



# RAFFMETAL

THE ALUMINIUM EVOLUTION



**Leghe di alluminio in colata continua. Continuous casting aluminium alloys**

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Si 5 Cu**

Alloy designation: **EN AB and AC 45000 - Al Si 6 Cu 4**

Replaces: **UNI 7369/4 - SG Al Cu 3°**

### CHEMICAL COMPOSITION %

ALLOY		ELEMENTS											Individual impurities	Global impurities	
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti			
EN AB 45000	min	5,0		3,0	0,20										
	max	7,0	0,9	5,0	0,65	0,55	0,15	0,45	2,0	0,30	0,15	0,20	0,05	0,35	
UNI 7369/4 - SG Al Cu 3°	min	5,0		3,00											
	max	7,0	1,0	5,00	0,5	0,30	-	0,30	2,00	0,20	0,15	0,15		3,3*	

\*Exc. Fe+Ti

### 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 7369/4	EN 1706	UNI 7369/4	EN 1706	UNI 7369/4	EN 1706	UNI 7369/4
		Mpa	N/mm2	Mpa	N/mm2	%	%	HBW	HB
SAND (as cast)	F	150	155-195	90		1	0,5-1,5	60	60 - 95
SHELL (as cast)	F	170	195-235	100	130-155	1	1-2	75	75 - 105
PRESSURE DIE (as cast)									

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

DENSITY	2.9 Kg/dm <sup>3</sup>
MELTING RANGE or MELTING POINT	510 °C 620 °C
SPECIFIC HEAT (at 100)°	0.23 cal/g °C
LATENT HEAT OF MELTING	93 cal/g
LINEAR SHRINKAGE	~1.20 %
ELECTRIC CONDUCTIVITY	14 - 17 MS/m
MODULUS OF ELASTICITY	7200 Kg/mm <sup>2</sup>

THERMAL CONDUCTIVITY at 20°C	110 - 120 W/(m K)
LINEAR THERMAL EXPANSION from 20 t 100°C	
LINEAR THERMAL EXPANSION from 20 t 200°C	25x10-6/°C
LINEAR THERMAL EXPANSION from 20 t 300°C	
SUGGESTED MAXIMUM TEMPERATURE	800 °C
SUGGESTED CASTING TEMPERATURE	
°in sand	660-740 °C
°in shell	700-740 °C
°in pressure die	

### TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

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

RESISTANCE TO HOT TEARING	MEDIUM
PRESSURE TIGHTNESS	SUFFICIENT
WELDABILITY	GOOD
DECORATIVE ANODISING	BAD
SUITABILITY FOR 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: **UNI 7369/4 - SG Al Cu 3°**

### GENERALITIES REGARDING USE

The ingots recasting process must be carried out as quickly as possible and overheating must be avoided and therefore the absorption of hydrogen.

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 45000 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 45000 is suitable for general use. Medium to large casts are realised cast in sand and less often in shell mode.

### TYPICAL USE

This alloy is used in mechanics in general and where high mechanical features are required.

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	Cu 3°							
Similar	7369/5	225	AS 7 UZ	LM 21	319.1	Al Si 6 Cu 4	AC 2 B	

### HEAT TREATMENTS

Heat treatments are not performed on this alloy.

#### 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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