

Aluminium Zirconium



Aluminium's mechanical and physical properties are enhanced with the use of alloying elements. These alloying elements are commonly referred to as hardeners. Aluminium-based master alloys which contain the hardener elements in high concentrations, provide a convenient and economical way to add them to aluminium to achieve desired properties. These master alloys readily go into solution at lower liquid aluminium temperatures, thus minimizing dross formation and solubility of hydrogen. Lower furnace temperatures also mean reduced energy consumption and longer furnace life.

Zirconium is added to certain aluminium-magnesium alloys such as 7050 to reduce stress corrosion susceptibility. Zirconium additions in the range of 0.1 to 0.3% form fine precipitates of intermetallic particles that inhibit recovery and recrystallization. Zirconium is added to aluminium-zinc-magnesium alloys to increase recrystallization temperature and control grain structure in wrought alloys. Additions of zirconium to 7XXX alloys are less quench sensitive than chromium additions. Higher levels of zirconium are employed in some superplastic alloys to retain a fine substructure during elevated-temperature forming. Zirconium additions have been used to reduce the as-cast grain size, but its effect is less than that of titanium.

Alloy	Designation	Color Code	Zr	Si	Fe	Ti	Ni	Sn	Cu	B	Others		Form
											Each	Total	
5% Zr	AA-H2607	■	4.5-5.5%	0.30%	0.30%					0.01%	0.04%	0.10%	Waffle Ingot
	CEN-94000	■	4.5-5.5%	0.30%	0.30%						0.04%	0.10%	
10% Zr Salts Based	AA-H2600	■	9.0-11.0%	0.20%	0.25%	0.05%					0.03%	0.15%	Waffle Ingot
	CEN-94002	■	9.0-11.0%	0.30%	0.30%						0.04%	0.10%	
10% Zr Metal Based	AA-H2612	■	9.0-11.0%	0.30%	0.45%	0.20%	0.20%	0.20%	0.20%		0.05%	0.15%	Waffle Ingot
	CEN-94003	■	9.0-11.0%	0.30%	0.45%	0.20%	0.20%	0.20%	0.20%		0.05%	0.15%	
15% Zr Salts Based	AA-H2615	■	13.5-16.5%	0.3%	0.3%						0.05%	0.15%	Waffle Ingot
	CEN-94004	■	13.5-16.5%	0.40%	0.30%						0.04%	0.10%	

Composition is a maximum unless shown as a range.

