

## RADIATION INSULATION

**T**he Apollo spacecraft was a masterpiece of temperature control technology. It had to be, to protect astronauts from temperatures that ranged 400 degrees above and below zero Fahrenheit.

A prime element of the environmental control system that permitted astronauts to work inside the Command Module in shirt-sleeves was a highly effective radiation barrier. Made of aluminized polymer film, it barred or let in heat to maintain a consistent temperature in an environment where ordinary insulative methods would not have sufficed. The key was aluminization of the material, which provided a

reflective surface that kept more than 95 percent of the radiated energy from reaching the spacecraft interior.

The radiation barrier has since been used on virtually all spacecraft, including unmanned spacecraft where delicate instruments need protection from extremes of temperature. It is also a key element of a sophisticated energy conservation technique for home and office building installations, plus a variety of special applications.

An example of companies supplying variations of the space-developed material is Quantum International Corporation, Puyallup, Washington. Quantum markets several trilaminated insulating materials known as Super "Q"® Radiant Barrier. Quantum's insulation is a combination of high grade industrial aluminum foil overlaid around a central core of another material, usually fire-resistant propylene or mylar. This central layer creates a thermal break in the structure, thereby allowing low values of radiant energy emission. The highly polished surface of the aluminum reflects as much as 97 percent of all infrared radiant energy (heat).

Quantum supplies materials for domestic and international contractors who use Super "Q" Radiant Barrier for thermal insulation of homes



and office buildings, and for a variety of industrial applications. A novel application for housing units is displayed **at left** by Quantum's senior vice president, Preston E. Smith, and Darrel A. Duisen, president of Global Development and Trading Corporation, Pauma Valley, California, which manufactures these modular panels in the U.S. and abroad.

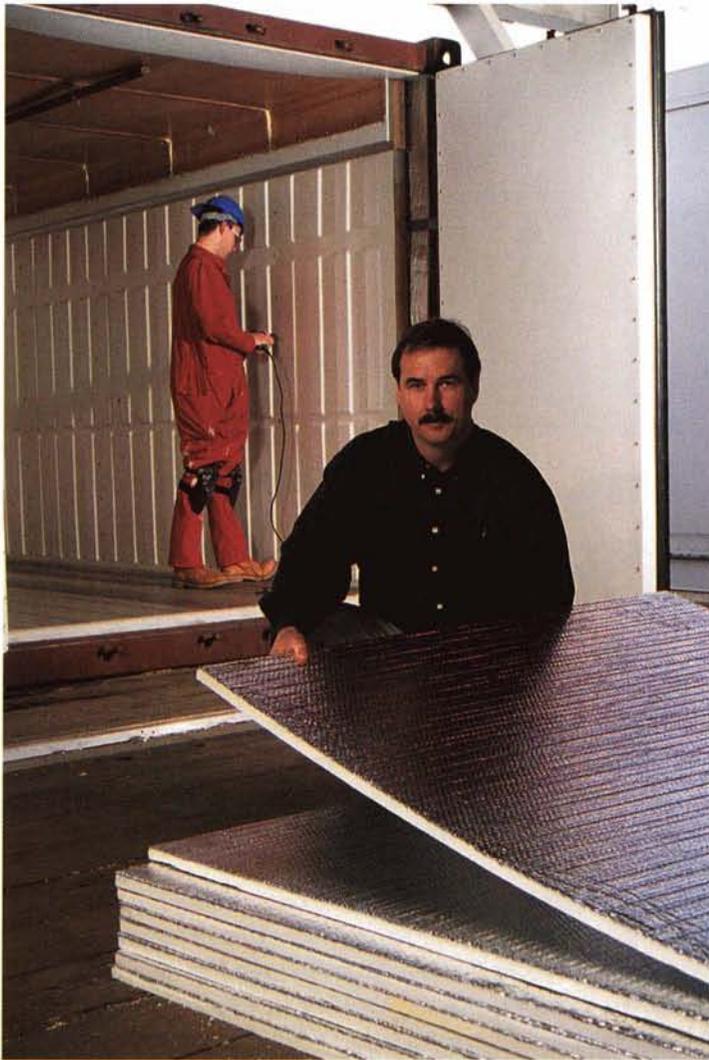
**Above** is a cutaway panel, showing the Super "Q" insulation sandwiched between an expanded polystyrene core strengthened with a steel wire grid. The panel weighs less than 30 pounds and can be lifted to heights by hand or winch pulley, which gives it special utility in undeveloped countries where cranes are often not available. The panels can be used for walls, floors or ceilings.

In addition to serving the traditional home and indus-



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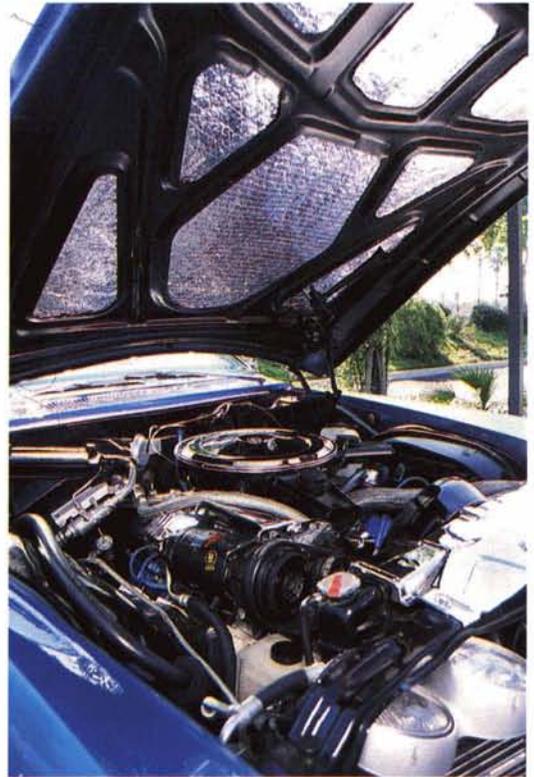
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trial market, Quantum is supplying Radiant Barrier for mobile applications, such as autos, trucks and food transports. **Above**, Quantum International president Mike Kerschner (foreground) displays a Quantum Cool Wall® panel while technicians of Cryo-Power Inc., Astoria, Oregon complete installation of Cool Wall in a cryogenic mobile container. The light-

weight panels take up less space while providing superior insulation value. Grocery and produce transporters use Super "Q" panels to line their trailers and containers, warding off unwanted heat during transportation to reduce spoilage and costs.

Auto and truck manufacturers are also using Super "Q" Radiant Barrier as reflective thermal liners in certain



parts of the vehicles to maintain passenger comfort by dampening sound and by blocking engine, exhaust and solar heat. **At left** are Garth Moore and Ken Loomis (hand on hood), co-owners of U-B-Kool, Reno, Nevada, a company that installs Super "Q" products in autos and trucks. The closeup **above** shows the under-the-hood insulation.

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