

Tarec[®]pir

Tarec[®]pir HT 2.5 Polyisocyanurate Insulation

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



- High-performance rigid insulation
- Meets ASTM C591 Type II classification
- Made using Low-GWP and Zero-ODP blowing agents
- Fabrication flexibility to virtually any shape/size

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Description

Tarecpir HT 2.5 is Kingspan Insulation, LLC's 2.5 lb/ft³ polyisocyanurate (polyiso), rigid, closed-cell foam insulation designed for higher-temperature applications within the Tarecpir product line. Tarecpir HT 2.5 provides continuous service temperatures up to 350°F (177°C), with intermittent exposure up to 375°F (190°C), making it suitable for both constant-temperature and heat-cycling environments.

Tarecpir HT 2.5 is independently tested and audited and offers higher thermal efficiency than competing polyiso, EPS, XPS, fiberglass, and cellular glass insulation. It provides exceptional performance in both piping and panel applications across a temperature range of -328°F to +350°F (-200°C to +177°C). Its physical properties include excellent dimensional stability, high closed-cell content, and moisture resistance, supporting code-compliant insulation systems and performance in demanding applications. Tarecpir HT 2.5 meets the requirements of ASTM C591 Type II, including thermal conductivity testing at -200°F (-129°C).

Polyisocyanurate provides exceptional R-value per unit cost and is well suited for low-temperature and cryogenic applications. Tarecpir HT 2.5 offers superior performance advantages when compared to polystyrene, polyurethane, phenolic, fiberglass, aerogel, and cellular glass insulation alternatives. For applications with temperatures below 300°F (149°C), the Tarecpir 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.

Tarecpir HT 2.5 is produced as a continuous foam bunstock and can be custom sized to support efficient fabrication of virtually any shape or size, helping to minimize material waste. For available bunstock sizes, contact the Tarecpir sales department at 1-800-336-2240 or visit our website for Tarecpir HT 2.5 sizing. Tarecpir products are manufactured using a proprietary production process that utilizes hydrocarbon blowing agents with low GWP and zero ODP. These blowing agents are not controlled under the Montreal Protocol and enable a portfolio of Tarecpir products with physical properties that exceed those of prior-generation formulations.

Thermal Efficiency

With its high R-value of R-5.26 (at +75°F), Tarecpir HT 2.5 can achieve the same insulating value with as little as half the thickness required by alternative insulating materials. Less insulation leads to thinner walls, less weight, more space, and fewer and tighter energy-losing seams - further enhanced by the availability of larger pieces (for example, 24-foot panels or blocks). Less insulation in mechanical applications also equates to reduced quantities of expensive vapor retarders, jackets, and mastics. The lighter weight of Tarecpir HT 2.5 compared to cellular glass also reduces structural support requirements.

Long Term R-Value

High thermal insulation efficiency is achieved by infusing cells with gases having low thermal conductivity. All such rigid foam insulation (including polyurethanes and extruded polystyrene) thus lose a small amount of their insulation value over time as air displaces insulating gases. Tarecpir HT 2.5'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 jacket constraints also limit gas diffusion.

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.

Surface Burning Characteristics

The National Fire Protection Association Life Safety Code, NFPA No. 101 defines Class 1 insulation as meeting the ≤25/450 flame spread/smoke development rating. Tarecpir HT 2.5 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 Tarecpir insulation system can improve overall fire/smoke performance of the polyiso insulation. Tarecpir HT 2.5 may be charred by flame, but maintains its integrity and continues to protect the insulated system.

Features and Benefits

- Dimensionally stable
- Insulation Value
- Moisture Resistance (see 12.5 and 12.6 in table)
- Easy to handle, shape in field
- Sheets can be cut to 1/32" tolerance
- Fabrication flexibility to virtually any shape/size
- High flexural strength (65psi parallel/71psi perpendicular)
- Light-weight

Industries

Cryogenic facilities such as liquid natural gas (LNG), liquid oxygen, (LOX), etc.; refrigeration/freezer manufacture; commercial HVAC and chilled water systems; low temperature steam; hot water; insulated metal panels for commercial building construction; and panels for refrigerated transportation.

Water Absorption

Water absorption by insulation can degrade thermal insulating performance, although the correlation between WA and loss of thermal efficiency varies considerably between insulants. Tarecpir HT 2.5's extraordinary resistance to water absorption (<1.0%) helps ensure long-term thermal performance, and remains superior to polystyrenes, phenolic foams, and fiberglass. Proper installation of vapor barriers can further improve performance of the complete Tarecpir HT 2.5 insulating system.

