ISO-HT® Polyisocyanurate Insulation

2.5 lb/ft³ (40 kg/m³) density for Higher Temperature Applications

ISO-HT (Higher Temperature)

ISO-HT is Dyplast Products' 2.5 lb/ft³ polyisocyanurate rigid, closed cell, foam insulation for higher temperature applications up to 350°F (177°C), with intermittent exposure up to 375°F (190°C). ISO-HT is suitable for constant temperature or heat cycling environments. ISO-HT is certified by independent laboratory to meet demanding Class 1 flame spread and smoke development requirements per ASTM E84. Dyplast Products offers ISO-HT as bunstock or as sheets and blocks, with tolerances up to 1/32 inch on surfaces. Our extensive network of fabricators can provide special shapes for pipe, fittings, vessels, or other mechanical applications.

Polyisocyanurate exhibits the highest R-factor (insulating value) to thickness ratio of commercially available insulation, and ISO-HT provides higher R-factors and reduced thermal aging at lower temperatures. Ideal for applications over a wide range of temperature, from cryogenic liquids to low-temperature steam, ISO-HT offers superior performance when compared to polystyrene, polyurethane, phenolic, fiberglass, and cellular glass alternatives. When temperatures are limited to less than 300°F, our ISO-C1 product line is also available in 2, 2.5, 3, 4, and 6 lb/ft³ densities, which each provide successively improved strength and other attributes for physically demanding applications.

Dyplast's ISO product line is produced as a continuous foam bunstock. For bun and sheet size options contact the sales department.

APPLICATIONS

ISO-HT is designed for use where temperatures range from -297°F to +350F°, making it ideal for low-temperature steam applications and refinery liquids, hot water,as well as commercial HVAC and chill water systems, panel insulation for transportation containers, and core material for architectural and panel construction.

WATER ABSORPTION

Water absorption by insulation can degrade thermal insulating performance. ISO-HT's extraordinary resistance to water absorption (0.6%) helps ensure long-term thermal performance remains superior to polystyrenes, phenolic foams, fiberglass, and even cellular glass - - which for example has water absorption of 0.2% (per manufacturer data), as well as considerably lower insulating value. Proper installation of vapor barriers can further improve performance of the complete ISO-HT insulating system.

NOTE TO ENGINEERS AND CONTRACTORS

Visit www.dyplast.com for easily accessible information on specifications as well as SDS, and more. Relevant documents are retrievable within two clicks from our home page.

REV. ISO-HT 0718

SURFACE BURNING CHARACTERISTICS

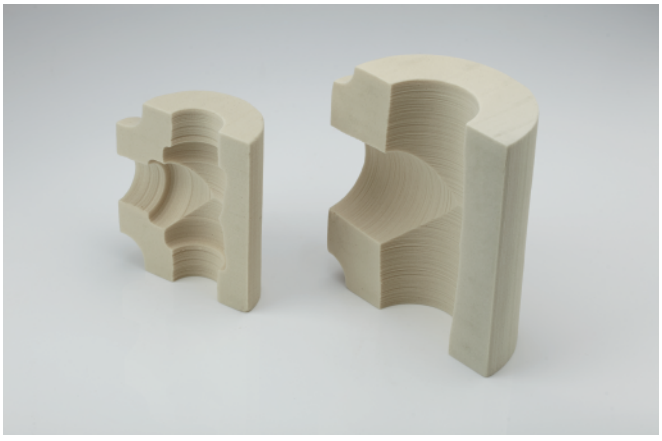
The International Mechanical Code defines Class 1 insulation as meeting the 25/450 flame spread/smoke development rating. ISO-HT performs well within this range with a 25/400 (at 4") rating. When comparing surface burning characteristics of alternative products, care must be taken to consider the installed insulation system as a whole, including sprinkler systems. For example, a well-designed ISO-HT insulation system can improve overall flame/smoke performance of the polyiso insulation. On the other hand, an alternative insulation's flame/smoke ratings may be compromised by the sealants or jacketing often recommended by suppliers. There is also the matter of insulation system integrity during a fire. ISO-HT may be charred by flame, but maintains its integrity and continues to protect the insulated system.

