

Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles

Part 1. Technical conditions for inspection and delivery

The European Standard EN 755-1 : 1997 has the status of a
British Standard

ICS 77.150.10

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee NFE/35, upon which the following bodies were represented:

Aluminium Federation
Aluminium Stockholders' Association
Association of Light Alloy Refiners Limited
Magnesium Industry Council
Ministry of Defence

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

Association of British Welded Aluminium Tube Makers
Institution of Structural Engineers
Metal Packaging Manufacturers' Association

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National foreword

This Part of BS EN 755 has been prepared by Technical Committee NFE/35 and is the English language version of EN 755 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 1 : 1997 Technical conditions for inspection and delivery*, published by the European Committee for Standardization (CEN).

This British Standard is published under the direction of the Engineering Sector Board whose Technical Committee NFE/35 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

This Part of BS EN 755 is published together with:

BS EN 755	<i>Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles</i>
Part 2	<i>Mechanical properties</i>
BS EN 754	<i>Aluminium and aluminium alloys — Cold drawn rod/bar and tube</i>
Part 1	<i>Technical conditions for inspection and delivery</i>
Part 2	<i>Mechanical properties</i>

As a result of the publication of the above standards, BS 4300 : Part 5 : 1973 is withdrawn and the following British Standards listed in the table are partially superseded.

NOTE. The table gives the full list of European Standards which partially supersede the British Standards.

British Standards partially superseded by this standard and other European Standards				
BS 1471 : 1972	BS 1474 : 1987	BS 4300 : Part 4 : 1973	BS 4300 : Part 12 : 1969	BS 4300 : Part 15 : 1973
EN 515	EN 515	EN 515	EN 515	EN 515
EN 573-3	EN 573-3	EN 573-3	EN 573-3	EN 573-3
EN 573-4	EN 573-4	EN 573-4	EN 573-4	EN 574-4
EN 754-1	EN 755-1	EN 755-1	EN 755-1	EN 755-1
EN 754-2	EN 755-2	EN 755-2	EN 755-2	EN 755-2
	EN 755-3	EN 755-3	EN 755-3	EN 755-3
	EN 755-4	EN 755-4	EN 755-4	EN 755-4
	EN 755-5	EN 755-5	EN 755-5	EN 755-5
	EN 755-6	EN 755-6	EN 755-6	EN 755-6

In addition, the British Standards in the table will be withdrawn when the following European Standards are published:

EN 754	<i>Aluminium and aluminium alloys — Cold drawn rod/bar and tube</i>
Part 7	<i>Seamless tubes, tolerances on dimensions and form</i>
Part 8	<i>Porthole tubes, tolerances on dimensions and form</i>
EN 755	<i>Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles</i>
Part 7	<i>Seamless tubes, tolerances on dimensions and form</i>
Part 8	<i>Porthole tubes, tolerances on dimensions and form</i>
Part 9	<i>Profiles, tolerances on dimensions and form</i>
EN 12020	<i>Aluminium and aluminium alloys — Extruded precision profiles in alloys EN AW 6060/EN AW 6063</i>
Part 1	<i>Technical conditions for inspection and delivery</i>
Part 2	<i>Tolerances on dimensions and form</i>

NOTE. International and European Standards, as well as overseas standards, are available from Customer Services, BSI, 389 Chiswick High Road, London W4 4AL.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 12, an inside back cover and a back cover

ICS 77.150.10

Descriptors: Aluminium, aluminium alloys, wrought products, extruded products, metal bars, metal tubes, metal sections, delivery, inspection, tests, specifications

English version

Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 1: Technical conditions for inspection and delivery

Aluminium et alliages d'aluminium — Barres, tubes et profilés filés — Partie 1: Conditions techniques de contrôle et de livraison

Aluminium und Aluminiumlegierungen — Stranggepreßte Stangen, Rohre und Profile — Teil 1: Technische Lieferbedingungen

This European Standard was approved by CEN on 1997-03-10. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

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

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

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 132, Aluminium and aluminium alloys, the secretariat of which is held by AFNOR.

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 October 1997, and conflicting national standards shall be withdrawn at the latest by October 1997.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 5, Extruded and drawn products, to prepare the following standard:

EN 755-1 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 1: Technical conditions for inspection and delivery*

This standard is part of a set of nine standards. The other standards deal with:

EN 755-2 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 2: Mechanical properties*

EN 755-3 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 3: Round bars, tolerances on dimensions and form*

EN 755-4 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 4: Square bars, tolerances on dimensions and form*

EN 755-5 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 5: Rectangular bars, tolerances on dimensions and form*

EN 755-6 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 6: Hexagonal bars, tolerances on dimensions and form*

prEN 755-7 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 7: Seamless tubes, tolerances on dimensions and form*

prEN 755-8 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 8: Porthole tubes, tolerances on dimensions and form*

prEN 755-9 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 9: Profiles, tolerances on dimensions and form*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of 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 and the United Kingdom.

