SLOVENSKI STANDARD
SIST EN 1715-2:2008

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Nadomešča:
SIST EN 1715-2:1998
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Aluminij in aluminijeve zlitine – Valjana žica – 2. del: Posebne zahteve za uporabo v elektrotehniki

Aluminium and aluminium alloys - Drawing stock - Part 2: Specific requirements for electrical applications

Aluminium und Aluminiumlegierungen - Vordraht - Teil 2: Besondere Anforderungen für elektrotechnische Anwendungen

Aluminium et alliages d'aluminium - Fil machine - Partie 2: Exigences spécifiques pour les applications électriques

Ta slovenski standard je istoveten z: **EN 1715-2:2008**

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Aluminium and aluminium alloys - Drawing stock - Part 2: Specific requirements for electrical applications

Aluminium et alliages d'aluminium - Fil machine - Partie 2: Exigences spécifiques relatives aux applications électriques

Aluminium und Aluminiumlegierungen - Vordraht - Teil 2: Besondere Anforderungen für elektrotechnische Anwendungen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 1715-2:2008) 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of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

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.

This document will supersede EN 1715-2:1997.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 4 "Wires and drawing stock" to revise EN 1715-2:1997.

Besides editorial adjustments in the text and update of normative references, the following changes have been made:

— Clause 3: amended; Table 1 inclusion of alloys EN AW-1110, EN AW-5005, EN AW-8030 and EN AW-8176;

— Clause 4: amended.

EN 1715 comprises the following parts under the general title: "*Aluminium and aluminium alloys – Drawing stock*":

— *Part 1: General requirements and technical conditions for inspection and delivery*

— *Part 2: Specific requirements for electrical applications*

— *Part 3: Specific requirements for mechanical uses (excluding welding)*

— *Part 4: Specific requirements for welding applications*

— *Part 5: Specific requirements for aluminium food packaging*[1)]

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1) Under preparation.

1 Scope

This European Standard specifies requirements for drawing stock of aluminium and aluminium alloys for electrical applications.

The general requirements and technical conditions for inspection and delivery are specified in EN 1715-1.

This European Standard does not apply to drawn wire.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) 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 and form of products*

EN 1715-1, *Aluminium and aluminium alloys — Drawing stock — Part 1: General requirements and technical conditions for inspection and delivery*

IEC 60468, *Method of measurement of resistivity of metallic materials*

3 Requirements

3.1 Chemical composition

Aluminium and aluminium alloys commonly used for electrical applications are given in Table 1.

Their chemical composition shall be in accordance with EN 573-3, and for alloys EN AW-1110, EN AW-8030 and EN AW-8176, according to Table A.1.

The elements determined and reported in the certificate of mass and analysis shall be:

Si, Fe, Cu, Mn, Mg, Cr, Zn, Ti, Ga, V and B.

Table 1 — Main alloys for electrical purposes - Tempers for delivery - Mechanical and electrical properties

Alloy designation	Temper	Mechanical properties			Electrical properties (temperature : 20 °C)	
		Tensile strength R_m MPa		Elongation typical $A_{100\ mm}$ %	Resistivity μΩ · cm	Conductivity % IACS
		min.	max.		max.	min.
EN AW-1110 [Al 99,1]	F	125	145	15	2,97	58,0
EN AW-1370 [Al 99,7] and EN AW-1350 [Al 99,5]	H14	115	130	14	2,801	61,5
	H13	105	120	16	2,801	61,5
	H12	95	110	20	2,801	61,5
	H11	80	95	25	2,785	61,9
	O	60	80	40	2,725	63,3
EN AW-5005 [Al Mg1]	H16	165	205	20	3,31	52,0
EN AW-5154A [Al Mg3,5]	F	210	280	16	5,20	33,1
	O	210	275	20	5,10	33,8
	O3	210	260	25	5,10	33,8
EN AW-6101 [Al MgSi]	T1 [a]	190	-	17	3,50	49,2
	T4 [a]	150	-	23	3,50	49,2
EN AW-6201 [Al Mg0,7Si]	T1 [a]	205	-	17	3,60	47,8
	T4 [a]	160	-	21	3,60	47,8
EN AW-8030 [Al FeCu]	O	60	110	40	2,86	60,2
	H24	100	150	25	2,86	60,2
EN AW-8176 [Al FeSi]	O	60	110	40	2,86	60,2
	H24	100	150	25	2,86	60,2

[a] Measurements made not less than 3 days after quenching.

