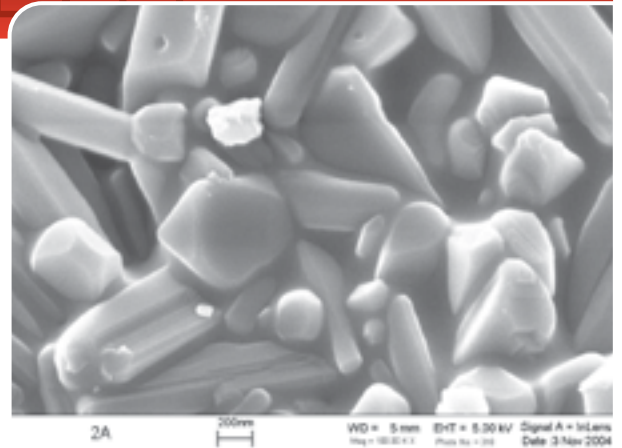


Purity • Consistent Quality • Abundant Supply • Expert Customer Service

What is Mullite?

Mullite rarely occurs as a mineral in nature. In fact, the word mullite is derived from the Isle of Mull off the English coast, where the only naturally occurring deposits of mullite have ever been found. Mullite is a mineral with a very high melting temperature of 1840° C. It is a premier acidic refractory mineral; it has no polymorphic inversions and possesses a low thermal expansion coefficient of $5.3 \times 10^{-6}/^\circ\text{C}$. Moreover when mullite re-crystallizes in a ceramic or a refractory it forms as small lenticular crystals which promote high strength, even at very high temperatures. Mullite is a key ingredient in many high temperature products.



Calcined Kyanite

Virginia Kyanite™ is converted to mullite by calcining it in excess of 1450° C in a rotary kiln. The resulting product, called Virginia Mullite™, contains about 80% mullite, 11% finely dispersed amorphous silica, 7% quartz, and about 2% cristobalite. Virginia Mullite is different in particle shape and impurities than mullite formed by calcining clay minerals. Virginia mullite contains 56-61% alumina.

Properties of Mullite

Mullite is a very important refractory material with high melting temperature, high hot strength, and excellent thermal shock resistant and high creep resistance. It is volume stable at very high temperatures and has a low coefficient of thermal expansion. It has excellent electrical insulation properties. It has outstanding hot load-bearing properties, and it is resistant to many corrosive environments. The finely dispersed, amorphous silica is very reactive and combines easily with sources of alumina to form Mullite that is beneficial. Mullite is very low in magnetic iron, which is beneficial in many applications.

Uses

Virginia Mullite is a key ingredient in many refractory and ceramics applications. Virginia Mullite has excellent electrical properties and is used in a wide range of electrical insulators and in heating elements where electrical receptivity is important. Virginia Mullite is used in brake shoe lining as an important ingredient that imparts strength, is heat resistant, and because of its particle shape, provides hardness and friability. Virginia Mullite is also used in various foundry wash and coatings for specialty alloy steel castings. It provides excellent surface finish to the casting and can withstand high temperatures. Virginia Mullite is extensively used in Mullite/Cordierite kiln furniture that provides excellent thermal shock resistance and high temperature strength. Virginia Mullite is also used in Investment Casting shells that provide excellent high temperature properties for special alloy castings.



VIRGINIA MULLITE

SPECIFICATIONS

Refractories



Investment Castings



Kiln Furniture



Typical Chemical Analysis (%)


Al ₂ O ₃	58.0 (55.0 min)
SiO ₂	40.2
TiO ₂	1.1
Fe ₂ O ₃	0.5 (0.75 max)
CaO	<0.04
MgO	<0.03
Na ₂ O	<0.04
K ₂ O	<0.07
P ₂ O ₅	<0.15

Mineralogy (%)

Typical

Mullite	79-85
Amorphous	8-12
Quartz/Cristobalite	4-8

Screen Analysis Specification of Virginia Mullite

	20m (850 microns)	35m (425 microns)	48m (300 microns)	100m (150 microns)	150m (106 microns)	200m (75 microns)	325m (45 microns)	Pan
20 x 50	0-2	30-45	30-50					13-30
35 Mesh		15-25	15-30	30-50				10-30
48 Mesh			4-10	10-25	10-20	10-20		35-55
100 Mesh				5-10	5-15	10-18		60-77
200 Mesh						10 max		90 min
325 Mesh							10 max	90 min

Screen analysis is reported on Tyler standard sieves. Pan designates material passing the last reported screen. All analysis are expressed in weight %.

