PYROTEK GRANULATED GRAIN REFINERS (PYROFLUX GR GR)

SODIUM AND CALCIUM FREE GRAIN REFINING FLUXES FOR ALUMINIUM AND ALUMINIUM ALLOYS

Pyrotek Grain Refining Fluxes (Pyroflux GR GR) are specialized, granulated salts designed to replace conventional grain refiners, such as Al-Ti-Boron rods, wafers, or small ingots. Unlike traditional, metallic grain refiners, these fluxes contain titanium and boron in the form of potassium fluorotitanate (K_2TiF_6) and potassium fluoroborate (KBF_4).

The resulting TiB_2 creates nucleation sites for solidifying metal, just like traditional grain refiners. However, compared to traditional grain refiners, these fluxes have shown better dissolution in molten systems and reduced metal-temperature loss during treatment. In addition, the presence of fluorine in their composition provides the added benefit of improved dross-drying.

Additional benefits include that $TiAl_3$ compounds contribute to the formation of a coherent aluminium structure, while boron can help to remove impurities such as V, Cr, Zr.

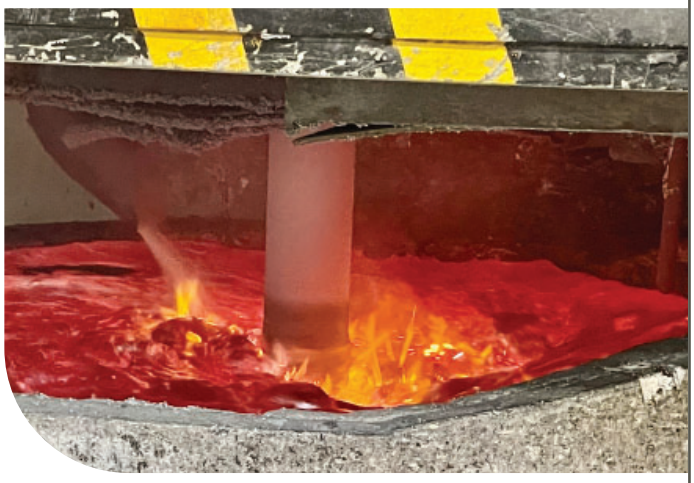
For best performance, these fluxes should be well mixed into molten systems before casting. By design, their consistent 1-3 mm grain size makes them suitable for injection. Another common application method is adding during vortex formation at the time of transfer ladle degassing treatments.

BENEFITS

- Two-in-one grain refining and dross drying capabilities
- Sodium (Na) and Calcium (Ca) free – compatible with hypereutectic and Sr-modified alloys
- Improves mechanical strength of final cast products
  * Promotes fine, equiaxed grain growth during solidification
  * Grain sizes typically smaller and more uniform than traditional grain refiners
- Potential production cost savings by reducing degassing time, inert gas, and cost of refiners
  * Up to 50% cost savings compared to traditional grain-refiners
- Ensures excellent die filling characteristics
- Uniform 1-3mm standard grain size and chemistry for consistent performance

APPLICATION

To ensure highly efficient grain refining and effective dross drying, Pyroflux GR GR must be well mixed with the molten metal. The most common application method is addition during rotary degassing, but injection in furnaces or other equipment can be possible. After thorough mixing, dry dross should be carefully removed using a suitable skimming tool.



PYROTEK GRANULATED GRAIN REFINERS (PYROFLUX GR GR)

ADDITION QUANTITY

- A typical addition amount is 0.05-0.10% of the weight of molten metal to be treated.
  * In other words, this is typically 0.5-1.0 kg per tonne (1.0-2.0 lb per ton) of molten metal.
- Keep in mind, the addition rate might need to be adjusted based on:
  * Required mechanical properties of final cast parts
  * Microsopic grain size and structure
- For assistance regarding addition quantity, please contact Pyrotek for support.

PRODUCTS

The following are standard Pyrotek products available today.

Product	Product Description	Suggested Alloys	Application Temperatures
Pyroflux GR GR580	Standard Pyrotek recipe developed for grain refining of most foundry alloys; common for gravity casting.	All aluminium alloys	≥650°C (≥1202°F)
Pyroflux GR GR581	Designed for improved suitability with hyper-eutectic silicon alloys (>12% Si); preferred by automotive foundries.	High silicon piston alloys	≥650°C (≥1202°F)
Pyroflux GR GR585	Recipe designed with lowered melting and reaction temperature; most suitable for wheel casters.	Wheel casting alloys	≥600°C (≥1112°F)

Note: custom recipes and product development possible through partnership with Pyrotek.

STORAGE

- Store in the original packaging
- Keep the packaging sealed in a cool, dry space
- There is no specified shelf-life, as long as the product is stored appropriately in well-maintained packaging
- If there is any doubt about the condition of the product after storage, please contact Pyrotek

HEALTH AND SAFETY

Please refer to Pyrotek SDS for Health and Safety information.

July-23-EN-1883

Product Type: 127
Commodity Code: 07056