski standard je istoveten z: EN 2157-2:1993

ICS:

49.025.10 Jekla Steels

SIST EN 2157-2:2001 en

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EUROPEAN STANDARD

EN 2157-2:1993

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 1993

UDC 669.14-4:621.73:620.1:629.7

Descriptors: Aircraft industry, forgings, die forgings, steels, specifications, forging

English version

**Aerospace series - Steel - Forging stock and
forgings - Technical specification - Part 2: Forging
stock**

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

SIST EN 2157-2:2001
<https://standards.iteh.ai/catalog/standards/sist/0ff519c-2017-497c-8a2d-7310>

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

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

This standard was submitted for Formal Vote, and the result was positive.

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 February 1994, and conflicting national standards shall be withdrawn at the latest by February 1994.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope

The present standard specifies the particular requirements for forging stock intended for the manufacture of steel forgings.

This standard shall be used in conjunction with EN 2157-1.

Bars and sections conforming to EN 2069-3 may be used as forging stock provided that an agreement was established between the forging stock manufacturer and the purchaser to ensure that the requirements of the present standard are met.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- EN 2002-1 Aerospace series - Test methods for metallic materials - Part 1 - Tensile testing at ambient temperature ¹⁾
- EN 2003-1 Aerospace series - Test methods for steel products - Part 1 - Charpy impact test (U notch) ¹⁾
- EN 2003-2 Test methods for steel products - Part 2 - Izod impact test - Aerospace series ²⁾
- EN 2003-8 Aerospace series - Test methods for products in steel, titanium, titanium alloys and heat resisting alloys - Part 8 - Ultrasonic inspection for semi-finished products (rolled, drawn, extruded, forged) ³⁾
- EN 2069-3 Inspection and testing requirements for steel wrought products - Part 3 - Inspection and testing requirements for bars and sections - Aerospace series ²⁾
- EN 2157-1 Aerospace series - Steel - Forging stock and forgings - Technical specification - Part 1 - General requirements
- EN 2951 Aerospace series - Test methods for steels - Microscopic examination for assessing the content of non metallic inclusions ³⁾

1) Published as AECMA Prestandard at the date of publication of this standard

2) Published as AECMA Standard at the date of publication of this standard

3) In preparation at the date of publication of this standard

3 Manufacture

Unless otherwise specified on the material standard, order or inspection schedule, the method of manufacture to be employed shall be at the discretion of the manufacturer.

All forging stock shall be mechanically worked with a minimum reduction of 4 : 1 (ratio between cross-section) unless otherwise agreed between the manufacturer and the purchaser.

4 Dimensions and tolerances

The dimensions and tolerances shall be defined by agreement between the manufacturer and the purchaser.

The frequency of examination adopted by the manufacturer shall be sufficient to permit him to certify compliance with the requirements.

5 Internal defects

Prior to final inspection, an adequate length shall be cut from the forging stock ends and metal removed from the surface.

The manufacturer shall establish an appropriate technique for verifying that adequate material has been removed. The technique used shall be recorded in the manufacturer's internal documentation.

5.1 Ultrasonic testing

Unless otherwise specified by the material standard, order or inspection schedule, all forging stock shall be ultrasonically tested in accordance with EN 2003-8.

Acceptance criteria :

- forging stock \leq 250 mm diameter : class 2 of EN 2003-8;
- forging stock $>$ 250 mm diameter : to be agreed between the manufacturer and the purchaser.

5.2 Inclusions

Verification of inclusion content shall be carried out on a sample forged with either :

- a reduction between 15 : 1 to 20 : 1 from the ingot, or,
- a maximum reduction of 4 : 1 from the forging stock.

The forged test sample diameter or thickness shall be \geq 25 mm.

Evaluation shall be made along the longitudinal axis of the forging stock in accordance with EN 2951 (microscopical method) and shall meet the requirements of the material standard.

Test frequency shall be in accordance with table 1.

6 External defects

The surface of the forging stock shall be free from defects which would be detrimental to further working.

All forging stock shall be visually examined in descaled condition.

Defects may be removed by local dressing providing the area of rectification is adequately blended into the surface and the dimension affected remains within any tolerance which may be specified.

Forging stock shall be inspected after dressing to verify that defects have been removed.

7 Mechanical tests

Tests shall be carried out on a sample forged as defined in sub-clause 5.2.

The sample shall be heat treated in accordance with the requirements of the material standard.

7.1 Tensile test

Tests shall be performed in accordance with EN 2002-1 on proportional round test pieces. The form and size shall be selected from EN 2002-1.

Test frequency shall be in accordance with table 1.

The results shall meet the requirements of the relevant material standard.

7.2 Beam impact test

Tests shall be performed in accordance with either EN 2003-1 or EN 2003-2 as required by the material standard.

Test frequency shall be in accordance with table 1.

The results shall meet the requirements of the relevant material standard.

8 Special tests

Special tests and inspection may be required by the purchaser (e.g. : macrography, fracture inspection, sulphur printing/etching, up-ending, overheating checks, etc...).

In such cases, after agreement between the manufacturer and the purchaser, the nature of test, methods, number and acceptance criteria shall be specified on the order or in the inspection schedule.

9 Marking

All products shall bear the following identification marking :

- material standard number;
- cast number;
- product identification number, when required;
- identification of manufacturer and, where appropriate, of plant;
- inspection stamp.

Identification marking shall be hard stamped at least once on each product.

Table 1 - Summary of requirements

Requirement	Clause	Product	Inspection / Testing			
			Method	Standard	Frequency	
Chemical composition	see EN 2157-1	All	-	-	1 per cast	
Dimensions	4	All	Appropriate	-	see 4	
Internal defects	5.1	All	Ultrasonic inspection	EN 2003-8	100 %	
	5.2	If required by the material standard	Inclusion content	EN 2951	1 per cast	
External defects	6	All	Visual	-	100 %	
Mechanical tests	Tensile test	7.1	If required by the material standard	Tensile	EN 2002-1	1 per cast
	Beam impact test	7.2		Beam impact	EN 2003-1 or EN 2003-2	3 per cast
Marking	9	All	Visual	-	See 9	