

Development of Transparent Ceramics at CeraNova Corporation

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ABSTRACT: Significant progress has been made on transparent polycrystalline ceramics in recent years, with several materials now displaying optical properties comparable to single crystals of similar composition. Transparent ceramics are being developed for a broad range of commercial and military applications including: infrared transparent materials for domes and windows, scintillators for medical diagnostics, laser host materials, transparent armor, and advanced light sources.

CeraNova's transparent alumina (CeraLumina™) has sub-micron grain size (300-500nm) and high transmittance in the mid-wave infrared. High purity nano-powders are used to produce fully dense, fine grain alumina which has significantly improved properties when compared to both larger grained alumina and single crystal sapphire. CeraLumina™ is produced using conventional powder processing methods, which are more amenable to shape forming than growth of single crystals. In addition to high transparency, the fine, uniform grain size of CeraLumina™ imparts high hardness, high strength, and high thermal shock resistance. The effects of grain size on optical, mechanical, and thermal properties will be presented.

CeraNova is a privately held company founded in 1992 as a developer and manufacturer of ceramic superconductors. Since that time, the company has grown into a leading innovator of ceramic processing solutions and engineered components for high technology systems. Today CeraNova's major focus is on transparent ceramics (monolithic, composite, and fibers) that are essential for an increasing number of military, industrial, and commercial products. CeraNova's experienced staff and well-equipped facility makes it well positioned to provide contract technology development and small-scale manufacturing when it may not be economically viable at larger firms.

ALL ARE WELCOME!!!