

Insulation Systems for

Residential & Commercial Construction





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Plasti-Fab: Quality, Service and Expertise

Behind every Plasti-Fab® product is our commitment to three key principals – Quality Service and Expertise.

Quality

Plasti-Fab prides itself on delivering product that meets customer specifications. In order to ensure consistency of product, our facilities adhere to stringent manufacturing process controls based on a Quality Management System including third party certification of insulation products. Our professionals apply rigid quality control and testing procedures to assure conformance with customer specifications.

Service

Service means delivery of product when the customers need it. The Plasti-Fab commitment in this area and proven track record of meeting these needs has developed into long-term relationships with many customers. Our market presence enables us to provide our customers with local market knowledge, expertise and superior customer service.

Expertise

Over 35 Years of Expertise. Recognized as leading experts in our industry, we meet our customers' requirements through product research and development. We deliver product innovation through understanding our customers' needs. We back our product performance with ongoing research and testing. We pride ourselves on maintaining a consistent link between product performance knowledge and product application knowledge.

Product Applications

Plasti-Fab EPS products are inert to a wide range of chemicals and do not contain any CFC's, HCFC's or HFC's. Plasti-Fab PlastiSpan™ insulation provides constant thermal performance and is used as the insulation component in foundation, floor, wall and roof systems.

Plasti-Fab building systems provide leaders in energy efficient construction with innovative product solutions to construct solid, secure and safe building envelopes. Plasti-Fab research, product development and testing ensure long term performance.

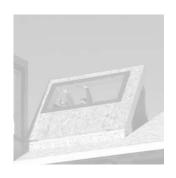
Plasti-Fab geotechnical engineered products offer designers options when faced with difficult site conditions. Plasti-Fab EPS products are available for use beneath, around or over structural elements in the building as a compressible medium or as a lightweight fill material.

Plasti-Fab insulation and building systems meet building code requirements for use in residential and commercial applications. Information on current code evaluation reports can be provided upon request.

The Plasti-Fab Design Manual is available to assist customers in determining how to make the best use of Plasti-Fab EPS product solutions. For additional information, contact your nearest Plasti-Fab sales office toll-free at 1-888-446-5377 or visit our website at www.plastifab.com.



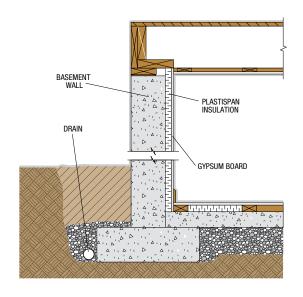




Interior Foundation Insulation

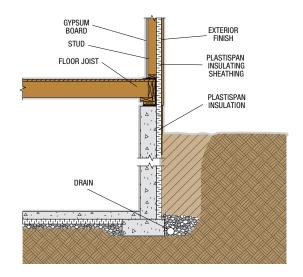
Plasti-Fab PlastiSpan® insulation board installed on the interior of the foundation wall provides a monolithic thermal blanket that eliminates thermal shorts. PlastiSpan insulation board can be attached to the interior surface of the foundation wall between wood strapping or directly to the surface of the concrete wall. PlastiSpan insulation boards of adequate thickness attached to the interior surface of the wall will raise the surface temperature to within 3°C (5°F) of the room temperature under normal conditions.

The National Building Code of Canada requires that interior surfaces of PlastiSpan insulation be covered using a thermal barrier, such as gypsum board. The gypsum board must be attached through the insulation to the foundation wall.



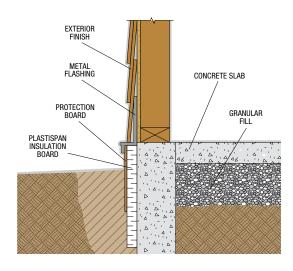
Exterior Foundation Insulation

With its outstanding resistance to moisture absorption, PlastiSpan insulation board provides dependable long-term thermal performance when installed on the exterior face of the foundation wall. PlastiSpan insulation installed on the exterior face of the foundation wall reduces the likelihood of condensation forming on the interior face of the wall behind interior wall construction. As well, exterior foundation insulation isolates the foundation wall from outdoor temperature fluctuations, provides a drainage plane to direct surface moisture to the drainage tile and protect foundation dampproofing during backfilling.



