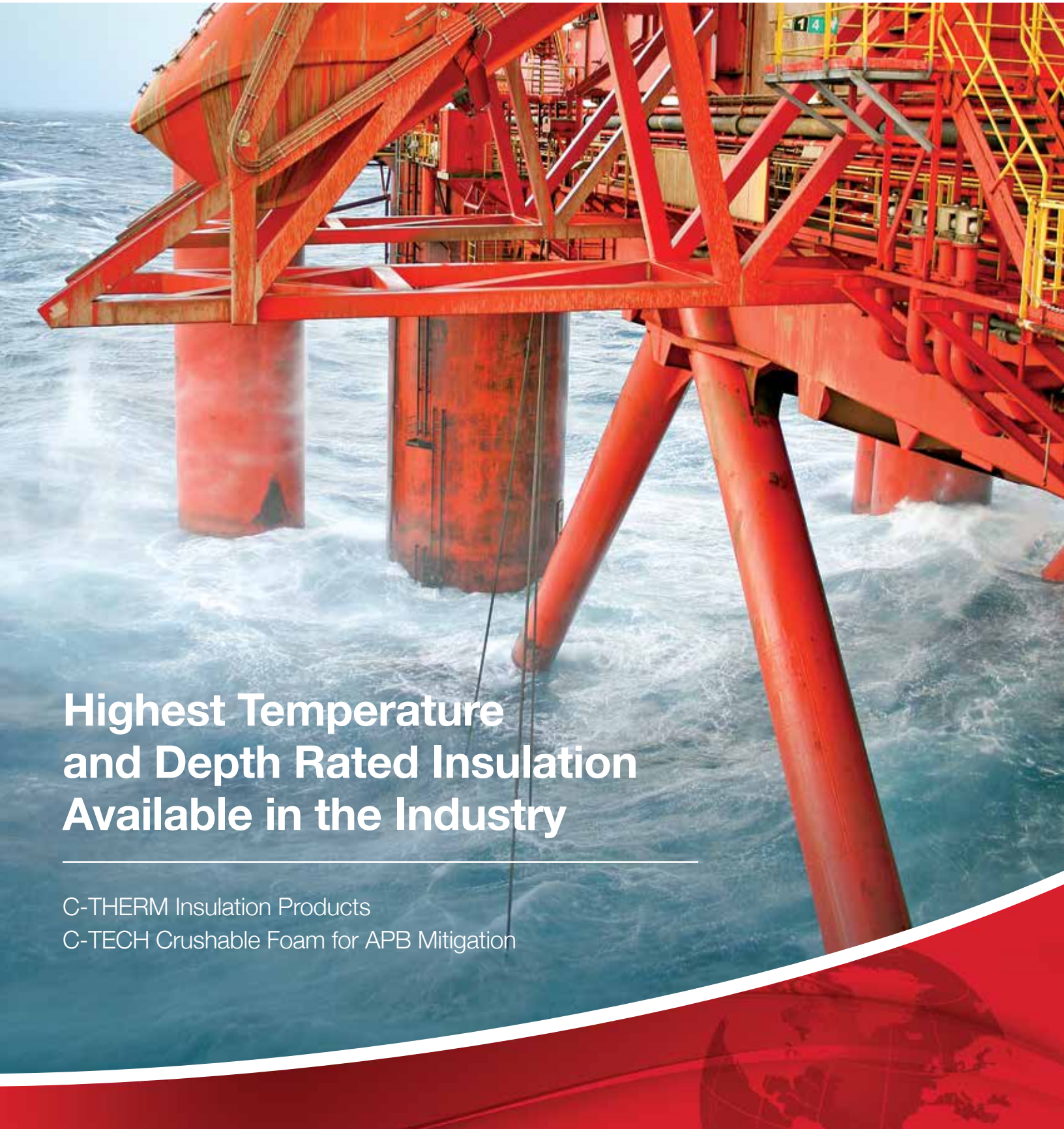
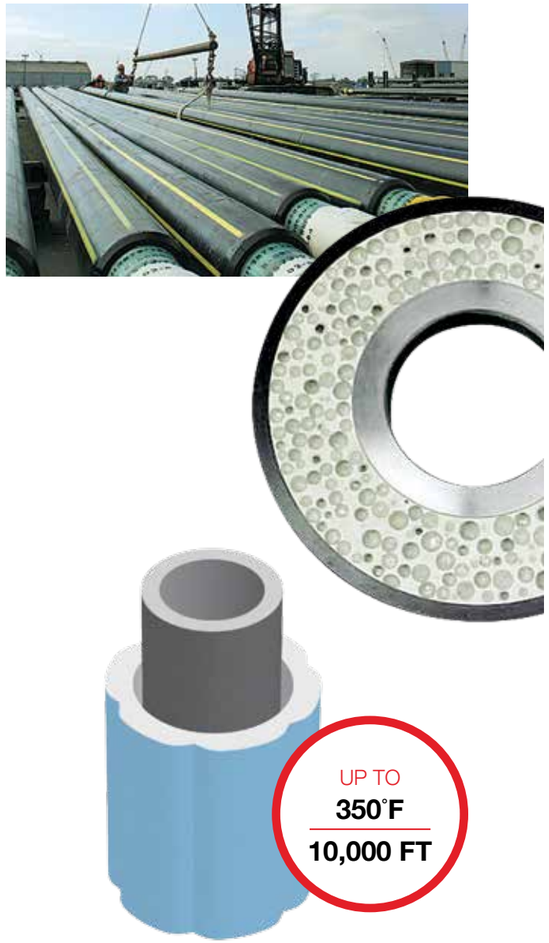
CUMING INSULATION
an AFGlobal Company



