

# BOYD

## CORPORATION

[WWW.BOYDCORP.COM](http://WWW.BOYDCORP.COM)

### SOLIMIDE® FOAMS



One Company, Many Solutions

### History of SOLIMIDE® Polyimide Foam

In the early 1970's, the first polyimide foam was created. NASA then sponsored additional development of the technology to decrease the flammability, smoke and toxicity of materials used in space environments. The space agency's search for non-burning, lightweight foam systems led directly to the development of SOLIMIDE® polyimide foam, which was initially used as thermal insulation and cushioning for the space shuttle program.

### Development of SOLIMIDE® Polyimide Foam

Today, the primary insulation systems used aboard all U.S. Navy warships and submarines are based on SOLIMIDE® Foams. International navies and operators of weight sensitive commercial vessels also take advantage of SOLIMIDE® Foams' lightweight and fire resistant properties to improve overall ship performance and life cycle costs.

As an outgrowth of the work with NASA, SOLIMIDE® Foams are being produced in an extremely lightweight form to meet the requirements of aerospace, aircraft and airframe manufacturers. These lighter foams give manufacturers major weight savings, while retaining excellent thermal and acoustic insulation properties.

### Properties include

- Lightweight
- Superior fire resistance
- Virtually no smoke or toxic gas production
- Outstanding thermal and acoustic insulation
- Environmentally friendly
- Proven durability
- Easy installation
- Wide operating temperature range
- Dimensional stability across full temperature range



### Partnering to Deliver Engineered Systems

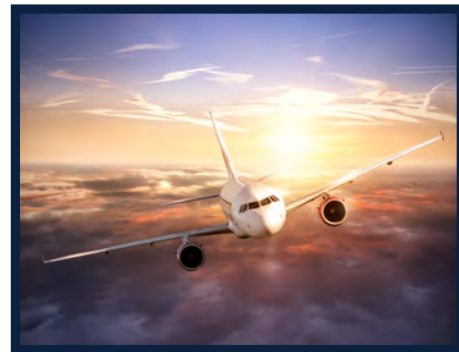
From cryogenic tanks and pipelines, to sensitive analytical and medical instruments, ovens and high temperature industrial applications, SOLIMIDE® Foams offer unique properties for your insulation needs. Whether your application requires an off-the-shelf or custom solution, SOLIMIDE® Foams and its worldwide distributor network are ready to assist you to solve tough design problems.

# SOLIMIDE® FOAMS

## Aircraft and Aerospace

SOLIMIDE® aircraft foam products are the ideal insulation to meet the stringent requirements of the aircraft and aerospace industries. They provide excellent acoustic and thermal insulation at extremely low weight and maintain dimensional stability and flexibility over a wide temperature range. Their superior fire resistance meets FAR 25.856(a) Radiant Panel Flame Propagation Rule; toxic gas, smoke generation and offgassing are virtually non-existent.

With a proven in-service durability record in hot, humid environments, they outperform traditional fiberglass insulation by retaining insulating properties far longer. SOLIMIDE® Foams are self-supporting and non-fibrous - making them easy to handle, quick to install and requiring fewer fasteners. They can be found in Airbus, Boeing, Canadair, Embraer, business jets, military aircraft and helicopters, as well as in demanding aerospace applications, including the International Space Station, Mars Rover, solar shields and cryogenic fuel tanks.



## Marine

SOLIMIDE® Foams are used as thermal and acoustic insulation on board military naval and commercial vessels around the world. Literally tons of topside weight is saved when lightweight SOLIMIDE® Foams replace heavier fibrous glass insulation in bulkhead, overhead, duct and piping applications. End users also choose SOLIMIDE® Foam for its excellent fire, smoke and toxicity performance in a fire scenario. SOLIMIDE® HT-340 foam is certified as a Fire-Restricting Material in accordance with the International Maritime Organization (IMO) High Speed Craft code. Over 15 navies and many commercial operators worldwide have chosen SOLIMIDE® Foams as the marine insulation solution for their vessels.