Perimeter Insulation

Apply PlastiSpan insulation board to the exterior perimeter of a foundation or footing that will be buried in backfill. Prior to application of the insulation, the below grade portions of the wall should be dampproofed or waterproofed as required. PlastiSpan insulation board can then be applied using adhesive or loose laid and held in position during the backfill process. When applied to the exterior of the wall, the exposed surface above grade must be protected using a galvanized steel flashing or other suitable method.



Frost Protected Shallow Foundations

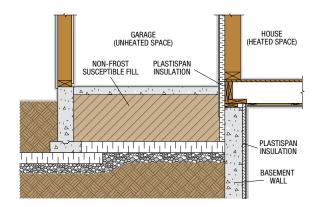
Canadian building codes state that foundations must extend below expected frost penetration depth unless they are insulated in a manner that will reduce the heat flow to the soil beneath the footing. This can result in additional cost especially in colder climates where frost may penetrate to significant depths.

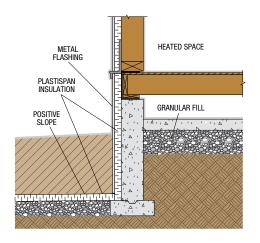
Frost protected shallow foundation (FPSF) designs using PlastiSpan insulation can be used for either heated or unheated structures allowing the footing to be placed above the frost line. In either type of structure, PlastiSpan insulation is placed horizontally out from the foundation to raise the frost line above the underside of the footing so there is no heaving of the foundation.

PlastiSpan insulation is ideal for use in FPSF designs for unheated structures such as attached garages. Unless the temperature within a garage is maintained above freezing at all times, frost susceptible soils beneath the foundation are subject to frost heave causing damage to the garage floor and movement of the footings. FPSF design can also be used for small-unheated portions of structures such as recessed entries or an entry at grade for a walkout basement.

PlastiSpan insulation can also be used for FPSF designs for heated structures. In this type of application, the insulation is placed vertically on the foundation wall in addition to the horizontal insulation.

For both types of structures, one of the most important considerations is ensuring continuity of the insulation application. The insulation layer must be continuous in order to ensure that no thermal bridges are built into the wall construction.

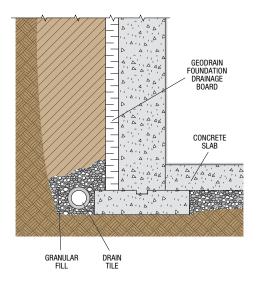




GeoDrain Foundation Insulation Board

The Canadian Construction Materials Centre (CCMC) has evaluated GeoDrain® foundation insulation board for requirements as a Class B, Type 2 drainage product. As outlined in CCMC Evaluation Report No. 12695-R, GeoDrain foundation insulation board has demonstrated that it can serve as an exterior below grade insulation layer providing drainage performance equivalent to that required in Ontario Building Code 1997, Clause 9.14.2.1.(2)(b).

GeoDrain foundation insulation board is intended to function as a key component in a properly designed foundation insulation and drainage system. The smooth surface of the board in contact with the soil provides a capillary-breaking layer directing water to the drainage tile. The grooved surface of the board in contact with the foundation wall provides an additional drainage plane and protects the foundation dampproofing. The thickness of GeoDrain foundation insulation board is designed to provide R-Value required for below grade foundation walls.



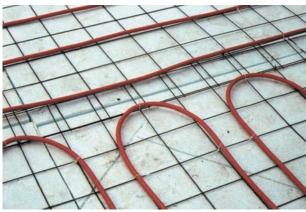
Insulation for Radiant Floor Heating Systems

PlastiSpan insulation board is used to insulate concrete slabs incorporating radiant heating systems. Radiant floor heating systems ensure that the entire floor area is heated more uniformly. Conventional forced air heating systems rely upon convection to force hot air towards the ceiling resulting in non-uniform heat distribution throughout the room area.



PlastiSpan insulation beneath a concrete slab containing hydronic tubing designed for use in radiant floor heating systems ensures that heat loss will be minimized and the entire floor area will be warmed faster. PlastiSpan insulation support blocks are available for support of hydronic heat tubing, if required.

The required thickness of PlastiSpan insulation board used in radiant floor heating systems will vary dependent upon the required thermal resistance value for the location.



Features/Advantages:

- PlastiSpan insulation provides a monolithic insulation blanket to ensure uniform heat distribution throughout room areas.
- Floor areas will be noticeably warmer to anyone standing on the floor.
- PlastiSpan insulation installs quickly and easily.
- No special skills, tools or equipment are required; no mechanical attachment is required.

