



SETTING A NEW STANDARD OF SAFETY IN UP-ARMORED MILITARY VEHICLES.

BACKGROUND

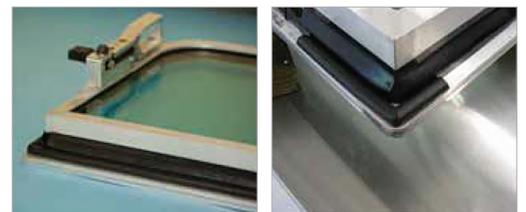
Over the course of the Iraq and Afghanistan wars, many soldiers have lost their lives in Humvee rollovers, when doors were jammed and they were trapped inside. The Department of Defense requested ideas from contractors to address the problem. One manufacturer proposed a solution: A prototype windshield with two quick-release latches that would allow soldiers to push out the windshield and escape in under five seconds.

CHALLENGE

The manufacturer presented PGC with a complex task:

- > Protect the vehicle windshields from the elements while supporting the weight of the ballistic glass.
- > Isolate the window frames from the vehicle superstructure while supporting the windows during installation and removal for escape.
- > Meet all requirements for vibration, the coefficient of thermal expansion (CTE) effects and vehicle rocking during operation.

Vehicle Emergency Escape (VEE) Window



INDUSTRY:

Defense

APPLICATION:

Humvee windshield

PRODUCT:

Seal

- > Develop the seal in one week, then ship eight sets overnight to the manufacturer, using production-level tooling, compounds and materials.

Our engineers identified specific requirements they would have to address:

- > The primary window seal needed to keep the elements out and remain intact over the vehicle's lifetime.
- > The secondary seal had to act as a weather backup seal while fully supporting the weight of the windshield, absorbing vehicle movements and damping the effects of vibration, temperature variation and CTE.
- > The secondary seal also needed to keep the windshield firmly positioned, while providing limited resistance during removal.

SOLUTION

PGC engineers developed same-day prototypes onsite at the manufacturer's facility until both primary and secondary seals were functionally modeled and installed on a windshield. The unit was mounted in a shaker table to simulate conditions in the field. After a 24-hour trial, it passed all vibration, install

and removal tests. PGC then proceeded with the next step: developing and manufacturing eight production-level sets of windshield seals, ready for overnight shipping in one week. The seals were delivered on time, with performance results exceeding expectations. After further refining profiles, working drawings and materials specifications, PGC moved into full production.

- > PGC generated all materials specifications, meeting ASTM D1056 cellular specs for extruded parts, and Mil Spec Standards for the UHMW Polyethylene stripping. All adhesives met strict temperature and adhesion requirements
- > All extruded profiles were cut and spliced to create the custom seals. These vulcanized joints met rigorous requirements for quality and surface finish.

RESULTS

From proofs to prototypes and concept to full production, PGC used a robust set of processes and multiple supply chain resources to meet stringent specifications and timelines. Designed to be installed by Army or Marine maintenance personnel in approximately one hour, the windshield kits have been used on the 1151 Series Hummer and newer MRAP Vehicle designs across multiple vehicle platforms.

If you would like more technical information on this case story, or have questions you'd like to discuss with one of our engineers, contact us at: sales@pgcsolutions.com or call (952) 942-6711



HEADQUARTERS

5732 Lincoln Drive
Edina, MN 55436
(952) 942-6711

pgc-solutions.com
info@pgc-solutions.com

© 2016 PGC. All rights reserved.