



RAFFMETAL

THE ALUMINIUM EVOLUTION



Leghe di alluminio in colata continua. Continuous casting aluminium alloys

Standard: **UNI 3054-50**

Alloy group: **Al Si Mn Mg**

Alloy designation: **UNI 3054**

Replaces:

CHEMICAL COMPOSITION %

ALLOY		ELEMENTS												Individual impurities	Global impurities *
		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti			
UNI 3054	min	4,2			0,60	0,55									
	max	5,5	0,50	0,05	0,80	0,75	-	0,01	0,05	-	-	0,15	0,03	0,1	
	min														
	max														

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	
		Mpa	N/mm2	Mpa	N/mm2	%	%	HBW	HB
SAND (as cast)	F		145 - 175		100-125		1.0-3.0		60-70
	T6		195 - 295		155 - 255		1.0-3.0		80-100
SHELL (as cast)	F		135-195		120 - 155		2.5-5.0		55-75
	T6		245-315		175 - 245		1.0-2.0		90-105
PRESSURE DIE (as cast)									

PHYSICAL PROPERTIES (indicative values subject to the UNI Standards)

DENSITY	2.65 Kg/dm ³
MELTING RANGE or MELTING POINT	550 °C 640 °C
SPECIFIC HEAT (at 100)°	0.23 cal/g °C
LATENT HEAT OF MELTING	93 cal/g
LINEAR SHRINKAGE	~1.30 %
RESISTIVITY at 20 °C	5.2 μΩ cm
MODULUS OF ELASTICITY	7200 Kg/mm ²

THERMAL CONDUCTIVITY at 20°C	0.35 cal/cm sec °C
LINEAR THERMAL EXPANSION from 20 t 100°C	22.0x10-6/°C
LINEAR THERMAL EXPANSION from 20 t 200°C	22.5x10-6/°C
LINEAR THERMAL EXPANSION from 20 t 300°C	23.0x10-6/°C
SUGGESTED MAXIMUM TEMPERATURE	780 °C
SUGGESTED CASTING TEMPERATURE	
°in sand	680-720 °C
°in shell	680-720 °C
°in pressure die	

TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS

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

RESISTANCE TO HOT TEARING	MEDIUM
PRESSURE TIGHTNESS	MEDIUM
WELDABILITY	GOOD
DECORATIVE ANODISING	MEDIUM
PROTECTIVE ANODISING	DISCRETE

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:

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.

The UNI 3054 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 important level of the Magnesium in the alloy recommends fast melting of the ingots 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 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

Alloy suitable for the realisation of castings that require good resistance to corrosion, polishing and machinability. Used in the chemical, naval, furniture and foodstuff industries.

UNI 3054 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	357.1		AS4 G	LM 16				
Similar		235						

HEAT TREATMENTS

Water quenching from 510-530 °C after pre-heating for 2-4 hours in normal conditions

Artificial aging at 155-165°C for 8 - 12 hours in normal conditions.

Stabilisation at 330-370°C for 4-8 hours in normal conditions

Limitation of liability

The contents of these technical sheets have 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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