Highest Temperature and Depth Rated Insulation Available in the Industry

C-THERM Insulation Products
C-TECH Crushable Foam for APB Mitigation

Cuming Insulation featured on the Atlantis Manifold.



Subsea Thermal Insulation

Modern offshore oil fields in deep water require thermal insulation to keep well products warm and flowing. C-THERM FPP and FPR epoxy-based insulation products, produced by Cuming Corporation, are the highest temperature and depth rated systems available (350°F and 10,000 feet). Our materials are fully qualified to recognized industry standards. C-THERM CSR syntactic foam insulation materials are available in a full range of products designed for ease of installation on sleds, trees, manifolds, jumpers, and other subsea equipment.

C-THERM FPP and FPR

Pour-in-place syntactic materials provide a quick and easy way to insulate even the most complex shapes. Low-temperature curing means that work can be done out of doors without special equipment or preparation. These materials are provided as pre-weighed kits to be mixed and applied at any worksite by our factory-trained technicians.

C-THERM CSR

The patented process by which Cuming Corporation applies C-THERM CSR syntactic foam insulation to pipe is innovative and unique. The insulation material is tightly bonded to the anti-corrosion coating of the pipe, preventing any water intrusion and reducing the danger of “hot/wet” corrosion under the insulation.

C-THERM FPG

Pack-in-place syntactic foam insulation is supplied in two-part, pre-weighed kits. The material is easily mixed together to a consistency of modeling clay that will cure into a tough rigid solid at ambient temperature. The application method, which does not require molds, allows this material to be applied to complex surfaces very easily.

C-THERM FPC

Precast blocks, panels, half-shells, and other shapes of syntactic foam insulation can be made for bonding, bolting, or strapping directly onto the equipment. Made from semi-rigid C-THERM syntactic foam, these custom shapes offer outstanding thermal insulation over a long reliable life. Fastening systems including special compliant adhesives are provided, along with expert engineering advice and trained installers.

