# RAFFMETAL

*THE ALUMINIUM EVOLUTION*

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

Standard: **UNI EN 1676 and 1706**

Alloy group: **Al Si 9 Cu**

Alloy designation: **EN AB and AC 46600 - Al Si 7 Cu 2**

Replaces: **LM 27**

## *CHEMICAL COMPOSITION %*

| ALLOY | | ELEMENTS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Si** | **Fe** | **Cu** | **Mn** | **Mg** | **Cr** | **Ni** | **Zn** | **Pb** | **Sn** | **Ti** | Individual impurities | Global impurities |
| **EN AB 46600** | min | 6,0 | | 1,5 | 0,15 | | | | | | | | | |
| | max | 8,0 | 0,7 | 2,5 | 0,65 | 0,35 | - | 0,35 | 1,0 | 0,25 | 0,15 | 0,20 | 0,05 | 0,15 |
| **LM 27** | min | 6,0 | | 1,50 | 0,20 | | | | | | | | | |
| | max | 8,0 | 0,80 | 2,50 | 0,65 | 0,35 | - | 0,35 | 1,00 | 0,25 | 0,15 | 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 | BS 1490:88 | EN 1706 | BS 1490:88 | EN 1706 | BS 1490:8 | EN 1706 | S 1490:88 |
| | | Mpa | N/mm2 | Mpa | N/mm2 | % | % | HBW | HB |
| **SAND** (as cast) | F | 150 | 140 | 90 | 80 - 90 | 1 | 1 | 60 | 70 - 85 |
| | | - | - | - | - | - | | - | |
| **SHELL** (as cast) | F | 170 | 160 | 100 | 90 - 110 | 1 | 2 | 75 | 75 - 90 |
| | | - | - | - | - | - | | - | |
| **PRESSURE DIE** (as cast) | | - | - | - | - | - | | - | |

## *PHYSICAL PROPERTIES (indicative values subject to the UNI EN and BS 1490:88 Standards)*

| | |
|---|---|
| DENSITY | 2.75 Kg/dm³ |
| MELTING RANGE or MELTING POINT | 525 °C<br>605 °C |
| SPECIFIC HEAT (at 100)° | |
| LINEAR SHRINKAGE IN SAND PROCESS | 1.30% |
| LINEAR SHRINKAGE IN SHELL PROCESS | 1.30% |
| LINEAR SHRINKAGE IN HIGH PRESSURE | |
| ELECTRIC CONDUCTIVITY | 15 - 19 MS/m |
| MODULUS OF ELASTICITY | 7200 Kg/mm² |

| | |
|---|---|
| THERMAL CONDUCTIVITY at 20°C | 120 - 130 W/(m K) |
| LINEAR THERMAL EXPANSION from 20 t 100°C | - |
| LINEAR THERMAL EXPANSION from 20 t 200°C | 23.0-10-6/°C |
| LINEAR THERMAL EXPANSION from 20 t 300°C | - |
| SUGGESTED MAXIMUM TEMPERATURE | 780 °C |
| SUGGESTED CASTING TEMPERATURE | |
| °in sand | 660 - 740 °C |
| °in shell | 660 - 740 °C |
| °in pressure die | - |

## *TECHNOLOGICAL FEATURES, QUALITATIVE INDICATIONS*

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

| | |
|---|---|
| RESISTANCE TO HOT TEARING | SMALL |
| PRESSURE TIGHTNESS | GOOD |
| WELDABILITY | MEDIUM |
| DECORATIVE ANODISING | LOW |
| PROTECTIVE ANODISING | MEDIUM |


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 EN 46600 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 46600 alloy is relatively easy to use and therefore requires general attention that characterise the foundry aluminium alloys.

### *TYPICAL USE*

Castings in sand and shell characterised by good workability and pressurised sealing. Used in the raw state for general uses.

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 | - | | | LM 27 | - | - | AC4B.1 | |
| Similar | | 225 | AS 7 U 3 G | | 328.1 | | C 2 BS | - |

### *HEAT TREATMENTS*



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