SLOVENSKI STANDARD
SIST EN 485-2:2007

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Nadomešča:
SIST EN 485-2:2004

Aluminij in aluminijeve zlitine - Pločevine, trakovi in plošče - 2. del: Mehanske lastnosti

Aluminium and aluminium alloys - Sheet, strip and plate - Part 2: Mechanical properties

Aluminium und Aluminiumlegierungen - Bänder, Bleche und Platten - Teil 2: Mechanische Eigenschaften

Aluminium et alliages d'aluminium - Tôles, bandes et tôles épaisses - Partie 2: Caractéristiques mécaniques

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ICS:

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Aluminium and aluminium alloys - Sheet, strip and plate - Part 2: Mechanical properties

Aluminium et alliages d'aluminium - Tôles, bandes et tôles épaisses - Partie 2: Caractéristiques mécaniques

Aluminium und Aluminiumlegierungen - Bänder, Bleche und Platten - Teil 2: Mechanische Eigenschaften

This European Standard was approved by CEN on 28 February 2007.

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

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Foreword

This document (EN 485-2:2007) 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of an identical text or by endorsement, at the latest by October 2007, and conflicting national standards shall be withdrawn at the latest by October 2007.

This document supersedes EN 485-2:2004.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 7 "Sheet, strip and plate" to revise EN 485-2:2004.

EN 485 comprises the following parts under the general tittle, "Aluminium and aluminium alloys — Sheet, strip and plate".

— *Part 1: Technical conditions for inspection and delivery*

— *Part 2: Mechanical properties*

— *Part 3: Tolerances on dimensions and form for hot-rolled products*

— *Part 4: Tolerances on shape and dimensions for cold-rolled products*

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

Clauses 3 to 9: Have been moved to prEN 485-1.

Tables 1 to 46: Due to the introduction of new alloys, the tables have been renumbered when necessary.

New alloys: EN AW-2618A; EN AW-5010; EN AW-5026; EN AW-5059; EN AW-5070; EN AW-5088; EN AW-6025; EN AW-7010 added.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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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, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document specifies the mechanical properties of wrought aluminium and wrought aluminium alloy sheet, strip and plate for general engineering applications.

It does not apply to semi-finished rolled products in coiled form to be subjected to further rolling (reroll stock) or to special products such as corrugated, embossed, painted, sheets and strips or to special applications such as aerospace, can stock, finstock, for which mechanical properties are specified in separate European Standards.

The chemical composition limits of the alloys are specified in EN 573-3.

Temper designations are defined in Annex B, in compliance with the provisions of EN 515.

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.

prEN 485-1, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 1: Technical conditions for inspection and delivery*

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

ASTM G66, *Visual Assessment of Exfoliation Corrosion Susceptibility of 5xxx Series Aluminium Alloys (ASSET test)*

ASTM G67, *Standard Test Method for Determining the Susceptibility to Intergranular Corrosion of 5xxx series Aluminium Alloys by mass loss after exposure to nitric acid (NAMLT test)*

3 Requirements

The mechanical properties shall be in conformity with those specified in Clause 4 or those agreed upon between purchaser and manufacturer and stated on order document.

4 List of alloys with mechanical property limits

4.1 General

Tables 1 to 46 contain mechanical property limits values obtained by tensile testing according to EN 10002-1 after sampling and after sample preparation according to prEN 485-1.

They also contain values of bend radius and hardness following sampling and test methods as described in prEN 485-1. These values are for information only.

For some alloys they contain provisions related to intergranular corrosion, exfoliation corrosion or stress corrosion testing, see also prEN 485-1.

4.2 Elongation

The A_{50mm} 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 $\sqrt{S_o}$ (where S_o is the initial cross-sectional area of the test-piece), and expressed in percent.

