



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Si 10 Mg**

Alloy designation: **EN AB and AC 43500 Al Si 10 Mn Mg**

Replaces: **AlSi10MgMn**

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS											Individual impurities	Global impurities	
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti			
EN AB 43500	min	9,0			0,40	0,15									
	max	11,5	0,20	0,03	0,80	0,60	-	-	0,07	-	-	0,15	0,05	0,15	
AlSi10MgMn	min	9,5			0,50	0,10									
	max	11,5	0,15	0,03	0,8	0,50	-	-	0,10	-	-	0,15	SR	0,03	

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	AlSi10MgMn	EN 1706	AlSi10MgMn	EN 1706	AlSi10MgMn	EN 1706	AlSi10MgMn
		Mpa	N/mm2	Mpa	N/mm2	%	%	HBW	HB
	F	250	250 - 290	120	120 - 150	5	5 - 10	65	75 - 100
PRESSURE DIE (as cast)	T5	270	260 - 330	150	150 - 240	4	3 - 10	80	90 - 115
	T6		290 - 350		200 - 280		6 - 12		100 - 115
The values indicated are obtained by modifying the Magnesium content in the alloy	T4		210 - 260		95 - 140		15 - 22		60 - 75
	T7	200	200 - 240	120	120 - 170	12	15 - 20	60	60 - 75

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

DENSITY	2.64 Kg/dm ³	THERMAL CONDUCTIVITY at 20°C	140 - 170 W/(m K)
MELTING RANGE or MELTING POINT	550 °C	LINEAR THERMAL EXPANSION from 20 t 100°C	-
	590 °C	LINEAR THERMAL EXPANSION from 20 t 200°C	21.0-10-6/°C
SPECIFIC HEAT (at 100)°		LINEAR THERMAL EXPANSION from 20 t 300°C	-
LINEAR SHRINKAGE IN SAND		SUGGESTED MAXIMUM TEMPERATURE	780 °C
LINEAR SHRINKAGE IN HIGH PRESSURE	0.4 - 0.6 %	SUGGESTED CASTING TEMPERATURE	
ELECTRIC CONDUCTIVITY	19 - 25 MS/m	°in sand	
MODULUS OF ELASTICITY	70 - 80 Gpa	°in shell	
		°in pressure die	650 - 730 °C

TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

STRENGTH AT ELEVATED TEMPERATURE(to 200°C)	CORRECT	RESISTANCE TO HOT TEARING	EXCELLENT
GENERAL RESISTANCE TO CORROSION	GOOD	PRESSURE TIGHTNESS	CORRECT
MACHINABILITY	GOOD	WELDABILITY	EXCELLENT
CASTABILITY	EXCELLENT	DECORATIVE ANODISING	OT RECOMMANDE
POLISHING	MEDIOCRE	PROTECTIVE ANODISING	OT RECOMMANDE

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 =
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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 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

It is recommended not to operate with Strontium values not exceeding 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

High pressure casting alloy with low Fe content. Modification using Strontium produces high material ductility. The elements of the alloy, such as manganese, allow to prevent the metalisation (adherence) of the metal on the mould and improve the easily removal of the casting produced.

This alloy can be welded and can be used for structural and safety applications.

The mechanical properties can be adapted to the specific necessities by calibrating the contents of Mg precisely.

In the condition as cast (raw), the alloy has high lengthening and can be improved via heat treatment.

Alloy suitable for applications requiring excellent castability in all casting techniques, for the realisation of thin wall castings on particulars that do not require high mechanical resistance but good lengthening values.

EN 43500 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								
Similar								

HEAT TREATMENTS

Heat treatment at 480°C-500°C for 2-5 hours. Successively, cooling in cold water followed by artificial aging at 155°C-170°C for 2-4 hours (the ideal parameters must be determined by a test).

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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PER LA QUALITÀ CERTIFICATO DA DNV
= UNI EN ISO 9001:2008 =**

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