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POWDERS FOR ABRASIVE APPLICATIONS

APPLICATIONS:

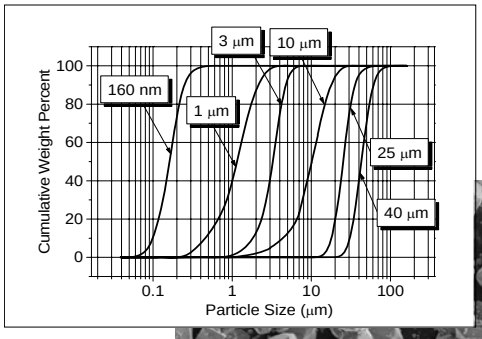
- Lapping (see next page for lapping performance)
- Polishing
- Chemical-mechanical polishing (CMP)
- Applications requiring high materials removal rate
- Applications demanding controlled chemical purity
- Abrasive wheels, belts, etc.

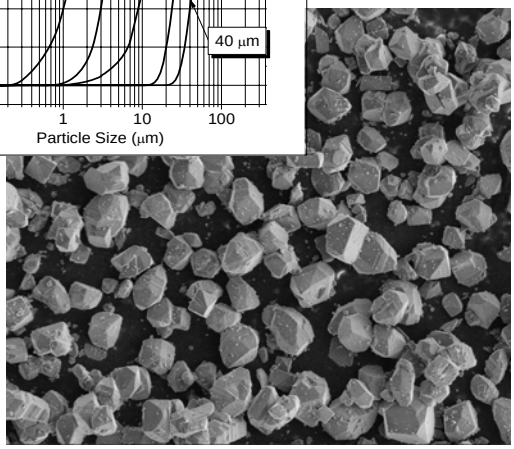
Properties of abrasive powders synthesized by the hydrothermal method*

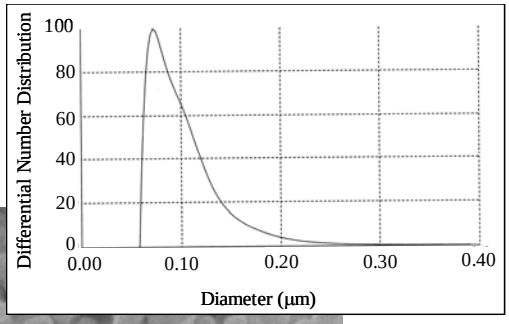
Property	Product Type			
	Alpha Alumina	**Alpha Alumina**	**Custom Oxide Powders**	**Zinc Oxide (Example)**
Crystal form	100% α-Al_2O_3 (corundum)	100% α-Al_2O_3 (corundum)	Per users specification	100% ZnO (zincite)
Chemical purity (%)	99.98	99.8+	Typically 99.9+	99.9+
Median particle size, D_{50}	Any D_{50} in the 1-40 μm range	100-250 nm	Per users specification (nanosized, submicrons, or microns)	90-150 nm
Powder morphology	Equiaxed, platelets, rods, sharp edges and corners	Equiaxed, round	Per users specification (equiaxed, platelets, rods, etc.)	Equiaxed, round (see picture below)

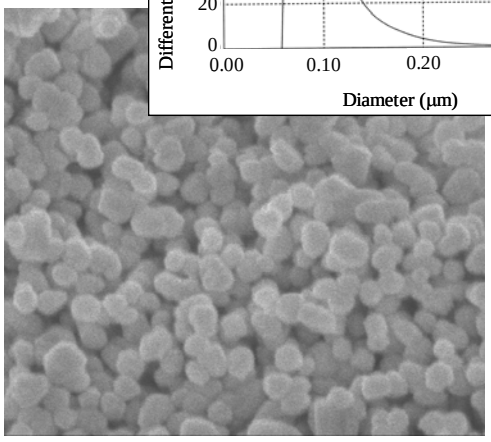
***Powders with other sizes, purity levels, and dopants may be available upon request.**
Dispersions may be available upon request

Hydrothermal method is very useful to produce a variety of advanced ceramic powders for abrasive applications, including nanosized oxide powders (right, ZnO) and a range of micron size powders, with very sharp edges and corners (left, α-Al_2O_3). Sawyer's abrasive powders exhibit very narrow particle size distributions, low aggregation/agglomeration, high chemical purity, and high level of lattice perfection.