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1 Scope

This Part of EN 755 specifies the technical conditions for inspection and delivery of wrought aluminium and aluminium alloy extruded rod/bar, tube and profile for general engineering applications.

This specification excludes forging stock, EN AW-6060/EN AW-6063 extruded precision profiles, and products delivered in coils.

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 515 *Aluminium and aluminium alloys — Wrought products — Temper designations*
- EN 573-3 *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition*
- EN 755-2 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 2: Mechanical properties*
- EN 755-3 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 3: Round bars, tolerances on dimensions and form*
- EN 755-4 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 4: Square bars, tolerances on dimensions and form*
- EN 755-5 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 5: Rectangular bars, tolerances on dimensions and form*
- EN 755-6 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 6: Hexagonal bars, tolerances on dimensions and form*
- prEN 755-7 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 7: Seamless tubes, tolerances on dimensions and form*
- prEN 755-8 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 8: Porthole tubes, tolerances on dimensions and form*

- prEN 755-9 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 9: Profiles, tolerances on dimensions and form*
- EN 10002-1 *Metallic materials — Tensile testing — Part 1: Method of test (at ambient temperature)*
- EN 10204 *Metallic products — Types of inspection documents*

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 extruded rod/bar

Solid extruded product of uniform cross-section along its whole length. Rod is normally less than 6 mm in diameter or minor dimension, bar is greater than 6 mm in diameter or minor dimension.

NOTE 1. These cross-sections are in the shape of circle, square, rectangle, or regular hexagon. Products with a square, rectangular or regular hexagonal cross-section can have corners rounded along their whole length.

NOTE 2. For rectangular bars:

- the thickness exceeds one-tenth of the width;
- the term 'rectangular bar' includes 'flattened circles' and 'modified rectangles' of which two opposite sides are convex arcs, the other two sides being straight, of equal length and parallel.

3.2 extruded tube

Extruded hollow product of uniform cross-section with only one enclosed void along its whole length, and with a uniform wall thickness. The cross-sections are in the shape of circle, square, rectangle, regular hexagon and regular octagon. Products with a square, rectangular, regular hexagonal or regular octagonal cross-sections can have corners rounded along their whole length.

3.3 seamless tube

Tube in which there is no split or deliberate longitudinal bonding of edges by pressure, fusion or mechanical interlocking.

3.4 porthole/bridge tube

Tube produced by extrusion of a solid billet through a porthole/bridge die.

3.5 porthole/bridge die

Extrusion die that incorporates a mandrel as an integral part of the die assembly.

NOTE. Bridge, spider and self-stripping dies are special forms of porthole/bridge die.

3.6 profile

Extruded product of uniform cross-section along its whole length, and with a cross-section other than rod/bar, wire, tube, sheet or strip.

3.7 hollow profile

Extruded profile in which the cross-section includes either one enclosed void, provided that the cross-section is other than a tube, or more than one enclosed void.

3.8 solid profile

Extruded profile in which the cross-section does not include any enclosed void.

3.9 inspection lot

Consignment, or part thereof, submitted for inspection, comprising products of the same grade or alloy, form, temper, shape, thickness or cross-section and processed in the same manner.

3.10 heat treatment batch or lot

Quantity of products of the same grade or alloy, form, thickness or cross-section and produced in the same way, heat-treated in one furnace load, or such products so solution-treated and subsequently precipitation-treated in one furnace load. More than one solution-treatment lot may be included in the precipitation furnace load.

3.11 sample

One or more products taken from an inspection lot.

3.12 specimen

One or more pieces taken from each product in the sample, for the purpose of producing test pieces.

3.13 test piece

Piece taken from each specimen and suitably prepared for the test.

3.14 test

Operation to which the test piece is subjected in order to measure or classify a property.

4 Orders or tenders

The order or tender shall define the product required and shall contain the following information:

- a) the form and type of product:
 - the form of the product (extruded rod/bar, tube or profile). If tube, whether seamless or porthole/bridge;
 - the designation of aluminium or aluminium alloy;
 - the customer application. In particular when subsequent anodizing by the customer is intended, this shall be clearly stated on the order;
- b) the temper of the material for delivery according to EN 515 and, if different, the temper for use;

c) the number of this European Standard or a specification number, or where none exists, the properties agreed between supplier and purchaser;

d) the dimensions and shape of the product:

- 1) round tube:
 - outside/inside diameter¹⁾;
 - wall thickness¹⁾;
 - length;
- 2) round bar:
 - diameter;
 - length;
- 3) square and hexagonal bar:
 - width across flats;
 - length;
- 4) rectangular bar:
 - width;
 - thickness;
 - length;
- 5) all other cases:
 - drawing for cross-section;
 - length;

e) the tolerances on dimensions and form, refer to the appropriate European Standard if not specified on the drawing;

f) the quantity:

- weight;
- number of pieces;
- total length;
- tolerance on quantity;

g) any requirements for certificates of conformity, test and/or analysis reports or inspection certificates;

h) any special requirements agreed between supplier and purchaser:

- marking of products;
- references to drawings, part numbers, etc.;
- additional or special testing;
- surface finish requirements;
- surface protection;
- packaging;
- inspection prior to delivery;

i) for products intended to be anodized by the customer, the order shall also contain the following information:

- the intended particular surface treatment (according to the relevant European Standard).

