Korolite® Graphite Expanded Polystyrene (GPS) Insulation

Product Description

Korolite® Graphite Expanded Polystyrene (GPS) is a high-performance, closed cell, rigid foam insulation material that uses air as main ingredient. GPS insulation resists moisture and mold/fungi growth with low environmental impacts, high & stable Long-Term Thermal Resistance, and good drying potential over the long service lives of buildings. Korolite® GPS is used in many residential and commercial construction applications such as such as wall, roof and below-grade insulation including under slabs.
Korolite® GPS is an advanced combination of Graphite nanoparticles and Expanded polystyrene (EPS) creating an energy-efficient and cost-effective insulation solution for architects, builders and contractors.

Sizes

Common widths and lengths are 2'x8', 4'x4' and 4'x8' [0.61m x 2.44m, 1.22m x 1.22m and 1.22m x 2.44m] but can be custom ordered in any size to meet your project specifications.
Common thicknesses are: 1", 1.5", 2", 2.5", 3", 4", 5" and 6" [25.4mm, 38.1mm, 50.8mm, 63.5mm, 76.2mm, 101.6mm, 127mm and 152.4mm] but can be custom ordered in any size, including factory-tapered, to meet your project specifications.

Material Properties

Korolite® GPS Insulation products exhibit the typical physical properties indicated below when tested as represented.

Manufacturer

Airfoam Industries Ltd.
19402 - 56 Ave, Surrey BC V3S 6K4 Canada
800.663.8162 or 604.534.8626 | www.airfoam.com

Code Compliance

Refer to Airfoam's Code Compliance Research Report CCRR-0379 at www.airfoam.com/Airfoam-Code-Report-CCRR-0379.pdf
Korolite® EPS insulation is Thermal Insulation with Surface Burning Characteristics. Most Korolite® Types comply with:

- Canada: CAN/ULC-S701.1, CAN/ULC-S102.2
- USA: ASTM C578, ICC-ES AC12, ASTM E84 (UL 723)

Fire Characteristics

- Limiting Oxygen Index: min. 24% per ASTM D2863. Airfoam's EPS for construction applications contains a polymeric (non-HBCD) fire retardant modifier.

Surface Burning Characteristics

- **Canada**: CAN/ULC-S102.2: Flame-Spread Rating ≤295, Smoke Developed Classification over 500.
- **USA**: ASTM E84 (UL 723)[a]: Flame Spread Index ≤25, Smoke-Developed Index ≤450 up to 6" thick.

[a] Ceiling measurement only, conducted through determination of flame spread index and smoke developed index with the removal of any contribution of molten materials ignited on the floor of the Steiner tunnel.

Korolite® GPS Insulation - Material Properties

Property[1]	Units		Korolite® GPS Types G100	G160	G250	Test Standard
Third Party Certified Type	Canada		1	2	3	CAN/ULC-S701
	USA		I	II	IX	ASTM C578
Compressive Resistance[2] Minimum @ 10% Deformation	psi		10	16	25	ASTM D1621 Proc.A
	kPa		70	110	172	
Thermal Resistance[3,4] Typical at mean temperatures of:						
R-Value / inch thickness	ft²•hr•°F/(BTU•in)	75°F	4.7	4.7	4.7	ASTM C518 or C177
		40°F	4.9	4.9	4.9	
RSI / 25mm thickness	m²•°C/(W•25mm)	24°C	0.815	0.815	0.815	
		4°C	0.850	0.850	0.850	
Flexural Strength Minimum	psi		25	35	50	ASTM C203 Proc. B
	kPa		172	240	345	
Water Vapor Permeance[4] Maximum @ 1" [25.4mm] thickness	perms		5.0	3.5	2.3	ASTM E96 desiccant
	ng/(Pa•s•m²)		287	201	132	
Water Absorption[5] Maximum	% by volume	USA	4	3	2	ASTM C272, 1 Day
		Canada	6	4	2	ASTM D2842, 4 Days
Density	Nominal[6] lbs/ft³		1	1½	2	ASTM C303 or D1622
	Minimum[7] kg/m³		14.4	21.6	28.8	
Dimensional Stability	% linear change max.			1.5		ASTM D2126, 7 Days @ 70±2°C

[1] The test methods used to determine the material properties provide a means of comparing different cellular plastic thermal insulations. They are intended for use in specifications, product evaluations and quality control, but they are not intended to predict end-use product performance. [2] The elastic limit is between 1% and 2% strain. Compressive resistances at 10% strain are provided for applications where the intended end-use can tolerate plastic (permanent) deformation under load. [3] R means resistance to heat flow. The higher the R-value, the greater the insulating power. [4] Values are for 1 inch or 25mm thick samples with natural skins intact. Better values will result for thicker materials. [5] The lab-test methods for water absorption use complete submersion under a head of water for 24 or 96 hours, so the values are applicable to specific design requirements only when the end-use conditions are similar to test method requirements. [6] Not part of all the industry consensus standards (ASTM C578, CAN/ULC-S701) and provided AS-IS solely for informational purposes. [7] Minimum Density only applicable to USA-bound products per ASTM C578 (not Canada-bound products per CAN/ULC-S701).

KOROLITE®

Korolite® GPS Insulation
Technical Summary

Fire Protection

CAUTION: This product is combustible. Keep away from high heat and ignition sources. A protective barrier or a thermal barrier is required as specified in the appropriate building code.

¾ Hour Fire Rating for a Composite Wall Assembly with EPS c.i. (Continuous Insulation) per **CAN/ULC-S101**, **ASTM E119,** see Design No. CPIA/CWP 45-01. Meets **NFPA 285** with specific limitations for an exterior wall assembly.