4.3 List of alloys and their mechanical properties

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

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness HBW[a]
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	
F[a]	≥ 2,5	150,0	60								
O/H111	0,2	0,5	65	95	20		20		0 t	0 t	20
	0,5	1,5	65	95	20		22		0 t	0 t	20
	1,5	3,0	65	95	20		26		0 t	0 t	20
	3,0	6,0	65	95	20		29		0,5 t	0,5 t	20
	6,0	12,5	65	95	20		35		1,0 t	1,0 t	20
	12,5	80,0	65	95	20			32			20
H112	≥ 6,0	12,5	75		30		20				23
	12,5	80,0	70		25			20			22
H12	0,2	0,5	85	125	65		2		0,5 t	0 t	28
	0,5	1,5	85	125	65		4		0,5 t	0 t	28
	1,5	3,0	85	125	65		5		0,5 t	0,5 t	28
	3,0	6,0	85	125	65		7		1,0 t	1,0 t	28
	6,0	12,5	85	125	65		9			2,0 t	28
	12,5	40,0	85	125	65			9			28
H14	0,2	0,5	105	145	85		2		1,0 t	0 t	34
	0,5	1,5	105	145	85		2		1,0 t	0,5 t	34
	1,5	3,0	105	145	85		4		1,0 t	1,0 t	34
	3,0	6,0	105	145	85		5			1,5 t	34
	6,0	12,5	105	145	85		6			2,5 t	34
	12,5	25,0	105	145	85			6			34
H16	0,2	0,5	120	160	100		1			0,5 t	39
	0,5	1,5	120	160	100		2			1,0 t	39
	1,5	4,0	120	160	100		3			1,5 t	39
H18	0,2	0,5	135		120		1			1,0 t	42
	0,5	1,5	140		120		2			2,0 t	42
	1,5	3,0	140		120		2			3,0 t	42
H19	0,2	0,5	155		140		1				45
	0,5	1,5	150		130		1				45
	1,5	3,0	150		130		1				45
H22	0,2	0,5	85	125	55		4		0,5 t	0 t	27
	0,5	1,5	85	125	55		5		0,5 t	0 t	27
	1,5	3,0	85	125	55		6		0,5 t	0,5 t	27
	3,0	6,0	85	125	55		11		1,0 t	1,0 t	27
	6,0	12,5	85	125	55		12			2,0 t	27

Table 1 *(continued)*

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness HBW[a]
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	
H24	0,2	0,5	105	145	75		3		1,0 t	0 t	33
	0,5	1,5	105	145	75		4		1,0 t	0,5 t	33
	1,5	3,0	105	145	75		5		1,0 t	1,0 t	33
	3,0	6,0	105	145	75		8		1,5 t	1,5 t	33
	6,0	12,5	105	145	75		8			2,5 t	33
H26	0,2	0,5	120	160	90		2			0,5 t	38
	0,5	1,5	120	160	90		3			1,0 t	38
	1,5	4,0	120	160	90		4			1,5 t	38
H28	0,2	0,5	140		110		2			1,0 t	41
	0,5	1,5	140		110		2			2,0 t	41
	1,5	3,0	140		110		3			3,0 t	41

[a] For information only.

Table 2 — Aluminium EN AW-1070A [Al 99,7]

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness HBW[a]
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	
F[a]	≥ 2,5	25,0	60								
O/H111	0,2	0,5	60	90	15		23		0 t	0 t	18
	0,5	1,5	60	90	15		25		0 t	0 t	18
	1,5	3,0	60	90	15		29		0 t	0 t	18
	3,0	6,0	60	90	15		32		0,5 t	0,5 t	18
	6,0	12,5	60	90	15		35		0,5 t	0,5 t	18
	12,5	25,0	60	90	15			32			18
H112	≥ 6,0	12,5	70		20		20				
	12,5	25,0	70					20			
H12	0,2	0,5	80	120	55		5		0,5 t	0 t	26
	0,5	1,5	80	120	55		6		0,5 t	0 t	26
	1,5	3,0	80	120	55		7		0,5 t	0,5 t	26
	3,0	6,0	80	120	55		9			1,0 t	26
	6,0	12,5	80	120	55		12			2,0 t	26
H14	0,2	0,5	100	140	70		4		0,5 t	0 t	32
	0,5	1,5	100	140	70		4		0,5 t	0,5 t	32
	1,5	3,0	100	140	70		5		1,0 t	1,0 t	32
	3,0	6,0	100	140	70		6			1,5 t	32
	6,0	12,5	100	140	70		7			2,5 t	32
H16	0,2	0,5	110	150	90		2		1,0 t	0,5 t	36
	0,5	1,5	110	150	90		2		1,0 t	1,0 t	36
	1,5	4,0	110	150	90		3		1,0 t	1,0 t	36
H18	0,2	0,5	125		105		2			1,0 t	40
	0,5	1,5	125		105		2			2,0 t	40
	1,5	3,0	125		105		2			2,5 t	40
H22	0,2	0,5	80	120	50		7		0,5 t	0 t	26
	0,5	1,5	80	120	50		8		0,5 t	0 t	26
	1,5	3,0	80	120	50		10		0,5 t	0,5 t	26
	3,0	6,0	80	120	50		12			1,0 t	26
	6,0	12,5	80	120	50		15			2,0 t	26
H24	0,2	0,5	100	140	60		5		0,5 t	0 t	31
	0,5	1,5	100	140	60		6		0,5 t	0,5 t	31
	1,5	3,0	100	140	60		7		1,0 t	1,0 t	31
	3,0	6,0	100	140	60		9			1,5 t	31
	6,0	12,5	100	140	60		11			2,5 t	31
H26	0,2	0,5	110	150	80		3			0,5 t	35
	0,5	1,5	110	150	80		3			1,0 t	35
	1,5	4,0	110	150	80		4			1,0 t	35

