



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Mg**

Alloy designation: **EN AB and AC 51400 - Al Mg 5 (Si)**

Replaces: **DIN 245**

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS											Individual impurities	Global impurities
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti		
EN AB 51400	min					4,8								
	max	1,3	0,45	0,03	0,45	6,5	-	-	0,10	-	-	0,15	0,05	0,15
DIN 245	min	0,9				4,50								
	max	1,5	0,5	0,05	0,45	5,50	-	-	0,10	-	-	0,20	0,05	0,15

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	160	160 - 200	100	110 - 130	3	2 - 4	60	60 - 75
SHELL (as cast)	F	180	180 - 240	110	110 - 150	3	2 - 5	65	65 - 85
PRESSURE DIE (as cast)									

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

DENSITY	2.66 Kg/dm ³	THERMAL CONDUCTIVITY at 20°C	110 - 140 W/(m K)
MELTING RANGE or MELTING POINT	550 °C 630 °C	LINEAR THERMAL EXPANSION from 20 t 100°C	-
SPECIFIC HEAT (at 100)°	0.93 J/Gk	LINEAR THERMAL EXPANSION from 20 t 200°C	24.0-10-6/°C
LINEAR SHRINKAGE IN SAND PROCESS	1.0 - 1.5 %	LINEAR THERMAL EXPANSION from 20 t 300°C	-
LINEAR SHRINKAGE IN SHELL PROCESS	1.0 - 1.2 %	SUGGESTED MAXIMUM TEMPERATURE	780 °C
LINEAR SHRINKAGE IN HIGH PRESSURE		SUGGESTED CASTING TEMPERATURE	
ELECTRIC CONDUCTIVITY	15 - 21 MS/m	°in sand	690 - 730 °C
MODULUS OF ELASTICITY	6900 Kg/mm ²	°in shell	690 - 730 °C
		°in pressure die	-

TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

STRENGTH AT ELEVATED TEMPERATURE(to 200°C)	GOOD	RESISTANCE TO HOT TEARING	MEDIUM
GENERAL RESISTANCE TO CORROSION	EXCELLENT	PRESSURE TIGHTNESS	MEDIUM
MACHINABILITY	EXCELLENT	WELDABILITY	INSUFFICIENT
CASTABILITY	SUFFICIENT	DECORATIVE ANODISING	GOOD
POLISHING	EXCELLENT	PROTECTIVE ANODISING	

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

Raffmetal S.p.a.
via malpaga, 82 25070 Casto (BS)
tel:0365.890.100 fax 0365.899.327
qualita@raffmetal.it
vendite@raffmetal.it

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



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Mg**

Alloy designation: **EN AB and AC 51400 - Al Mg 5 (Si)**

Replaces: **DIN 245**

GENERALITIES REGARDING USE

The ingot recasting process must be carried out as quickly as possible and overheating must be avoided (maximum melting temperature 780°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

As it is a Magnesium-based alloy, fast melting of the ingots is recommended in order to reduce the loss of the same, the oxidation of the melted metal and the absorption of hydrogen.

If casting must be produced for heat treatment, the loss of magnesium during melting of the metal must be considered (about 0.1% for each melting process), the integration of this element is therefore recommended to guarantee the effective heat treatment.

Considering the relative level of purity of the alloy's chemical composition (reduced content of Cu - Zn - Fe) it is important to check 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 that can be heat treated with average mechanical resistance values. Excellent resistance to corrosion and brightness after mechanical polishing. Components with high resistance to corrosion for the chemical and foodstuff industries.

Alloy EN 51400 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 3059	DIN 242	A G 3 T	LM 5	514.2	-	-	
Similar								

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:

Hardening at 550 °C for 4 - 8 hours

Complete Artificial Aging at 160°C for 8 - 10 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.

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

Raffmetal S.p.a.
via malpaga, 82 25070 Casto (BS)
tel:0365.890.100 fax 0365.899.327
qualita@raffmetal.it
vendite@raffmetal.it

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