



SLOVENSKI STANDARD

SIST EN 755-2:1998

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Aluminij in aluminijeve zlitine - Iztiskane palice/drogovi, cevi in profili - 2. del: Mehanske lastnosti

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

Aluminium und Aluminiumlegierungen - Stranggepreßte Stangen, Rohre und Profile -
Teil 2: Mechanische Eigenschaften

Aluminium et alliages d'aluminium - Barres, tubes et profilés filés - Partie 2:
Caractéristiques mécaniques

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Ta slovenski standard je istoveten z: EN 755-2:1997

ICS:

77.150.10 Aluminijski izdelki Aluminium products

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EUROPEAN STANDARD

EN 755-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1997

ICS 77.150.10

Descriptors: aluminium, aluminium alloys, wrought products, extruded products, metal bars, metal tubes, metal sections, mechanical properties, tables (data)

English version

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

Aluminium et alliages d'aluminium - Barres,
tubes et profilés filés - Partie 2:
Caractéristiques mécaniques

Aluminium und Aluminiumlegierungen -
Stranggepreßte Stangen, Rohre und Profile -
Teil 2: Mechanische Eigenschaften

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.

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

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

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

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

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 profile - 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

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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.

1 Scope

This part of EN 755 specifies the mechanical property limits applicable to aluminium and aluminium alloy extruded rod/bar, tube and profile.

Temper designations are defined in EN 515. The numerical designation system of alloys is specified in EN 573-1. The chemical symbol based designation system is specified in EN 573-2. The chemical composition limits for these materials are given in EN 573-3. Mechanical property limits are specified for all Class "A" alloys as defined in EN 573-4.

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 573-1	Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 1 : Numerical designation system
EN 573-2	Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 2 : Chemical symbol based designation system
EN 573-3	Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3 : Chemical composition
EN 573-4	Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 4 : Forms of products
EN 755-1	Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 1 : Technical conditions for inspection and delivery
EN 2004-1	Aerospace series - Test methods for aluminium and aluminium alloy products - Part 1 : Determination of electrical conductivity of wrought aluminium alloys
EN 10002-1	Metallic materials - Tensile testing - Part 1 : Method of test (at ambient temperature)
ISO 9591	Corrosion of aluminium alloys - Determination of resistance to stress corrosion cracking
ASTM G 47	Standard test method for determining susceptibility to stress-corrosion cracking of high-strength aluminium alloy products

3 Requirements

The mechanical properties shall be in conformity with those specified in clause 5 or those agreed upon between supplier and purchaser and stated in the order.

4 Tensile test

The selection, preparation and number of specimens and test pieces, are specified in EN 755-1.

Tensile testing shall be carried out as specified in EN 10002-1.

4.1 Test direction

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

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

4.2 Elongation values

The $A_{50\text{ mm}}$ value is the elongation measured over a gauge length of 50 mm and expressed in percent.

The A value for elongation is the % elongation measured over a gauge length of $5,65\sqrt{S_0}$ (where S_0 is the initial cross-sectional area of the test-piece), and expressed in percent.

a) Extruded rod/bar

the $A_{50\text{ mm}}$ value shall be used for rectangular rod/bar tested in the full thickness up to 12,5 mm thickness ;

the A value shall be used for all other test pieces.

b) Extruded tube

the $A_{50\text{ mm}}$ value shall be used for tube tested in the full section and the sheet type specimens taken from tube having either a flat or a curved wall up to and including 12,5 mm thick ;

the A value shall be used for round test pieces machined from wall thicknesses over 12,5 mm.

c) Extruded profile

the $A_{50\text{ mm}}$ value shall be used for shapes tested in full section and for sheet type specimens machined from material up to and including 12,5 mm in thickness having parallel surfaces ;

the A value shall be used for round test specimens machined from material thicknesses over 12,5 mm.

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NOTE : EN AW-5019 is the new designation for EN AW-5056A.

