

HYTAC[®] - A

Engineered Thermoplastic for Transparent PP Applications

Technical Bulletin



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Innovative Tooling Materials for Thermoforming

Overview

Thermoforming clear polypropylene parts without haze, scratches or plug mark-off is an extremely difficult task. Many thermoformers utilize plugs with highly polished surfaces in order to eliminate the possibility of blemishes on the part. *HYTAC-A* is an improved grade of polyethereimide, (PEI), that can be polished to an extremely smooth surface, yet offers an inherently low thermal conductivity and heat transfer insuring good material distribution as well as high part clarity.

- **Superb Machinability and Polishing**

Plugs made from *HYTAC-A* will be smoother than those made from syntactic. No dust collection equipment or respirators are required due to the large, non-abrasive chips. Plugs can be machined over three times faster than syntactic foam due to the easy chip formation.

- **High Toughness and Durability**

HYTAC-A has improved toughness and durability over solid polymer plug materials such as polysulfone, Delrin[®] or nylon. It also has higher purity than standard PEI and polysulfone resulting in better stress crack resistance and less down time due to broken plugs.

- **Highest Temperature Resistance**

HYTAC-A is specially formulated for service temperatures up to 400°F with minimal loss in mechanical properties and good dimensional stability.

- **Low Surface Friction**

The material is produced with a special additive to improve the friction characteristics resulting in better part transparency.

Applications

HYTAC-A has primarily found use in the forming of clear PP cups and containers. However, higher melt temperature sheet materials, such as polycarbonate or acrylic that degrade standard plugs assist materials can benefit from *HYTAC-A*. It is the best combination of high heat resistance, low thermal conductivity and excellent machining and durability of any solid polymer plug material on the market



Typical Properties

Property	Value
Color	Amber
Density (ρ)	79.9 lb/ft ³ [1280 kg/m ³]
Thermal Conductivity (k)	0.85 BTU -in /hr-ft ² -°F [0.123 W/m ² K]
Specific Heat (C_p) per weight	0.27 BTU/(lb•°F) [1.15 kJ/(kg•°C)]
Coefficient of Thermal Expansion (CTE)	31 x 10 ⁻⁶ in/in/°F [56 x 10 ⁻⁶ m/m/°C]
Compressive Strength	22,000 psi [152 MPa]
Compressive Modulus	480 Ksi [3.31 GPa]
Service Temperature	400 °F [200 °C]