



DEVCOM
GROUND VEHICLE
SYSTEMS CENTER



VEHICLE ARMOR LAB

OVERVIEW

The Vehicle Armor Lab (VAL) is a multifunctional facility that focuses on the research, development, fabrication, and integration of vehicle armor systems.

The VAL provides the capability to design and build composite systems for structural, armor, and general vehicle applications. Using computer-aided design (CAD) software and specialized equipment, VAL engineers and technicians can rapidly fabricate custom size and custom shape composite panels.

The VAL's specialized equipment includes an automated glass/panel washing system, Computer Numerical Controlled (CNC) router, automated wet table saw, curing oven, walk-in freezer, 180 psi autoclave, and a Graco XFR Rhino-coating

Above: The VAL is leading Transparent Armor research for the Army with an autoclave capable of adding 180 psi of pressure to a ballistic panel

machine for components containing metal, glass, ceramic, or thick section composites. The two Thermotron environmental chambers enable early durability testing.



The VAL is a recognized leader in the Vacuum Assisted Resin Transfer Molding (VARTM) process



BENEFITS

Ability to economically design, fabricate, and test prototype composite parts at a coupon, subsystem, and system level to find material issues early in the development stage. In conjunction with the onsite Survivability Armor Ballistic Laboratory (SABL) armor design concepts are rapidly fabricated, evaluated or tested. Fabrication of prototype parts and early testing improves transition to full-scale production.

CAPABILITIES

- Transparent Armor: Capable of fabricating and designing transparent armor coupons.
- Composites: Extensive use of composite materials and cutting-edge fabrication techniques including pre-preg autoclave-cured armor panels.
- Metals: Lightweight metals such as aluminum and titanium can be incorporated into armor designs. Capable of cutting 3" aluminum on the CNC router.

INSTRUMENTATION

- Thermal Cycling: Two Thermotron environmental chambers with humidity control
- Thermocouple data recorder for accurate cure cycle feedback



Overhead View of the VAL



The VAL has a diamond wet saw capable of cutting through silicon ceramic tiles and composite panels

GROUND VEHICLE SURVIVABILITY & PROTECTION (GVSP) is part of the U. S. Army Ground Vehicle Systems Center (GVSC). GVSP is responsible for ground vehicle ballistic protection, blast mitigating technologies, and hit and kill avoidance initiatives for the Department of Defense. GVSP uses its unique in-house laboratories and subject matter expertise to reinforce its reputation as the Army's technical authority on survivability in the following research areas:

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| • Ballistics and blast testing | • Vehicle crash and rollover assessment |
| • Armor component fabrication and characterization | • Active protection testing |
| • Dynamic impact/impulse testing | • Laser and fire protection studies |

For further Information visit: <https://www.usarmygvsc.com/> or contact: James P. Muldoon at james.p.muldoon3.civ@army.mil