Table 1 : Alloy EN AW-1050A [Al 99,5]

Extruded rod/bar								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	D ¹⁾	S ²⁾	min.	max.	min.	max.	min.	min.
F ⁴⁾ , H112	all	all	60	-	20	-	25	23
O, H111	all	all	60	95	20	-	25	23
Extruded tube								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	e ³⁾		min.	max.	min.	max.	min.	min.
F ⁴⁾ , H112	all		60	-	20	-	25	23
O, H111	all		60	95	20	-	25	23
Extruded profile								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	e ³⁾		min.	max.	min.	max.	min.	min.
F ⁴⁾ , H112	all		60	-	20	-	25	23

1) D = Diameter for round bar.
2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar.
3) e = Wall thickness.
4) F Temper : property values are for information only.

Table 2 : Alloy EN AW-1070A [Al 99,7]

Extruded rod/bar								
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	$D^{1)}$	$S^{2)}$	min.	max.	min.	max.	min.	min.
$F^{4)}$, H112	all	all	60	-	20	-	25	23
Extruded tube								
Not specified.								
Extruded profile								
Not specified.								
1) D = Diameter for round bar.								
2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar.								
4) F Temper : property values are for information only.								

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Table 3 : Alloy EN AW-1200 [Al 99,0]

Extruded rod/bar								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	$D^{1)}$	$S^{2)}$	min.	max.	min.	max.		
$F^{4)}$, H112	all	all	75	-	25	-	20	18
Extruded tube								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	$e^{3)}$		min.	max.	min.	max.		
$F^{4)}$, H112	all		75	-	25	-	20	18
Extruded profile								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	$e^{3)}$		min.	max.	min.	max.		
$F^{4)}$, H112	all		75	-	25	-	20	18
<p>1) D = Diameter for round bar.</p> <p>2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar.</p> <p>3) e = Wall thickness.</p> <p>4) F Temper : property values are for information only.</p>								

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Table 4 : Alloy EN AW-1350 [EAI 99,5]

Extruded rod/bar ¹¹⁾								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	D ¹⁾	S ²⁾	min.	max.	min.	max.	min.	min.
	all	all	60	-	-	-	25	23
Extruded tube ¹¹⁾								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	e ³⁾		min.	max.	min.	max.	min.	min.
	all		60	-	-	-	25	23
Extruded profile ¹¹⁾								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	e ³⁾		min.	max.	min.	max.	min.	min.
	all		60	-	-	-	25	23
1) D = Diameter for round bar. 2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar. 3) e = Wall thickness. 4) F Temper : property values are for information only. 11) Electrical conductivity $\gamma \geq 35,4$ MS/m.								

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Table 5 : Alloy EN AW-2007 [Al Cu4PbMgMn]

Extruded rod/bar								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	A_{50} mm %
	D ¹⁾	S ²⁾	min.	max.	min.	max.	min.	min.
T4, T4510, T4511 ⁵⁾	≤ 80	≤ 80	370	-	250	-	8	6
	$80 < D \leq 200$	$80 < S \leq 200$	340	-	220	-	8	-
	$200 < D \leq 250$	$200 < S \leq 250$	330	-	210	-	7	-
Extruded tube								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	A_{50} mm %
	e ³⁾		min.	max.	min.	max.	min.	min.
T4, T4510, T4511 ⁵⁾	≤ 25		370	-	250	-	8	6
Extruded profile								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	A_{50} mm %
	e ³⁾		min.	max.	min.	max.	min.	min.
T4, T4510, T4511 ⁵⁾	≤ 30		370	-	250	-	8	6
1) D = Diameter for round bar. 2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar. 3) e = Wall thickness. 5) Properties may be obtained by press quenching.								

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Table 6 : Alloy EN AW-2011 [Al Cu6BiPb]

Extruded rod/bar								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	D ¹⁾	S ²⁾	min.	max.	min.	max.	min.	min.
T4 ⁵⁾	≤ 200	≤ 60	275	-	125	-	14	12
T6 ⁵⁾	≤ 75	≤ 60	310	-	230	-	8	6
	75 < D ≤ 200	-	295	-	195	-	6	-
Extruded tube								
Temper	Dimensions mm		R_m MPa		$R_{P0,2}$ MPa		A %	$A_{50\text{ mm}}$ %
	e ³⁾		min.	max.	min.	max.	min.	min.
T6 ⁵⁾	≤ 25		310	-	230	-	6	4
Extruded profile								
Not specified.								
1) D = Diameter for round bar. 2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar. 3) e = Wall thickness. 5) Properties may be obtained by press quenching.								

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