***SOLIMIDE® Foams aviation, marine and industrial products offer major benefits in design, outfitting and retrofit applications worldwide.***





### Rail

SOLIMIDE® Foams offer a lightweight, non-fibrous solution for thermal and acoustic insulation in the rail industry. It is especially useful in areas that see humid conditions, high temperatures, or where loose fibers are a concern. SOLIMIDE® Foams meet the U.S. FRA and FTA (Docket 90-A) Recommendations for Flammability and Smoke Emission Characteristics. Typical applications include sidewall and roof insulation, HVAC systems and packing or seals around doors and windows.



### Cryogenic

SOLIMIDE® Foams' ability to maintain its flexibility at liquid nitrogen gas (LNG) temperatures makes it a superior choice for cryogenic expansion joints, designed to absorb expansion and contraction stresses caused by thermal cycling of rigid insulation materials. The foam is used as joints and pipe shoes for pipelines at olefin production and petrochemical facilities. Other cryogenic applications using SOLIMIDE® Foams include medical storage and transport units, cryogenic fuel tanks and wind tunnels.



### Industrial

SOLIMIDE® Foams' unique combination of properties makes it an ideal choice for many industrial applications. Because of its +300°C continuous use temperatures and inherent fire resistance, SOLIMIDE® Foams are used in environments as diverse as ovens to nuclear power plants. Its very low off-gassing makes it a superior choice for sensitive electronic, medical and analytical instruments. SOLIMIDE® Foams are lightweight, durable, and exhibit excellent acoustic, thermal and chemical resistance properties. In addition, it can be fabricated into a variety of shapes and sizes, making it easy to install in any industrial application.



### Applications



#### Thermal & Acoustic Insulation

SOLIMIDE® Foams are combined with a variety of vapor barriers, coatings and facings to provide long-lasting, lightweight thermal and acoustic insulation packages with superior fire resistance. Pressure sensitive adhesive backings are also available.



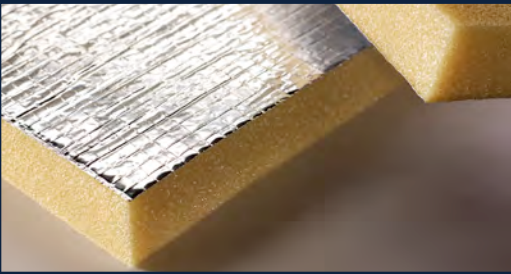
#### Noise Transmission Loss Blanket

Glass cloth or other facings laminated to the surface of SOLIMIDE® Foams are used in combination with a variety of septum materials to treat noise transmission problems. These systems also offer outstanding acoustic absorption properties, superior fire resistance, easy installation and can be designed to be fiber-free.



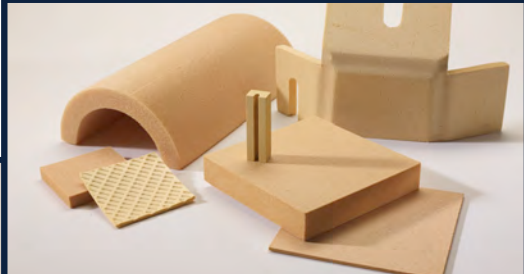
#### Duct Insulation

SOLIMIDE® Foams are laminated to reinforced aluminum and polyester or elastomeric vapor barrier films and shaped for easy installation as external duct wrapping. They also come sealed in a thermoplastic film or laminated to other facings, such as aluminum foil or ceramic glass cloth.



#### Pipe Insulation

SOLIMIDE® Foams are readily cut into one and two piece shapes for easy pipe covering installation. A facing or coating can be applied to provide a vapor barrier. Pipe insulation made of densified foam is also available.



#### Acoustic Ceiling Panel

Attractive, lightweight ceiling panels are designed to fit T-bar grid systems. They provide excellent acoustic absorption along with fire safety, durability and easy ceiling access.



#### Densified, Flexible Foams

SOLIMIDE® Densified foams are flexible yet firm offering a combination of excellent thermal insulation values and lightweight support for applications requiring material with higher compressive or tensile strength.

## SOLIMIDE Polyimide Foam Characteristics

SOLIMIDE® Foams have an unrivaled advantage over traditional insulation materials, making them the products of choice for solving tough problems aboard marine vessels and aircraft in industries worldwide.

