

SYNTAC® 450

High Temperature Syntactic Composite Material for Thermoforming

Introduction

Trelleborg Emerson & Cuming, Inc. pioneered the development and introduction of the first syntactic foam thermoforming material in 1981 and through a process of continuous investment and product development are recognised as leaders in the field.

Syntac® 450 syntactic foam is the high temperature (232°C/450°F) member of the Syntac® product family.

A rigid, high strength composite of epoxy resin and hollow glass microspheres, Syntac® 450 maintains its hardness right up to the maximum running temperature and exhibits excellent abrasion resistance.

Available in block, sheet and rod form it is easily machined using standard shop tools and offers a lightweight, durable and cost effective alternative to wood, felt, aluminium and delrin.



Features & Benefits

Syntac® 450 is engineered to address problems inherent in traditional thermoforming tooling, such as sticking, deformation and failure.

- **Simple and fast plug preparation**
Syntac® can be easily machined, using standard tooling equipment.
- **Smooth surface**
Machines to a polished finish.
Extra slip for high definition.
- **Low thermal conductivity and Specific Heat**
Reduced warm up times, and elimination of plug sticking or fouling.
- **Excellent Dimensional Stability and Temperature Resistance**
Maintains shape and temperature at elevated temperatures.
Consistent performance.
Long plug life, proven by long service history in application.
- **High Clarity**
Virtual elimination of swirl and chill marks.
- **Lightweight**
Reduces wear and tear on moving machinery parts.
- **Variety of rods, sheets and block available**
Customised plugs can also be molded.

Major cost saving benefits

- Simple and fast plug preparation.
- No plug heaters.
- Reduced warm up time.
- Consistent performance.
- Long plug life.

Typical Properties

Syntac® 450	Metric	Imperial
Colour	Blue	Blue
Density	736kg/m ³	46lb/ft ³
Service temperature	232°C	450°F
Thermal conductivity	0.15W/m ² K	0.09 BTU/hr-ft ² °F
Specific heat	2090 J/kg ² K	0.50 BTU/lb ² °F
Coefficient of thermal expansion	31x10 ⁻⁶ cm/cm/°C	17x10 ⁻⁶ in/in/°F
Compressive strength	51MPa	7,400psi
Compressive modulus	2351MPa	341,000psi
Shore D hardness	55°D@232°C	55°D@450°F

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Applications

Syntac® 450 can be used to form a wide range of polymer sheet materials, and works well with polyolefins, as well as APET and CPET.

It is ideal for thermoforming on a wide range of inline, sheet or rotary fed systems, such as component manufacture within the food and medical packaging, aerospace and automotive sectors. Syntac® 450 is recommended for high temperature runs, and for thermoforming thicker sheet material.

The material's versatility also makes it ideal for prototype tooling in many other plastics processes.

Syntac® 450 can be used as a direct replacement for Hytac®-WF and Teflon® coated materials.

Safety

Syntac® 450 can be handled without any specific ventilation, hygiene or flammability precautions being necessary.

However, sanding, grinding and other machine operations may result in nuisance dusts that may be irritating to the eyes and upper respiratory tract. Nuisance particle masks, safety goggles and good local ventilation (preferably flexible duct work extending to the point of contact) should always be used. Consult the MSDS for more detailed information on safety and personal protection.

Machining

Recommended speeds and feed for optimum performance when turning Syntac® 450 are as follows:

Speeds	3,000 – 3,500rpm
Cut Size	6mm (0.25") maximum
Feed	381-508mm (15-20") per min.
Tooling	Carbide or high speed steel. Maintain sharp edge with slight chip breaker.
Flutes	2/3 for optimum performance.

Technical Assistance

Trelleborg Emerson & Cuming, Inc. welcomes discussions with potential users about the ways that Syntac® thermoforming plug materials can help increase productivity and reduce costs. Trelleborg Emerson & Cuming, Inc. provide information and assistance to help users achieve maximum benefits from Syntac® 450.



TRELLEBORG

Trelleborg Emerson & Cuming, Inc.
290 Forbes Boulevard, Mansfield, MA 02048-1817 USA
Tel: +1 774 719 1400. Fax: +1 774 719 1410
Email: eandcsales@trelleborg.com
Website: www.trelleborg.com/eandc