

# HYTAC<sup>®</sup> - LP Large Plug Assist

## System

### Technical Bulletin



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*Innovative Materials for Plug Assist*

### Overview

HYTAC-LP is a new epoxy syntactic plug assist system aimed at providing heavy gauge thermoformers with a durable lightweight, low thermal conductivity, castable system that reduces large plug costs while increasing performance.

HYTAC-LP will result in improved thickness control and more consistent quality of your final part. HYTAC-LP may also reduce sticking of difficult to process polymers.

HYTAC-LP is a two-part system consisting of a core of partially cured epoxy coated large hollow composite spheres and a skin of thick, non-sloughing syntactic foam. The core is generally formed first, followed by application and final curing of the skin. Alternatively, the skin can be applied to the form then back filled with the core material. Curing requires a heat source that can provide 180°F temperatures.

- **Low Thermal Conductivity and Specific Heat**

The syntactic foam structure of HYTAC-LP maintains the low thermal conductivity desired in a plug assist material.

- **Dimensionally Stable up to 350°F.**

- **Lightweight**

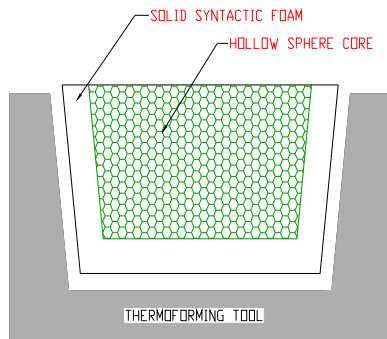
This increases the life of capital equipment due to reduced wear and tear on moving parts.

- **Low Cost**

The system is about half the cost of similar solid syntactic foam plugs.

- **Easily Formed or Machined**

HYTAC-LP can be easily shaped or cast to any size or shape using conventional equipment.



Typical Properties

Property	HYTAC-LP
Color	White
Density ( $\rho$ )	15-20 lb/ft <sup>3</sup> [280 kg/m <sup>3</sup> ]
Thermal Conductivity ( $k$ )	0.054 BTU /hr-ft-°F [0.093 W/m <sup>2</sup> K]
Specific Heat ( $C_p$ ) per mass	0.22 BTU/(lb•°F) [0.92 kJ/(kg•°C)]
Coefficient of Thermal Expansion (CTE)	22 x 10 <sup>-6</sup> in/in/°F [40 x 10 <sup>-6</sup> m/m/°C]
Compressive Strength	1,000 psi [7 MPa]
Compressive Modulus	100 Ksi [700 MPa]
Service Temperature	350 °F [180 °C]

### Applications

HYTAC-LP may be used in a wide variety of applications on sheet-fed, rotary, or in-line machines. It may also be used with most commonly thermoformed materials, as well as some of the more exotic materials available today.