



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Si 9 Cu**

Alloy designation: **EN AB and AC 46200 - Al Si 8 Cu 3**

Replaces: **DIN 226 A - Al Si 9 Cu 3**

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS												
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti	Individual impurities	Global impurities
EN AB 46200	min	7,5		2,0	0,15	0,15								
	max	9,5	0,7	3,5	0,65	0,55	-	0,35	1,2	0,25	0,15	0,20	0,05	0,25
DIN 226 A	min	8,0		2,00	0,15	0,15								
	max	11,0	0,80	3,50	0,5	0,55	-	0,35	1,20	0,25	0,15	0,15	0,05	0,25

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	DIN 1725	EN 1706	DIN 1725	EN 1706	DIN 1725	EN 1706	DIN 1725
		Mpa	N/mm2	Mpa	N/mm2	%	%	HBW	HB
SAND (as cast)	F	150	160 - 200	90	100 - 150	1	1 - 3	60	65 - 90
		-	-	-	-	-	-	-	-
SHELL (as cast)	F	170	180 - 240	100	110 - 160	1	1 - 3	75	70 - 110
		-	-	-	-	-	-	-	-
PRESSURE DIE (as cast)	F	240	-	140	-	1	-	80	-

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

DENSITY	2.76 Kg/dm³
MELTING RANGE or MELTING POINT	500 °C 600 °C
SPECIFIC HEAT (at 100)°	0.88 J/Gk
LINEAR SHRINKAGE IN SAND PROCESS	1.0 - 1.2 %
LINEAR SHRINKAGE IN SHELL PROCESS	0.6 - 0.9 %
LINEAR SHRINKAGE IN HIGH PRESSURE	
ELECTRIC CONDUCTIVITY	14 - 18 MS/m
MODULUS OF ELASTICITY	7500 Kg/mm²

THERMAL CONDUCTIVITY at 20°C	110 - 130 W/(m K)
LINEAR THERMAL EXPANSION from 20 t 100°C	21 10-6/°K
LINEAR THERMAL EXPANSION from 20 t 200°C	-
LINEAR THERMAL EXPANSION from 20 t 300°C	-
SUGGESTED MAXIMUM TEMPERATURE	750 °C
SUGGESTED CASTING TEMPERATURE	
°in sand	680 - 750 °C
°in shell	680 - 750 °C
°in pressure die	-

TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

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

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

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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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 46200 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

SPECIFICITY REGARDING USE

The EN 46200 alloy is among the great "worldwide" classics of the shell casting and gravity casting aluminium alloys. It is relatively easy to use and requests simple general attentions that characterise the foundry aluminium alloys. The EN Standard envisions Mg as an alloy element, to make it able to respond to a heat treatment. The latter is a delicate operation with its critical specifications. In this case it is good practice to operate with due attention in terms of temperatures and process times so that the Mg is kept "well" within the limits of the Standard.

TYPICAL USE

Alloy with many uses, complex casting and casting with thin walls; resistant to high temperatures. Use in the motor industry and in the building sector

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	-	DIN 226 A	-	-	-	-	-	-
Similar	UNI 5075		AS9U3	LM 24	333.1		AC4B	ETIAL - 160

HEAT TREATMENTS

Heat treatments are not generally performed on this alloy; however, the following treatments can be performed to increase the mechanical properties of the same:

520 °C for 6 - 10 hours.

at 160°C for 8 - 12 hours.

Hardening at
Complete Artificial Aging

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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