MINEX

Aluminum-Zirconium Master Alloy

Alloy Description:

Aluminum Zirconium master alloy is the alloy of Aluminium and zirconium which is used as additive for Zirconium in aluminium alloys as a hardener and grain refiner. This alloy is dissolved fast in aluminium melt and gives maximum recovery of Zirconium than the Zirconium added individually, because Zirconium has very high melting point, and dissolves slowly in aluminium. The chemical composition and physical properties of the Aluminium Zirconium master alloy is given bellow:

Chemical composition:

Alloy Grade	Chemical Composition (%)			
	Zr	Fe (max)	Others (max)	Al
AlZr 5	4.5-5.5	0.25	0.5	Balance
AlZr 6	6.5-5.5	0.25	0.5	Balance
AlZr 10	9-11	0.25	0.5	Balance

Other impurities- Mn, Ca, Zn, Na, Si, Pb **above hardeners are produced from 99.7% (Min.) purity of Al.

Physical properties:

Alloy Grade	Density (gm/cc)	Melting point (°C)
AlZr 5	2.85 – 2.95	1100*
AlZr 10	3.0 – 3.1	1200*
* melting point is not a relevant in normal use, the majority of master alloy and tablets produced by Minex Metallugical Co. Ltd., dissolve in Aluminium rather than melt.		

Application:

Aluminium Zirconium master alloy has been added in experimentally in aluminium alloys (e.g 7xxx series… etc..) as a zirconium additive. Zirconium addition in the range of 0.1 – 0.3% are used to form a fine precipitate of intermetallic particles that inhibit recovery and recrystallization. An increasing number of alloys particularly in the aluminium – zinc – magnesium family, use zirconium additions to increase the recrystallization temperature and to control the grain structure in wrought products. Zirconium additions leave this family of alloys less quench sensitive than similar chromium additions. Higher level of zirconium are employed in some superplastic alloys to retain the required fine structure during elevated temperature forming.

Zirconium additions have been used to reduce the as – cast grain size, but its effect is less than titanium. In addition, zirconium tends to reduce the grain-refining effect of titanium plus boron additions so that it's necessary to use more titanium and boron to grain refine zirconium- containing alloy. But zirconium has no poisoning effect on Titanium-Carbon- aluminium grain refiner, thus its wiser to use **TiCAl** grain refiner to grain refine the zirconium-containing alloys.

Addition technique: Remove heavy dross from melt surface and add appropriate amount of AlZr master alloy (At T 720 - 760°C). After the dissolution of alloy, stir the melt gently for 30sec.

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Available form:

Forms	Std. Size (mm)	Std. Weight (Kg)
Piglet	60×45×45	
Waffle plate		8 – 10
Ingot		6 – 8

Packing:

Piglet	Ingot	Waffle plate
25 Kg gunny bag/500 Kg Jumbo Bag (or as per customer requirement)	1000 Kg jumbo bag or strapping with palette (or as per customer requirement)	500 Kg strapping with palette (or as per customer requirement)

Storage:

Use cool and dry place to store the material.

Safety:

Material Safety Data Sheet can be supplied on demand. Material is not hazardous but normal safety precautions to be followed.

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