

**ELASTO  
PROXY** INC.  
*The Art of Sealing*



## **Acoustic and Thermal Insulation**

Engine Bay Solutions for Military Vehicles

## Introduction



**Acoustic and thermal insulation won't stop an IED attack, but it's still mission-critical.**

**Learn about acoustic foams and thermal management materials, and how Elasto Proxy custom-fabricates insulation sandwiches that protect engines and soldiers against noise, heat, and vibrations.**

Military machines like the [MRAP](#) are designed to project power while protecting personnel. With their V-shaped hulls and add-on armor, the mine

resistant ambush protected (MRAP) vehicle can withstand IEDs, mines, RPG rounds, and small arms fire.

Ballistic protection alone won't keep armored vehicles on patrol, however. The MRAP is powered by a big diesel engine that runs hot and loud. Without engine bay insulation, heat and noise could put both the powerplant and military personnel at risk.

## Engine Bay Insulation for Armored Vehicles



[Acoustic and thermal insulation](#) isn't as strong as armor plating, but that doesn't mean vehicle designers have to choose materials that aren't ready to deploy. No, engine bay insulation isn't bulletproof; however, stopping shrapnel isn't the objective.

Instead, acoustic insulation is designed to dampen or even absorb sounds from the engine that would otherwise spread to the vehicle's interior. Similarly,

thermal insulation is designed to absorb heat from the engine compartment and deflect it away from the cab.

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## Sound Absorption and Thermal Management



Let's take a look at both types of insulation in greater detail, and examine some of the sound and heat absorbing materials that are used. We'll also address a few vehicle design questions.

For example, what if you need both acoustic and thermal insulation? For that matter, what if you also need vibration damping materials to reduce resonance and resulting sounds?

By using [sandwich-like structures](#) of multiple materials, engine bay insulation can provide protection against sound, heat, and vibrations.

## Acoustical Insulation for Sound Reduction

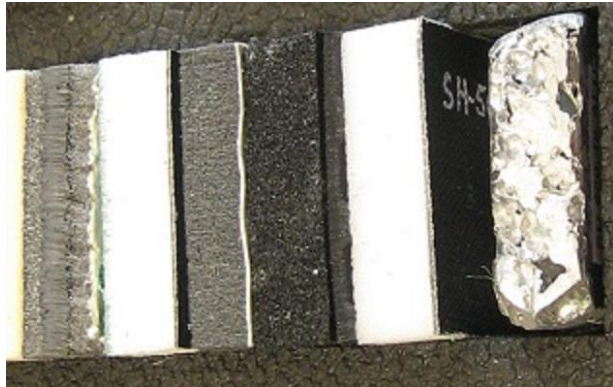


Sound absorbing insulation is made of lightweight, open-cell acoustical foams that may also offer resistance to fire, water, moisture, and extreme temperatures.

[Elastomeric materials](#) such as urethane, polyurethane, polyester, and hydrophobic melamine are used and may meet flame, smoke, and toxicity (FST) standards.

Typically, acoustic foam insulation is supplied in thick sheets and then cut to size. Film facings and pressure sensitive adhesives promote installation on the assembly line or even in the field.

## Thermal Insulation for High-Temperature Environments

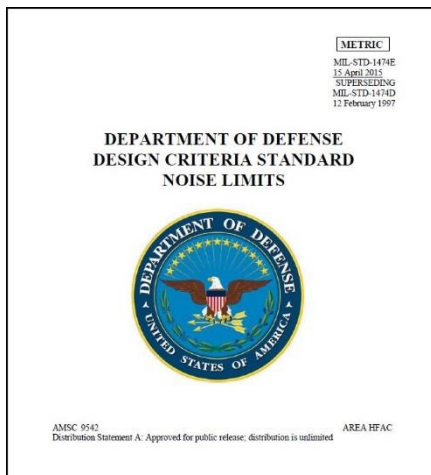


Heat management materials include melamine and polyimide foams, aluminum foil-faced fiberglass fabric composites, and closed-cell [custom thermal insulation](#) that's designed to stop the propagation of flame and smoke.

As with acoustic insulation, these thermal insulators are supplied in thick sheets and then cut to size. [Fireproof rubber](#) that meets FST standards is available, and some thermal management materials

reflect significant amounts of radiant heat while also providing a vapor barrier.

## Meeting Military Standards

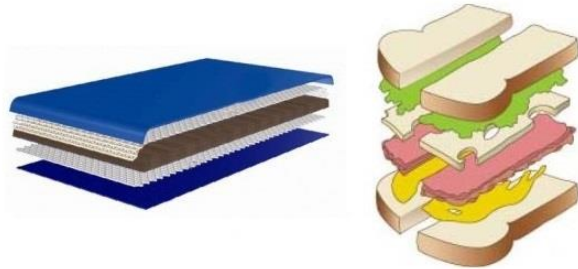


If you're a vehicle designer or a technical buyer, choosing the right materials for thermal and acoustic insulation can also mean meeting military requirements.

For example, the U.S. Department of Defense recently released a new standard, [MIL-STD-1474E](#), that specifies the maximum permissible noise levels produced by military systems.

In addition to supporting speech communications in noisy environments, MIL-STD-1474E seeks to minimize the risk of permanent noise-induced hearing loss.

## Insulation Sandwiches for Noise, Heat, and Vibration



provides protection against noise, heat, and vibration.

Compound selection is important, but insulating an engine bay may require multiple materials.

By building sandwich-like structures that include not just foams and foil-faced fabrics but also fillers, adhesives, and barrier materials, Elasto Proxy can create custom insulation that

With our [water jet cutting](#) and [taping](#) capabilities, Elasto Proxy cost-effectively cuts insulating materials to size, assembles them, and then delivers solutions that are ready-to-install.

## Visit Elasto Proxy at CANSEC (Booth #935) | Two Informational Sessions



Canada's Premier Defence Trade Show | May 27 & 28 | EY Centre | Ottawa



Do you have questions about acoustic or thermal insulation for military vehicles?

Would you like to learn more about “insulation sandwiches” that are effective, efficient, and easy-to-install?

If you're headed to CANEC 2015, please [visit Elasto Proxy in Booth #935](#) on May 27 or May 28 in Ottawa.



**WE EVOLVE  
TO BETTER SERVE  
YOUR NEEDS.**



## How Can We Help You?



For over [25 years](#), Elasto Proxy has been solving sealing and insulation challenges in a wide variety of industries. How can we help you?

[Contact us](#) at our website or via any of the methods below.

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