

WONDERSTONE-PYROPHYLLITE

Wonderstone Limited
15 Fricker Road, Johannesburg, South Africa
+27 11 770 6800
wonderstonesales@assore.com

General Description (Refractory Grade)

Description: Light Grey Pyrophyllite Powder (-125 micron)
Crystallinity: Laminar to semi-massive
Specific Gravity: 2.7 to 2.85 g/cm³
PCE (ASTM C-24): 29 to 30
pH: 4.85
Bulk Density: 0.69 g/cm³
Tap density: 0.98 g/cm³
Coefficient of Thermal Expansion: $3.6 \times 10^{-6} \text{ }^\circ\text{C}^{-1}$
Melting Point: 1680 °C
Softening Temperature: 1600 °C

XRF Analysis - Typical Composition (Calculated as Oxides)

Elements	Percentage (%)
SiO ₂	57.35
Al ₂ O ₃	32.75
TiO ₂	1.70
K ₂ O	0.70
Fe ₂ O ₃	0.70
P ₂ O ₆	0.14
CaO	0.02
MgO	0.01
NaO ₂	0.07
V ₂ O ₆	0.05
C	0.12
LOI	6.33

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XRD Analysis (%)

Pyrophyllite	Quartz	Kaolinite	Muscovite	Rutile	Cristobalite	Gibbsite
78 - 85	trace	1 -6	1 -6	1 - 2	0 - 1	trace

Particle Size Distribution (PSD) Specification:

Wonderstone -125 micron Pyrophyllite Powder		
Screen (microns)	Typical Sample (WT%)	Standard Deviation (WT%)
150	0.00	0.00
125	0.18	0.27
75	3.31	1.28
45	14.93	2.69
-45	81.57	2.76

Wonderstone Refractory Grade Pyrophyllite is a high-quality raw material for use in:

- 1) Insulating firebrick
- 2) Kiln refractories
- 3) Metal casting & pouring refractories
- 4) Monolithic refractories (Alumina-silica):
 - Ramming mixes
 - Gunning mixes
 - Castable mixes
- 5) Foundry washes
- 6) Ceramic Filters

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Wonderstone pyrophyllite powders for refractory applications have the following useful characteristics:

1. Expands permanently on firing (650°C to 870°C) during dehydration of pyrophyllite
2. Low reversible thermal expansion
3. Excellent stability when reheated after firing
4. Good insulating properties – low thermal conductivity
5. Resists corrosion by molten metals and slags
6. Low deformation under hot load
7. When firing above 1050°C, transformation of pyrophyllite to mullite occurs with significant improvements in mechanical properties such as hardness, compressive strength and flexural strength.