



Engineering Better Material Solutions

SURMET CORPORATION

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Advances in making Large ALON[®] Armor Windows

Surmet continues its advances in fabricating cost effective large area ALON[®] Transparent Armor Windows for many applications. Current capability allows for monolithic ALON[®] windows to be fabricated in sizes as large as 15x27-in (38cm x 68.5cm) with plans for making windows of even larger sizes. "ALON[®] Optical Ceramic also has the unique advantage of being made in thicknesses varying from 0.2 to 1.5-in to meet the required ballistic performance" says Uday Kashalikar, The director of armor products at Surmet Corp.

Interestingly, no matter how large a monolithic ALON[®] window Surmet makes, there are always customers who want windows of even larger sizes! To meet these needs, Surmet has developed approaches to produce very large armor windows using tiling approaches.

ALON[®] Armor typically consists of an outer ALON strike face laminated to layers of glass and polycarbonate. Since the glass and polycarbonate sheets are available in very large sizes, this construction allows ALON[®] armor windows to be assembled by assembling and laminating multiple ALON tiles of smaller size on the surface of monolithic layers of glass and polycarbonate.

As shown in the picture, the seams between ALON tiles can be engineered to maximize the ballistic performance with minimal optical obscuration. With appropriate seam design, tiling provides multi-hit ballistic performance and producibility over monolithic windows. Tiled ALON[®] Armor windows have been very successfully used to defeat 30 cal and 50 cal AP threats even when shot directly at the seam locations, as well as IED threats.



Crystal clear tiled ALON[®] Armor Window

This same tiling approach is used in opaque ceramic armor systems, where tiling allows the damage to be isolated to one ceramic tile, thus enhancing multi-hit performance of the armor.

Since smaller tiles can be produced in higher volumes, with higher yields, at lower cost per unit area, tiling provides significant cost advantages over large monolithic windows.

Founded in 1982, [Surmet Corporation](#) is an Advanced Materials Technology and solutions 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.

To find out what Surmet can do for you, please visit our new and improved website www.Surmet.com