LONG TERM R-FACTOR

High thermal insulation efficiency is achieved by infusing cells with gases having low thermal conductivity. All such rigid foam insulation (including polyurethane, extruded polystyrene, and polyisocyanurate) thus lose a small amount of their insulating value over time as air displaces insulating gases. ISO-HT's smaller, stronger cell structure and our proprietary cell-gas formulation work together to impede gas transfer across cell boundaries, thus reducing loss of thermal efficiency. Thicker insulation, vapor barriers, and metal constraints also limit gas diffusion. Current LTTR calculation standards are primarily applicable to "faced" polyiso board, and are not appropriate for ISO-HT bunstock.

INSTALLATION RECOMMENDATIONS

ISO-HT is designed for constant temperature exposure up to 350°F continuous. ISO-HT should be installed on pipe at room temperature and installation onto high temperature or live steam lines is discouraged, since this will cause dimensional stability problems. ISO-HT should be used with an appropriate ASJ or Vapor Barrier held in place with SSL tape. The use of ¾ inch filament tape with a 25% overlap is recommended, as is a PVC or Metal Jacket secured with metal banding.



ISO-HT® POLYISOCYANURATE INSULATION: (2.5 lb/ft³ density)

DYPLAST products

ISO-HT® Foam Comparison vs. ASTM C591-17

General Physical Properties	Test Method	Units	ASTM C591	ISO-HT®
Service Temperature		°F	**300**	**350**
		°F	**-297**	**-297**
12.1 **Nominal Density**	ASTM D1622	lb/ft^3	**2.5**	**2.5**
12.2 **Compressive Resistance (Strength)**	ASTM D1621	psi		
Parallel			**35**	**41.4**
Perpendicular (Length)				**33.3**
Perpendicular (Width)				**30.6**
12.3 **Apparent Thermal Conductivity (aged 6 months @ 73 ± 4°F)**	ASTM C177	Btu.in/ $h.ft^2$ °F		
Mean temperature of measurement: 265°F			**Not specified**	**0.084**
-200°F			**0.13**	**0.116**
-150°F			**0.15**	**0.137**
-100°F			**0.17**	**0.158**
-50°F			**0.19**	**0.178**
0°F			**0.20**	**0.188**
50°F			**0.19**	**0.183**
75°F			**0.20**	**0.191**
150°F			**0.24**	**0.229**
200°F			**0.27**	**0.257**
75°F	ASTM C518	Btu.in/ $h.ft^2$ °F	**0.20**	**0.186**
12.4 **Hot-Surface Performance at 300°F**	ASTM C411	Deflection (in.)	**< 0.25"**	**Pass**
			At 350°F	**0.09**
12.5 **Water Absorption**	ASTM C272	% by volume	**1.0**	**0.27**
12.6 **Water Vapor Permeability (Transmission)**	ASTM E96	Perm-in.	**3.5**	**1.93**
12.7 **Dimensional Stability,** D2126	ASTM D2126	% Linear Change		
-40°F, 14 days			**1% max**	**0.6**
158°F, 97% RH, 14 days			**4% max**	**-1.6**
212°F, 14 days			**2% max**	**-0.5**
12.8 **Closed Cell Content**	ASTM D2856	% minimum	**90**	**97**
Meets ASTM C 591-17				**Yes**

1. *Physical properties are measured at 70-75F, unless otherwise indicated, and all test values are from independent certified testing laboratories.*
2. *These are nominal values obtained from representative product samples, and are subject to normal manufacturing variances.*
3. *Average value through the foam cross section.*
4. *Frequent and severe thermal cycling can produce dimensional changes significantly greater than those listed here. Special design considerations must be made in systems subject to severe cycling.*
5. *This numerical flame spread data is not intended to reflect hazards presented by this or any other material under actual fire conditions.*
6. *FITNESS FOR USE MUST BE DETERMINED BY BUYER AND ENGINEER; DYPLAST PRODUCTS DOES NOT WARRANT FITNESS FOR USE.*
7. *CAUTION: Severe degradation of the foam can result if water gets into the insulation system on a high temperature pipe. These include accelerated degradation and extensive charring, and loss of insulation performance. Thus it is critical that the jacketing and joint sealers are designed and installed correctly to prevent water ingress.*
8. *Intermittent exposures up to 375F (190C) are allowable.*

