

# Cuming Corporation

225 Bodwell Street  
Avon, MA 02322.1148  
1.800.432.6464  
Fax 508.580.0960  
www.cumingcorp.com



PRODUCT INFORMATION AND ENGINEERING DATA SHEET

## TECHNICAL BULLETIN 625-2

### C-THERM FPP Pour-In-Place Syntactic Insulation

#### INTRODUCTION

Cuming Corporation's *C-THERM* product line of syntactic foam thermal insulation offers superior performance for deepsea oil and gas production. See Technical Bulletin 601 for an overview of the entire product line. This document is one of several bulletins describing insulation systems for field installation on subsea equipment. Other bulletins in the series include 625-1, "precast," and 625-3, "pack-in-place" materials.

#### SYNTACTIC FOAM

The basis of any *C-THERM* product is syntactic foam, an advanced composite material of glass or ceramic microspheres cast into a binder of semi-rigid epoxy plastic resin. The chemical and mechanical properties of *C-THERM* materials are adaptable to almost any operating condition.

#### FORMS AVAILABLE

*C-THERM* FPP pour-in-place syntactic foam is supplied in two-part liquid kits. The kits are intended to be mixed on site by factory-trained technicians for pouring into molds attached to subsea equipment. Cuming Corporation provides the molds, manpower, and all equipment as part of a "turnkey" project. The mixing and pouring operations are best performed under clean and dry conditions between 15° - 32° C (60° - 90° F). The following kits are standard. SIZE 1: 3.7 liter (1 gallon) kit, supplied in two containers. Intended for test and evaluation.

SIZE 2: 18 liter (5 gallons) kit, supplied in two containers. A convenient size for small jobs.

SIZE 3: 200 liter (55 gallons) kit, supplied in two containers. Our standard project size. Requires powered mixing and dispensing equipment.

OTHER SIZES: Custom-designed kits of almost any size and special-purpose pour-in-place materials can be designed for specific applications.

TOTAL COVERAGE: The *C-THERM* insulation system uses an "ensemble" of precast panels, pour-in-place kits, and pack-in-place syntactic foam to achieve total coverage of critical subsea equipment. Consult our engineers for advice.



C-THERM syntactic foam insulation

#### OPERATING LIMITS

The standard grade of *C-THERM* FPP as described in this bulletin is FPP-100-2,300, rated for continuous service at 100° C in 2,300 m water (212° F in 7,500 fsw). See the chart on the next page for thermal and mechanical properties.

#### PREPARATION

The surfaces of the subsea equipment must be clean and dry and warmed to at least 15° C (60° F). *C-THERM* FPP will adhere well to any metal or painted surface. A release agent must be applied to any surface where adhesion is not desirable. Molds and forms can be made of metal, wood, or plastic. Cuming Corporation technicians are skilled in the fabrication of such molds, which are included in "turnkey" projects.

#### SAFETY AND HEALTH

These products present no unusual hazard under normal use; however, they are intended for use by trained professionals in accordance with all applicable regulations. Consult Material Safety Data Sheet 625-2 and file for reference.

▶ CONTINUED ON BACK

C-THERM FPP Epoxy Based Syntactic Foam Pour-In-Place Deepwater Thermal Insulation

Property	Units	Value	Test Method
Product Description	—	Pourable epoxy syntactic foam	—
Application	—	Field joints, jumpers, lines and subsea equipment	—
Application Method	—	Casting, molding	—
Max. Service Depth	<i>m</i> <i>ft</i>	2,300 7,500	—
Max. Service Temperature	<i>°C</i> <i>°F</i>	100 212	—
Density	<i>kg/m<sup>3</sup></i> <i>Lb/ft<sup>3</sup></i>		ASTM D 792
Thermal Conductivity	<i>W/m-°K</i> <i>BTU-ft/hr-ft<sup>2</sup>-°F</i>		ASTM C 518
Specific Heat	<i>J/g-°C</i> <i>BTU/lb-°F</i>		ASTM C 351
Hardness	<i>Shore</i>		ASTM D 2240
Compressive Strength	<i>Mpa</i> <i>psi</i>		ASTM D 695
Compressive Modulus	<i>Mpa</i> <i>psi</i>	229,000	ASTM D 695
% Strain @ Max Stress	<i>%</i>	8.5	ASTM D 695
Tensile Strength	<i>Mpa</i> <i>psi</i>	22 3,200	ASTM D 1623
Tensile Modulus	<i>Mpa</i> <i>psi</i>	1,580 229,000	ASTM C 1623
Tensile Elongation	<i>%</i>	10	ASTM D 1623
Hydrostatic Compression Strength	<i>Mpa</i> <i>psi</i>	>55 >8,000	ASTM D 2736*
Water Absorption:			
168 hr @ 70°F	<i>%</i>	0.87	
168 hr @ 200°F	<i>%</i>	7.40	
168 hr @ 70°F/3,000 psi	<i>%</i>	1.01	ASTM D 570*
168 hr @ 200°F/3,000 psi	<i>%</i>	8.90	

**WARNING!**  
 This is an uncontrolled document that may not contain current data. Please request our most recent data sheets through any of our sales offices or e-mail us via [www.cumingcorp.com](http://www.cumingcorp.com) (click on "contact us").

\* Cuming Corporation proprietary hydrostatic testing procedures are similar to the ASTM standards shown. Supporting test data is available upon request.