### Flame Resistant

Inherently non-flammable, SOLIMIDE® Foams emit virtually no smoke or incapacitating toxic byproducts when exposed to open flame.

### Lightweight

SOLIMIDE® Foams are extremely lightweight - translating into fuel savings and extra payload capacity.

### Wide Temperature Operating Range

SOLIMIDE® Foams remain functional when exposed to extremes of cold and heat that would degrade competitive polymer foams. The foam maintains flexibility even at cryogenic temperatures.

### Acoustic and Thermal Performance

SOLIMIDE® Foams offer excellent acoustic absorption and good thermal insulation properties.

### Environmentally Friendly

This non-fibrous insulation requires no special handling. No halogens, heavy metals, formaldehyde or ozone-depleting chemical are used in the manufacture of SOLIMIDE® Foams.

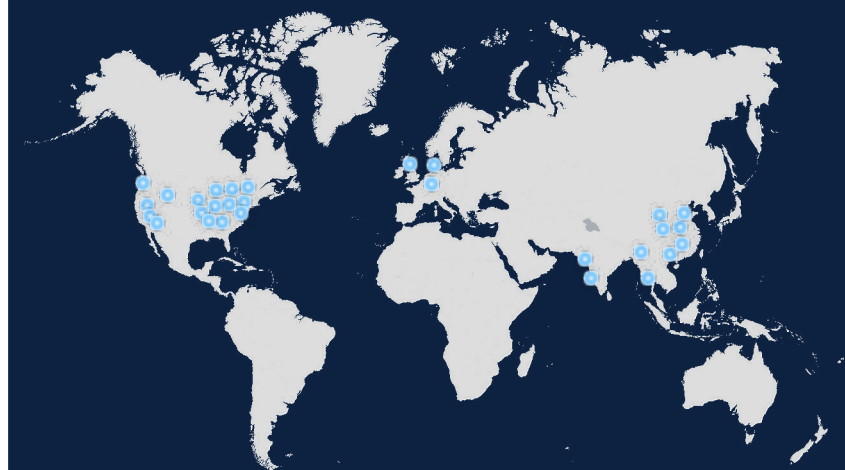
### Productivity

SOLIMIDE® Foams products are more cost effective to handle and install than fibrous insulation. They are light, easy to cut and fit, and readily adapt to fabrication with other materials.

### Durable

SOLIMIDE® Foams show significantly greater resistance to damage than traditional insulation products. They maintain integrity after long term usage in a vibrating environment and when exposed to extremes of cold and heat that would degrade other products. Polyimide foams also have a high degree of chemical stability and are resistant to hydrocarbons, alcohols and non-concentrated acids.

## Global Presence



### Corporate Headquarters

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## Boyd America

Our highly-trained North American support teams are here to assist with your program management requirements, material selections, product design, commodity management, application engineering and raw material or finished goods testing. Our cross-functional team can be tailored to your unique needs and will closely monitor your initiatives and new programs, while ensuring tight management of new product introduction, volume production and delivery deadlines.

Arkansas • California • Connecticut • Georgia • Indiana • Michigan • New Hampshire • New York • North Carolina • Oregon • Pennsylvania • South Carolina • Tennessee • Washington • Wisconsin • Mexico

## Boyd Europe

Our engineers have decades of research and develop experience to provide European customers with the highest quality custom technologies. Boyd excels in rapid prototyping and regional design services deployed for global mass production. We offer sophisticated order management that caters to your custom EDI or supply portal needs with just-in-time stocking and delivery support. Boyd delivers high touch customer service in a global environment, optimized for your complex value chains.

Italy • Germany • Poland • United Kingdom

## Boyd Asia

With operations spread across Asia, Boyd's global manufacturing footprint, engineering design centers and clean room capabilities from Class 100 to Class 100,000 provide consistent quality, speed and cost-effectiveness with centers of excellence and quality management systems to meet the unique needs of highly diversified industries, providing Asia-Pacific customers as well as global OEMs reliability throughout the product life cycle.

China • India • Singapore • South Korea • Taiwan • Thailand • Vietnam