

ISO-C1/2.0 Polyisocyanurate Insulation

2.0 lb/ft³ (32.1 kg/m³) Density Foam

ISO-C1/2.0 is Dyplast Products' newest polyisocyanurate rigid foam insulation in its ISO line of products, tested by Underwriters Laboratories and Factory Mutual to meet demanding Class 1 flame spread and smoke development requirements per ASTM E84. Our ISO-C1 product line has the highest R-factor to thickness ratios of commercially available insulation, offering exceptional performance in both piping and panel applications from -297F to +300F. ISO-C1/2.0 thus provides superior performance when compared to polystyrene, polyurethane, phenolic, fiberglass, and cellular glass insulation alternatives, achieving code compliance, plus levels of thermal efficiency otherwise unattainable.

ISO-C1/2.0 is produced as a continuous foam bunstock with the ability to custom size the bun in order to provide for customer fabrication to virtually any shape or size while reducing waste. For specific standard stock bun sizes contact the sales department at 1-800-433-5551 or logon to our website for ISO-C1 sizing (www.dyplastproducts.com/ISO_bun_sizing.htm). Our proprietary production process utilizes hydrocarbon blowing agents creating a portfolio of ISO-C1 products with physical properties superior to prior generation formulations.

THERMAL EFFICIENCY

With its high R-factor, ISO-C1/2.0 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 panels or blocks). Less insulation in mechanical applications also equates to reduced quantities of expensive vapor retarders, jackets, and mastics. The lighter weight of ISO-C1/2.0 compared to cellular glass (roughly one-third) reduces structural support requirements.

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-C1'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. At a testpoint of 75F, the average R-factor of ISO-C1/2.0 over a 15 year period is comparable to the six-month "aged" R-factor. It is important to note that ISO-C1/2.0's service temperatures are normally well below 75F, and that thermal aging is reduced considerably at lower operating temperatures. Thicker insulation, vapor barriers, and metal constraints also limit gas diffusion. Long Term Thermal Resistance calculation standards are not accurate for ISO-C1/2.0 bunstock, particularly as-installed in low temperature applications.

Dyplast Products is the preeminent manufacturer of polyisocyanurate and expanded polystyrene rigid foam products, and also distributes a variety of complementary products. With new world-class production facilities in Miami, Florida, Dyplast Products offers its customers unsurpassed technology, responsiveness, wide-ranging product configurations, and state-of-the-art quality control. Our customer-focused staff, combined with our sound financial footing, ensure we deliver incomparable value to our customers far into the future. **For information on Dyplast Products or additional technical data on this product, visit our website at www.dyplastproducts.com.**

WATER ABSORPTION

Water absorption by insulation can degrade thermal insulating performance. ISO-C1/2.0's excellent resistance to water absorption (0.24%) and high R-factor help ensure long-term thermal performance remains superior to polystyrenes, phenolic foams, fiberglass, and even cellular glass - - which has water absorption of 0.2% (per manufacturer data), but has considerably lower insulating value. Proper installation of vapor retarders can further improve performance of the complete ISO-C1/2.0 insulating system.

WATER VAPOR TRANSMISSION

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-C1/2.0's combination of superior R-factor and low permeability of 2.33 perm-inch.

SURFACE BURNING CHARACTERISTICS

The International Mechanical Code defines Class 1 insulation as meeting the 25/450 flame spread/smoke development rating. ISO-C1/2.0 performs well within this range with a 25/195 rating. When comparing surface burning characteristics of alternative products, care must be taken to consider the installed insulation system as a whole. For example, a well-designed ISO-C1/2.0 insulation system can improve overall fire/smoke performance of the polyiso insulation system. On the other hand, cellular glass' fire/smoke ratings may be compromised by the use of the sealants or jacketing often recommended by suppliers. There is also the matter of insulation system integrity during a fire. ISO-C1/2.0 may be charred by flame, but maintains its integrity and continues to protect the insulated system.