¹⁾ Only two of these dimensions can be specified, but not all three.

5 Requirements

5.1 Production and manufacturing processes

Unless otherwise specified in the order, the production and manufacturing processes shall be left to the discretion of the producer. Unless it is explicitly stated on the order, no obligation shall be placed on the producer to use the same processes for subsequent similar orders.

5.2 Quality control

The supplier shall be responsible for the performance of all inspection and tests required by the relevant European Standard and/or the particular specification prior to shipment of the product. If the purchaser wishes to inspect the product at the producer's works, he shall notify the supplier at the time of placing the order.

5.3 Chemical composition

The chemical composition shall comply with the limits specified in EN 573-3.

If the purchaser requires content limits for elements not specified in the above standard, these limits shall be stated on the order, after agreement between purchaser and supplier.

5.4 Mechanical properties

The mechanical properties shall be in conformity with those specified in EN 755-2 or those agreed between purchaser and supplier and stated on the order.

5.5 Freedom from surface defects

The extruded surface shall be free from defects prejudicial to its suitable and proper use.

The product shall have a smooth and clean surface. However, small surface defects such as light scratches, indentations, laminations, discolouration and non-uniform surface appearance resulting from heat-treatment, etc., which cannot always be totally avoided, are generally permitted on the product surface.

Whilst an operation designed to mask a fault is not permitted, the elimination of a superficial fault is permissible provided that the dimensional tolerances and material properties continue to meet the specification.

For products intended for surface treatment, the superficial defects (discolouration, mechanical or structural) shall not be so extensive as to impair the decorative appearance of the surface after the agreed surface treatment. Limiting samples may be agreed between purchaser and supplier.

5.6 Tolerances on dimensions and form

For the different forms of products, if not otherwise agreed between supplier and purchaser, the tolerances on dimensions and form shall be in conformity with the relevant European Standards EN 755-3, EN 755-4, EN 755-5, EN 755-6, prEN 755-7, prEN 755-8, and prEN 755-9.

Unless otherwise agreed, the purchaser may reject only those products having dimensions not complying with the specified tolerances.

5.7 Other requirements

Additional requirements shall be agreed between purchaser and supplier and stated on the order.

6 Test procedures

6.1 Sampling

6.1.1 *Specimens for chemical analysis*

The specimens for chemical analysis shall be taken at the time of casting. Their shape and conditions of production (mould design, cooling rate, mass, etc.) shall be so designed that their composition is homogeneous and be appropriate to the method of analysis.

6.1.2 *Specimens for mechanical testing*

6.1.2.1 *Location and size*

Specimens shall be taken from samples in such a way that it is possible to orientate the test pieces in relation to the product, as specified in 6.1.2.2.

The specimens shall be sufficiently large to allow manufacture of the test pieces necessary to carry out the required test, and shall include sufficient metal to allow manufacture of test pieces for any re-tests required.

6.1.2.2 *Orientation*

All products shall be tested in the longitudinal direction in order to provide guaranteed mechanical properties.

Tests in other directions may be carried out and property limits established. However, this shall be agreed between supplier and purchaser and shall be stated on the order. It should be noted that the mechanical properties obtained may differ from those for the longitudinal direction quoted in the relevant standard.

6.1.2.3 *Identification*

Each specimen shall be marked in such a manner that, after removal, it is always possible to identify the inspection lot from which it was taken, and if required, the location and orientation. If, during the course of subsequent operations, removal of the markings cannot be avoided, new markings shall be made before the originals are removed.

6.1.2.4 *Preparation*

Specimens shall be taken from the sample after completion of all the mechanical and heat-treatments which the product has to undergo before delivery, and which might influence the mechanical properties of the metal.

In cases where this is not possible, the sample or specimens may be taken at an earlier stage, but they shall be subjected to the same treatments as that to which it is intended to submit the product concerned.

NOTE. If the purchaser intends to convert the material to a final temper which is different from the 'as supplied' temper, then additional testing may be requested by the purchaser in order to satisfy himself that the material is capable of meeting the specified properties of the final temper. It is only necessary for the supplier to confirm that selected specimens, heat treated using supplier laboratory conditions, meet the properties specified for the final temper required by the purchaser.

