USP™ ISO-1 CG Roof Insulation

Product Name: USP™ ISO-1 CG (Manufactured by Hunter: H-SHIELD CG)

Classification: Thermal Insulation, Polyisocyanurate

Product Description: USP™ ISO-1 CG is a rigid roof insulation panel composed of a closed cell polyisocyanurate foam core laminated to a premium performance coated glass facer.

Available in 4' x 4' (1.2m x 1.2m) and 4' x 8' (1.2m x 2.4m) panels.

Green Standards Information: USP™ ISO-1 CG uses NexGen™ chemistry blowing technology with CFC-, HCFC-, and HFC-free foam which has zero Ozone Depletion Potential (ODP) and zero (negligible) Global Warming Potential (GWP).

Recycled Content: USP™ ISO-1 CG contains between 18% and 38% by weight, recycled content, depending on foam thickness. (Between 50% and 73% is comprised of post-consumer recycled materials and between 26% and 50% is derived from post-industrial recycled materials, depending on thickness of foam core. The use of these materials averts disposal in the land fill.

Application Method: USP™ ISO-1 CG is applied using mechanical fasteners, hot asphalt in hot mop techniques, or low rise foam adhesive.

Approvals: Federal Specification HH-I-1972/GEN and HH-I-1972/2 Class 1. This federal specification has been cancelled.

- ASTM C1289, Type II, Class 1
- National Building Code (1998) Section 2603 Building Officials and Code Administration International, Inc.

FM Standard 4450/4470 Approval

USP™ ISO-1 CG is supplied under the label of H-SHIELD CG and as such is approved for Class 1 wood, lightweight concrete and gypsum roof deck construction for both 1-60 and 1-90 Windstorm Classifications and insulated steel deck construction for 1-60 to 1-465 and insulated concrete deck construction for 1-60 to 1-405 Windstorm Classifications. (USP™ ISO-1 CG may be mopped or mechanically fastened to concrete roof deck). Refer to FM Approval Guide for details on specific systems.

UL Standard 1256 Classification

Insulated metal deck construction assemblies – Construction #120 and #123

UL Standard 790 (ASTM E 108) Classification

Class A with most roof membrane systems. See UL Roofing Materials & Systems Directory.

UL Standard 263 Fire Resistance Classification (ASTM E 119)

Some classifications for fire resistance are P225, P230, P232, P259, P508, P510, P514, P519, P701, P710, P713, P717, P718, P719, P720, P722, P723, P724, P727, P728, P729, P730, P732, P734, P735, P739, P801, P814, P815, P818, P819, P823, P824, P826, P827 and P828. See UL Fire Resistance Directory for updated listings.

UL Standard 1897 Uplift Resistance
120 PSF, 150 PSF, 165 PSF, 245 PSF

Long-Term Thermal Resistance*

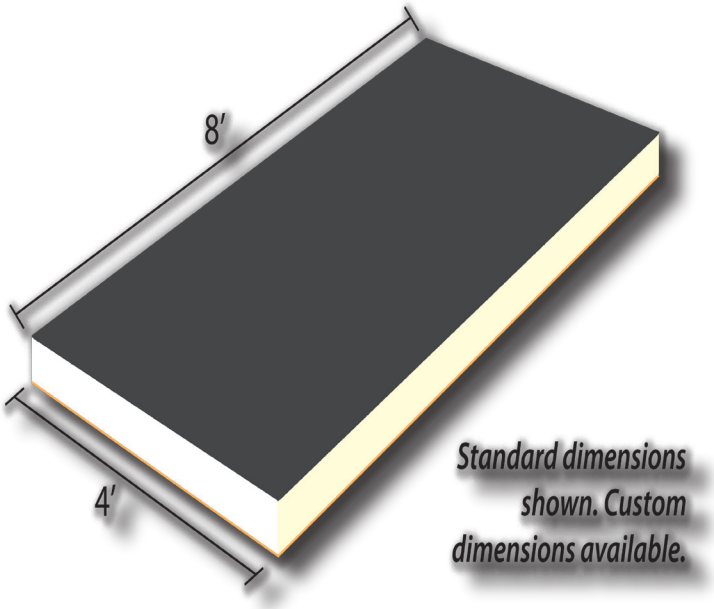
THICKNESS		*LTTR VALUE	**RSI	SPANABILITY	
in	mm			in	mm
1.0	25.4	6.0	1.06	2.625	66.68
1.5	38.1	9.0	1.58	4.375	111.13
1.6	40.6	9.6	1.69	4.375	111.13
1.7	43.1	10.3	1.82	4.375	111.13
1.8	45.7	10.9	1.92	4.375	111.13
2.0	50.8	12.1	2.13	4.375	111.13
2.5	63.5	15.3	2.69	4.375	111.13
2.7	68.6	16.6	2.93	4.375	111.13
3.0	76.2	18.5	3.26	4.375	111.13
3.1	78.7	19.1	3.36	4.375	111.13
3.3	83.8	20.4	3.59	4.375	111.13
3.5	88.9	21.7	3.82	4.375	111.13
3.6	91.4	22.4	3.95	4.375	111.13
3.7	93.9	23.0	4.05	4.375	111.13
4.0	101.60	25.0	4.40	4.375	111.13