Physical Properties ¹	ASTM Method	English Units ²	Metric Units ²
Density ³	D 1622	2.1 lb/ft ³	33.64 kg/m ³
Compressive Strength ³	D 1621		
Parallel to Rise		26 lb/in ²	179 kPa
Perpendicular to Rise		29 lb/in ²	200 kPa
Shear Strength: Parallel and Perpendicular	C 273	27 lb/in ²	187 kPa
Shear Modulus	C 273	346 lb/in ²	2386 kPa
Tensile Strength: Parallel and Perpendicular	D 1623	33 lb/in ²	228 kPa
Flexural Strength: Parallel and Perpendicular	C 203	54 lb/in ²	372 kPa
Flexural Modulus	C 203	864 lb/in ²	5957 kPa
Thermal Conductivity: K-Factor (@ i" 10-day initial)	C 518	0.15 BTU·in/hr·ft ² ·F	0.022 W/m·C
Thermal Conductivity: K-Factor (@ 1" aged 6 months)	C 518	0.18 BTU·in/hr·ft ² ·F	0.026 W/m·C
Thermal Resistance R-Factor (@ 1" aged 6 months)	C 518	5.6 hr·ft ² ·F/BTU	0.99 m ² ·C/W
Closed Cell Content	D 2856	>95 %	>95 %
Water Absorption (24-hour immersion)	C 272	0.24 % by volume	0.24 % by volume
Water Vapor Transmission	E 96	2.33 perm-inch	3.40 ng/Pa·s·m
Service Temperature ⁴		-297 to +300F	-183 to +149C
Dimensional Stability ⁵	D 2126		
@ -40F (-40C), 7 days:			
Length		< +0.1 % Change	< +0.1 % Change
Volume		< +0.1 % Change	< +0.1 % Change
@ 158F (70C)/97% RH, 7 days:			
Length		< +1.0 % Change	< +1.0 % Change
Volume		< +2.0 % Change	< +2.0 % Change
@ 212F (100C), 7 days:			
Length		< +0.6 % Change	< +0.6 % Change
Volume		< +1.0 % Change	< +1.0 % Change
Surface Burning Characteristics ⁶		UL Rating	FM Rating
Flame Spread @ 4" (10 cm)	E 84	25	25
Smoke Density @ 4" (10 cm)	E 84	195	130
Hot Surface	C 411	Pass	Pass

- Physical properties are measured at 70-75F, unless otherwise indicated, and all test values are from independent certified testing laboratories.
- These are nominal values obtained from representative product samples, and are subject to normal manufacturing variances.
- Average value through the foam cross section.
- Above 300F, discoloration and charring will occur, resulting in an increased K-Factor in the discolored area.
- 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.
- This numerical flame spread data is not intended to reflect hazards presented by this or any other material under actual fire conditions.

FEATURES AND BENEFITS

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



APPLICATIONS

- Pipe, tank, and vessel insulation
- Panel insulation for refrigeration and freezers
- Core material for architectural and panelized construction
- Panel insulation for shipping containers and rail cars
- Flat panels for duct and air plenum insulation

INDUSTRIES

- Refrigeration/freezer manufacture
- Commercial HVAC and chill water systems
- LNG, LOX and other cryogenic facilities
- Commercial building construction
- Refrigerated transportation

COMPLIANCES AND APPROVALS

ISO-C1/2.0 has been tested and found to meet or exceed the requirements of the ASTM C591 and the applicable North American standards, and has a Class 1 E84 rating from UL and FM. Visit www.dyplastproducts.com or ask a Dyplast Products representative for more detail. Material Safety Data Sheets, Specifications, and other technical information are conveniently accessible from our website home page.

LIMITATIONS AND DISCLAIMER OF WARRANTIES AND LIABILITIES

Characteristics, properties, performance of materials, and application specifications herein described are based on data obtained under controlled conditions. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. Dyplast Products makes no implied warranties of any type, including without limitation, any warrant of merchantability or fitness of purpose. In no event will Dyplast Products be responsible for damages of any nature whatsoever resulting from the use of or reliance upon this information or the product to which information refers. No agent, sales representative, or employee is empowered to change, alter, or amend this provision, unless approved in writing by a duly authorized officer of Dyplast Products.



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