Above and Below Concrete Slab-on-Grade

Below Concrete Floor

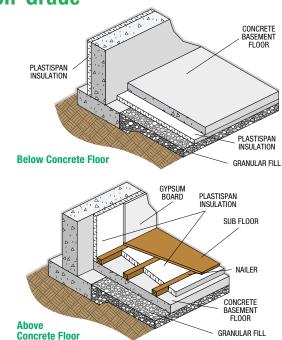
Use PlastiSpan insulation board installed in adequate thickness to satisfy insulation requirements under cast-in-place concrete floors placed on grade.

A moisture barrier should be placed between the insulation layer and the underside of the concrete slab. The floor surface will be noticeably warmer to anyone standing on the floor.

Above Concrete Floor

Cover the entire concrete slab-on-grade with a polyethylene moisture barrier. Attach wood strapping to concrete surface at required spacing and place PlastiSpan insulation boards between strapping A sub-floor grade plywood is then placed over the PlastiSpan insulation.

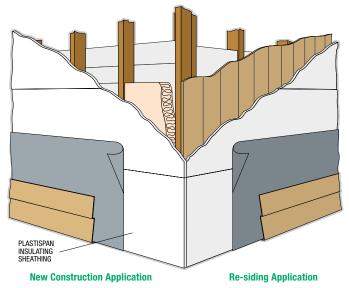
PlastiSpan insulation boards of adequate thickness placed above the floor slab will raise the surface temperature to within 3°C (5°F) of the room temperature under normal conditions.



Exterior Insulating Sheathing Board

Use PlastiSpan insulation for new construction as an exterior insulating sheathing board applied to the exterior of above grade walls constructed using wood studs, steel studs, cast-in-place concrete or masonry to provide walls with any desired R-Value. For renovation applications, PlastiSpan insulation board can be applied directly to the surface of existing siding materials to add the desired R-Value. Cladding materials must be fastened through the insulation to the framing.

Because PlastiSpan insulation is placed over the entire exterior of the building envelope, it provides a monolithic insulation layer, which eliminates thermal shorts, reduces air infiltration and isolates the structure from outdoor temperature fluctuations. To maximize your R-Value at a given thickness of insulation or for added strength when applying insulation board directly over existing siding, PlastiSpan HD insulation can be used.

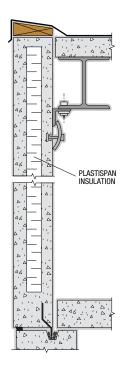


Precast Concrete Wall Panels

PlastiSpan insulation can be easily and economically incorporated into precast concrete wall panels at the time of manufacture. The precast wall panel is constructed so that the interior wythe of the panel is structural. Thus, the structural portion of the panel is protected from thermal expansion as a result of exterior temperature fluctuations.

PlastiSpan insulation board can also be applied on the interior surface of a precast panel.

The National Building Code of Canada requires application of a thermal barrier over PlastiSpan insulation to be supported through the insulation to the precast concrete wall.



Exterior Insulation & Finish Systems

PlastiSpan EFS insulation supplied as a component for exterior insulation and finish systems (EIFS) is designed to meet stringent exterior wall specifications. It is also available under the tradename PlastiSpan EFS insulation.

Application of PlastiSpan EFS insulation to the exterior of the building envelope provides a monolithic insulation layer. In addition to stabilizing indoor temperatures, it isolates the building from exterior temperature fluctuations reducing expansion and contraction of the structure.

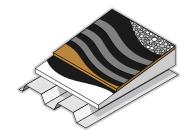
PlastiSpan EFS insulation can be cut to provide architectural contours for exterior wall applications. Special shapes, such as the cornice detail shown, can be provided where required. PlastiSpan EFS insulation has an etched texture and bonds tenaciously to wall substrates using a variety of adhesives. It is compatible with the three protective coating types as classified by the Exterior Insulation Manufacturers
Association (EIMA). Consistent product quality is assured through a third party certification program monitored by ULC.

PlastiSpan Roof Insulation

PlastiSpan insulation can be incorporated into a variety of roofing systems in order to reduce energy loss. The detail drawings and information below provide basic selection criteria. Specific Plasti-Fab brochures are available to provide additional information on design, selection and specification for each of the roof types.

