



**SLOVENSKI STANDARD**  
**SIST EN 754-2:1998**

01-april-1998

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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 754-2:1997**

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**ICS:**

77.150.10

Aluminijski izdelki

Aluminium products

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**en**

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ICS 77.150.10

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

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

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

Contents	Page
Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Requirements.....	5
4 Tensile test.....	5
4.1 Test direction.....	5
4.2 Elongation values .....	5
5 List of alloys and their mechanical properties .....	6
Annex A (normative) Resistance to stress-corrosion cracking - Stress-corrosion cracking test .....	39
Annex B (normative) Resistance to stress-corrosion cracking - Electrical conductivity.....	40

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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 754-2                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 2 :  
Mechanical properties

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

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

EN 754-3                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 3 :  
Round bars, tolerances on dimensions and form

EN 754-4                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 4 :  
Square bars, tolerances on dimensions and form

EN 754-5                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 5 :  
Rectangular bars, tolerances on dimensions and form

EN 754-6                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 6 :  
Hexagonal bars, tolerances on dimensions and form

prEN 754-7                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 7 :  
Seamless tubes, tolerances on dimensions and form

prEN 754-8                    Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 8 :  
Porthole tubes, 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.

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## 1 Scope

This part of EN 754 specifies the mechanical property limits applicable to aluminium and aluminium alloy cold drawn rod/bar and tube.

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 specified 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 754-1	Aluminium and aluminium alloys - Cold drawn rod/bar and tube - 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	<a href="https://standards.iteh.ai/catalog/standards/sist/en-754-2-1998/1999-11-7546791f2a/sist-en-754-2-1998">https://standards.iteh.ai/catalog/standards/sist/en-754-2-1998/1999-11-7546791f2a/sist-en-754-2-1998</a> 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 754-1.

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.

Test in other directions may be carried out. However, this 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 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) cold drawn rod/bar ;

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

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The  $A$  value shall be used for all other test pieces.

b) cold drawn 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.

## 5 List of alloys and their mechanical properties

	Page
Table 1 : Alloy EN AW-1050A [Al99,5]	7
Table 2 : Alloy EN AW-1200 [Al99,0]	8
Table 3 : Alloy EN AW-2007 [Al Cu4PbMgMn]	9
Table 4 : Alloy EN AW-2011 [Al Cu6BiPb]	10
Table 5 : Alloy EN AW-2011A [Al Cu6BiPb(A)]	11
Table 6 : Alloy EN AW-2014 [Al Cu4SiMg]	12
Table 7 : Alloy EN AW-2014A [Al Cu4SiMg(A)]	13
Table 8 : Alloy EN AW-2017A [Al Cu4MgSi(A)]	14
Table 9 : Alloy EN AW-2024 [Al Cu4Mg1]	15
Table 10 : Alloy EN AW-2030 [Al Cu4PbMg]	16
Table 11 : Alloy EN AW-3003 [Al Mn1Cu]	17
Table 12 : Alloy EN AW-3103 [Al Mn1]	18
Table 13 : Alloy EN AW-5005 [Al Mg1(B)]	19
Table 14 : Alloy EN AW-5005A [Al Mg1(C)]	20
Table 15 : Alloy EN AW-5019 [AlMg5]	21
Table 16 : Alloy EN AW-5251 [Al Mg2]	22
Table 17 : Alloy EN AW-5052 [Al Mg2,5]	23
Table 18 : Alloy EN AW-5154A [Al Mg3,5(A)]	24
Table 19 : Alloy EN AW-5754 [Al Mg3]	25
Table 20 : Alloy EN AW-5083 [Al Mg4,5Mn0,7]	26
Table 21 : Alloy EN AW-5086 [Al Mg4]	27
Table 22 : Alloy EN AW-6012 [Al MgSiPb]	28
Table 23 : Alloy EN AW-6060 [Al MgSi]	29
Table 24 : Alloy EN AW-6061 [Al Mg1SiCu]	30
Table 25 : Alloy EN AW-6262 [Al Mg1SiPb]	31
Table 26 : Alloy EN AW-6063 [Al Mg0,7Si]	32
Table 27 : Alloy EN AW-6063A [Al Mg0,7Si(A)]	33
Table 28 : Alloy EN AW-6082 [Al Si1MgMn]	34
Table 29 : Alloy EN AW-7020 [Al Zn4,5Mg1]	35
Table 30 : Alloy EN AW-7022 [Al Zn5Mg3Cu]	36
Table 31 : Alloy EN AW-7049A [Al Zn8MgCu]	37
Table 32 : Alloy EN AW-7075 [Al Zn5,5MgCu]	38

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

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SIST EN 754-2:1998

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

Drawn rod/bar								
Temper	Dimensions mm		$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	$A_{50}$ mm % min.
	D 1)	S 2)	min.	max.	min.	max.		
O, H111	≤ 80	≤ 60	60	95	-	-	25	22
H14	≤ 40	≤ 10	100	135	70	-	6	5
H16	≤ 15	≤ 5	120	160	105	-	4	3
H18	≤ 10	≤ 3	145	-	125	-	3	3
Drawn tube								
Temper	Dimensions mm e 3)	$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	$A_{50}$ mm % min.	
		min.	max.	min.	max.			
O, H111	≤ 20	60	95	-	-	25	22	
H14	≤ 10	100	135	70	-	6	5	
H16	≤ 5	120	160	105	-	4	3	
H18	≤ 3	145	-	125	-	3	3	
1) D = Diameter for round bar. 2) S = Width across flats for square and hexagonal bar, thickness for rectangular bar. 3) e = Wall thickness.								

