

Technical Data

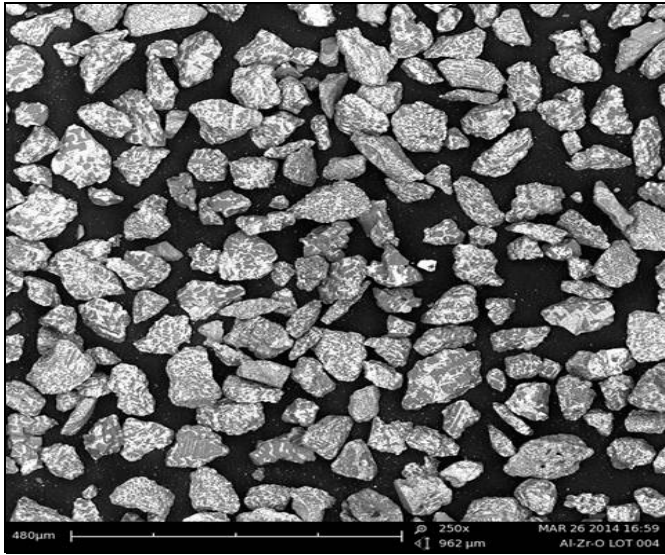
HA 1192

Alumina Zirconia Powder

Product Code: 411192
 Technical Data Sheet

Revision: 002
 Dated: 03/31/14

HA 1192 POWDER CHARACTERISTICS



Typical Powder Morphology

HA 1192 is an alumina-zirconia ceramic powder. In the most challenging applications HA 1192 offers exceptional mechanical strength and a level of toughness that far exceeds pure aluminum oxide, titanium oxide, and chromium oxide thermal sprayed coatings, making it particularly suited to the most physically demanding environments and is the ideal ceramic material for a wide range of components and applications which have high levels of wear, corrosion and electrical insulation.

HA 1192 is a fully reacted composite ceramic material with zirconia grains in the alumina matrix. Alumina toughened with zirconia composites are well known for their mechanical and physical properties commonly used in challenging applications that many well-known thermally sprayed ceramics fail. HA 1192 features high strength, fracture toughness, elasticity, hardness, and wear resistance. HA 1192's mechanical robustness compared to that of pure alumina is attributed to the phase transformation of the metastable tetragonal zirconia grains when the material is stressed. The stress concentration at a crack tip can cause a transformation from a tetragonal crystal structure to monoclinic, which has an associated volume expansion of zirconia. This volume expansion effectively pushes back the propagation of the crack resulting in higher toughness and strength.

TYPICAL USES & APPLICATIONS

HA 1192 is specifically designed for use in the Oilfield Machinery, Pump & Valve, Chemical Processing, Paper, and Steel & Biomedical Industries.

- Down Hole Applications
- Pump Components & Parts
- Ball Valves/ Valve Seats
- Steel Mill Hearth Rollers

CHEMICAL PROPERTIES

Al ₂ O ₃ [%]	58 - 62
ZrO ₂ [%]	37 - 41
TiO ₂ [%]	0.10 - 0.50
Y ₂ O ₃ [%]	0.5 - 0.9

PHYSICAL PROPERTIES

Melting Point [°F]/[°C]	3,452/1,900
Hall Flow [s/50g] ASTM B213	36
Apparent Density [g/cm ³] ASTM B212	1.9
Coverage Rate	0.05 lbs./sq. ft./0.001"
Thermal Conductivity [W/m-K]	27
Fracture Toughness [MPa/m ²]	5.5
Volume Resistivity, ambient [ohm-cm]	>10 ¹⁴