



## Potassium Aluminum Fluoride

Potassium Aluminum Fluoride (KAIF<sub>x</sub>) – KBAloys' potassium aluminum fluoride is a commercial grade fused solid, inorganic salt comprising of a mixture of potassium hexa- and tetrafluoroaluminates (K<sub>3</sub>AlF<sub>6</sub> and KAIF<sub>4</sub>). The material serves as an alternative to conventional fluoride salts for a variety of applications, a few of which are listed below.

### Fluxes

Potassium Aluminum Fluoride is often the primary constituent in salt fluxes for metal cleaning, either as a stand-alone addition or combined with other salts such as NaCl and KCl. The addition of fluoride enhances the general performance of the salt flux. The function of the salt flux is to separate metals from oxide and dross and to prevent incendiary burning of the aluminum, thereby maximizing yields. When Potassium Aluminum Fluoride is added to a mixture of NaCl and KCl the resulting flux is more fluid. This increased fluidity better covers the exposed molten metal and facilitates the release of metals entrapped in the dross. The active fluoride will also remove magnesium in the melt, improving metal purity. Some aluminum foundry alloy producers use KAIF as their exclusive magnesium remover (in lieu of dangerous chlorine gas)

### Other

In powder form Potassium Aluminum Fluoride is used in the manufacture of grinding wheels (filler/binder) and other abrasive products. KAIF is a common additive to roofing shingles as an alkaline Ph adjuster and color additive to the coatings for roofing granules as well as aiding in flame retardant characteristics. Glass producers use the KAIF for opacification, or to cloud the glass giving it a milky white color.

Physical Chemical Properties	
Appearance	Grey-white crystalline
Absorbed Moisture	1% Max.
Solubility in H <sub>2</sub> O at 25°C	.25 gm per 100 ml
Density	2.7 g/cm <sup>3</sup>
Melting Point	1076°F (580°C)

Typical Chemical Composition	Percent Weight
Potassium	24 to 30%
Aluminum	17 to 20%
Fluoride	42 to 50%

Standard Forms	
Granular Powders	Lump
-20 Mesh	1 inch by down
-30 Mesh	6 inch by down
-150 Mesh	
-200 Mesh	

Packaging	
Granular Powders	Lump
25 Kg poly-lined paper bags	Gaylord Box
300 lb. Fiber drums	Open Container
2000 lb. Or 1 MT. Super Sacks	



Physical Chemical Properties	
Molecular Weight	125.91
Molar Volume	49.4 cm <sup>3</sup>
Density	2.50-2.55 grams/cm <sup>3</sup>
Melting Point	530°C
Decomposition	Decomposes starting slowly at approximately 615°C; at 700°C to KF & BF <sub>3</sub> (gaseous)
Decomposition Pressure: (510-930°C)	Log Pmm = .6317/T+8.15
Heat of Decomposition	28900 cal/mole
Appearance	White, fine granular, free flowing crystals
Crystal structure	a) at 20°C, 4.5 gms per liter of water b) at 100°C, 62.7 gms per liter of water c) at 20°C, 14 mg per 1000 ml of ethyl alcohol
Flammability	Nonflammable
Reactivity	Does not react with air and moisture at normal temperature. Contact with acids or acid fumes may liberate hydrogen fluoride.