Insulation Testing

Syntactic foam has over 30 years of successful history as a buoyancy material. Its use as an insulation material, however, is more recent and less well established. Recognizing this, Cuming Corporation operates one of the most robust testing and qualification programs in the industry, with hundreds of candidate materials under test. A number of heated pressure vessels are used to perform characterization and accelerated aging on syntactic foam samples, ranging from small screening chips to full-sized modules weighing up to 450 kg (1,000 lbs).

Dedicated to rigorous testing of all of our products to ensure consistent quality, Cuming Corporation is actively involved in an insulation testing program at Heriot-Watt University in Edinburgh, Scotland, SouthWest Research Institute in San Antonio, Stress Engineering in Houston, MERL in the U.K., and Doosan in Scotland. We evaluate insulation samples at water temperatures and pressures simulating conditions expected over the typical 20-year operating lifetime of a subsea pipeline system, and we use the latest scientific equipment to ensure our materials meet customer specifications.

The typical testing hierarchy consists of the following stops:

- Initial screening to determine the hydrothermal resistance of the polymer and fillers
- Long-term testing to verify performance over extended periods
- Type-specific testing for actual project qualification

C-THERM Applications

PRODUCT	PURPOSE
Flowlines	Using proprietary patented cast-on-pipe technology, rigid or flexible C-THERM insulation is applied to any subsea flowline.
SCRs	A variation of the cast-on-pipe process to apply C-THERM coatings of controlled flexibility and buoyancy to steel catenary risers.
Vertical Risers	Similar methods are used to create optimized combinations of insulation and/or buoyancy for vertical riser systems.
Hybrid Risers	Efficiently engineered insulation and buoyancy packages are made for both integral and non-integral pipe systems.
Field Joints	C-THERM syntactic foam is cast into sleeves, collars, and bulkhead covers for insulating joints in flowlines and SCRs.
Jumpers	Custom-engineered solutions combine a variety of C-THERM materials options to insulate all kinds of jumpers and similar lines.
Subsea Equipment	The widest choice of pack-in-place, pour-in-place, or precast shapes for insulating trees, manifolds, and equipment.

C-TECH Crushable Foam

A serious problem encountered in hot and deep offshore oil wells is annular pressure buildup (APB). Hot fluids may become trapped where successive lengths of casing overlap the annulus between the inner and outer casing, leading to pressure spikes that can collapse the inner casing as temperatures increase during production. When this happens, the well must be shut in and may be abandoned. Crushable foam is syntactic foam with precision-engineered properties tailored for wellbore conditions. Placed inside the annulus, the foam crushes at pressures and temperatures just below the pipe strength limits, thereby relieving stress on the casing and preventing collapse.

All grades of crushable foam can be supplied in either of two basic forms:

- Precast half-shells for strapping and/or banding to the casing at any location.
- Patented “cast on” syntactic foam applied directly to joints of casing pipe. Cuming Corporation engineers can assist in selecting grades and forms of crushable foam, along with accessories such as adhesives, straps, and fiberglass overwrap.

Specifying crushable foam begins with an analysis of down-hole wellbore conditions and definition of upper limits of pressure and temperature in the annulus, along with the required amount of volume relief. These parameters are compared to the properties of existing C-TECH materials and development steps taken as necessary to adjust performance. Finally, testing is performed to verify behavior under design conditions.

New Iberia, Louisiana

Our recently opened New Iberia facility produces our patented C-THERM syntactic foam insulation, which helps ensure steady flow of deepwater petroleum products from the wellhead to their final destination. This $3 million, 30,000-square-foot facility features state-of-the-art manufacturing and test equipment, with the potential for quadrupling manufacturing capacity in the years to come.

Our New Iberia facility offers related services for the convenience of our customers. Our plant is conveniently located at the Port of Iberia, offering barging facilities to access the Gulf of Mexico and the world beyond, and it also serves as home base for service teams handling custom insulation and repair work throughout the Gulf.

AFGlobal Oil & Gas

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