Cutting shall be carried out in such a manner that it does not change the characteristics of the part of the specimen from which the test pieces are to be prepared. Thus, the dimensions of the specimens shall provide an adequate machining allowance to permit removal of the zone affected by cutting.

Specimens shall not be machined or treated in any way by which their mechanical properties may be altered. Any straightening required shall be carried out with great care, preferably by hand.

6.1.2.5 *Number*

Unless otherwise specified, the minimum numbers of specimens shall be as follows:

- for products having a nominal weight up to and including 1 kg per linear metre (1 kg/m), one specimen shall be taken for each lot of 1 000 kg or part thereof;
- for products having a nominal weight greater than 1 kg/m up to and including 5 kg/m, one specimen shall be taken for each lot of 2 000 kg or part thereof;
- for products having a nominal weight greater than 5 kg/m, one specimen shall be taken for each lot of 3 000 kg or part thereof.

Not less than one specimen representing any one inspection lot nor less than one specimen representing any one heat-treatment lot shall be taken.

6.1.3 *Test pieces for tensile test*

6.1.3.1 *Identification*

Each test piece shall be marked in such a manner that it is possible to identify the inspection lot from which it was taken and, if required, the location and orientation in the product.

If a test piece is identified by hard stamping, this shall not be in a place or manner which may interfere with subsequent testing. Where it is not convenient to mark a test piece, an identification tag may be attached.

6.1.3.2 *Machining*

Any machining necessary shall be carried out in such a manner that it does not change the characteristics of the metal in the test piece.

6.1.3.3 *Number*

One test piece shall be taken from each specimen. The recommended shapes and dimensions of test pieces are specified in EN 10002-1.

6.1.3.4 *Type and location*

Details of type and location of the test pieces are given in annexes A and B respectively.

6.2 *Test methods*

6.2.1 *Chemical composition*

Methods of analysis are at the discretion of the supplier. In cases of dispute concerning the chemical composition, referee analysis shall be carried out by the methods specified in the relevant European Standards and the results obtained by these methods shall be accepted.

6.2.2 *Tensile testing*

The tensile test shall be carried out in accordance with EN 10002-1.

6.2.3 *Measurement of dimensions*

The dimensions shall be measured by means of measuring instruments which are of the accuracy required by the dimensions and tolerances on dimensions. All dimensions shall be checked at the ambient temperature of the workshop or laboratory or, in case of dispute, at a temperature between 15 °C and 25 °C.

6.2.4 *Surface finish*

Unless otherwise specified, examination of surface appearance shall be carried out without the assistance of magnifying apparatus on products before delivery.

For products intended to be anodized, it is recommended that an anodizing test be carried out by the producer of the product before delivery. The frequency and the conditions of the test can be agreed between purchaser and supplier.

6.2.5 *Other tests*

If other mechanical or physical tests are required, these shall be agreed between the supplier and the purchaser. These tests shall be carried out in accordance with the existing European Standards or a method agreed between purchaser and supplier.

6.3 *Re-tests*

6.3.1 *Chemical composition*

If any analysis does not meet the compositional requirements, the cast shall be rejected.

NOTE. An individual analysis outside specified compositional limits may not result in the rejection of the lot if written agreement has been obtained from the purchaser after a request for a concession has been made.

6.3.2 *Mechanical properties*

If any one of the test pieces first selected fails to meet the requirements for the mechanical tests, the following procedure shall be applied:

- if an error is clearly identified, either in the test piece's preparation or in the test procedure, then the corresponding result shall be disregarded and the testing recommenced as initially required;
- if this is not the case, then two further specimens shall be taken from the same inspection lot, one being from the same unit of product (rod/bar, tube or profile) from which the original specimen was taken, unless that unit of product has been withdrawn by the supplier.

If both test pieces from these additional specimens meet the requirements, the inspection lot which they represent shall be deemed to comply with the requirements of this Part of the standard.

Should one test piece fail:

- the inspection lot shall be deemed not to comply with the requirements of this Part of the standard;
- or, where applicable, the lot may be submitted to additional mechanical or thermal treatment(s) and then re-tested as a new lot.

6.3.3 Other properties

The re-test procedure for other properties shall be agreed upon between purchaser and supplier (see 6.2.5).

7 Inspection documents

7.1 General

If requested by the purchaser on the order, the supplier shall provide one or more of the following documents as applicable.

7.2 Documents established on the basis of inspections and tests performed by qualified personnel who are involved in the manufacturing process and/or belong to the quality control department

7.2.1 Certificate of conformity

Document by which the producer certifies that according to inspections and results of representative tests, the products for delivery comply with the relevant standards and with the additional requirements of the order, if any.

