

ANTI-SPALL LINER DEVELOPMENT & TESTING

SEAL SOLUTIONS

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Aim.

The aim of the SEAL Solutions spall liner testing was to validate the proposed solution against representative RPG 7 shaped charges using a test specification developed by General Dynamics that was designed to accurately record the number of perforations and the reduction in cone angle achieved through the use of spall liners on Light Armoured Vehicle hulls.

Background.

SEAL Solutions have partnered with Combat Clothing Australia to develop an advanced spall liner design to mitigate against the spall effects created by shaped charges. Combat Clothing Australia are providing aramid ballistic protection kits to the ADF Chinook and Black Hawk helicopter fleets, and were therefore well placed to assist SEAL Solutions in the development of an aramid based spall liner system.

SEAL Solutions utilised Australian SME, Havoc Industries, to develop a shaped charge to simulate the effects of an RPG-7 strike. As shown in the images below, the shaped charge was very successful in replicating the spall effects generated by an RPG-7.

Anti-Spall Liner System Specifications.

- 16 kg per square meter at 20 mm thickness
- A 46% reduction in cone angle
- A 85% reduction in area affected by spall
- Significant reduction in perforations
- No use of polyethylene
- Several protection level options
- Tested to the General Dynamics test specification for spall liners



Figure 1 - Ivan Vrankovic Assisting With Test Setup

Testing Performed.

Extensive testing has been conducted by SEAL Solutions of its spall liner products to the General Dynamics test specification. The spall liner performance was compared to other spall liner products including aramid based spall liners during testing. The SEAL Solutions Spall Liner out performed these products in both performance and environmental protection (i.e. delamination caused by humidity) without increasing weight.

Testing Images.

Figure 2 below shows the SEAL Solutions Spall Liner pre and post testing.

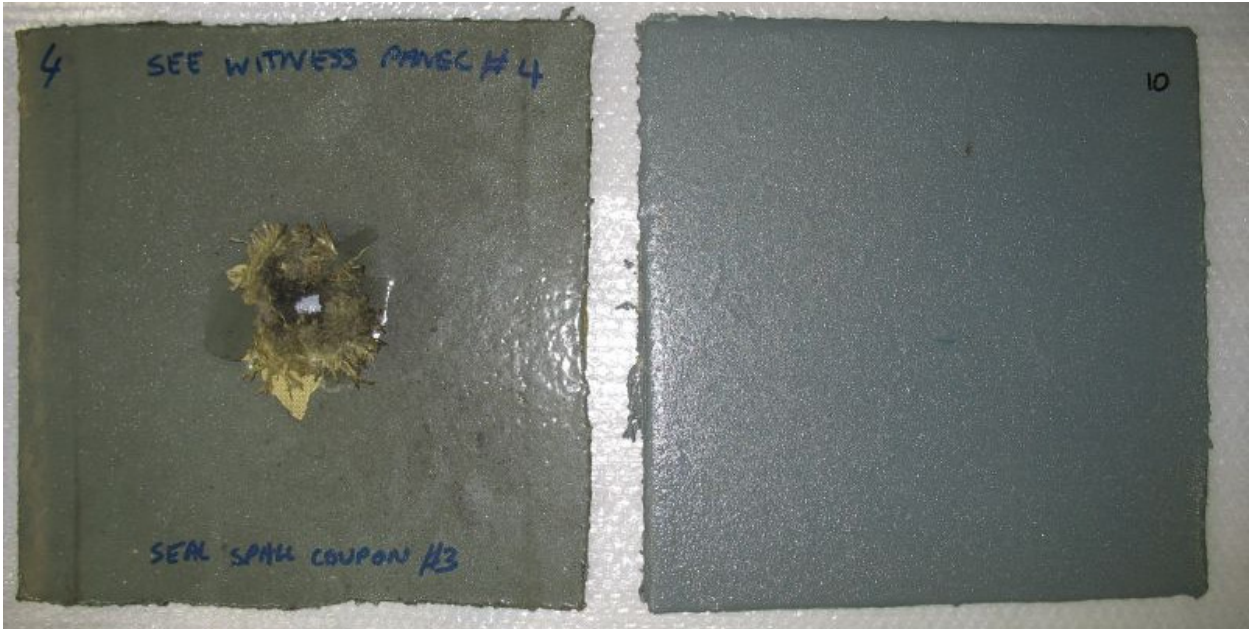


Figure 2- Images of the SEAL Solutions Anti Spall Liner Pre and Post Testing

The image at the left of Figure 3 below shows the witness plate when no spall liner was used in order to provide a baseline result from which comparisons can be made. The image at the right of Figure 2 below shows a witness plate when the SEAL Solutions anti spall liner was used. In both images a circle has been drawn to illustrate the reduction in cone angle the SEAL Solutions spall liner achieved.

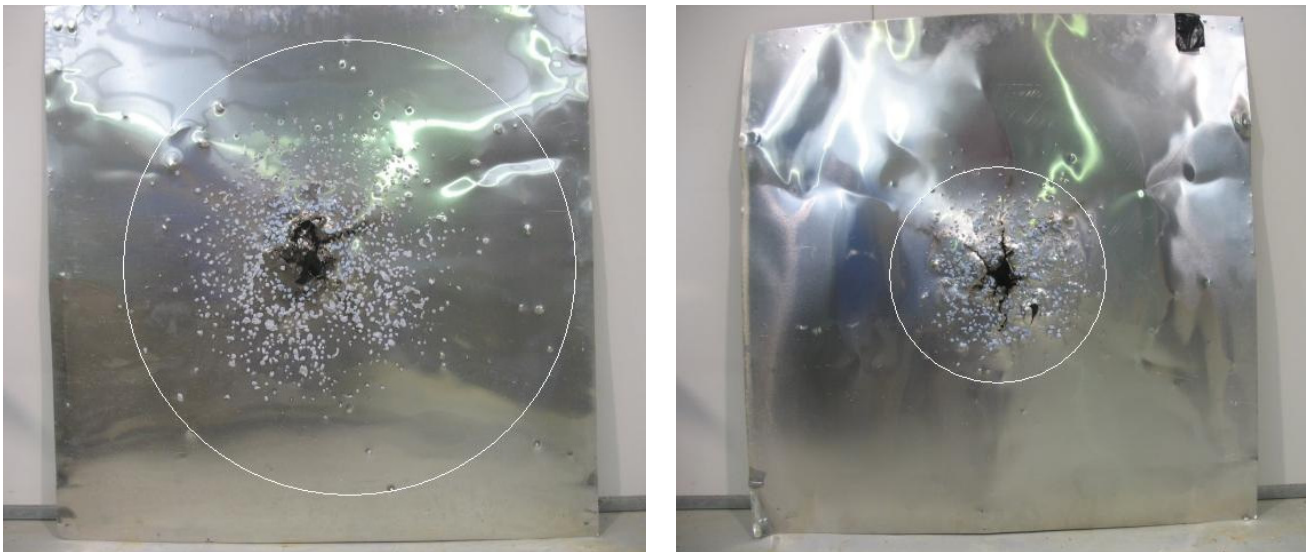


Figure 3 - Baseline Witness Plate - No Spall Liner Used (left), Witness Plate - SEAL Solutions Spall Liner Used.