[a] For information only.

Table 3 — Aluminium EN AW-1080A [Al 99,8(A)]

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness HBW[a]
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	
F[a]	≥ 2,5	25,0	60								
O/H111	0,2	0,5	60	90	15		26		0 t	0 t	18
	0,5	1,5	60	90	15		28		0 t	0 t	18
	1,5	3,0	60	90	15		31		0 t	0 t	18
	3,0	6,0	60	90	15		35		0,5 t	0,5 t	18
	6,0	12,5	60	90	15		35		0,5 t	0,5 t	18
H112	≥ 6,0	12,5	70				20				
	12,5	25,0	70					20			
H12	0,2	0,5	80	120	55		5		0,5 t	0 t	26
	0,5	1,5	80	120	55		6		0,5 t	0 t	26
	1,5	3,0	80	120	55		7		0,5 t	0,5 t	26
	3,0	6,0	80	120	55		9			1,0 t	26
	6,0	12,5	80	120	55		12			2,0 t	26
H14	0,2	0,5	100	140	70		4		0,5 t	0 t	32
	0,5	1,5	100	140	70		4		0,5 t	0,5 t	32
	1,5	3,0	100	140	70		5		1,0 t	1,0 t	32
	3,0	6,0	100	140	70		6			1,5 t	32
	6,0	12,5	100	140	70		7			2,5 t	32
H16	0,2	0,5	110	150	90		2		1,0 t	0,5 t	36
	0,5	1,5	110	150	90		2		1,0 t	1,0 t	36
	1,5	4,0	110	150	90		3		1,0 t	1,0 t	36
H18	0,2	0,5	125		105		2			1,0 t	40
	0,5	1,5	125		105		2			2,0 t	40
	1,5	3,0	125		105		2			2,5 t	40
H22	0,2	0,5	80	120	50		8		0,5 t	0 t	26
	0,5	1,5	80	120	50		9		0,5 t	0 t	26
	1,5	3,0	80	120	50		11		0,5 t	0,5 t	26
	3,0	6,0	80	120	50		13			1,0 t	26
	6,0	12,5	80	120	50		15			2,0 t	26
H24	0,2	0,5	100	140	60		5		0,5 t	0 t	31
	0,5	1,5	100	140	60		6		0,5 t	0,5 t	31
	1,5	3,0	100	140	60		7		1,0 t	1,0 t	31
	3,0	6,0	100	140	60		9			1,5 t	31
	6,0	12,5	100	140	60		11			2,5 t	31
H26	0,2	0,5	110	150	80		3			0,5 t	35
	0,5	1,5	110	150	80		3			1,0 t	35
	1,5	4,0	110	150	80		4			1,0 t	35

[a] For information only.

Table 4 — Aluminium EN AW-1200 [Al 99,0]