US Patents Pending

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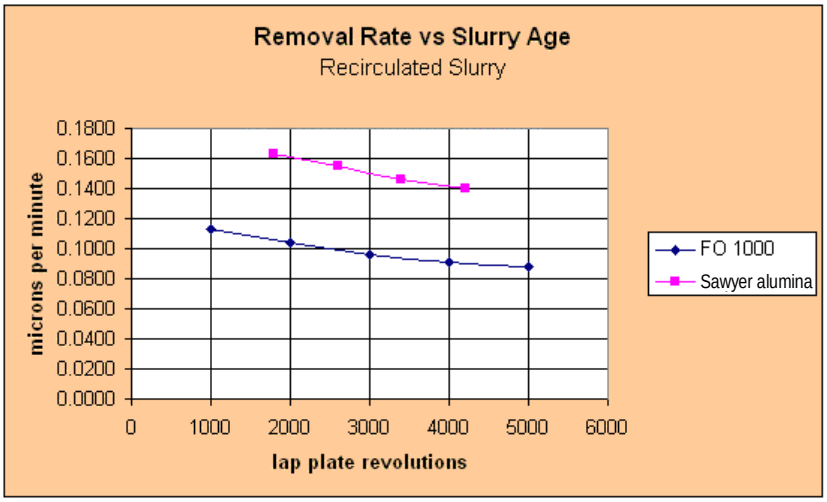
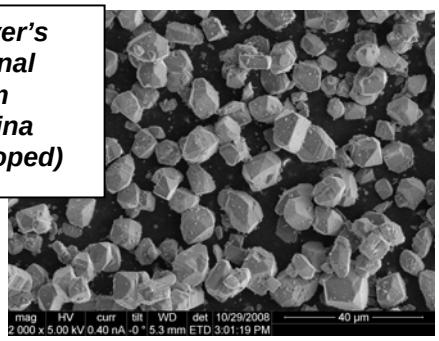
POWDERS FOR ABRASIVE APPLICATIONS

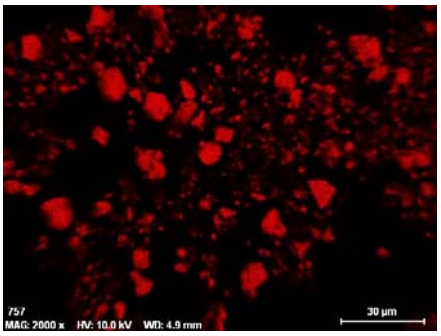
LAPPING TESTS:

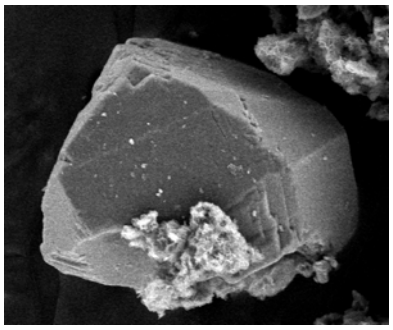
- Materials lapped – quartz wafers
- Facilities – Sawyer's wafer manufacturing plant in Conroe, TX
- Purpose – comparison of Sawyer's alpha alumina powder with commercial abrasive FO1000 with the same particle size (nominal and measured)
- Results - over 50% increase of the materials removal rate for Sawyer's alumina, which sustained minimum damage after 5 lapping cycles (see SEM and EDS data below)



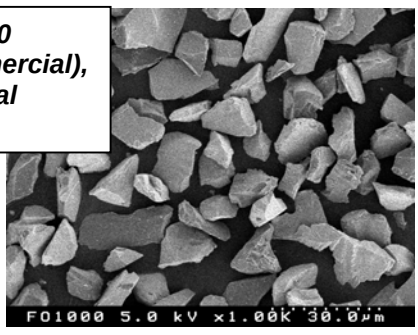
Sawyer's nominal 10 μm alumina (undoped)

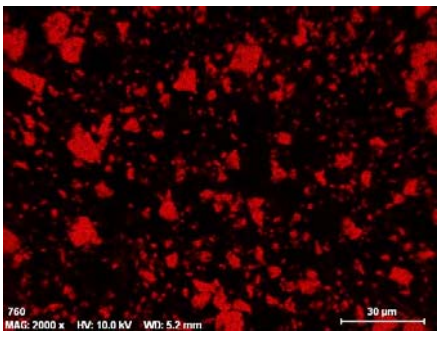


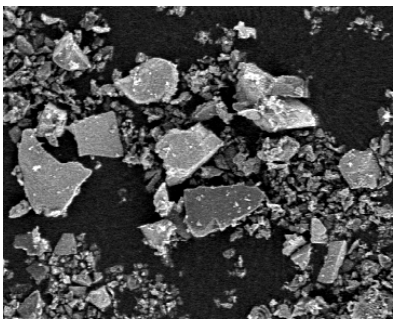




FO1000 (commercial), nominal 10 μm







Powder morphology by SEM before lapping

Al distribution by EDS after lapping (5 cycles)

Crystal morphology by SEM after lapping

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