

Small Arms Testing

KEYWORDS

Rifles

Pistols

Universal Gun
Systems

NIJ 0101.04

Lightweight Armor

Personnel Protection

Body Armor

Ballistics Testing

High-Speed Imaging

MIL-STD 662F

Non-Lethal Weapons
Development/Testing

Transparent Armor

Southwest Research Institute® (SwRI®) operates a Ballistics and Explosives Range and a Small Arms Test Facility. SwRI engineering dynamics experts are noted for their ability to effectively combine experimentation and numerical simulations to provide customers with answers and solutions to problems in penetration and armor mechanics.

The Small Arms Test Facility contains a control/instrumentation room, a gun room, and three target rooms. The rooms are located so that targets can be positioned at about 20, 50 and 150 feet from the gun. Adjustable target fixtures are available that provide quick vertical and horizontal adjustments of the target position.

SwRI has conducted many different types of small arms projects for more than 25 years, from complex programs involving considerable experimentation, materials evaluation and computations to simple, quickly executed projects that require only ballistic testing.

Capabilities

- Testing with:
 - Universal gun system with all standard cartridge reloading equipment
 - Rifled and smooth-bore barrels from .17 cal to 50 mm; all common pistol, rifle and shotgun barrels
 - U.S. and foreign ball, armor-piercing and fragment-simulating ammunition
- Live-fire testing of numerous handguns and rifles of various calibers
- High-speed digital video of impacts up to 200,000,000 frames per second
- High-speed data acquisition up to 200 MHz

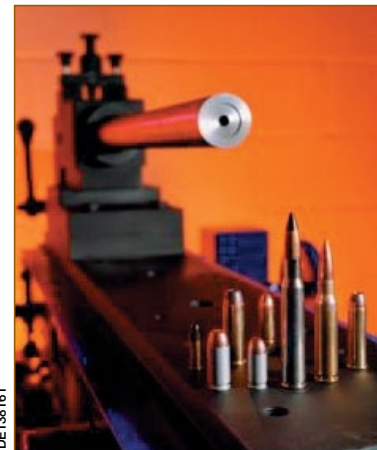
- ISO-compliant quality assurance
- Computational impact simulations
- Generation and storage of classified documents, materials and targets

Experience

- Ultra-lightweight body armor design and development
- Modeling and testing of fabrics and ceramic-faced armor
- Enhanced concealed armor: analysis, modifications and testing
- Evaluation and development of projectiles and/or armor systems
- Shooting of various protective structures such as windows and doors
- Evaluation and modeling of transparent armor
- Helmet performance and deflection studies

Facilities

- Indoor ballistics range
- Laser-based gun alignment system
- Test fixture fabrication, machine shop and welding
- Outdoor test areas up to 1,000 yards

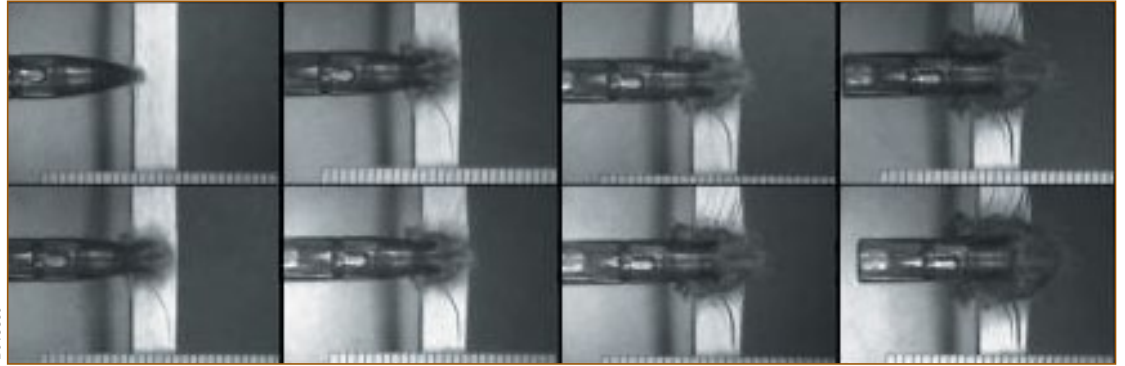


Universal gun system and various test rounds



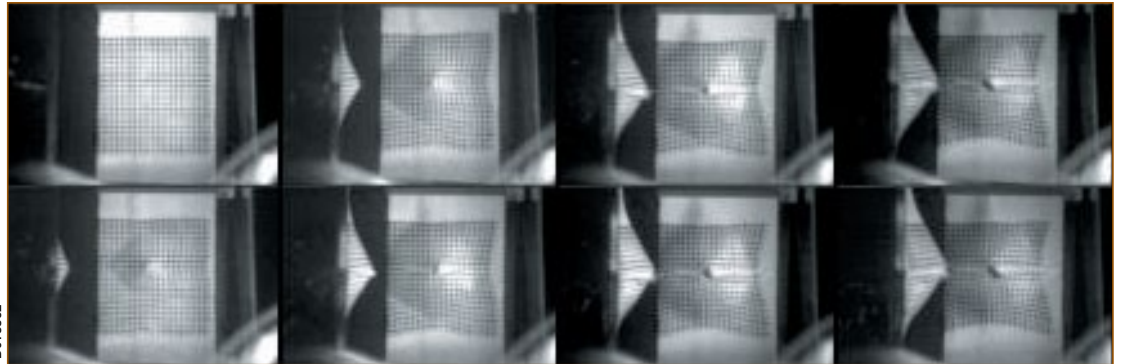
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Small Arms Test Facility (left to right: Control Room/Gun Room, Target Room #1, Target Room #2)



D013860

Ultra-high-speed image of a 7.62-mm bullet impacting a ceramic tile, showing formation and growth of cracks including the fracture conoid



D013862

Side and back views of the deformation of a ballistic fabric after impact (the grid structure on the fabric is used to assist in deformation-time measurements)



Southwest Research Institute is an independent, nonprofit, applied engineering and physical sciences research and development organization using multidisciplinary approaches to problem solving. The Institute occupies 1,200 acres in San Antonio, Texas, and provides more than 2 million square feet of laboratories, test facilities, workshops and offices for more than 3,000 employees who perform contract work for industry and government clients.

We welcome your inquiries.

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