A three-part specification in Construction Specification Canada standard format is available. The specification is available in electronic format to permit modification for inclusion in project documents.

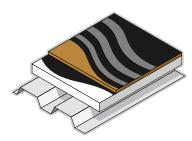
Sloped Insulation



Selection Factors

PlastiSpan sloped roof insulation is used to provide the positive slope to drain required for new and re-roofing applications.

Built-Up Roofing

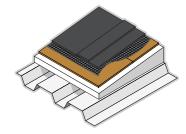


Selection Factors

Economical for high thermal resistance. Fibreboard provides an excellent and familiar surface for the application of built-up roofing.

Easily installed over thermal barriers on steel deck.

Single Ply Roofing



Selection Factors

PlastiSpan insulation adapts to requirements of single ply membrane.

Economical for high thermal resistance.

Easily installed over thermal barriers on steel decks.

Modified Bitumen Roofing



Selection Factors

Suitable for either new or maintenance roofing applications.

Used successfully in North America since approximately 1975.

Protection board required over top surface of the insulation board in order to avoid damage.

Fire-Rated Assemblies



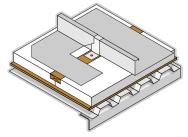
Selection Factors

Thermal barriers on steel decks tested to comply with Building Code.

Steel deck with suspended ceiling can provide 1 hour fire rating.

Choose thickness of concrete deck to provide required fire rating.

Standing Seam Roofing



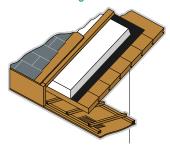
Selection Factors

Variety of profiles and colours.

Install at any temperature

Easily installed over thermal barriers on steel decks.

Cathedral Ceilings



Selection Factors

Ideal where exposed timber deck is chosen inside building finish and slope is sufficient to allow the use of shingles, shakes or tiles.

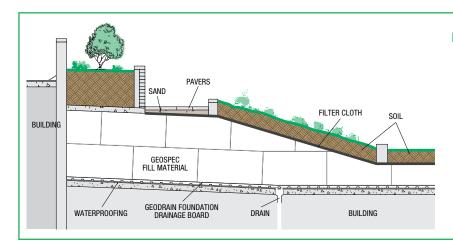
GeoSpec Lightweight Fill Material

GeoSpec® lightweight fill material is an expanded polystyrene (EPS) product used in ground fill applications where a lightweight fill material is required to reduce stresses on underlying or adjoining soils/structures. Typical uses for building applications include lightweight fill material for landscaping and as a compressible inclusion against foundation walls.

GeoSpec lightweight fill material is used in either block or board form. Traditional earth fill materials are generally more than 100 times heavier than GeoSpec lightweight fill material and can cause settlement or instability of underlying soils.

GeoSpec lightweight fill material can also be used as a compressible fill material against

foundation walls. In this type of application, the surface of GeoSpec fill material against the earth fill also functions as drainage plane. Additional drainage capabilities can also be easily incorporated when used as exterior foundation insulation — see information on GeoDrain foundation insulation board in this brochure.



Features/Advantages:

- Material arrives ready to place, no weather delays.
- Material can be prefabricated or cut at the jobsite, no staging required.
- Material can be inventoried, improving production efficiency.
- Lightweight, easy to handle.

GeoSpan & GeoVoid Compressible Fill Materials

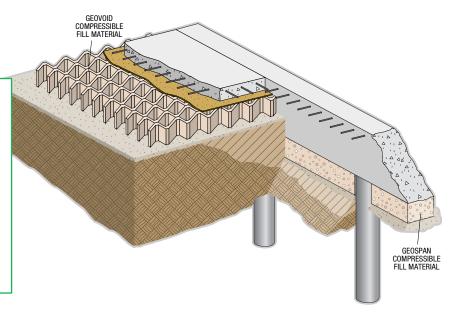
Soil expansion, which occurs after construction has been completed, can transfer significant forces to structures. Plasti-Fab has developed GeoSpan® and GeoVoid® compressible fill materials as products specifically designed to reduce loads transferred in these types of applications.

GeoSpan compressible fill material is intended for use under grade beams and some heavier structural slabs supported on pile foundations or against foundation walls

GeoVoid compressible fill material is a fabricated shape specifically engineered for use beneath structural slabs that have been designed to resist limited uplift pressures.