7.2.2 Test report

Document by which the producer certifies that the products for delivery comply with the requirements specified on the order. This document details the results of the current production controls carried out on identical products made using the same method as the products for delivery but not necessarily on the products for delivery themselves.

7.2.3 Specific test report

Document by which the producer certifies that the products for delivery comply with the requirements specified on the order. This document details the chemical composition and the results of prescribed mechanical tests and of any other tests specified on the order. It is established on the basis of tests carried out on specimens taken from the products for delivery themselves. The delivery of such a certificate generally implies inspection tests on individual lots.

7.3 Documents established on the basis of inspections and tests performed or supervised by qualified personnel organizationally independent from the manufacturing department, according to the requirements specified on the order and carried out on the products for delivery or on the relevant inspection lot

Inspection documents in accordance with EN 10204:

- ‘3.1.A’: Certificate issued and validated by an inspector designated by the official regulations, in accordance with these and the corresponding technical rules.
- ‘3.1.B’: Certificate issued by the department independent of the manufacturing department and validated by an authorized representative of the producer independent of the manufacturing department.
- ‘3.1.C’: Certificate issued and validated by an authorized representative of the purchaser, in accordance with the specifications of the order.

8 Marking of products

Marking of products shall be undertaken when specified in the standard or when agreed upon between purchaser and supplier and stated on the order. This marking shall not adversely affect the final use of the product. The detail of information required in the marking shall be agreed between purchaser and supplier.

9 Packaging

Unless otherwise specified in European Standards relating to special products or specified in the order, the type of packaging shall be specified by the supplier who shall take all suitable precautions to ensure that, under the usual conditions of transportation, the products will be delivered in a condition suitable for use.

The product for delivery will not normally be treated with a corrosion preventative. If this is required, it shall be specified on the order and agreed with the supplier. The type of corrosion preventative used shall also be agreed between purchaser and supplier.

10 Arbitration

In cases of dispute concerning conformity with the requirements of this European Standard or specification cited on the order, and before rejecting the products, testing and examination shall be carried out by an arbitrator chosen by mutual agreement between purchaser and supplier.

The arbitrator's decision shall be final.

Annex A (normative)
Types of test pieces

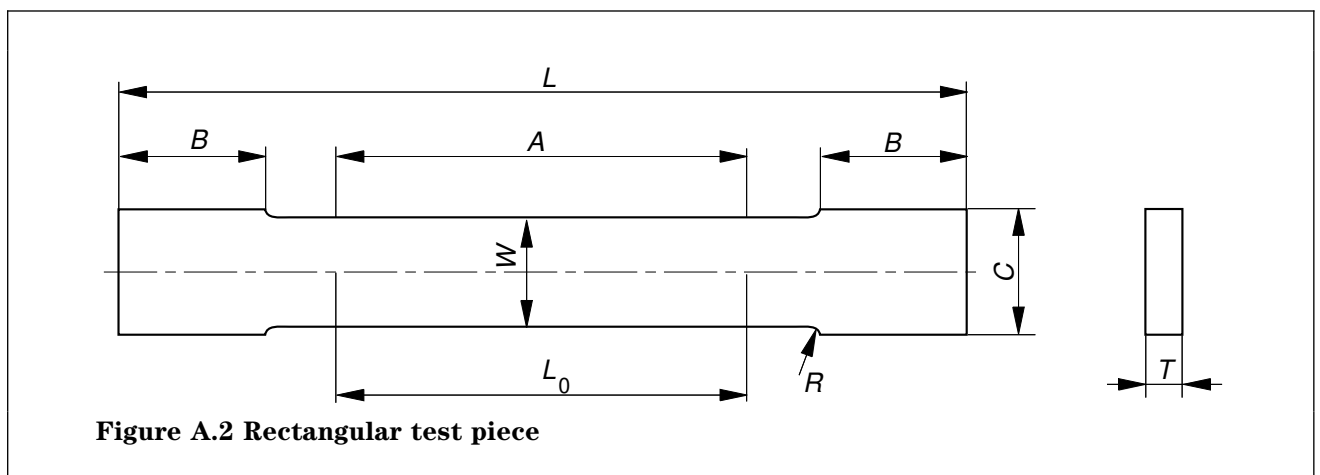
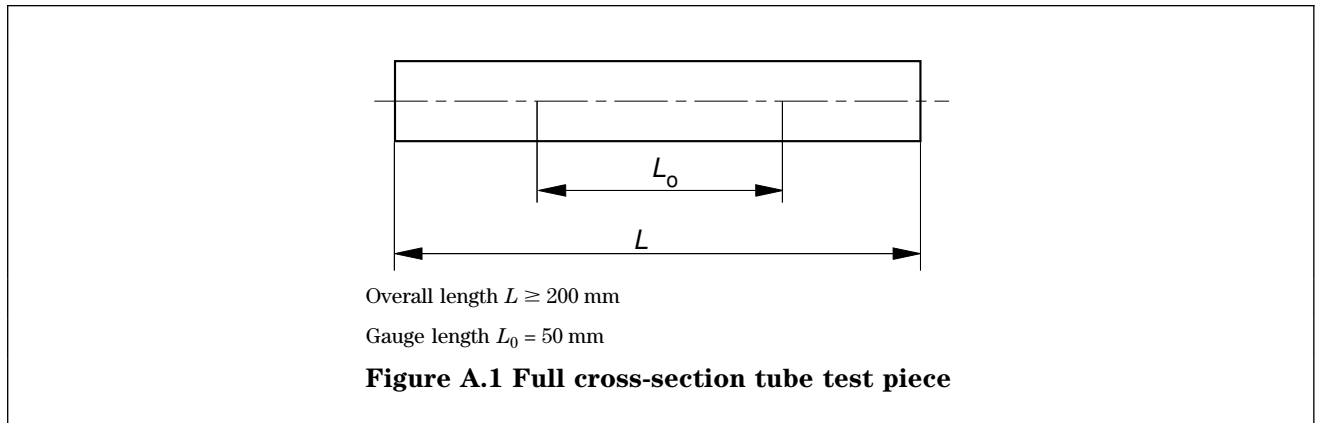


