

## Project Case Study: Windshield Seal

### Product Type:

Extruded and spliced rubber seal

### Industry / Application:

Military vehicle windshield sealing component

### Challenge:

A leading manufacturer of military vehicles was experiencing production issues with windshield installations at one of its plants. The assembly process was slow and complex, resulting in high scrap rates and often damaged windshields. Additionally, long lead times for replacement windshields delayed shipments to their customers and increased costs. Any changes in design would require vigorous testing and acceptance by the US Army.

### Analysis:

After review, Longwood engineers determined that the existing seal design caused many of the production issues. The seal manufacturing process used multiple steps and was made with molded corners bonded to two different extruded profiles. Because of the complex design and multiple steps, the seal size varied significantly. Our engineers also recognized that the rubber material being used was too stiff for the application.



### Solution:

Longwood formulated a new rubber compound with a lower modulus to increase material flexibility, the profile was redesigned for consistency, the seal was made with a single piece and splice design and the seal circumference size was reduced. With these changes, the new seal allowed the profile to form to the truck windshield shape without molded corners and the extension of the seal lip allowed for enhanced sealing capability. The redesigned single-piece seal surpassed all weathering and vigorous field test requirements and was approved by the US Army. The results to our customer was a 30% reduction in part cost, decreased installation times by removing unnecessary steps, and the elimination of scrap during installation.

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