

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 209

**COMPOSITION OF WROUGHT PRODUCTS
OF ALUMINIUM AND ALUMINIUM ALLOYS
CHEMICAL COMPOSITION (PER CENT)**

<https://standards.iteh.ai/catalog/standards/sist/94a71177-f573-428a-8b4f-f4c8b3bca6c3/iso-r-209-1971>

3rd EDITION

August 1971

This third edition supersedes the second edition

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BRIEF HISTORY

The ISO Recommendation R 209, *Composition of wrought 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 1956 and led, in 1958, to the adoption of a Draft ISO Recommendation.

In November 1959, this Draft ISO Recommendation (No. 327) was circulated to all the ISO Member Bodies for enquiry. It was approved by 22 Member Bodies and disapproved by 1 Member Body.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in July 1961, to accept it as an ISO RECOMMENDATION.

BRIEF HISTORY CONCERNING THE 2nd EDITION

Work on the revision of ISO Recommendation R 209-1961 led to the adoption of Draft ISO Recommendation No. 1066, which was circulated to all the ISO Member Bodies for enquiry in August 1966. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Hungary	Sweden
Austria	India	Thailand
Belgium	Japan	Turkey
Brazil	Korea, Rep. of	U.A.R.
Canada	Netherlands	United Kingdom
Chile	Norway	U.S.A.
Czechoslovakia	Poland	U.S.S.R.
France	South Africa, Rep. of	Yugoslavia
Germany	Spain	

Two Member Bodies opposed the approval of the Draft :

Italy
Switzerland

The Draft Revision of ISO Recommendation R 209-1961 was then submitted by correspondence to the ISO Council which decided, in March 1968, to accept it.

The new title, *Composition of wrought products of aluminium and aluminium alloys – Chemical composition (per cent)*, superseded the title of the first edition : *Composition of wrought products of aluminium and aluminium alloys*.

[ISO/R 209:1971](https://standards.iteh.ai/catalog/standards/sist/94a71177-f573-428a-8b4f-f4c8b3bca6c3/iso-r-209-1971)

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BRIEF HISTORY CONCERNING THE 3rd EDITION

The third edition of ISO Recommendation R 209, drawn up by Technical Committee ISO/TC 79, results from a Draft Revision, which was the subject of Draft ISO Recommendation No. 2087.

This Draft ISO Recommendation was circulated to all ISO Member Bodies for enquiry in July 1970. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Belgium	Israel	South Africa, Rep. of
Canada	Italy	Spain
Czechoslovakia	Korea, Rep. of	Sweden
Finland	Netherlands	Switzerland
France	New Zealand	Thailand
Germany	Norway	U.A.R.
Greece	Poland	United Kingdom
India	Portugal	U.S.A.
Iran	Romania	U.S.S.R.

The following Member Body opposed the approval of the Draft :

Japan

This Draft ISO Recommendation, included in a Draft Revision of ISO Recommendation R 209, was then submitted by correspondence to the ISO Council, which decided to accept it as the third edition of ISO Recommendation R 209.

This third edition of ISO Recommendation R 209 supersedes all previous editions and cancels the second edition.

**COMPOSITION OF WROUGHT PRODUCTS
OF ALUMINIUM AND ALUMINIUM ALLOYS
CHEMICAL COMPOSITION (PER CENT)**

1. SCOPE

This ISO Recommendation specifies the chemical composition (per cent) of wrought products of aluminium and aluminium alloys.

2. ALUMINIUM

TABLE 1

Grade (ISO symbol)	Maximum impurities					
	Cu	Si	Fe	Mn	Zn	Total Cu+ Si+ Fe+ Mn+ Zn
Al 99.0	0.10	0.5	0.8	0.1	0.1	1.0
Al 99.5	0.05	0.3	0.4	0.05	0.10	0.5
Al 99.7	0.03	0.20	0.25	0.03	0.07	0.3
Al 99.8	0.03	0.15	0.15	0.03	0.06	0.2

