

ALUMINUM

Project Fact Sheet



REFLECTIVE ALUMINUM CHIPS

BENEFITS

- Saves energy equal to nearly 14 barrels of oil each year for each warehouse roof with an area of 10,000 square feet
- Offers promise of energy savings that could total the equivalent of 1.3 million barrels of oil annually for 100,000 warehouses of the same size
- Reduces air conditioning energy consumption (savings could total as much as 8.6 trillion Btu annually in the United States if all dwellings had such roofs)
- Increases the roof's service life, reducing maintenance and reroofing costs
- Cuts down on installation costs and effort because of lighter weight than stone aggregate coverings

APPLICATIONS

This technology was designed to be used on asphalt roofing. It is applicable to buildings of all sizes. The inventor plans to expand its application to other areas where energy conservation is vital.

CREATING UNIFORM ALUMINUM CHIPS FOR REFLECTIVE ROOFING

The energy demands and resulting pollution created from using air conditioning in warm climates are increasing concerns. In the United States alone, air conditioning consumes more than 0.85 quadrillion Btu per year, leading to frequent power outages and shortages. Applying reflective aluminum chips to dark asphalt roof coverings is an inexpensive, lightweight, effective way to reduce the contribution that these types of roofs make to the air conditioning power load.

Until the mid-1980s when these chips were developed, the building industry typically mixed gravel into the asphalt, sprayed a reflective pigment, or covered the asphalt with a pigmented rubber sheet. Reflective aluminum chips are much lighter than gravel and are so cost-effective that they are ideal not only for hot climates, but also for use on large roofs or with low-cost housing, among many other uses.

REFLECTIVE ALUMINUM CHIPS



Aluminum chips form a highly reflective surface on asphalt roofs, cutting down on heat absorption by the dark pigmented asphalt, and decreasing the need for air conditioning inside.



Project Description

Goal: The goals of this project are to move the technology into a full-scale demonstration project and to interest the building and roofing industries in adopting the technology.

The 1-mm-square aluminum chips are produced through a proprietary process where small streams of liquid metal are rapidly solidified. The chips are air-sprayed on site at a rate of three or four pounds per builder's square (100 square feet) of asphalt flood coat while the fresh asphalt is still tacky. The chips can also be applied to rolled roofing materials at the factory, using available equipment that can be easily modified.

Transmet Corporation is developing this new technology with the help of a grant funded by the Inventions and Innovation Program through the Department of Energy's Office of Industrial Technologies.

Progress and Milestones

- Since its introduction in 1984, this invention has been used on more than 33 million square feet of roofing.
- Although most of the applications have been to roofs in the United States, the technology has also been used on roofs in Singapore, Bahrain, and the United Kingdom.
- Patents have been obtained.
- In 1985, test roofs in five locations were installed and evaluated.
- Reflection and environmental tests were performed on 88 roofing samples.



The Inventions and Innovation Program works with inventors of energy-related technologies to establish technical performance and conduct early development. Ideas that have significant energy savings impact and market potential are chosen for financial assistance through a competitive solicitation process. Technical guidance and commercialization support are also extended to successful applicants.

PROJECT PARTNERS

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INDUSTRY OF THE FUTURE—ALUMINUM

Through OIT's *Industries of the Future* initiative, the Aluminum Association, Inc., on behalf of the aluminum industry, has partnered with the U.S. Department of Energy (DOE) to spur technological innovations that will reduce energy consumption, pollution, and production costs. In March 1996, the industry outlined its vision for maintaining and building its competitive position in the world market in the document, *Aluminum Industry: Industry/Government Partnerships for the Future*.

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