For more information consult Airfoam's CCRR-0379 at www.airfoam.com/Airfoam-Code-Report-CCRR-0379.pdf, your engineer, local building department or call Airfoam at 800.663.8162.

Environment Data

GPS has much lower environmental impacts than most other foam plastic insulation materials. Korolite® GPS insulation may contain up to 30% pre-consumer recycled content or can be ordered without recycled content for EIFS/Stucco applications.

Korolite® GPS insulation **resists mold & fungi growth** per ASTM C1338 and has no nutritional value for insects. To protect against termites place adequate physical barriers such as membranes around below-grade GPS.

Max. service temperature: Long-Term Exposure 75°C [167°F], Intermittent Exposure 80°C [176°F]

Thermal expansion coefficient: 5-7 • 10^{-5}/°K

Capillarity: None.

Solubility & Incompatibility

Insoluble in water and in general chemically inert. GPS dissolves in hydrocarbons (e.g. fuels, oils, tar), organic solvents (e.g. acetone/ketones, benzene, paint thinner), ethers, esters, aldehydes and amines.

Jobsite Storage & Installation

CAUTION: Keep graphite-enhanced (gray) EPS insulation protected from excessive heat at all times!

Excessive heat build-up will damage GPS insulation. When storing Korolite® GPS Insulation products, keep them protected from direct and reflected sunlight at all times because the GPS insulation will deform with excessive heat from solar radiation. Store indoors if possible or keep product tarped or covered to protect from sunlight and weather. Do not use clear plastic covering.

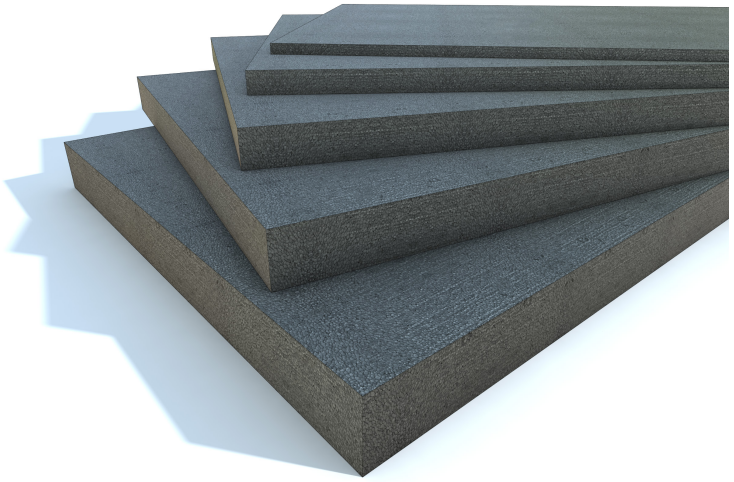
During construction leave GPS products in their white opaque packaging as long as possible, then quickly protect exposed Korolite® GPS surfaces from direct or reflected solar energy. If deformation of the insulation product occurs due to excessive heat transferred from direct or reflected sunlight, shield the exposed insulation from that solar energy with tarps or similar protection. This is only needed while the GPS insulation remains exposed, e.g. until the finishes are applied.

In all other respects, follow the Installation Guide for Korolite® (white) Expanded Polystyrene (EPS) Rigid Insulation available at www.airfoam.com. Install Korolite® GPS insulation in compliance with all applicable building codes. Korolite® insulation is easy to handle and install and can be cut with a utility knife or any sharp blade. Butt edges and ends tightly to adjacent GPS boards. Ensure compatibility of any other product (such as adhesives, tapes, coatings or finishes) with Expanded Polystyrene. Korolite® Rigid Foam Insulation is a non-structural material. Korolite® insulation shall only be placed into an assembly where the moisture transport mechanisms are well understood and determined to be acceptable in accordance with accepted engineering practice (e.g. current ASHRAE Handbook of Fundamentals).

For safe handling and storage information refer to the Safety Data Sheet (SDS) at www.airfoam.com/SDS.pdf or request a printed copy.

GHS Classification: Non-Hazardous.

UV-light surface degradation: Avoid prolonged Korolite® GPS exposure to direct sunlight. The ultraviolet light creates a yellow dust on the surface of GPS products which has negligible impact on the products' properties but may require removal before adhering other materials such as stucco or self-adhesive membranes.



Availability

Korolite® GPS insulation is supplied from Surrey BC through our extensive distribution network. For product availability or to get in touch with your local distributor, call Airfoam at 800.663.8162 or +1.604.534.8626.

Warranty

Airfoam offers a **30-year limited warranty** for Korolite® GPS Insulation **including retention of 100% of its R-value**. See www.airfoam.com/Korolite-Insulation-30-Year-Limited-Warranty.pdf and www.airfoam.com/terms for Terms and Conditions of Sale.

Maintenance

No maintenance is required in normal use. GPS insulation that became wet can be dried out within reasonable times per ASTM C1512 tests using adequate drainage and/or ventilation.

Recycling

Graphite Expanded Polystyrene (GPS) can be recycled for reuse in a variety of different applications, from construction and landscaping to packaging and park benches. Airfoam Industries Ltd. is a registered Recycling Facility accepting recyclable #6 Graphite Expanded Polystyrene (GPS) from our customers - free of charge, if it is clean, dry, and not mixed with any other materials.

Technical Services

Airfoam can provide technical information and support to help address questions when using Korolite® GPS insulation. Technical personnel are available to assist with any insulation project. For technical assistance, contact Airfoam at:

Online: www.airfoam.com/EPS-Insulation-Support.php
Phone: 800.663.8162 or +1.604.534.8626
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airfoam
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