DYPLAST products

(800) 433-5551
info@dyplast.com
www.dyplast.com
12501 N.W. 38th Ave.
Miami, FL 33054

ISO-HTx® POLYISOCYANURATE INSULATION: (2.5 lb/ft³ density)

The following properties are NOT Specified for ASTM C591 but are often reported

General Physical Properties	Test Method	Units	ISO-HT®
Surface Burning Characteristics (if required)	ASTM E84		
Flame Spread (@4" thickness)			**≤25**
Smoke Density (@4" thickness)			**≤400**
Leachable Chloride	ASTM C871	ppm	**55**
Shear Strength	ASTM C273	psi	
Average of 3 directions			**28**
Shear Modulus	ASTM C273	psi	**289**
Tensile Strength	ASTM D1623	psi	
Parallel			**51**
Perpendicular			**35**
Tensile Modulus	ASTM D1623	psi	
Parallel			**2044**
Perpendicular			**1251**
Flexural Strength	ASTM C203	psi	
Parallel			**65**
Perpendicular			**71**
Flexural Modulus	ASTM C203	psi	
Parallel			**1042**
Perpendicular			**1172**
Coefficient of Linear Expansion	ASTM E228	in/in.°F	
Average Value			**33×10^{-6}**
Color			**Red**

CONDENSATION

For optimum performance and longevity, insulation systems for low temperature applications must be designed to control condensation. One primary design strategy is to specify high insulation efficiency since if the surface temperature of the insulation system can be maintained above the dewpoint, condensation will not occur. Since a minimal amount of condensation may be acceptable (or unavoidable) in humid environments, a secondary design strategy is to also demand insulation with low water vapor transmission. In this regard, no other insulation alternative offers ISO-HT's combination of superior R-factor and low water vapor permeance of 1.93 perm-inch.

FEATURES AND BENEFITS

- Fabrication available to virtually any shape/size
- Variable bunstock sizing in 3 dimensions
- Environmentally friendly (Zero-ODP)
- Up to 1/32" cut tolerance on surfaces
- Easy to handle, shape in the field
- Excellent Moisture Resistance
- Superior insulating value
- High flexural strength
- Dimensionally stable
- Chemically resistant
- Low life-cycle cost
- Light-weight

THERMAL EFFICIENCY

With its high thermal efficiency, ISO-HT can achieve the same insulating value with as little as half the thickness required by alternative insulating materials. Less insulation leads to thinner walls, more space, and fewer and tighter energy-losing seams - - further enhanced by the availability of larger pieces (for example, 24-foot lengths). Less insulation in mechanical applications also equates to reduced quantities of expensive vapor retarders, jackets, and mastics. The lighter weight of ISO-HT compared to cellular glass (roughly one-third) reduces structural support requirements.

LIMITATIONS AND DISCLAIMER OF WARRANTIES AND LIABILITIES

Dyplast Products, LLC ("Dyplast") warrants that all products manufactured and sold by us are free from defects in material and workmanship at the time of shipment. Dyplast shall be notified promptly of any material claimed defective and such materials shall be subject to inspection by Dyplast. With respect to material proven to be defective, Dyplast will replace any material; replacement will be CIF to the buyer's location. This warranty is given in lieu of all other warranties expressed or implied, including without limitation any warranty of merchantability or fitness for a particular purpose and all other such warranties are expressly disclaimed. In no event shall Dyplast be liable, under this warranty for special, incidental, punitive or inconsequential damages of any kind whatsoever arising from the use or installation of the materials sold hereunder, and Dyplast's liability under the above warranty shall be expressly limited to the cost of those materials proven to be defective. In no event, whether as a result of breach of contract, warranty or alleged negligence shall Dyplast be liable for damages for lost profits or revenue, claims of Dyplast's customer's or their customer's inability to operate their facilities, or any other item of special incidental, punitive or consequential damages.

(800) 433-5551
info@dyplast.com
www.dyplast.com
12501 N.W. 38th Ave.
Miami, FL 33054