



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Si 7 Mg**

Alloy designation: **EN AB and AC 42100 Al Si 7 Mg 0.3**

Replaces:

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS											Individual impurities	Global impurities
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti		
EN AB 42100	min	6,5				0,30						0,10		
	max	7,5	0,15	0,03	0,10	0,45	-	-	0,07	-	-	0,18	0,03	0,10
	min	6,5				0,30						0,10		
	max	7,5	0,15	0,02	0,10	0,45	-	-	0,07	-	-	0,18	0,03	0,10

MECHANICAL FEATURES DETECTED FROM SEPARATE CASTING TEST SPECIMENS

Casting process	Temper designations	Rm Tensile strength		Sp 0,2 Yield strength		A Elongation		HB Brinell hardness	
		EN 1706		EN 1706		EN 1706		EN 1706	
		Mpa	N/mm2	Mpa	N/mm2	%	%	HBW	HB
SAND (as cast) Partially Aged Hardened and Aged artif.	F		140 - 220		80 - 140		2 - 6		45 - 60
	T64		200 - 270		120 - 170		4 - 10		60 - 80
	T6	230	240 - 320	190	220 - 280	2	3 - 6	75	80 - 110
SHELL (as cast) Partially Aged Hardened and Aged artif.	F		180 - 240		90 - 150		4 - 8		50 - 65
	T6	290	250 - 340	210	220 - 280	4	5 - 9	90	80 - 100
	T64	250	220 - 270	180	120 - 180	8	6 - 12	80	65 - 85

PHYSICAL PROPERTIES (indicative values subject to the UNI EN and ex DIN Standards)

DENSITY	2.66 Kg/dm ³
MELTING RANGE or MELTING POINT	550 °C 625 °C
SPECIFIC HEAT (at 100)°	0.92 J/Gk
LINEAR SHRINKAGE IN SAND	1.1 - 1.2 %
LINEAR SHRINKAGE IN SHELL PROCES	0.8 - 1.1 %
ELECTRIC CONDUCTIVITY	21 - 27 MS/m
MODULUS OF ELASTICITY	7400 m/mm ²

THERMAL CONDUCTIVITY at 20°C	160 - 180 W/(m K)
LINEAR THERMAL EXPANSION from 20 t 100°C	-
LINEAR THERMAL EXPANSION from 20 t 200°C	22.0-10-6/°C
LINEAR THERMAL EXPANSION from 20 t 300°C	-
SUGGESTED MAXIMUM TEMPERATURE	780 °C
SUGGESTED CASTING TEMPERATURE	
°in sand	680 - 750 °C
°in shell	680 - 750 °C
°in pressure die	-

TECHNOLICICL FEATURES, QUALITATIVE INDICATIONS

STRENGTH AT ELEVATED TEMPERATURE(to 200°C)	LOW
GENERAL RESIATANCE TO CORROSION	GOOD
MACHINABILITY	GOOD
CASTABILITY	GOOD
POLISHING	MEDIUM

RESISTANCE TO HOT TEARING	SMALL
PRESSURE TIGHTNESS	GOOD
WELDABILITY	EXCELLENT
DECORATIVE ANODISING	BAD
PROTECTIVE ANODISING	BAD

AZIENDA CON SISTEMA DI GESTIONE PER LA QUALITÀ CERTIFICATO DA DNV = UNI EN ISO 9001:2008 =

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AZIENDA CON SISTEMA DI GESTIONE AMBIENTALE CERTIFICATO DA DNV = UNI EN ISO 14001:2004 =



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Replaces:

GENERALITIES REGARDING USE

The ingot recasting process must be carried out as quickly as possible and overheating must be avoided (maximum melting temperature 760°C).

The iron tools that can come into contact with the liquid metal must be appropriately painted to prevent contamination of the alloy.

The best results for refining the alloy are reached by treatments with inert gases such as nitrogen and/or argon with the intent of removing the hydrogen dissolved and the oxides present in the bath of molten metal. Better distribution of the gas in the molten metal is obtained by the use of relevant rotors. Pay particular attention that all transfer operations of the molten metal are performed with less turbulence possible. It is recommended to leave the molten metal at rest for a few minutes before starting casting. Careful skimming operations of the bath are recommended.

The re-cycling of risers and casting appendixes is allowed but within the limits of 40% of the total weight of the load.

SPECIFICITY REGARDING USE

For the realisation of casting with sensitive thickness, it is recommended to envision "modification" treatment.

If Strontium is used as the modifying element, it is recommended to operate with Strontium that do not exceed 300 ppm in order to prevent excess reactivity of the alloy in the liquid state with consequent oxidation and gassing phenomena

Remember that the contents of Strontium exceeding 100 ppm are normally sufficient to obtain a well-modified structure.

Considering the relative level of purity of the alloy's chemical composition (reduced content of Cu - Zn - Fe) it is important to consider the level of cleanliness of the melting furnaces and the attention of the re-cycling of the risers in order to prevent induced pollution that could jeopardise the technical properties of the alloy.

TYPICAL USE

Alloy suitable for realising casting with complex design, obtaining high mechanical features; good pressurised sealing and weldability. It is used in the motor, railways, aeronautical and armaments industries (heads and bases)

EN 42100 alloy is in compliance with the EN 601 foodstuff Standard.

COMPARISON WITH EQUIVALENT OR SIMILAR FOREIGN STANDARDS

	ITALY	GERMANY	FRANCE	G.B.R.	USA	ISO	JAPAN	TURKEY
	UNI	(Din1725/5-86)	(NFA57-105)	(BS1490-88)	(ASTM B179-82)	(3522-84)	(JIS H2211-92)	(ETIAL)
Equivalent	UNI 8024	GALSI 7 MG	AS 7 G03		A 356.2	Al Si 7 Mg	C 4 CV	
Similar				LM 25				

HEAT TREATMENTS

Hardening 520 - -535°C after pre-heating of 4 - 10 hours in aging conditions

Complete Artificial Aging at 155 - 165°C for 6 - 8 hours.

Partial aging at 150 - 160 °C for 2 - 3 hours.

Limitation of liability

The contents of these technical sheets gave an informative purpose and do not constitute a warranty regarding the properties stated. The decisions based on this information are taken under the responsibility and risk of the user and do not exclude it from the verification. If the former are not carried out, we do not assume any liability.

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