



# ALCOA WORLD ALUMINA, LLC

## ALUMINUM FLUORIDE

Produced at Point Comfort, TX Operations

CHE 960  
June 2003

### Product Information

Alcoa® Aluminum fluoride (anhydrous) is an off-white, free-flowing granular material, insoluble in most organic and inorganic liquids at room temperatures. It is soluble in many fused salts. At ambient temperatures, it is chemically inactive. It is readily fluidized and can be transferred easily by pneumatic transport systems. Its crystalline structure is similar to that of alumina. At Alcoa's Point Comfort Operations, it is produced from a reaction between alumina trihydrate and hydrogen fluoride gas.

Aluminum fluoride is considered a non-toxic chemical unless heated to above 932°F (500°C) in the presence of moisture, at which time a pyrohydrolysis occurs with the evolution of hydrogen fluoride vapor, a respiratory irritant. For more details, refer to Alcoa Material Safety Data Sheet No. 148.

### Product Applications

Aluminum fluoride is used by aluminum producers to lower the melting point of electrolytes in the smelting process and increase production efficiency.

It is also used as a flux ingredient for the removal of magnesium in the refining of aluminum scrap. When magnesium-bearing aluminum alloys are melted, fluoride reacts with the magnesium and permits removal of this element. This enables remelters to produce aluminum alloys substantially free of magnesium.

The ceramic industry uses aluminum fluoride for some body and glaze mixtures and in the production of specialty refractory products. Aluminum fluoride is used in the manufacture of aluminum silicates and in the glass industry as a filler.

### Packaging & Shipping

Bulk shipments available in railcar, barge or ship. Standard packaged product available in 50 and 100 pound bags, 25 kg bags, and super sacks.

### Physical Properties

Melting Point	2300°F (1260°C)
Specific Gravity	2.88
Loose Bulk Density	84 - 94 lb/ft <sup>3</sup> (1346 - 1506 kg/m <sup>3</sup> )
Solubility in H <sub>2</sub> O	Slightly soluble (0.56 g/100 ml)

### Typical Properties of Point Comfort Aluminum Fluoride

Chemical Analysis, wt%	Typical Range <sup>(1)</sup>	Shipping Limits
SiO <sub>2</sub>	0.15 - 0.35	0.400 max
Fe <sub>2</sub> O <sub>3</sub>	0.005 - 0.015	0.020 max
Na <sub>2</sub> O	0.16 - 0.22	0.25 max
AlF <sub>3</sub>	90.00 - 94.00	90.00 min
Free Al <sub>2</sub> O <sub>3</sub>	4.00 - 8.00	10.00 max
Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	0.4 - 0.7	0.8 max
P <sub>2</sub> O <sub>5</sub>	0.005 - 0.015	0.030 max
LOI (0 - 480°C)	0.15 - 0.80	1.20 max

### Particle Size Analysis (cumulative)

% on 100 mesh	1 - 15	-
% on 200 mesh	70 - 95	-
% on 325 mesh	95 - 100	-

(1) Approximately 2 Standard Deviations from Average.

### Alcoa World Alumina, LLC

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ISO 9002 Certified