



SLOVENSKI STANDARD

SIST EN 754-2:2014

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Nadomešča:
SIST EN 754-2:2008

Aluminij in aluminijeve zlitine - Hladno vlečene palice/drogovi in cevi - 2. del: Mehanske lastnosti

Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 2: Mechanical properties

Aluminium und Aluminiumlegierungen - Gezogene Stangen und Rohre - Teil 2:
Mechanische Eigenschaften

Aluminium et alliages d'aluminium - Barres et tubes étirés - Partie 2: Caractéristiques
mécaniques

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Ta slovenski standard je istoveten z: **EN 754-2:2013**

ICS:

77.150.10 Aluminijski izdelki Aluminium products

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EUROPEAN STANDARD

EN 754-2

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English Version

Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 2: Mechanical properties

Aluminium et alliages d'aluminium - Barres et tubes étirés -
Partie 2: Caractéristiques mécaniques

Aluminium und Aluminiumlegierungen - Gezogene Stangen
und Rohre - Teil 2: Mechanische Eigenschaften

This European Standard was approved by CEN on 22 August 2013.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 754-2:2013) 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of an identical text or by endorsement, at the latest by April 2014, and conflicting national standards shall be withdrawn at the latest by April 2014.

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.

CEN/TC 132 affirms its policy that if a patentee refuses to grant licenses on standardized products under reasonable and not discriminatory conditions, this product will be removed from the corresponding document.

This document supersedes EN 754-2:2008.

CEN/TC 132 has decided to revise this European Standard as follows:

- addition of the alloys EN AW-6026 in a new Table 24 and EN AW-6064A in a new Table 31;
- EN 10002-1 was replaced by EN ISO 6892-1.

EN 754 comprises the following parts under the general title "*Aluminium and aluminium alloys — Cold drawn rod/bar and tube*":

- *Part 1: Technical conditions for inspection and delivery*
- *Part 2: Mechanical properties*
- *Part 3: Round bars, tolerances on dimensions and form*
- *Part 4: Square bars, tolerances on dimensions and form*
- *Part 5: Rectangular bars, tolerances on dimensions and form*
- *Part 6: Hexagonal bars, tolerances on dimensions and form*
- *Part 7: Seamless tubes, tolerances on dimensions and form*
- *Part 8: Porthole tubes, tolerances on dimensions and form*

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.

EN 754-2:2013 (E)**1 Scope**

This European Standard specifies the mechanical property limits resulting from tensile testing applicable to aluminium and aluminium alloy cold drawn rod/bar and tube.

Technical conditions for inspection and delivery, including product and testing requirements, are specified in EN 754-1. Temper designations are defined in EN 515. The chemical composition limits for these materials are given in EN 573-3.

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 754-1:2008, *Aluminium and aluminium alloys — Cold drawn rod/bar and tube — Part 1: Technical conditions for inspection and delivery*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

3 Mechanical property limits

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3.1 General

The mechanical properties shall be in conformity with those specified in Table 1 to Table 37 or those agreed upon between supplier and purchaser and stated in the order document.

For all alloys the condition F (as fabricated) can be used, but without guaranteed mechanical properties.

Table 1 to Table 37 contain limits of mechanical property values obtained by tensile testing according to EN ISO 6892-1 after sampling and test piece preparation according to EN 754-1.

NOTE The mechanical properties refer to test pieces taken in the longitudinal direction. Mechanical properties of test pieces taken in other directions can differ from those for the longitudinal direction quoted in this standard.

Brinell hardness values given in Table 1 to Table 37 expressed as HBW values are for information only.

3.2 Elongation

If not otherwise agreed, the A value shall be used.

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.

For certain products the supplier may choose (if not otherwise specified in the order documents) to use the elongation based on A_{50mm} . Consequently, values for the A_{50mm} are included in the following tables.

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

Test pieces and their location in the specimen are given in EN 754-1.

3.3 Reference list of the tables of mechanical properties of the relevant aluminium and aluminium alloys

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3.4 Detailed tables of mechanical properties

Table 1 — Aluminium EN AW-1050A [Al 99,5]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
	D^a	S^b	min.	max.	min.	max.	min.	min.	
O, H111	≤ 80	≤ 60	60	95	-	-	25	22	20
H14	≤ 40	≤ 10	100	135	70	-	6	5	30
H16	≤ 15	≤ 5	120	160	105	-	4	3	35
H18	≤ 10	≤ 3	145	-	125	-	3	3	43
Drawn tube									
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value	
		min.	max.	min.	max.	min.	min.		
O, H111	≤ 20	60	95	-	-	25	22	20	
H14	≤ 10	100	135	70	-	6	5	30	
H16	≤ 5	120	160	105	-	4	3	35	
H18	≤ 3	145	-	125	-	3	3	43	
^a D = Diameter for round bar. ^b S = Width across flats for square and hexagonal bar, thickness for rectangular bar.									