Applications

Pipe, tank, and vessel mechanical insulation; panels for refrigeration and freezers; core material for architectural and panelized construction; panel insulation for shipping containers and rail cars; insulated metal panels; flat panels for duct and air plenum insulation.

Compliances and Approvals

Tarecpir HT 2.5 has been tested by independent laboratories to meet or exceed the requirements of ASTM C591, the Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Insulation.

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Typical Physical Properties ^{1,2,3}	Tarecpir HT 2.5	ASTM C591 Max or Min
Service Temperature °F (°C)		
Maximum ⁴	350 ⁸	300
Minimum	-328	-297
12.1 ⁵ Nominal Density, D1622, lb/ft ³ (kg/m ³)	2.5	2.5
12.2 Compressive Resistance (Strength), D1621 psi (kPa)		
Parallel	43.1	35
Perpendicular (Length)	33.3	
Perpendicular (Width)	30.6	
12.3 Apparent Thermal Conductivity, C177 ⁶ (aged 6 months @ 73 +/- 4°F) Btu.in/hr.ft ² .°F (W/m.°K)		
Mean temp of measure -265°F (-165°C)	0.08	Not specified
Mean temp of measure -200°F (-129°C)	0.12	≤0.13
Mean temp of measure -150°F (-101°C)	0.14	≤0.15
Mean temp of measure -100°F (-73°C)	0.16	≤0.17
Mean temp of measure -50°F (-45°C)	0.18	≤0.19
Mean temp of measure -0°F (-18°C)	0.19	≤0.20
Mean temp of measure +50°F (+10°C)	0.18	≤0.19
Mean temp of measure +75°F (+24°C)	0.19	≤0.20
Mean temp of measure +150°F (+66°C)	0.23	≤0.24
Mean temp of measure +200°F (+93°C)	0.26	≤0.27
Apparent Thermal Conductivity C518, aged, +75°F (+24°C)	0.19	Not specified
12.4 Hot-Surface Performance, C411 at 300°F (149°C) Deflection inches (mm)	Pass	<0.25"
12.5 Water Absorption, C272, % by volume	0.6	≤1.0
12.6 Water Vapor Permeability (Transmission), E96, Perm-in (ng/Pa.s.m)	1.7	≤3.5
12.7 Dimensional Stability ⁷ , D2126, % linear change		
-40°F, 14 days	0.12	≤1
158°F, 97% RH, 14 days	-0.1	≤4
212°F, 14 days	0.5	≤2
12.8 Closed Cell Content, D2856, %	90	95

¹ All properties were measured at temperatures at or near 75°F unless otherwise indicated, and all test values were obtained 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 of tested sample.

⁴ Above 300°F, discoloration and charring will occur, potentially resulting in an increased k-factor in the discolored area.

⁵ Table 1 includes the paragraph numbering system utilized within section 12 of ASTM C591.

⁶ Thermal Conductivities (k-factors) at low Temperatures: ASTM C591 is the standard specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation, and is arguably the key standard used by insulation system end-users and engineer/specifiers to guide decision-making. Compliance with ASTM C591 is often a prerequisite within an insulation Request for Proposal.

⁷ 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 sever cycling.

⁸ Intermittent exposures up to +375°F (+190°C) are allowable.

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The following properties are not specified by ASTM C591, yet are often reported⁹

Surface Burning Characteristics⁹, E84

Flame Spread (@4" thickness)	≤25
Smoke Density (@4" thickness)	≤400
Leachable Chloride, C871, ppm	55
Shear Strength, C273, Average of 3 directions in psi (kPa)	28
Shear Modulus, C273, psi (kPa)	289
Tensile Strength, D1623, psi (kPa)	
Parallel	51 (352)
Perpendicular	38 (241)
Tensile Modulus, D1623, psi (kPa)	
Parallel	2044
Perpendicular (average)	1481
Flexural Strength, C203, psi (kPa)	
Parallel	65
Perpendicular	71
Flexural Modulus, C203, psi (kPa)	
Parallel	1042
Perpendicular	1172
Coefficient of Linear Expansion, E228, Average Value in/in.°F (m/m.°C)	33 x 10 ⁻⁶
Color	Red

⁹ This numerical flame spread data is not intended to reflect hazards presented by this or any other material under actual fire conditions.



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kingspan-tarecpir-ht-2.5-product-data-sheet-en-us-v2

Version 2 - 08/2026