Table A.1		
Dimensions in millimetres		
Symbol	Description	Standard test piece
	Nominal width	12,5
L_0	Gauge length	$50 \pm 0,5$
W	Width	$12,5 \pm 0,10$
T	Thickness	thickness of material
R	Radius of fillet, minimum	12,5
L	Overall length, minimum	200
A	Length of reduced section, minimum	57
B	Length of grip section, minimum	50
C	Width of grip section, minimum	20

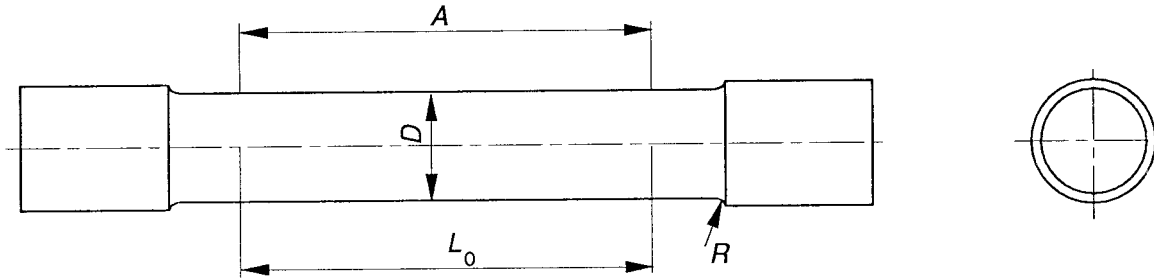


Figure A.3 Round test piece

Table A.2

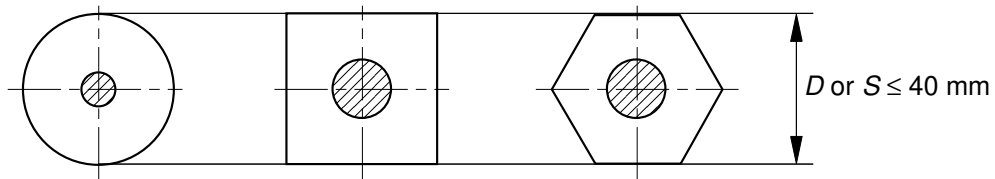
		Dimensions in millimetres				
Symbol	Description	Standard test pieces dimensions				
		13,82	10	8	6	4
L_0	Gauge length	$69,0 \pm 0,5$	$50,0 \pm 0,5$	$40,0 \pm 0,5$	$30,0 \pm 0,5$	$20,0 \pm 0,5$
D	Diameter	$13,82 \pm 0,10$	$10,0 \pm 0,10$	$8,0 \pm 0,10$	$6,0 \pm 0,10$	$4,0 \pm 0,10$
R	Radius of fillet	13	9	8	6	4
A	Length of reduced section, minimum	76	60	48	36	24

Annex B (normative)

Location of test pieces

B.1 Round, square and hexagonal bar

For D or S up to and including 40 mm: a round standard test piece (10 mm diameter or less) taken from the centre of the bar shall be used.