Table 2 — Aluminium EN AW-1200 [Al 99,0]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
	D^a	S^b	min.	max.	min.	max.	min.	min.	
O, H111	≤ 80	≤ 60	70	105	-	-	20	16	23
H14	≤ 40	≤ 10	110	145	80	-	5	4	37
H16	≤ 15	≤ 5	135	170	115	-	3	3	45
H18	≤ 10	≤ 3	150	-	130	-	3	3	50
Drawn tube									
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value	
		min.	max.	min.	max.	min.	min.		
O, H111	≤ 20	70	105	-	-	20	16	23	
H14	≤ 10	110	145	80	-	5	4	37	
H16	≤ 5	135	170	115	-	3	3	45	
H18	≤ 3	150	-	130	-	3	3	50	
^a D = Diameter for round bar. ^b S = Width across flats for square and hexagonal bar, thickness for rectangular bar.									

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Table 3 — Alloy EN AW-2007 [Al CuPbMgMn]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
	D^a	S^b	min.	max.	min.	max.	min.	min.	
T3 ^c	≤ 30	≤ 30	370	-	240	-	7	5	95
	$30 < D \leq 80$	$30 < S \leq 80$	340	-	220	-	6	-	95
T351 ^c	≤ 80	≤ 80	370	-	240	-	5	3	95
Drawn tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
			min.	max.	min.	max.	min.	min.	
T3 ^c	≤ 20		370	-	250	-	7	5	95
T3510 T3511 ^c	≤ 20		370	-	240	-	5	3	95

^a D = Diameter for round bar.
^b S = Width across flats for square and hexagonal bar, thickness for rectangular bar.
^c Properties may be obtained by press quenching.

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Table 4 — Alloy EN AW-2011 [Al Cu6BiPb]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
	D^a	S^b	min.	max.	min.	max.	min.	min.	
T3	≤ 40	≤ 40	320	-	270	-	10	8	90
	$40 < D \leq 50$	$40 < S \leq 50$	300	-	250	-	10	-	90
	$50 < D \leq 80$	$50 < S \leq 80$	280	-	210	-	10	-	90
T8	≤ 80	≤ 80	370	-	270	-	8	6	115
Drawn tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
			min.	max.	min.	max.	min.	min.	
T3 ^c	≤ 5		310	-	260	-	10	8	90
	$5 < t \leq 20$		290	-	240	-	8	6	90
T8	≤ 20		370	-	275	-	8	6	115
<p>^a D = Diameter for round bar.</p> <p>^b S = Width across flats for square and hexagonal bar, thickness for rectangular bar.</p> <p>^c Properties may be obtained by press quenching.</p>									

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Table 5 — Alloy EN AW-2011A [Al Cu6BiPb(A)]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
	D^a	S^b	min.	max.	min.	max.	min.	min.	
T3	≤ 40	≤ 40	320	-	270	-	10	8	90
	$40 < D \leq 50$	$40 < S \leq 50$	300	-	250	-	10	-	90
	$50 < D \leq 80$	$50 < S \leq 80$	280	-	210	-	10	-	90
T8	≤ 80	≤ 80	370	-	270	-	8	6	115
Drawn tube									
Temper	Wall thickness t mm		R_m MPa		$R_{p0,2}$ MPa		A %	$A_{50\text{ mm}}$ %	HBW Typical value
			min.	max.	min.	max.	min.	min.	
T3 ^c	≤ 5		310	-	260	-	10	8	90
	$5 < t \leq 20$		290	-	240	-	8	6	90
T8	≤ 20		370	-	275	-	8	6	115

^a D = Diameter for round bar.

^c S = Width across flats for square and hexagonal bar, thickness for rectangular bar.

^c Properties may be obtained by press quenching.

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Table 6 — Alloy EN AW-2014 [Al Cu4SiMg]

Drawn rod/bar									
Temper	Dimensions mm		R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\text{ mm}}$ % min.	HBW Typical value
	D^a	S^b	min.	max.	min.	max.			
O, H111	≤ 80	≤ 80	-	240	-	125	12	10	45
T3	≤ 80	≤ 80	380	-	290	-	8	6	110
T351	≤ 80	≤ 80	380	-	290	-	6	4	110
T4	≤ 80	≤ 80	380	-	220	-	12	10	110
T451	≤ 80	≤ 80	380	-	220	-	10	8	110
T6	≤ 80	≤ 80	450	-	380	-	8	6	140
T651	≤ 80	≤ 80	450	-	380	-	6	4	140
Drawn tube									
Temper	Wall thickness t mm	R_m MPa		$R_{p0,2}$ MPa		A % min.	$A_{50\text{ mm}}$ % min.	HBW Typical value	
		min.	max.	min.	max.				
O, H111	≤ 20	-	240	-	125	12	10	45	
T3	≤ 20	380	-	290	-	8	6	110	
T3510, T3511	≤ 20	380	-	290	-	6	4	110	
T4	≤ 20	380	-	240	-	12	10	110	
T4510, T4511	≤ 20	380	-	240	-	10	8	110	
T6	≤ 20	450	-	380	-	8	6	140	
T6510, T6511	≤ 20	450	-	380	-	6	4	140	

^a D = Diameter for round bar.

^b S = Width across flats for square and hexagonal bar, thickness for rectangular bar.