*LTTR (long-term thermal resistance) values were determined in accordance with CAN/ULC-S770 and ASTM C 1289, Annex A1. All test samples were third-party selected and tested by an accredited material testing laboratory. Laboratory. The LTTR results were reviewed and authorized by FM Approvals and certified by the PIMA Quality Mark Program.

The R-value (1.39) for ½ in. perlite was provided by ASHRAE Handbook, Fundamentals. The R-value (.28) for 1/4 in. glass-mat gypsum board was provided by the glass-mat gypsum board manufacturer. The R-value (1.3) of ½ in. high density wood fiberboard was provided by the wood fiberboard manufacturer.

U.S. Ply recommends multi-layering when desired insulation thicknesses are greater than 2.7 in.

**RSI is the metric expression of R-value (m^2 • K/W).



Standard dimensions shown. Custom dimensions available.

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USP ISO-1 CG

Application Specifications

Property	Test Method	Typical Result
Dimensional Stability (Length & Width)	ASTM D 2126	<2%
Compressive Strength (10% Deformation)	ASTM D 1621	20 psi (138 kPa) or 25 psi (172 kPa)
Water Absorption	ASTM C 209, ASTM D 2842	<1% <3.5%
Moisture Vapor Transmission	ASTM E 96	<1.0 perm (85.0ng/(Pa•s•m^2))
Product Density	ASTM D 1622	Nominal 2.0 pcf (32.04 kg/m^3)
Flame Spread	ASTM E 84 (Full 10 min. Test)	50*
Smoke Developed	ASTM E 84 (Full 10 min. Test)	<135*
Tensile Strength	ASTM D 1623	>730 psf (35 kPa)
Service Temperature		-100 to 200° F**

**The numerical ratings as determined by ASTM Test Method E 84 are not intended to reflect hazards presented by this or any other material under actual fire conditions. A flame spread index of 75 or less and smoke development of 450 or less meet code requirements regarding flame spread and smoke development for foam plastic roof insulation. However, the codes exempt foam plastic insulation when used in roof deck constructions that comply as an assembly with FM 4450 or UL 1256 (see IBC, NBC, UBC, and SBC Sections on Foam Plastic Insulation (Chapter 26). Smoke development does not apply to roofing.*

***ASTM C 1289 Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.*

The physical properties listed above are presented as typical average values as determined by accepted ASTM test methods and are subject to normal manufacturing variation.

Installation: Before installation begins, the roof deck should be firm, well attached, even, clean and dry. Proper attachment of the insulation is necessary to prevent roof failures. U.S. Ply is not responsible for any damage caused by improper attachment. USP™ ISO-1 CG installation can be attached to decks that are approved by FM Approvals and local codes. U.S. Ply is not responsible for determining the suitability of the deck.

Storage and Handling: USP™ ISO-1 CG must be kept dry before, during and after installation. Install only as much USP™ ISO-1 CG as can be covered the same day with completed roofing.

Although USP™ ISO-1 CG has been designed to withstand normal foot traffic, protection from damage to withstand normal foot traffic, protection from damage by construction traffic, and/or abuse is extremely important. Roof surface protection such as plywood shall be used in areas where storage and staging are planned and heavy or repeated traffic is anticipated during or after installation.

Multi-Layer Installation: A two-layer application of USP™ ISO-1 CG is strongly recommended. The joints in each layer should be offset in order to avoid a vertically continuous joint through the total insulation thickness. Two layers (or more) with joints staggered can provide improved insulation performance by eliminating thermal bridges. This method also reduces condensation potential and thermal stress on the roof membrane.

Mechanical Attachment: Mechanical fastening is the recommended method of attachment over nailable decks. Fastener frequency and spacing for steel, wood, cast-in-place structural concrete, lightweight insulating concrete decks and poured gypsum concrete decks are covered in the current U.S. Ply Specification Manual according to the membrane system. Refer to the current FM Loss Prevention Data Sheet 1-29 for special considerations regarding perimeter and corners of the roof for non-hurricane prone zones. Follow the more stringent requirement of manufacturer and FM 1-29 for hurricane prone zone attachment. For more information contact U.S. Ply Technical Services at 1-866-PUSH-PLY (866-787-4759).

