

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 826

MECHANICAL PROPERTY LIMITS
FOR ROLLED PRODUCTS OF ALUMINIUM
AND ALUMINIUM ALLOYS

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BRIEF HISTORY

The ISO Recommendation R 826, *Mechanical property limits for rolled products of aluminium and aluminium alloys*, was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question by the Technical Committee began in 1959 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In October 1966, this Draft ISO Recommendation (No. 1116) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	Ireland	South Africa, Rep. of
Belgium	Israel	Turkey
Canada	Italy	U.A.R.
Chile	Japan	United Kingdom
Czechoslovakia	Netherlands	U.S.A.
France	Norway	U.S.S.R.
Hungary	Sweden	Yugoslavia
India	Switzerland	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in September 1968, to accept it as an ISO RECOMMENDATION.

MECHANICAL PROPERTY LIMITS FOR ROLLED PRODUCTS OF ALUMINIUM AND ALUMINIUM ALLOYS

1. SCOPE

The grades or alloys listed in this ISO Recommendation are those the designation and chemical composition of which are specified in ISO Recommendation R 209-1968, *Composition of wrought products of aluminium and aluminium alloys*.

Before comparing them with the limiting values listed in section 3, the measured or calculated values of 0.2 % proof stress or yield strength [$R_c(0.2)$], or of tensile strength (R_m), should be rounded off to the nearest 0.1 kgf/mm² (or 100 lbf/in²) and those of the percentage elongation (A) to the nearest 1 % (see Annexes A and B).

For products up to 2.6 mm (0.102 in) thick, national standards may contain either elongation requirements or bend test requirements, or both.

The values given for alloys Al-Cu4MgSi, Al-Cu4MgI and Al-Cu4SiMg apply to the material delivered by the supplier in the "solution treated and naturally aged" condition (or "solution treated and precipitation treated" condition). If the user reheat-treats the material, these values may not be attained.

2. SYMBOLS AND ABBREVIATIONS

The symbols and abbreviations used in section 3 have the following meanings :

$R_c(0.2)$	: 0.2 % proof stress or yield strength
R_m	: Tensile strength
A	: Percentage elongation after rupture
S_o	: Original cross-sectional area of the gauge length of the test piece
1 kgf/mm ²	: 1 kilogramme-force per square millimetre = about 9.8 N/mm ² (newton per square millimetre)
1000 lbf/in ²	: 1000 pounds-force per square inch = about 6.9 N/mm ²

3. MECHANICAL PROPERTY LIMITS

1	2	3	4	5	6	7	8	9	10	11	12	13
Grade or alloy	Condition	Thickness e		$R_c(0.2)$ min.		R_m				A min. on		Bend radius
		millimetres	inches	kgf/mm ²	1000 lbf/in ²	kgf/mm ²	min.	max.	1000 lbf/in ²	5.65 $\sqrt{S_0}$	%	
Al 99.0 and Al 99.0 Cu	annealed	0.5 $\leq e \leq$ 0.8	0.020 $\leq e \leq$ 0.031	—	—	7.0	7.0	11.0	10.0	30	20	flat
		0.8 $< e \leq$ 1.3	0.032 $\leq e \leq$ 0.050	—	—	7.0	7.0	11.0	10.0	30	25	flat
		1.3 $< e \leq$ 2.6	0.051 $\leq e \leq$ 0.102	—	—	7.0	7.0	11.0	10.0	30	30	flat
		2.6 $< e \leq$ 6.3	0.103 $\leq e \leq$ 0.249	—	—	7.0	7.0	11.0	10.0	30	30	—
		6.3 $< e \leq$ 25	0.250 $\leq e \leq$ 1.0	—	—	7.0	7.0	11.0	10.0	28	28	—
	intermediate temper	0.5 $\leq e \leq$ 0.8	0.020 $\leq e \leq$ 0.031	—	—	11.0	11.0	15.0	16.0	5	3	0.5 e
		0.8 $< e \leq$ 1.3	0.032 $\leq e \leq$ 0.050	—	—	11.0	11.0	15.0	16.0	5	4	0.5 e
		1.3 $< e \leq$ 2.6	0.051 $\leq e \leq$ 0.102	—	—	11.0	11.0	15.0	16.0	5	5	0.5 e
		2.6 $< e \leq$ 6.3	0.103 $\leq e \leq$ 0.249	—	—	11.0	11.0	15.0	16.0	5	5	—
		6.3 $< e \leq$ 25	0.250 $\leq e \leq$ 1.0	—	—	11.0	11.0	15.0	16.0	5	6	—
Al 99.5	annealed	0.5 $\leq e \leq$ 0.8	0.020 $\leq e \leq$ 0.031	—	—	5.5	5.5	10.0	8.0	32	22	flat
		0.8 $< e \leq$ 1.3	0.032 $\leq e \leq$ 0.050	—	—	5.5	5.5	10.0	8.0	32	25	flat
		1.3 $< e \leq$ 2.6	0.051 $\leq e \leq$ 0.102	—	—	5.5	5.5	10.0	8.0	32	30	flat
		2.6 $< e \leq$ 6.3	0.103 $\leq e \leq$ 0.249	—	—	5.5	5.5	10.0	8.0	32	32	—
		6.3 $< e \leq$ 25	0.250 $\leq e \leq$ 1.0	—	—	5.5	5.5	10.0	8.0	30	30	—
	intermediate temper	0.5 $\leq e \leq$ 0.8	0.020 $\leq e \leq$ 0.031	—	—	10.0	10.0	14.0	14.0	6	4	0.5 e
		0.8 $< e \leq$ 1.3	0.032 $\leq e \leq$ 0.050	—	—	10.0	10.0	14.0	14.0	6	5	0.5 e
		1.3 $< e \leq$ 2.6	0.051 $\leq e \leq$ 0.102	—	—	10.0	10.0	14.0	14.0	6	6	0.5 e
		2.6 $< e \leq$ 6.3	0.103 $\leq e \leq$ 0.249	—	—	10.0	10.0	14.0	14.0	6	6	—
		6.3 $< e \leq$ 25	0.250 $\leq e \leq$ 1.0	—	—	10.0	10.0	14.0	14.0	6	7	—
Al 99.7	annealed	0.5 $\leq e \leq$ 2.6	0.020 $\leq e \leq$ 0.102	—	—	—	—	10.0	—	34	29	flat
		2.6 $< e \leq$ 6.3	0.103 $\leq e \leq$ 0.249	—	—	—	—	10.0	—	34	34	—
Al 99.8	annealed	0.5 $\leq e \leq$ 2.6	0.020 $\leq e \leq$ 0.102	—	—	—	—	9.0	—	34	29	flat
		2.6 $< e \leq$ 6.3	0.103 $\leq e \leq$ 0.249	—	—	—	—	9.0	—	34	34	—