



Engineering Better Material Solutions

SURMET CORPORATION

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Surmet-led team wins Phase II award from DARPA to develop ALON[®] Manufacturable Graded Refractive Index (M-GRIN) lenses.

[Surmet](#) will lead a team that includes the University of Rochester and Ed White Consultants to establish a production capability for Manufacturable Gradient Index (M-GRIN) lenses from ALON[®] optical ceramic. ALON[®] GRIN lenses hold the promise of higher Vis-MWIR performance at reduced size, weight and cost.

During the M-GRIN program's first phase, Surmet demonstrated the ability to create ALON[®] GRIN lens blanks with axial gradients. During Phase II Surmet will develop the ability to extend the magnitude and spatial extent of these gradients, using processes compatible with large volume manufacturing. At the culmination of the Phase II effort, Surmet will use proprietary fabrication processes to produce several prototype [ALON[®]](#) GRIN lenses and deliver them to DARPA.

The University of Rochester (U of R) will develop the metrology used to characterize the ALON[®] GRIN lens blanks and lenses produced during this program. The U of R will also lead the design effort to exploit the advantages of ALON[®] M-GRIN lenses for Advanced DoD optical systems. Ed White Consultants will guide the manufacturing readiness assessment of the MGRIN technology. Surmet will also include DoD Prime Contractors in the program to facilitate the transition of the ALON[®] M-GRIN technology into military systems.

Current applications for ALON[®] optical components exploit its unique combination of broadband transparency (UV-MWIR) with excellent physical, mechanical and chemical properties. [ALON[®] Transparent Armor](#) can stop armor piercing projectiles at half the weight and half the thickness of conventional glass armor, while providing 50% higher transmission for night vision goggles. ALON[®] windows and domes are being used in military systems for tracking, imaging and reconnaissance. ALON is also being evaluated for semiconductor processing and energy related applications because of its high dielectric breakdown strength and excellent chemical resistance.

Its cubic structure means that ALON is transparent in its polycrystalline form. This means that ALON[®] Optical Ceramic can be produced using conventional powder ceramic processing techniques. ALON[®] powder is synthesized from abundantly available precursor materials. The powder is then consolidated into a green body using any one of a number of forming techniques including cold isostatic pressing, slip casting and injection molding. The green body is then brought to full optical density through a series of heat treatments. The final blank is then cut ground and polished into the final optical component.

Founded in 1982, [Surmet Corporation](#) is an Advanced Materials Technology company, with a vertically integrated manufacturing capability. Surmet is headquartered in Burlington, MA and has R&D and manufacturing facilities in Buffalo, NY and Murrieta, CA. In addition to ALON, Surmet is a leading manufacturer of high strength fine-grained Magnesia Spinel optical components. Surmet also is a leader in making Aluminum

Nitride (AlN) powder and sintered AlN bodies with high thermal conductivity.

Surmet's technical and customer relations staff are ready to work with you to meet the needs and exacting specifications of your next generation product designs. Please go to our web site www.surmet.com to learn more about us, and to find out what Surmet can do for you.