

Titanium Boron Aluminium Grain Refiners



In casthouse applications, the control of grain size is absolutely essential in maintaining product consistency and quality, reducing costs, and maintaining high levels of productivity. The controlled addition of AMG Aluminum's titanium boron aluminium grain refiners to molten aluminium releases nucleant particles that promote equiaxed, fine grain structures throughout the cast alloy, thus avoiding formation of columnar crystals. Casting speed can also be increased.

The addition of a titanium-boron-aluminium grain refiner improves homogeneity and allows for a uniform distribution of alloying elements, reduces porosity, eliminates hot tearing in cast structures, improves responsiveness to subsequent heat treatment, and enhances mechanical properties and machinability in the fabrication process.

Continuous injection of titanium-boron-aluminium rod is a highly effective treatment for all aluminium alloys.

There are two distinct types of particles seen in the microstructure of titanium-boron-aluminium grain refiners: TiB_2 particles (grain refining nuclei, typically 1-2 microns in size), which do not dissolve in liquid aluminium and $TiAl_3$ plates (larger than TiB_2 , typically 30-50 microns in size) which dissolve readily in liquid aluminium. Both types of particles play an essential role in the grain refining process.

Decades of research and development into the application of aluminium grain refiners have made titanium-boron-aluminium the preferred choice of casthouses world-wide. AMG Aluminum leads the world in the development and production of highly effective grain refining agents for the aluminium industry.

Alloy	Designation	Color Code	Ti	B	Si	Fe	V	Others		Form
								Each	Total	
1.6% Ti - 1.4% B			1.30-2.20%	1.10-1.70%	0.20%	0.30%	0.20%	0.03%	0.10%	Waffle, Sheared Ingot, Button, Rod
3% Ti - 1% B	AA-H2214		2.80-3.40%	0.70-1.10%	0.20%	0.30%	0.05%	0.03%	0.10%	Waffle, Sheared Ingot, Button, Rod
	CEN-92250		2.70-3.50%	0.80-1.20%	0.30%	0.30%	0.20%	0.04%	0.10%	
5% Ti - 0.1% B	AA-H2201		4.50-5.50%	0.10-0.20%	0.30%	0.35%	0.25%	0.03%	0.10%	Waffle, Sheared Ingot, Button, Rod
5% Ti - 0.2% B	AA-H2207		4.50-5.50%	0.15-0.25%	0.30%	0.35%	0.25%	0.03%	0.10%	Waffle, Sheared Ingot, Button, Rod
	CEN-92252		4.50-5.50%	0.15-0.25%	0.30%	0.30%	0.25%	0.04%	0.10%	
5% Ti - 1% B	AA-H2252		4.50-5.50%	0.80-1.20%	0.20%	0.30%	0.20%	0.03%	0.10%	Waffle, Sheared Ingot, Button, Rod
	CEN-92256		4.50-5.50%	0.90-1.10%	0.30%	0.30%	0.20%	0.04%	0.10%	

Composition is a maximum unless shown as a range.

