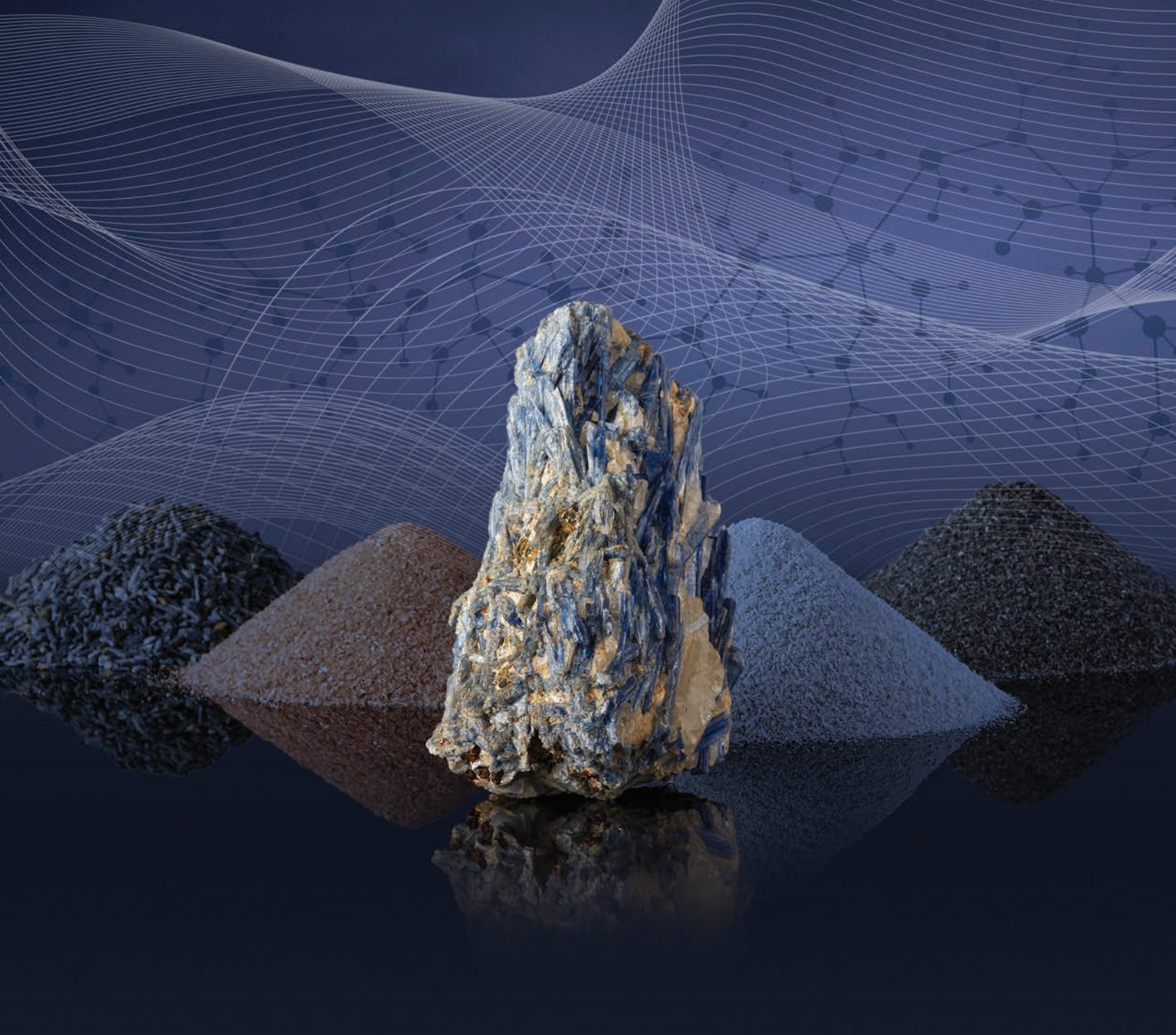


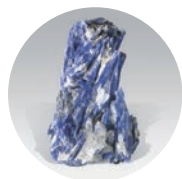
VIRGINIA KYANITE™ | $\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$

