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# HYTAC<sup>®</sup> - W Epoxy Syntactic

## Foam Tooling

### Technical Bulletin

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*Innovative Materials for Plug Assist*

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## Overview

The use of syntactic materials as plug assist tooling replacing conventional materials such as aluminum, wood, felt or Delrin has become increasingly popular in the thermoforming industry. Syntactics, the combination of hollow glass spheres in a polymer matrix, have many unique properties which make them ideal candidates for these applications.

- **Low Thermal Conductivity and Specific Heat**

This translates to lower heat transfer reducing warm-up time and virtually eliminating material sticking to the plug.

- **Dimensionally Stable**

The low coefficient of thermal expansion means the plug maintains its shape over a wide temperature range.

- **Excellent Temperature Resistance**

HYTAC-W is specially formulated with an epoxy resin which maintains a high modulus at elevated temperatures.

- **Lightweight**

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

- **Easily Machined**

HYTAC-W can be easily machined to any size or shape using conventional equipment.

- **Variety of Shapes and Sizes**

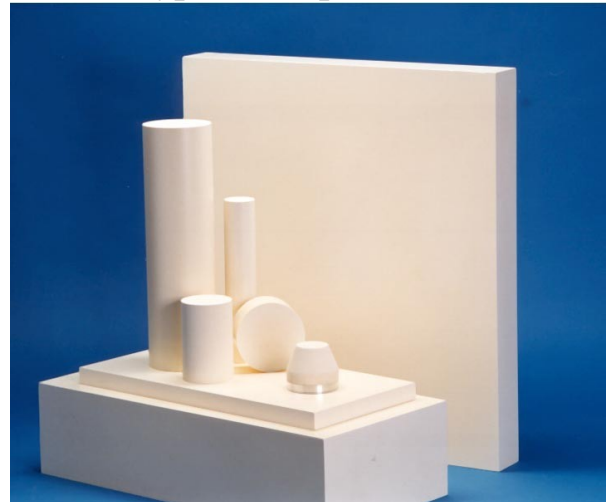
The material is provided in standard sized rods or sheets, but may be custom molded to meet your specific needs.

## Applications

HYTAC-W 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. HYTAC-W may be used as a direct replacement for other epoxy syntactic materials such as SYNTAC<sup>®</sup> and SYNFORM.

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## Typical Properties



Property	HYTAC-W
Color	White
Density ( $\rho$ )	36-40 lb/ft <sup>3</sup> [610 kg/m <sup>3</sup> ]
Thermal Conductivity ( $k$ )	0.076BTU /hr-ft-°F [0.11 W/m <sup>2</sup> K]
Specific Heat ( $C_p$ ) per mass	0.42 BTU/(lb•°F) [1.76 kJ/(kg•°C)]
Coefficient of Thermal Expansion (CTE)	17 x 10 <sup>-6</sup> in/in/°F [31 x 10 <sup>-6</sup> m/m/°C]
Compressive Strength	6,200 psi [42.7 Mpa]
Compressive Modulus	227 Ksi [1.57 Gpa]
Service Temperature	350 °F [180 °C]