Adhesive Attachment: For installing USP™ ISO-1 CG to a structural concrete deck, adhesive/ bitumen attachment is the recommended method. USP™ ISO-1 CG shall not be adhered directly to lightweight insulating concrete decks and poured gypsum concrete decks by any bitumen or adhesive attachment method. When using hot bitumen on concrete decks, priming is necessary. Precautions must be taken to ensure that concrete decks have fully hydrated and do not continue to release moisture. Insulation must remain dry before, during, and after installation. Precautions must also be taken to prevent bitumen drippage. When using hot-applied bitumen for attachment of insulation to structural concrete decks and successive insulation layers, the temperature of the bitumen should be approximately 50°F below the interply hand mopping EVT. The deck must be dry and care must be taken to apply the bitumen in sufficient quantity to totally cover the available deck surface when applied at the correct temperature (390°F). To ensure embedment, the board must also be "stepped in" at several points while the bitumen is still hot enough to allow positive attachment. USP™ ISO-1 CG insulation size for hot bitumen attachment is 4' x 4' (maximum).

When using polyurethane adhesives or cold applied asphalt adhesive the recommended polyiso is USP™ ISO-1 CG or USP™ ISO-2 CG in maximum 4' x 4' panels. Consult and follow the adhesive manufacturer's installation recommendation at all times.

VAPOR/AIR RETARDERS: Moisture vapor tends to migrate from warmer to cooler areas. In building construction, vapor/air retarders are used to inhibit or block the passage of warm, moisture-laden air into walls or roofing assemblies. To determine whether a vapor/air retarder is necessary, calculations based on interior relative humidity, interior temperature, and the outside design temperature must be performed. Consult the NRCA Roofing Manual, Membrane Roof Systems 2007 for more information regarding vapor/air retarders and dew point calculations.

Special consideration should be given to construction-generated moisture as well. For example, construction-generated moisture will be released when concrete floor slabs are placed after the roof has been installed, which can drive large quantities of moisture into the roof system. Therefore, Atlas is not responsible for damage to the insulation when exposed to construction-generated moisture. Refer to the NRCA Roofing Manual, Membrane Roof Systems 2007 for recommendations for the use of a vapor retarder when construction-generated moisture is present (5th Edition, Volume 3, p. 813). Consult vapor/air retarder manufacturer for recommended applications and details.

STORAGE: Factory applied packaging is intended only for protection during transit. When stored outdoors or on the job site, the insulation should be stacked on pallets at least four inches above ground level and completely covered with a weatherproof covering such as a tarpaulin. The temporary factory-applied packaging should be slit or removed to prevent accumulation of condensation. Roof insulation which has become wet or damaged should be removed and replaced with solid, dry insulation.

TECHNICAL ASSISTANCE: U.S. Ply believes success comes through backing quality products with the best service in the industry. Contractors, architects, engineers, distributors, property managers and building owners are invited to contact our Technical Service Assistance Team at 1-866-PUSH-PLY (866-787-4759) and speak to a knowledgeable roofing representative regarding specifications, material application, code approvals, product information and uses.

U.S. Ply has a user-friendly website that includes information about the U.S. Ply roofing systems, product line, specifications, technical data and sales information. Visit our website at www.usply.com.

WARNING - DO NOT LEAVE EXPOSED: This product is polyisocyanurate organic plastic foam and will burn if exposed to an ignition source of sufficient heat and intensity, or open flame, such as a welder's torch. Like other organic materials, this product will release smoke if ignited. Do not apply flame directly to USP™ ISO-1 CG roof insulations. This product should be used only in strict accordance with Atlas recommended uses and application instructions.

LIMITATIONS OF LIABILITY: Other than the aforementioned representations and descriptions, U.S. Ply, Inc. (hereafter, "Seller") makes no other representations or warranties as to the insulation sold herein. The Seller disclaims all other warranties, express or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose. Seller does, however, have a limited warranty as to the LTTR-value of the insulation, the terms of which are available upon request from the Seller.

The Seller shall not be liable for any incidental or consequential damages including the cost of installation, removal, repair or replacement of this product. The Buyer's remedies shall be limited exclusively to, at Seller's option, the repayment of the purchase price or resupply of product sold by U.S. Ply, Inc. in a quantity equal to that of the nonconforming product. U.S. Ply, Inc. distributors, agents, salespersons or other independent representatives have no authority to waive or alter the above limitation of liability and remedies.

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