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness HBW[a]
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	
F [a]	≥ 2,5	150,0	75								
O/H111	0,2	0,5	75	105	25		19		0 t	0 t	23
	0,5	1,5	75	105	25		21		0 t	0 t	23
	1,5	3,0	75	105	25		24		0 t	0 t	23
	3,0	6,0	75	105	25		28		0,5 t	0,5 t	23
	6,0	12,5	75	105	25		33		1,0 t	1,0 t	23
	12,5	80,0	75	105	25			30			23
H112	≥ 6,0	12,5	85		35		16				26
	12,5	80,0	80		30			16			24
H12	0,2	0,5	95	135	75		2		0,5 t	0 t	31
	0,5	1,5	95	135	75		4		0,5 t	0 t	31
	1,5	3,0	95	135	75		5		0,5 t	0,5 t	31
	3,0	6,0	95	135	75		6		1,0 t	1,0 t	31
	6,0	12,5	95	135	75		8			2,0 t	31
	12,5	40,0	95	135	75			8			31
H14	0,2	0,5	105	155	95		1		1,0 t	0 t	37
	0,5	1,5	115	155	95		3		1,0 t	0,5 t	37
	1,5	3,0	115	155	95		4		1,0 t	1,0 t	37
	3,0	6,0	115	155	95		5		1,5 t	1,5 t	37
	6,0	12,5	115	155	90		6			2,5 t	37
	12,5	25,0	115	155	90			6			37
H16	0,2	0,5	120	170	110		1			0,5 t	42
	0,5	1,5	130	170	115		2			1,0 t	42
	1,5	4,0	130	170	115		3			1,5 t	42
H18	0,2	0,5	150		130		1			1,0 t	45
	0,5	1,5	150		130		2			2,0 t	45
	1,5	3,0	150		130		2			3,0 t	45
H19	0,2	0,5	160		140		1				48
	0,5	1,5	160		140		1				48
	1,5	3,0	160		140		1				48

Table 4 *(continued)*

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	HBW[a]
H22	0,2	0,5	95	135	65		4		0,5 t	0 t	30
	0,5	1,5	95	135	65		5		0,5 t	0 t	30
	1,5	3,0	95	135	65		6		0,5 t	0,5 t	30
	3,0	6,0	95	135	65		10		1,0 t	1,0 t	30
	6,0	12,5	95	135	65		10			2,0 t	30
H24	0,2	0,5	115	155	90		3		1,0 t	0 t	37
	0,5	1,5	115	155	90		4		1,0 t	0,5 t	37
	1,5	3,0	115	155	90		5		1,0 t	1,0 t	37
	3,0	6,0	115	155	90		7			1,5 t	37
	6,0	12,5	115	155	85		9			2,5 t	36
H26	0,2	0,5	130	170	105		2			0,5 t	41
	0,5	1,5	130	170	105		3			1,0 t	41
	1,5	4,0	130	170	105		4			1,5 t	41

[a] For information only.

Table 5 — Alloy EN AW-2014 [Al Cu4SiMg]

Temper	Specified thickness mm		R_m MPa		$R_{p0,2}$ MPa		Elongation min. %		Bend radius[a]		Hardness HBW[a]
	over	up to	min.	max.	min.	max.	$A_{50\ mm}$	A	180°	90°	
O	≥ 0,4	1,5		220		140	12		0,5 t	0 t	55
	1,5	3,0		220		140	13		1,0 t	1,0 t	55
	3,0	6,0		220		140	16			1,5 t	55
	6,0	9,0		220		140	16			2,5 t	55
	9,0	12,5		220		140	16			4,0 t	55
	12,5	25,0		220				10			55
T3	≥ 0,4	1,5	395		245		14				111
	1,5	6,0	400		245		14				112
T4	≥ 0,4	1,5	395		240		14		3,0 t [b]	3,0 t [b]	110
T451	1,5	6,0	395		240		14		5,0 t [b]	5,0 t [b]	110
	6,0	12,5	400		250		14			8,0 t [b]	112
	12,5	40,0	400		250			10			112
	40,0	100,0	395		250			7			111
T42	≥ 0,4	6,0	395		230		14				110
	6,0	12,5	400		235		14				111
	12,5	25,0	400		235			12			111
T6	≥ 0,4	1,5	440		390		6			5,0 t [b]	133
T651	1,5	6,0	440		390		7			7,0 t [b]	133
	6,0	12,5	450		395		7			10 t [b]	135
	12,5	40,0	460		400			6			138
	40,0	60,0	450		390			5			135
	60,0	80,0	435		380			4			131
	80,0	100,0	420		360			4			126
	100,0	125,0	410		350			4			123
	125,0	160,0	390		340			2			
T62	≥ 0,4	12,5	440		390		7				133
	12,5	25,0	450		395			6			135

Whenever a new application of this alloy is contemplated, and if this application involves special properties such as corrosion resistance, toughness, fatigue strength, it is strongly recommended that the user consult the producer in order to make a precise and appropriate selection of the material.

[a] For information only.

[b] Appreciably smaller cold bend radii can be achieved immediately after quenching.