3. ALUMINIUM ALLOYS

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TABLE 2

Alloy (ISO symbol)	Chemical composition									Remarks	Al
	Cu	Mg	Si	Fe	Mn	Zn	Cr	Ti+ Zr			
Al 99.0 Cu	min. 0.05		—	—	—	—	—	—	—	Cu+ Si+ Fe+ Mn+ Zn : 1.0 max.	The remainder
	max. 0.20		0.5	0.8	0.1	0.1					
Al-Mn 1	min. —	—	—	—	0.8	—	—	—	—	Ti+ Zr+ Cr : 0.2 max.	
	max. 0.1	0.3	0.6	0.7	1.5	0.2					
Al-Mn 1 Cu	min. 0.05		—	—	1.0	—	—	—	—	Ti+ Zr+ Cr : 0.2 max.	
	max. 0.20		0.6	0.7	1.5	0.2					
Al-Mg 1	min. —	0.5	—	—	—	—	—	—	—	The remainder	
	max. 0.20	1.1	0.4	0.7	0.2	0.2	0.1	0.2			
Al-Mg 1.5	min. —	1.1	—	—	—	—	—	—	—		
	max. 0.20	1.8	0.4	0.7	0.3	0.2	0.1	0.2			
Al-Mg 2	min. —	1.7	—	—	—	—	—	—	—		Mn+ Cr : 0.5 max.
	max. 0.10	2.4	0.5	0.5	0.5	0.2	0.35	0.2			
Al-Mg 2.5	min. —	2.2	—	—	—	—	—	—	—		Mn+ Cr : 0.5 max.
	max. 0.10	2.8	0.5	0.5	0.5	0.2	0.35	0.2			
Al-Mg 3	min. —	2.4	—	—	—	—	—	—	—		The remainder
	max. 0.10	3.1	0.5	0.5	0.4	0.2	0.35	0.2			
Al-Mg 3 Mn	min. —	2.4	—	—	0.3	—	—	—	—		
	max. 0.10	3.4	0.5	0.5	1.0	0.2	0.25	0.2			
Al-Mg 3.5	min. —	3.1	—	—	—	—	—	—	—		
	max. 0.10	3.9	0.5	0.5	0.6	0.2	0.35	0.2			

TABLE 2 (concluded)

Alloy (ISO symbol)	Chemical composition									Remarks	Al
	Cu	Mg	Si	Fe	Mn	Zn	Cr	Ti+Zr			
Al-Mg4 min. max.	— 0.10	3.5 4.6	— 0.5	— 0.5	— 0.8	— 0.2	— 0.35	— 0.2		Mn+Cr min. : 0.15 max. : 0.9	The remainder
Al-Mg4.5Mn min. max.	— 0.10	4.0 4.9	— 0.5	— 0.5	0.3 1.0	— 0.2	— 0.25	— 0.2			
Al-Mg5 min. max.	— 0.10	4.5 5.6	— 0.5	— 0.5	— 0.5	— 0.2	— 0.35	— 0.2		Mn+Cr min. : 0.1 max. : 0.5	
Al-Si1Mg min. max.	— 0.10	0.4 1.4	0.6 1.6	— 0.5	0.4 1.0 ⁽¹⁾	— 0.2	— 0.35	— 0.2			
Al-MgSi min. max.	— 0.10	0.4 0.9	0.3 0.7	— 0.5	— 0.30	— 0.2	— 0.10	— 0.2			
Al-Mg1SiCu min. max.	0.15 0.40	0.8 1.2	0.4 0.8	— 0.7	— 0.15	— 0.25	0.04 0.35 ⁽²⁾	— 0.2			
Al-Cu2Mg min. max.	2.0 3.0	0.2 0.5	— 0.8	— 0.7	— 0.2	— 0.2	— 0.1	— 0.2			
Al-Cu4MgSi min. max.	3.5 4.7	0.3 1.2	0.2 0.8	— 0.7	0.3 1.0	— 0.5				Ni : 0.2 max. Ti+Zr+Cr : 0.3 max.	
Al-Cu4Mg1 min. max.	3.8 4.9	1.0 1.8	0.3 0.5	— 0.5	0.3 1.2	— 0.2				Ni : 0.2 max. Ti+Zr+Cr : 0.3 max.	
Al-Cu4SiMg min. max.	3.8 5.0	0.2 0.8	0.5 1.2	— 0.7	0.3 1.2	— 0.2				Ni : 0.2 max. Ti+Zr+Cr : 0.3 max.	
Al-Zn6MgCu min. max.	1.2 2.0	2.1 2.9	— 0.40	— 0.50	— 0.30	— 0.4	— 0.35	— 0.30		Ni : 0.10 max. Mn+Cr : 0.50 max.	

- (1) Alternatively, in place of a mandatory manganese content this alloy may contain 0.15 to 0.35 % chromium.
- (2) Alternatively, in place of a mandatory chromium content this alloy may contain 0.2 to 0.8 % manganese.

NOTES

1. In the recording of results of chemical analysis, the number representing the result of the determination of an element content should be taken to the same number of decimal places as the corresponding number in this ISO Recommendation.
The following rule should be applied for the rounding-off of this number :
 - (a) When the figure immediately after the last figure to be retained is lower than 5, the last figure to be retained remains unchanged.
 - (b) When the figure immediately after the last figure to be retained is greater than 5, or equal to 5 and followed by at least one figure other than zero, the last figure to be retained is increased by one.
 - (c) When the figure immediately after the last figure to be retained is equal to 5 and followed by zeros only, the last figure to be retained remains unchanged if even and is increased by one if odd.
2. It is the responsibility of the supplier to ensure that any element not specifically limited by this ISO Recommendation is not present in an amount such as is generally accepted as having an adverse effect on the product. If the purchaser's requirements necessitate limits for any element not specified, these should be agreed upon between supplier and purchaser.