ALUMINUM ALLOYS

Aluminum alloys are one of our major metal product groups. We supply aluminum in all of its raw material forms: powder, foil, sheet, plate, wire, bar, tube, extruded shape, casting, and forging.

The Aluminum Association has established a system of classification of aluminum wrought alloys based on the chemical composition and the temper. The principal alloying elements that impart specific properties to the alloys are Copper (Cu), Manganese (Mn), Magnesium (Mg), Silicon (Si), and Zinc (Zn). Depending on the elements added, the resulting alloys may be strengthened by heat treatment or they may depend solely on cold-working (strain-hardening) for the development of higher tensile properties. The non-heat treatable, as well as several of the heat treatable, grades—such as 2011, 2014, 2017, and 6063—are often considered “commercial alloy.” Commercial alloys are not generally stenciled or marked by the manufacturers and, as such, no heat lot traceability is maintained and no specific manufacturer test reports or certification are available.

The aluminum industry uses a four-digit number for the designation of the wrought aluminum alloys. The first of the digits, in these numbers, identifies the primary alloying element that is effective in developing the mechanical properties by subsequent processing. These designations are outlined below.

Alloy Designations

ALLOY NUMBER	MAJOR ALLOYING ELEMENT
1XXX – Non-Heat Treatable	None (99.0% min aluminum)
2XXX – Heat Treatable	Copper
3XXX – Non-Heat Treatable	Manganese
4XXX – Non-Heat Treatable	Silicon
5XXX – Non-Heat Treatable	Magnesium
6XXX – Heat Treatable	Magnesium and Silicon
7XXX – Heat Treatable	Zinc
8XXX	Other Element
9XXX	(Unused Series)

The temper designation system is used for all forms of wrought and cast aluminum and aluminum alloys except ingot. It is based on the sequences of basic treatments used to produce the different tempers. The alloy designation is followed by the temper designation, being separated by a dash. Basic temper designations consist of letters. One or more digits following the letter indicates a subdivision of the basic temper. These designate specific sequences of basic treatments, but only when operations significantly influencing the characteristics of the product are indicated. Should another variation of the same sequence of basic operations be applied to the same alloy, then additional digits are added to the designation.

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