3.2 Temper for delivery

The variety of application of drawn wire and cable made from drawing stock of aluminium and aluminium alloys requires the precise definition of the temper for delivery. Temper shall be indicated in accordance with EN 515.

For aluminium grades EN AW-1350 [Al 99,5] and EN AW-1370 [Al 99,7] the temper shall be either:

— O annealed; or

— H11 - H12 - H13 - H14 corresponding to different mechanical strength level for the "as fabricated" condition.

For age hardening alloys EN AW-6101 [Al MgSi] and EN AW-6201 [Al Mg0,7Si], two tempers of delivery are commonly used:

— T4: solution heat-treated and naturally aged;

— T1: cooled from an elevated temperature shaping process and naturally aged.

For the different alloys and tempers, the mechanical and electrical properties shall be in accordance with Table 1.

If no temper is specified when ordering, the supplied temper shall be F (as manufactured) without special range of characteristics.

Other tempers shall be agreed between manufacturer and purchaser.

4 Product inspection and testing methods

4.1 Chemical composition

The chemical composition shall be checked for each cast delivered in accordance with EN 1715-1.

4.2 Mechanical properties

The mechanical properties shall be measured once per coil in accordance with EN 1715-1.

Other test frequencies shall be agreed between manufacturer and purchaser.

4.3 Specific electrical resistivity (or conductivity)

The specific electrical resistivity (or conductivity) shall be measured according to IEC 60468 at least once per cast.

Other test frequencies shall be agreed between manufacturer and purchaser.

5 Delivery documents and inspection documents

A certificate of mass and analysis shall be provided in accordance with EN 1715-1.

In addition, a test report in accordance with EN 1715-1 shall be delivered for each consignment with reference to the order, and giving the following information:

— identification of the alloy;

— temper;

— nominal diameter;

— list of coil identification numbers;

— results of test for mechanical and electrical properties;

— date of manufacture;

— date of heat treatment for alloys EN AW-6101 and EN AW-6201;

— net mass.

NOTE Other inspection documents can be defined between manufacturer and purchaser in accordance with EN 1715-1.

6 Marking and packaging

Marking and packaging shall be carried out in accordance with EN 1715-1.

Annex A
(normative)

Chemical composition of aluminium alloys EN AW-1110, EN AW-8030 and EN AW-8176

The chemical composition of aluminium alloys EN AW-1110, EN AW-8030 and EN AW-8176 is specified in percentage by mass in Table A.1. Limits are expressed as a maximum unless shown as a range or a minimum.

Table A.1 — Chemical composition of aluminium alloys EN AW-1110, EN AW-8030 and EN AW-8176

Alloy designation		**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Ni**	**Zn**	**Ti**	**Ga**	**V**	**Remarks**	**Others [a]**		**Aluminium**
Numerical	Chemical symbols													**Each**	**Total [b]**	min.
EN AW-1110	EN AW-Al 99,1	0,30	0,8	0,04	0,01	0,25	0,01	–	–	–	–	–	0,02B, 0,03V + Ti	0,03	0,15	99,10 [c]
EN AW-8030	EN AW-Al FeCu	0,10	0,30 to 0,8	0,15 to 0,30	–	0,05	–	–	0,05	–	–	–	0,001 to 0,04B	0,03	0,10	Remainder
EN AW-8176	EN AW-Al FeSi	0,03 to 0,15	0,40 to 1,0	–	–	–	–	–	0,10	–	0,03	–	–	0,05	0,15	Remainder

[a] "Others" includes listed elements for which no specific limit is shown as well as unlisted metallic elements. The producer may analyze samples for trace elements not specified in the registration or specification. However, such analysis is not required and may not cover all metallic "Other" elements. Should any analysis by the producer or the purchaser establish that an "Others" element exceeds the limit of "Each" or that the aggregate of several "Others" elements exceeds the limit of "Total", the material shall be considered non-conforming.

[b] The sum of those "Others" metallic elements 0,010 % or more each, expressed to the second decimal place before determining the sum.

[c] The aluminium content for unalloyed aluminium not made by a refining process is the difference between 100,00 % and the sum of all other metallic elements present in amounts of 0,010 % or more each, expressed to the second decimal place before determining the sum.