PYRAX® RG Pyrophyllite

Refractory Grade Pyrophyllite

PYRAX RG is a valuable refractory raw material for use in:

1) Foundry washes
2) Insulating firebrick
3) Metal pouring refractories
4) Alumina-silica monolithic refractories:
   - Ramming mixes
   - Gunning mixes
   - Castable mixes
5) Kiln car refractories
6) Ceramic Filters
7) Catalytic converter carriers

General Description:

Description:	High pyrophyllite ore with low alkali content
Crystallinity:	Laminar to semi-massive
Workability:	Nonplastic
Density:	2.8 to 2.9 Mg/m^3
PCE (ASTM C-24):	27 to 28

Typical Chemical Analysis:
(Calculated as oxides)

	%
Silicon dioxide (SiO_2)	71.5
Aluminum oxide (Al_2O_3)	20.8
Iron Oxide (Fe_20_3)	1.9
Magnesium oxide (MgO)	0.1
Calcium oxide (CaO)	0.1
Sodium oxide (Na_2O)	0.4
Potassium oxide (K_2O)	0.3
Titanium dioxide (TiO_2)	0.5
Ignition loss	4.0

X-ray and Petrographic Analysis:

Mineral	Composition	Amount %
Pyrophyllite	$Al_2O_3 \bullet 4SiOH_2O$	60 to 70
Quartz	SiO_2	20 to 30
Kaolin	$Al_2O_3 \bullet 2SiO_2 2H_2O$	3 to 7
Muscovite	$K_2O \bullet 3Al_2O_3 6SiO_2 \bullet 2H_2O$	1 to 5

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Typical Screen Analysis and Bulk Densities of **PYRAX® RG** Pyrophyllite

Screen Numbers		Cumulative Percent Retained	
U.S. Series	µm	**140** Mesh	**200** Mesh
100	150	1.0	Trace
200	75	14.0	1.0
325	45	21.5	4.6
Compact Bulk			
lbs/ft^3		61	59
kg/m^3		977	945

Properties:

PYRAX RG has the following properties of particular interest for refractory applications:

1) Permanent expansion
2) Excellent reheat stability
3) Low hot load deformation
4) Low reversible thermal expansion
5) Low bulk density
6) Low thermal conductivity
7) High resistance to corrosion by molten metals and basic slags

The *permanent expansion* of **PYRAX RG** is due to physical changes taking place during dehydration. The greatest expansion occurs between 650°C (1200°F) and 870°C (1600°F) which corresponds approximately to the range of greatest weight loss. The amount of expansion is dependent on the particle size.

The *reversible thermal expansion* of **PYRAX RG** is low for specimens fired below C/13 (1330°C, 2430°F). This property is dependent on the heat level, for at higher temperatures the silica is gradually converted to cristobalite and there is a corresponding increase in expansion.

The excellent *dimensional stability* of **PYRAX RG** is well-established.

Pyrophyllite compositions show *superior hot load bearing ability*, as was demonstrated by W. Gower and W. C. Bell.

There is high *resistance to thermal shock* (spalling) by virtue of pyrophyllite's *low thermal conductivity* and *low coefficient of thermal expansion*.

Above 1050°C the *transformation of pyrophyllite to mullite* corresponds to significant increases in mechanical properties, such as compressive strength, flexural strength and hardness.