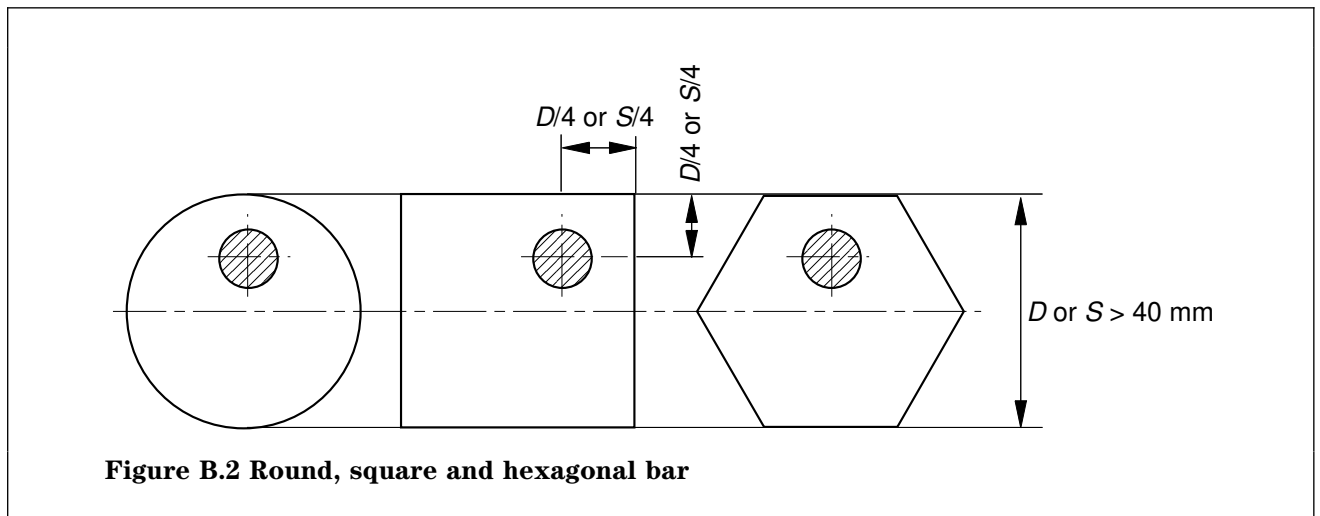


D : diameter

S : width across flat

Figure B.1 Round, square and hexagonal bar

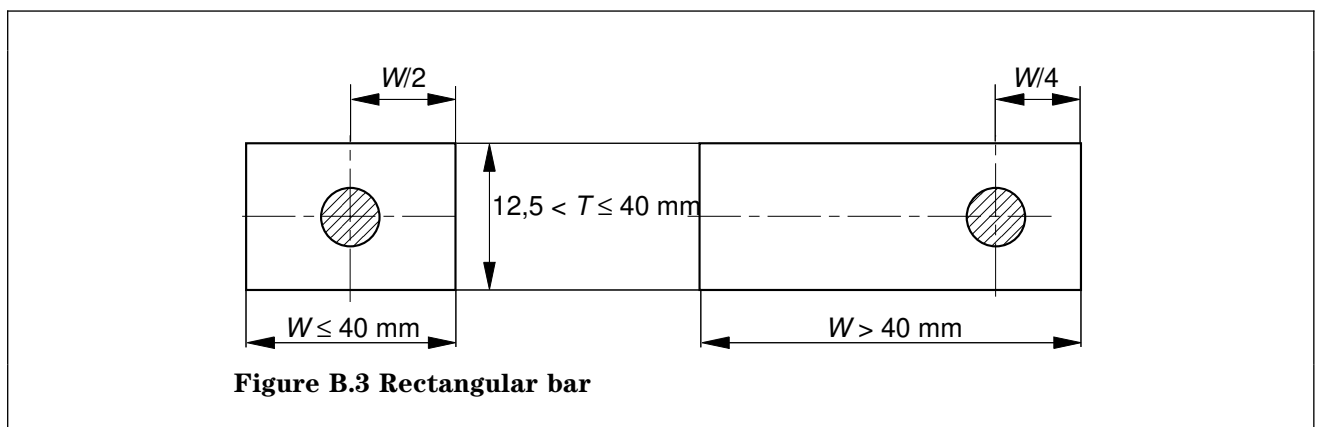
For D or S over 40 mm: a round standard 10 mm diameter test piece shall be used, located as follows:



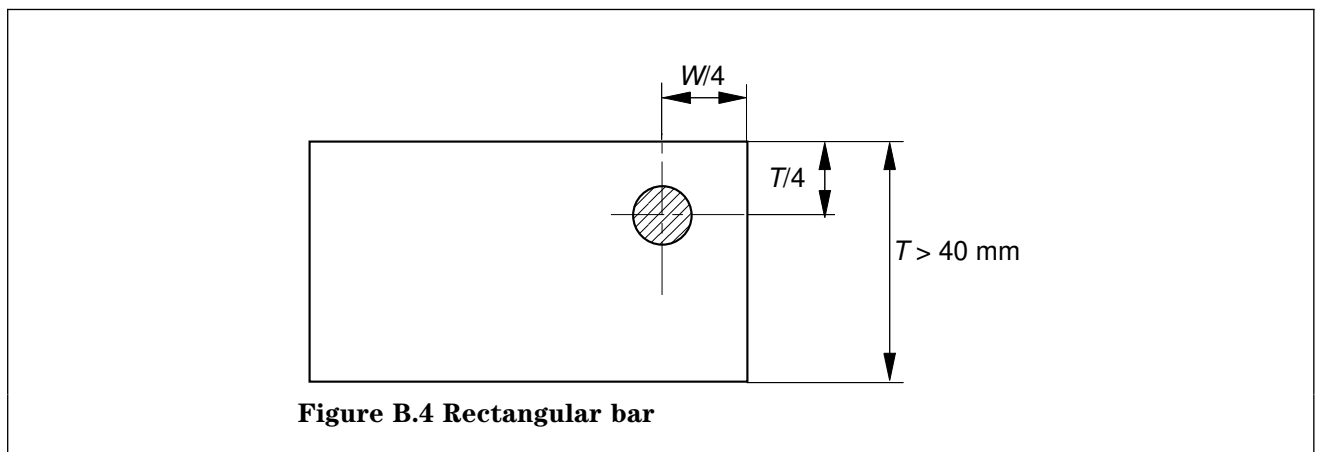
B.2 Rectangular bar

For thickness up to and including 12,5 mm: a rectangular test piece shall be used. The test piece shall be prepared such as the two fabricated surfaces are preserved without modification.

For thickness over 12,5 mm and up to and including 40 mm: a round standard test piece (10 mm diameter or less) shall be used, located as follows:



For thickness exceeding 40 mm: a round standard 10 mm test piece shall be used, located as follows:



B.3 Tube

The test piece requirements for tube are given in the following table:

Table B.1			
Description	Round tube	Square tube	Oval, rectangular and polygonal tube
Full section test piece	Area $\leq 150 \text{ mm}^2$ and $D \leq 25 \text{ mm}$	Area $\leq 150 \text{ mm}^2$ and $D \leq 25 \text{ mm}$	—
Rectangular machined test piece	Wall thickness $\leq 12,5 \text{ mm}$	Wall thickness $\leq 12,5 \text{ mm}$	Wall thickness $\leq 12,5 \text{ mm}$
Round machined test piece	Wall thickness $> 12,5 \text{ mm}$	Wall thickness $> 12,5 \text{ mm}$	Wall thickness $> 12,5 \text{ mm}$

B.4 Profiles

For $T \leq 12,5 \text{ mm}$: rectangular test piece. The test piece shall be prepared so that both as fabricated surfaces are included undisturbed.

For thickness over 12,5 mm and up to and including 40 mm: a round standard 10 mm diameter test piece shall be used, located as follows:

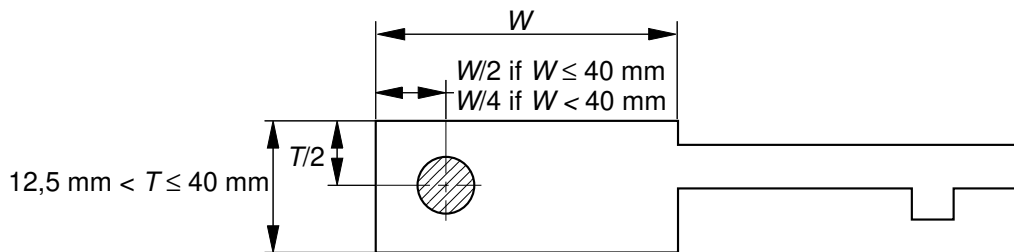


Figure B.5 Profile

For thickness exceeding 40 mm: a round standard 10 mm diameter test piece shall be used, located as follows:

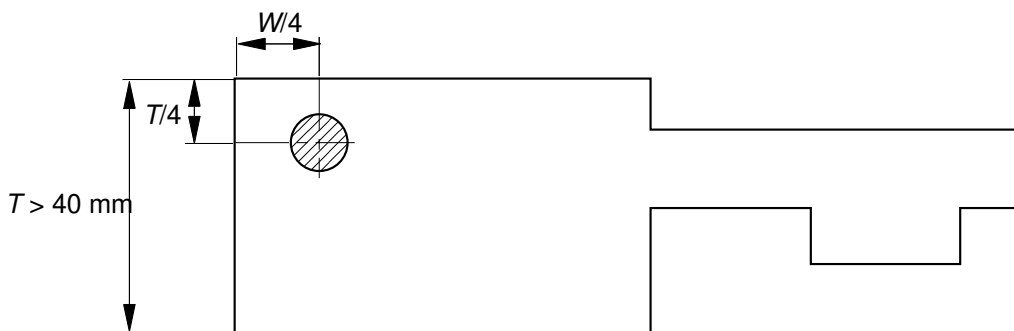


Figure B.6 Profile

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