

THE CHOICE OF ALUMINUM ALLOY

The surface appearance is conditioned by the type of alloy used; the standard norm indicate the possible consequences found on finished products according to the main alloying elements and impurities of the alloy. The elements considered are the following: iron, silicon, copper, manganese, magnesium, zinc, and chromium.

In the UNI 10681 Norm, the following indications are given:

- On the quality of materials for decorative and protective finishes, for polished and industrial use
- On the oxide thickness obtainable by anodic oxidation and in particular the significance of medium thicknesses and accuracy, specific standards for the choice of width class and the three methods of measuring the thickness - a) metallographic microscope b) induced current system c) optical microscopy.
- On the sealing quality, we show here, in case of dispute, the UNI 9178 norm that provides the destructive method of weight loss
- On the resistance to light and UV radiation for oxide colored layers for external applications that must have high resistance to light, the ISO 6581 norm is indicated as an accelerated method that evaluates its resistance to UV radiation.

Choosing the most suitable alloy.

- I° consult the UNI Tables for the classification of alloys
- II° chose the alloy most suitable for the type of technical transformation or rather:
Alloy castings (foundry) or plastic processing alloy.
- III° once the production process for the item is known then you should choose the alloy with the technological characteristics most suitable, for example:
 - Machinability
 - Attitude towards anodic oxidation
 - Resistance to corrosion in the environment: marine-industrial, urban-rural,
 - Dry insides

Example of aluminum alloy castings,

Name: G- AlSi8 , 5Cu

Designation UNI 3601

Example of aluminum alloy for a plastic working,

Chemical designation P- AlMgSi

Designation UNI 3569

Numerical designation A.A. 6060

Aluminium Alloys

Designation and Properties

SERIE	primary alloys EN AW	chemical	anodizing suitability		typical applications
			protective	trim	
1000	1050	Al 99,5	A	B	chemical and electrical industry, wire.
	1370	Al 99,7	A	A	
2000	2014	Al Cu4SiMg	C	D	Aerospace industry, aeronautics industry forged parts, mechanical parts, wire
	2017	Al Cu4MgSi	C	D	
	2024	Al Cu4Mg1	C	D	
	2011	Al Cu6BiPb	D	D	Cnc precision manufacturing
	2030	AlCu4PbMg	D	D	
3000	3103	Al Mn1	A	B	products for domestic appliances
4000	4032	Al Si12,5MgCuNi	B	C	forged pistons, heat resistant mechanical parts
5000	5019	Al Mg5	A	B	welded structures for marine environments, forged parts, wire
	5049	Al Mg2Mn0,8	A	B	
	5051	Al Mg2	A	B	
	5251	Al Mg2	A	B	
	5154	Al Mg3,5	A	B	
	5754	Al Mg3	A	B	
	5083	Al Mg4,5Mn0,7	A	B	
6000	6101	Al MgSi	A	A	electrical conductors, wire, metallic sheath
	6012	Al MgSiPb	A	B	nuts, screws, turned parts, mechanical parts
	6262	Al Mg1SiPb	A	B	
	6060	Al MgSi	A	A	furnishings, structural and transport uses
	6063	Al MgSi0,5	A	A	buildings products
	6061	Al Mg1SiCu	A	B	building products, structural and transport uses, mechanical parts, forged parts
	6005	Al SiMg	A	A	
	6082	Al Si1MgMn	A	B	
7000	7003	Al Zn6Mg0,8Zr	B	B	welded structures, mechanical parts, forged parts
	7020	Al Zn4,5Mg1	B	B	
	7010	Al Zn6MgCu	C	D	aerospace structures, forged parts, sport equipments
	7022	Al Zn5Mg3Cu	C	D	
	7049	Al Zn8MgCu	C	D	
	7075	Al Zn5,5MgCu	C	D	

A = Excellent B = Good C = Fair D = Not Recommended

Al = Aluminum - Bi = Bismuth - Cu = Copper - Mg = Magnesium - Mn = Manganese - Ni = Nickel - Pb = Palladium - Si = Silicon - Zn=Zinc - Zr = Zirconium