

## Vehicle Armor Composite System (VACS)

Composite armor solutions for a wide variety of vehicle systems made with glass fiber manufactured by AGY and processed by proven industry partners. The VACS system has a composite protection solution to meet your needs.



# AGY Quicksilver™

## Cost Effective Ballistic Solutions for High Volume Armor Requirements

Quicksilver S-1 Glass roving is a cost-effective material solution for applications where ballistic protection is required, but weight savings and performance are not as critical as cost control. Quicksilver fibers outperform standard E-glass roving solutions, but at a cost that is much lower than aramid fibers. Armor solutions made with Quicksilver will fit a space in-between E-glass fibers and S-2 Glass fibers on the cost-weight-performance armor triangle. The S-1 Glass fibers set a new standard for high-volume applications of high-strength glass fiber reinforcements for the armor market.

The Quicksilver performance is a result of a special high-strength glass fiber formulation designed to impart high tenacity fibers from a bulk manufacturing process. The improved ballistic performance of the fibers, when combined with the right resin, will easily meet the ballistic requirements of 2152 fps at an areal density of 5 psf required by MIL-DTL-64154B class B materials.

The Quicksilver roving is currently available in epoxy compatible sizings; however, it is appropriate for ballistic applications in phenolic and thermoplastic resins.



**strength** in materials

## AVAILABLE PRODUCTS

Product Identification	Type	Tex	Yards/Pound
463-CB-250	Assembled Roving	2033	244

## PROPERTIES

Characteristic (in epoxy)	Test Method	Values
Impregnated strand tensile strength	ASTM D-2343	2.8-4.0 GPa (410-580 ksi)
Horizontal shear (short beam)	ASTM D-2344	55-76 MPa (8-11 ksi)
Wet strength retention after 6-hr. water boil		— 95%

## GLASS COMPOSITION

“R Glass” (reference: AMS 3832A, ASTM C 162-90, MIL-R-60346)

## NOMINAL FILAMENT DIAMETER

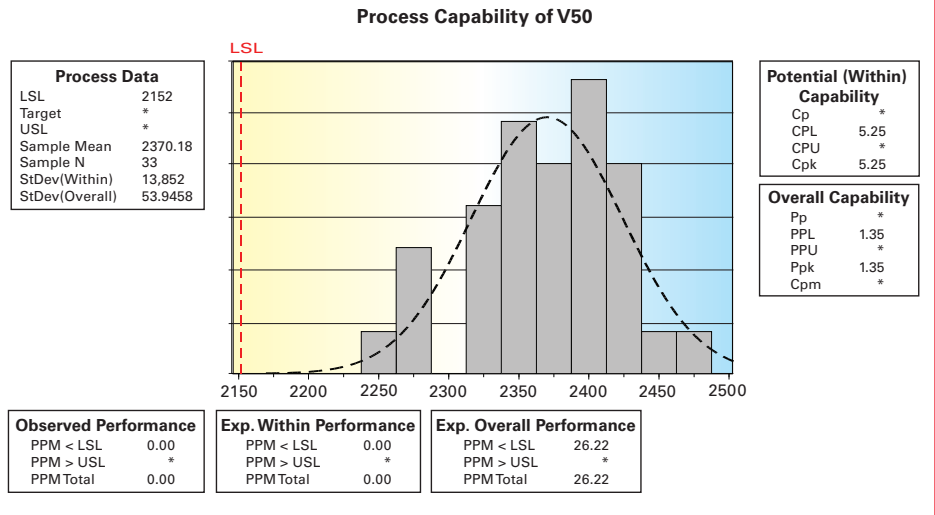
12 microns or 0.00047 inches

## SOLIDS (% LOI\*)

0.80 min. 1.00 nom. 1.20 max.

\* Loss on ignition after drying

## Phenolic/Glass Fiber Laminates vs. 0.30 cal FSP



Quicksilver has been tested in AGY’s HJ1 composite armor system to determine the level of ballistic improvement due to the processing change. The performance improvement is shown graphically.

Composite armor panels manufactured with Quicksilver will exhibit excellent fire, smoke and toxicity performance typically associated with glass fiber reinforced phenolic composite armor. Composite panels manufactured with

Quicksilver will have mechanical performance greater than E-Glass or aramid panels. Quicksilver can be deployed in both structural and nonstructural components on a vehicle, enabling lightweight, fire retardant and load bearing structures to compete head-to-head with steel and aluminum solutions.

Consider using AGY Quicksilver fibers for your next large armoring challenge!



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