SPECIFICATION



KYANITE MINING CORPORATION

Consistent Purity • Abundant Supply • Personalized Service



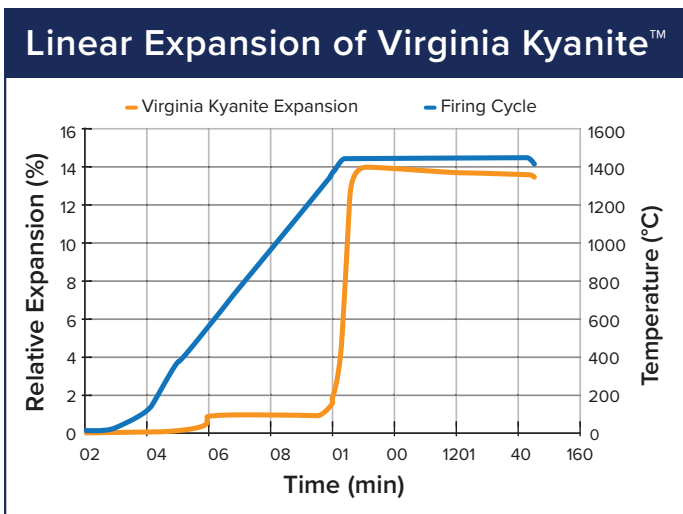
Kyanite and its Properties

Virginia Kyanite™ is a naturally occurring polymorph of $Al_2O_3 \cdot SiO_2$ with elongated “blade-like” crystals. This “blade-like” structure and other unique properties make it a valuable raw material in refractory and ceramic products.


Kyanite decomposes into mullite, ($3Al_2O_3 \cdot 2SiO_2$) at $1200^\circ C - 1450^\circ C$, depending on the hold time. During this conversion, Virginia Kyanite™ undergoes a large, irreversible volume expansion. This expansion is used by refractory and ceramic manufacturers to counterbalance the firing shrinkage of clays, cements, and other binders. Volume expansion is particle size dependent and ranges from over 25% for 35 mesh material to about 3% for 325 mesh. The “blade-like” shape of Virginia Kyanite™ crystals enhances the green strength of ceramics and refractories.

Uses

Virginia Kyanite™ has many uses in refractory and ceramic products. Monolithic refractories are the largest user of Virginia Kyanite™. Coarser grades are used for expansion to counteract shrinkage associated with cement and binders. Finer mesh Virginia Kyanite™ is used to reduce porosity and is a source of mullite in the matrix. Virginia Kyanite™ is used in the foundry industry as mold coatings where gas permeability is an important criterion. Virginia Kyanite™ is also used in kiln furniture to offset shrinkage from clays, reduce creep and provide an economical source of mullite at higher temperatures. Other uses include brake shoes, grinding wheels, pottery, sanitaryware, ovenware, tiles, and ceramic parts.



Typical Chemical Analysis (%)	
Al_2O_3	57.5 *(55.0 min)
SiO_2	40.3
TiO_2	1.2
Fe_2O_3	0.6 (0.85 max)
CaO	<0.04
MgO	<0.03
Na_2O	<0.04
K_2O	<0.07
P_2O_5	<0.15
Mineralogy (%)	Typical
Kyanite	92–98
Quartz	2–8

Screen Analysis Specification of Virginia Kyanite™								Total % Volume Expansion at Approximately 7% Addition
	40m (425 microns)	50m (300 microns)	100m (150 microns)	140m (106 microns)	200m (75 microns)	325m (45 microns)	Pan	
35 Mesh	15–30	10–30	20–40				15–45	8–9%
48 Mesh		6–16	10–29	5–26	5–26		23–60	4–5%
100 Mesh			5–10	5–15	8–20		55–82	2–3%
200 Mesh					10 max		90 min	1–2%
325 Mesh						10 max	90 min	1–2%