



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Si (Cu)**

Alloy designation: **EN AB and AC 47100 - Al Si 12 Cu 1 (Fe)**

Replaces: **UNI 5079 - GD Al Si 13 Fe**

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS												Individual impurities	Global impurities
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti			
EN AB 47100	min	10,5	0,6	0,7											
	max	13,5	1,1	1,2	0,55	0,35	0,10	0,30	0,55	0,20	0,10	0,15	0,05	0,25	
UNI 5079	min	11,5	0,70												
	max	13,0	1,0	0,80	0,3	0,30		0,20	0,50	0,15	0,10	0,15		2,0*	

MECHANICAL FEATURES DETECTED FROM SEPARATE CASTING TEST SPECIMENS

Casting process	Temper designations	Rm Tensile strenght		Sp 0,2 Yield strenght		A Elongation		HB Brinell hardness	
		EN 1706	UNI 5079	EN 1706	UNI 5079	EN 1706	UNI 5079	EN 1706	UNI 5079
		Mpa	N/mm2	Mpa	N/mm2	%	%	HBW	HB
SAND (as cast) Annealed									
SHELL (as cast) Annealed									
PRESSURE DIE (as cast)	F	240	225-265	140	130-165	1	1,5-2,5	70	75-95

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

DENSITY	2.65 Kg/dm ³
MELTING RANGE or MELTING POINT	570 °C 590 °C
SPECIFIC HEAT (at 100)°	0.23 cal/g °C
LATENT HEAT OF MELTING	93 cal/g
LINEAR SHRINKAGE	~0.7 %
ELECTRIC CONDUCTIVITY	15 - 20 MS/m
MODULUS OF ELASTICITY	7600 Kg/mm ²

THERMAL CONDUCTIVITY at 20°C	120 - 150 W/(m K)
LINEAR THERMAL EXPANSION from 20 t 100°C	
LINEAR THERMAL EXPANSION from 20 t 200°C	20.5x10 ⁻⁶ /°C
LINEAR THERMAL EXPANSION from 20 t 300°C	
SUGGESTED MAXIMUM TEMPERATURE	750 °C
SUGGESTED CASTING TEMPERATURE	
°in sand	
°in shell	
°in pressure die	630-680 °C

TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

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

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

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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Alloy designation: **EN AB and AC 47100 - Al Si 12 Cu 1 (Fe)**

Replaces: **UNI 5079 - GD Al Si 13 Fe**

GENERALITIES REGARDING USE

The ingot recasting process must be carried out as quickly as possible and overheating must be avoided (maximum melting temperature 750°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.

The EN 47100 alloy is delivered by RAFFMETAL exclusively under the form of ingots produced with Continuous Casting, this has the following advantages:

- Lower presence of oxides with consequent reduced aptitude for the formation of HARD POINTS
- Fine and even structure with reduced quantity and dimension intermetallic compounds
- Reduced hydrogen content in relation to the high solidification speed.
- Possibility of customising according to different options of the dimensions and geometry of the stack
- Less risk of explosion of the ingot in the melting phase owing to the smaller presence of open shrinkage cavities.
- Improved metal yield owing to the excellent surface quality of the ingot

The EN 47100 is among the most used and well-known pressurised casting alloys in Europe called "semi-primaries". It is relatively easy to use and therefore requires general attention that characterise the foundry aluminium alloys. The particularity of this alloy is the good castability and flowing features owing to the high level of Silicone, which facilitates filling of casts with thin walls.

TYPICAL USE

Alloy used for the realisation of complex casting with thin walls, which require good castability. It is used in several sectors where resistance to corrosion and sufficient mechanical features are requested.

Alloy **not 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	5079	231	AS 12 UY 4	LM 2		AlSi12CuFe		
Similar	7369/2	231 A	AS 12 U	LM 20	A 413.1 - 413,0		D1V-D1S	ETIAL - 180

HEAT TREATMENTS

Heat treatments are not normally provided.

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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