



Over the last several years, rigid thermal coatings such as Firwin's HC, have found wider application in stationary and mobile engine systems.

## Making Hard (or Soft) Choices

Choosing between using thermal insulation blankets or newer hard coat insulation depends on the application

Thermal insulation remains a key safety and operating technology for a wide range of engine-powered vehicles and equipment. It offers many benefits, including shielding hoses, wiring, electric and electronic components from excess heat. This can reduce the potential for fires, protect operating personnel from burns and reduce sound emissions from machines and equipment.

But nowadays, the equipment designer or packager has more choices to make in terms of exactly what medium is used to cover hot surfaces on engines and exhaust systems.

For decades, insulation blankets were the only solution, but the last several years have seen the development of new generations of solid-coated insulation products. For example, Firwin Corp., the Ontario, Canada-based manufacturer of removable insulation blankets, tapes and sleeves, last year introduced Firwin Hard Coat (HC), a rigid insula-

tion material that is designed to be directly affixed to the product.

Unlike insulation blankets, hard coat insulation materials are applied directly to the component to be insulated. The product consists of a lightweight, durable exterior. This is typically applied to components such as exhaust manifolds, turbochargers, elbows and exhaust tubing. Since its introduction, Firwin said the HC system has been applied in a range of industries, including mining, marine and defense.

According to Firwin President Paul Herman, "For certain high-temperature applications where protection from oil leaks is a priority, space is at a premium and an insulation product is required, Firwin HC is a definite option and may be more economical in the long run."

The growth in the application of such new types of thermal insulating technologies — which have been spurred by an increased emphasis on machine

safety as well as the desire to maximize heat loading in emissions-related components and systems — have made the selection of specific insulation techniques more of a challenge.

"There are a number of factors to consider," said Brett Herman, Firwin's vice president of engineering and customer service. "Does the customer require removable insulation? Are there space constraints?"

"Is the application such that there is the potential of fluid seeping into the insulation material, thereby posing a fire hazard? These are just some of the factors that need to be taken into account when deciding between hard coat and standard removable insulation blankets."

Each of the technologies has its own particular advantages and drawbacks. The hard outer surface of HC materials makes them less prone to tears or punctures than standard silicone-impregnated blankets and less prone to



**Blanket insulation is generally easier to install and also provides a higher degree of sound attenuation.**

damage from fluid leaks. In addition, HC insulation is formed directly to the component to be insulated, making them more compact, which can be critically important in engine compart-

ments where space is at a premium. The hard outer coating is also more durable than blankets and is made from noncombustible materials.

HC materials do have their limitations, however. Making them conform exactly to the component being insulated requires that the part be shipped to Firwin, where the HC material is applied through a proprietary process. “While Firwin HC has its advantages, it cannot be removed should a part need servicing,” noted Paul Herman. “The coating must be applied at our factory. It is also more expensive up front than traditional insulation blankets.”

The advantages of insulation blankets in some applications remain significant, the company said. They are designed to be easily installed, requiring no special tools or training for installation. Importantly, they can also be easily removed, a key benefit where equipment might require periodic maintenance and inspection.

Firwin Insulation blankets are typically designed remotely using mea-

surements, drawings and digital pictures. Firwin maintains an extensive library of patterns covering a wide range of engines and exhaust system components — minimizing redesign. Each custom design is stored, and replacement sections can be easily made should any part of the insulation blanket be damaged.

Traditional blanket designs can be susceptible to fluid absorption of flammable fluids from leaks into the insulation material. Through careful design and material selection Firwin Corp. has been able to minimize this issue. All the materials used in the blankets are noncombustible, the company said.

Along with its thermal shielding properties, insulation blankets also typically offer greater sound absorption than hard coat materials and also tend to be more vibration resistant.

As with most technologies, the choice as to which material to use comes down to the specific application. Firwin said that its in-house and field personnel are trained to assist in selecting the optimum material for the job. 