SIST EN 754-2:1998

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Table 2 : Alloy EN AW-1200 [Al 99,0]

Drawn rod/bar								
Temper	Dimensions mm		$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	$A_{50}$ mm % min.
	$D$ <sup>1)</sup>	$S$ <sup>2)</sup>	min.	max.	min.	max.		
O, H111	≤ 80	≤ 60	70	105	-	-	20	16
H14	≤ 40	≤ 10	110	145	80	-	5	4
H16	≤ 15	≤ 5	135	170	115	-	3	3
H18	≤ 10	≤ 3	150	-	130	-	3	3
Drawn tube								
Temper	Dimensions mm $e$ <sup>3)</sup>	$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	$A_{50}$ mm % min.	
		min.	max.	min.	max.			
O, H111	≤ 20	70	105	-	-	20	16	
H14	≤ 10	110	145	80	-	5	4	
H16	≤ 5	135	170	115	-	3	3	
H18	≤ 3	150	-	130	-	3	3	
<p>1) <math>D</math> = Diameter for round bar.</p> <p>2) <math>S</math> = Width across flats for square and hexagonal bar, thickness for rectangular bar.</p> <p>3) <math>e</math> = Wall thickness.</p>								

SIST EN 754-2:1998

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Table 3 : Alloy EN AW-2007 [Al Cu4PbMgMn]

Drawn rod/bar								
Temper	Dimensions mm		$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	A <sub>50 mm</sub> % min.
	$D$ <sup>1)</sup>	$S$ <sup>2)</sup>	min.	max.	min.	max.		
T3 <sup>4)</sup>	$\leq 30$	$\leq 30$	370	-	240	-	7	5
	$30 < D \leq 80$	$30 < S \leq 80$	340	-	220	-	6	-
T351 <sup>4)</sup>	$\leq 80$	$\leq 80$	370	-	240	-	5	3
Drawn tube								
Temper	Dimensions mm $e$ <sup>3)</sup>		$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	A <sub>50 mm</sub> % min.
	min.	max.	min.	max.				
T3 <sup>4)</sup>	$\leq 20$		370	-	250	-	7	5
T3510, T3511 <sup>4)</sup>	$\leq 20$		370	-	240	-	5	3
<p>1) <math>D</math> = Diameter for round bar.</p> <p>2) <math>S</math> = Width across flats for square and hexagonal bar, thickness for rectangular bar.</p> <p>3) <math>e</math> = Wall thickness.</p> <p>4) Properties may be obtained by press quenching.</p>								

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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 <sub>50 mm</sub> %
	D <sup>1)</sup>	S <sup>2)</sup>	min.	max.	min.	max.	min.	min.
T3	≤ 40	≤ 40	320	-	270	-	10	8
	40 < D ≤ 50	40 < S ≤ 50	300	-	250	-	10	-
	50 < D ≤ 80	50 < S ≤ 80	280	-	210	-	10	-
T8	≤ 80	≤ 80	370	-	270	-	8	6
Drawn tube								
Temper	Dimensions mm e <sup>3)</sup>	$R_m$ MPa		$R_{p0,2}$ MPa		A %	A <sub>50 mm</sub> %	
		min.	max.	min.	max.	min.	min.	
T3	≤ 5	310	-	260	-	10	8	
	5 < e ≤ 20	290	-	240	-	8	6	
T8	≤ 20	370	-	275	-	8	6	
<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>								

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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 % min.	A <sub>50 mm</sub> % min.
	$D$ <sup>1)</sup>	$S$ <sup>2)</sup>	min.	max.	min.	max.		
T3	$\leq 40$	$\leq 40$	320	-	270	-	10	8
	$40 < D \leq 50$	$40 < S \leq 50$	300	-	250	-	10	-
	$50 < D \leq 80$	$50 < S \leq 80$	280	-	210	-	10	-
T8	$\leq 80$	$\leq 80$	370	-	270	-	8	6
Drawn tube								
Temper	Dimensions mm $e$ <sup>3)</sup>		$R_m$ MPa		$R_{p0,2}$ MPa		A % min.	A <sub>50 mm</sub> % min.
	min.	max.	min.	max.				
T3	$\leq 5$		310	-	260	-	10	8
	$5 < e \leq 20$		290	-	240	-	8	6
T8	$\leq 20$		370	-	275	-	8	6
<p>1) <math>D</math> = Diameter for round bar.</p> <p>2) <math>S</math> = Width across flats for square and hexagonal bar, thickness for rectangular bar.</p> <p>3) <math>e</math> = Wall thickness.</p>								

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