

Silicide-Based Coatings and Structural Components

**A GLASS
INDUSTRY VISION:**

**ONGOING RESEARCH
PROJECT**

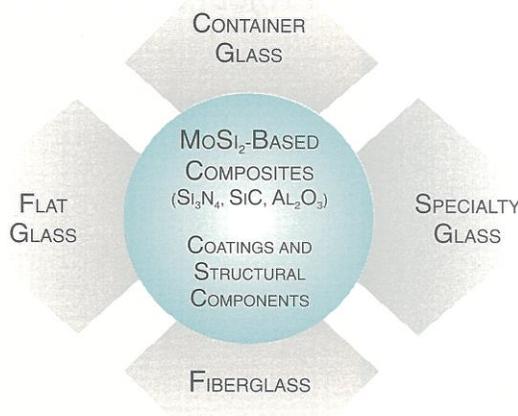
Opportunity for Industry

Silicide-based coatings and structural components offer glass manufacturers a cost-effective way to reduce the erosion of glass refractories and components from molten glass. Researchers at Los Alamos National Laboratory (LANL) have developed advanced high-temperature materials — MoSi_2 and MoSi_2 composites — to enhance the performance of glass-melting furnaces and components in the melt and, consequently, reduce the significant loss associated with erosion.

To meet industry needs as well as federal objectives for improving energy efficiency, LANL will team with industry partners through Cooperative Research and Development Agreements (CRADAs). Ultimately, industry involvement will help to ensure the commercial acceptability of the advanced materials in industrial applications.

MoSi_2 -based materials will benefit all segments of the glass industry — container glass, flat glass, fiberglass, and specialty glass — as well as other energy-intensive industries such as the aluminum, chemicals, forest products, metalcasting, petroleum refining, and steel industries. The key benefits include:

- Reduced waste
- Energy savings
- Increased fuel efficiency
- Increased unit life
- Increased productivity
- Reduced costs



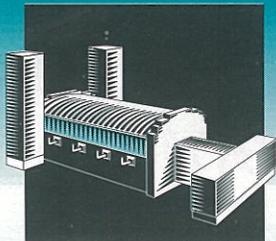
Project Partners

Office of Industrial Technologies
U.S. Department of Energy
Washington, D.C.

Los Alamos National Laboratory
Los Alamos, New Mexico

Schuller International
Littleton, Colorado

Molybdisilicide-based high temperature structural materials will enhance performance in and provide benefits to all four of the glass industry segments.



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Project Description

LANL has signed a CRADA with Schuller International Mountain Technical Center to jointly develop silicide-based coatings and structural components for furnaces that produce fiberglass.

The project consists of three phases: 1) establishing the performances of the silicides, 2) optimizing the coating and component performance, and 3) fabricating full-scale components to transfer the technology to industry.

Benefits

Advanced coatings and structural components fabricated from MoSi_2 -based materials will have the following significant impacts on the glass industry:

- **Reduced Waste** — Disposal of hazardous refractories in landfills will decline. Additionally, CO_2 , NO_x , and SO_x emissions will be reduced.
- **Energy Savings** — The glass industry is expected to save energy by replacing conventional burners with burners made from advanced materials.
- **Increased Efficiency** — Longer glass-melting campaigns will increase fuel efficiency, as well as component and refractory life.
- **Reduced Costs** — The use of advanced materials for the production of fiberglass will save the glass industry millions annually.

Commercialization Plan

Under a proprietary information agreement, LANL will provide Schuller with MoSi_2 -based coatings and structural components for on-site industrial performance testing. The CRADA will facilitate technology transfer.

Project Span: 1st Quarter 1996 - 1st Quarter 1999



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