



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 43400 Al Si 10 Mg (Fe)**

Replaces: **DIN 239 D - GD Al Si 10 Mg**

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS												Individual impurities	Global impurities
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti			
EN AB 43400	min	9,0	0,45			0,25									
	max	11,0	0,9	0,08	0,55	0,50	-	0,15	0,15	0,15	0,05	0,15	0,05	0,15	
DIN 239 D - GD Al Si 10 Mg	min	9,0				0,20									
	max	11,0	1,00	0,10	0,4	0,50	-	0,05	0,15	0,05	0,05	0,15	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
IN SAND									
IN SHELL									
PRESSURISED (Raw)	F	240	220 - 300	140	140 - 200	1	1 - 3	70	70 - 100

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

DENSITY	2.68 Kg/dm ³
MELTING RANGE or MELTING POINT	550 °C 600 °C
SPECIFIC HEAT (at 100)°	0.91 J/Gk
LINEAR SHRINKAGE IN SAND	
LINEAR SHRINKAGE IN HIGH PRESSURE	0.4 - 0.6
ELECTRIC CONDUCTIVITY	16 - 21 MS/m
MODULUS OF ELASTICITY	7400 Kg/mm ²

THERMAL CONDUCTIVITY at 20°C	130 - 150 W/(m K)
LINEAR THERMAL EXPANSION from 20 t 100°C	21 10-6/°K
LINEAR THERMAL EXPANSION from 20 t 200°C	22.0-10-6/K
LINEAR THERMAL EXPANSION from 20 t 300°C	-
SUGGESTED MAXIMUM TEMPERATURE	750 °C
SUGGESTED CASTING TEMPERATURE	
°in sand	-
°in shell	-
°in pressure die	630 - 700

TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

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

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

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: **DIN 239 D - GD Al Si 10 Mg**

GENERALITIES REGARDING USE

The ingot recasting process must be carried out as quickly as possible and overheating must be avoided (maximum melting temperature 740°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 EN 43400 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

This alloy is suitable for the casting process under pressure, but with relatively important purity features and therefore it is fundamental always to pay attention so that the melting furnaces and the tools used in contact with the liquid metal are conveniently cleaned. Attention must be paid to quality and quantity (not over 50% of the load) of the risers recycled. The presence of Mg as alloy element recalls the necessity for particular attention to melting and casting times and temperatures.

Considering the relative level of purity of the alloy's chemical composition (reduced content of Cu - Zn) 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

Pressure castable alloy with good mechanical features used to realise casts with complex shapes.

EN 43400 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		239 D	AS 9 G			Al Si 10 Mg		
Similar		239 A			360.2		D 3V	ETIAL - 171

HEAT TREATMENTS

The Standard and current use do not envision heat treatment. The presence of Mg as an alloy element gives the potentiality for treatment in particular cases.

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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