Eccostock®FPH

High Temperature Foam-in-Place Liquid



HIGH TEMPERATURE FOAM-IN-PLACE LIQUID

Eccostock FPH is a two part closed cell foam-in-place resin system. It is a rigid, high temperature polyurethane (isocyanate). Once cured, Eccostock FPH will withstand continuous exposure up to 135°C (275°F) and up to 163°C (325°F) for short periods remaining rigid.

FEATURES AND BENEFITS

- Maintains rigid characteristics at high service temperatures
- Foam-in-place

MARKETS

- Commercial Telecom
- Security and Defense

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSTOCK FPH		
Bulk Density lbs/ft^3 (g/cc)	**2 (0.03)**	**8 (0.13)**	**14 (0.22)**
Dielectric Constant (1 MHz)	1.04	1.12	1.25
Dissipation Factor (1 MHz)	0.001	0.002	0.005
Dielectric Strength, volts/mil	40	40	40
Compressive Strength, psi (kg/cm²)	30 (2.1)	250 (17.6)	600 (42.3)
Flexural Strength at 5% strain, psi (kg/cm²)	25 (1.8)	225 (15.8)	800 (56.0)
Flexural Modulus, psi (kg/cm2)	500 (35.2)	7,000 (493)	20,000 (1408)
Tensile Strength, psi (kg/cm2)	40 (2.8)	200 (14.1)	450 (31.7)
Shear Strength, psi (kg/cm²)	35 (2.5)	140 (9.9)	300 (21.1)
Coefficient of Thermal Expansion per °C	25 x 10^{-6}	40 x 10^{-6}	50 x 10^{-6}
Water Absorption, % of gain in 24 hours	3	1.5	1

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

APPLICATIONS

- As Eccostock FPH maintains its rigid characteristics at high service temperatures, it is suitable for structural applications.
- Its foam-in-place characteristic makes it an excellent choice for encapsulation applications.
- Encapsulation of electronic modules, antennas, rockets, satellites and missiles.
- Encapsulation of coiled waveguide delay line to provide rigidity
- Vibration and sound deadener when applied to interior surfaces of an instrument cabin.
- Encapsulation of crystal ovens for temperature stability.
- Staking material for high Q coils.

AVAILABILITY

Kit Availability

	Size I	Size II	Size III
FPH Resin	1.3 Lbs.	5.2 Lbs.	45.4 Lbs.
Catalyst (12-2H)	0.9 Lbs.	3.4 Lbs.	29.5 Lbs.
Catalyst (12-4H)	1.0 Lbs.	3.9 Lbs.	34.1 Lbs.
Catalyst (12-6H)	1.0 Lbs.	3.9 Lbs.	34.1 Lbs.
Catalyst (12-10H)	1.1 Lbs.	4.4 Lbs.	38.6 Lbs.

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www.lairdtech.com

Eccostock® FPH

INSTRUCTIONS FOR USE

Caution:

Eccostock FPH contains toluene diisocyanate, an obnoxious and hazardous material. Handling should be carried out in a well-ventilated area. The use of rubber gloves and face shield is recommended. Toluene diisocyanate is an irritant to the skin and mucous membranes, especially eyes and upper respiratory tract. Please consult the MSDS for FPH and the associated catalyst before using this product.

For best results, it is preferable that Eccostock FPH liquids be at or below room temperature.

Weigh out, into separate containers, the required amount of Eccostock FPH and catalyst as determined by the table below for the desired density.

Add the catalyst to the liquid Eccostock FPH and mix rapidly. Mechanical mixing is preferred. Mixing time will be shorter when the raw materials are warm. Indications of complete mixing are color changes from a deep to pale pink and temperature increasing as the exothermic reaction of foam formation begins. Prolonged mixing will start the foaming and curing in the mixing container.

Free pour the mixed material into the cavity or mold without scraping.

Foaming will begin shortly after the batch is poured and, depending upon the batch size, will usually be complete within a few minutes. For production uses, the foam can usually be removed from the mold prior to complete cure.

Cure of the higher density foams is generally complete within a few hours at room temperature. For foams up to about 0.1 g/cc (6 lb/ft^3) density, an elevated temperature post cure is necessary to complete the reaction. Friability and an easily powdered surface are indications of incomplete cure. Post curing conditions depend on size and configuration. For most purposes a post cure of 4 hours at 93°C (200°F) is adequate.

Molds

Molds are preferably made of aluminum or steel because of high heat capacity. It is preferable to use a closed mold that will confine the foam. Small holes or cracks at the top of the mold will allow air to escape as the foam rises. When the foam completely fills the mold, it will exert a positive pressure on the mold.

By proper mold design and by pouring a weighed amount in the mold, it is possible to adjust bulk density. For example, 0.13 g/cc (8 lb/ft$^{3)}$ foam can be produced by adding the appropriate quantity of Eccostock FPH and Catalyst to a closed mold.

Eccostock FPH has excellent adhesion to a wide variety of materials. In the event that release from the mold is desired, silicone mold releases are recommended. For very small molds small amounts of petroleum jelly can also be used.

Notes

Under certain conditions, Eccostock FPH will undergo some loss of solubility of ingredients. This does not apply to the catalyst. Before use, check each container for clarity. If the material is cloudy, it should be gently heated to 79°C (175°F) in a well-ventilated oven and cooled to room temperature or below before use. Containers should be tightly sealed after use to prevent moisture pick up. The foaming process is an exothermic reaction.

Consistency of the final density of foam is dependent on temperature, humidity and mixing technique. The shelf life of this product is 1 year when stored in unopened containers at temperatures no higher than 25°C (77°F).

Eccostock FPH at densities less than 0.05 g/cc (3 lb/ft^3) may warp at temperatures above 93°C (200°F). Higher density materials will withstand higher temperatures.

Cleanup

Methylene Chloride is recommended for the cleanup of mixing equipment.

Dynasolve 100 is the only recommended solvent powerful enough to dissolve away cured urethane foams such as Eccostock FPH. Information on this product can be found at www.dynaloy.com.

FPH/Catalyst Ratio By Weight

Catalyst	12-2H	12-4H	12-6H	12-10H
Parts Catalyst Per 100 Parts FPH Resin	65	75	75	85
Unconfined Bulk Density, lbs/ft^3 (g/cc)	2 (.03)	4 (.06)	6 (.10)	10 (.16)
Desired Bulk Density, lbs/ft^3 (g/cc)	2-3 (.03 - .05)	4-5 (.06 - .08)	6-10 (.10 - .16)	10-14 (.16 - .22)

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