Features / Advantages

- Engineered products designed for each application.
- Presence of water does not affect the engineered properties of the product.
- Mechanical properties can be predicted for both short and longterm behavior.
- Lightweight and easy to handle.
- Dimensions can be easily adjusted on the job site.



Insulating Concrete Forming (ICF) Systems

The Plasti-Fab patented Advantage ICF System® is an insulating concrete forming system consisting of two layers of expanded polystyrene (EPS) insulation connected with web connectors moulded into the EPS insulation. The top and bottom edges of Advantage ICF System blocks have a preformed interlocking mechanism which ensures web connectors align vertically for attachment of surface finish materials.

When the installed Advantage ICF System blocks are filled with concrete, an insulated, monolithic concrete wall of uniform thickness is formed. The result is a superior, energy efficient wall that will provide long-term energy cost savings and add resale value to the building.

Effective Thermal Resistance

Walls built with the Advantage ICF System provide improved energy efficiency that result in reduced operating costs for the life of the building. In addition, since less energy is being used, related greenhouse gas emissions are proportionately reduced. Today, more than ever, building an

Studies have shown that space heating and cooling accounts for 61% of total energy consumption for residential buildings and 56% for commercial and institutional buildings. energy efficient structure is the right environmental choice and will provide savings in energy costs.

The thermal resistance (R-Value) of a wall assembly provides a measure of its ability to resist heat flow through it.

Walls constructed with the Advantage ICF System have a higher R-Value than other construction methods. It is important to distinguish between the overall "effective" R-Value of a wall assembly calculated using the methods detailed in model energy codes versus "nominal" R-Values.

Minimum thermal insulation requirements in building codes are typically nominal values based on the centre-of-cavity R-value at the point in a wall cross-section containing the most insulation. In wood-frame construction, this nominal value indicates the thermal insulation required between framing members. The "effective" R-value of a wall assembly, on the other hand, refers to the complete assembly, including the effect of thermal bridges such as wood framing members.

The higher effective R-Value of the Advantage ICF System significantly reduces heat transfer compared to other construction methods resulting in lower energy consumption for heating & cooling.

Wall assemblies built with the Advantage ICF system incorporate a monolithic layer of expanded polystyrene (EPS) insulation over the interior and exterior face. Walls built using wood-frame construction

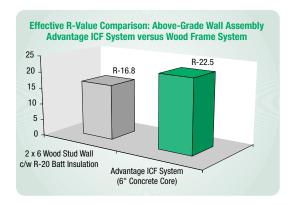
include framing members at 406 or 600 mm (16" or 24") on center with insulation between them. The effective R-Value of a wall assembly provides a better measure of thermal resistance because it includes the effect of thermal bridges in the wall assembly.

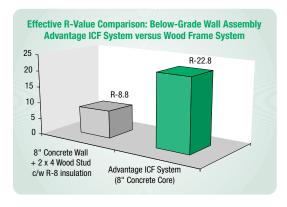
A home built using the Advantage ICF System will provide a wall structure at least 40% more energy efficient than a new home constructed using wood stud framing and batt insulation. This will translate into a savings in energy consumption of at least 30%. The graph shown provides a comparison of the effective R-Value for a wall assembly constructed using the Advantage ICF System versus a wood frame system with R-20 insulation.

Typical Effective Thermal Resistance

	Below Grade	Above Grade
6" Advantage ICF System	R-21.7	R-22.5
8" Advantage ICF System	R-22.8	R-23.6

Attention to maintaining energy efficiency can not be focused solely on the above-grade portion of the construction. A poorly insulated below-grade wall can account for more than 50% of total heat loss from a house. The graph below provides a comparison of the effective R-Value provided by a below-grade wall constructed with the Advantage ICF System wall versus a typical concrete wall with wood frame wall and R-8 insulation.





Structural Insulating Panel (SIP) System

Effective Thermal Resistance

The Insulspan® SIP System provides wall and roof assemblies with higher effective thermal resistance (R-Value) than other construction methods. The R-Value of an assembly is a measure of its ability to resist heat flow through it. The higher the R-Value of your wall assembly, the lower your energy costs for heating and cooling your home.

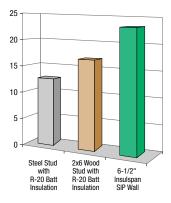
Wall and roof assemblies built with the Insulspan SIP System result in 40-60% reduction in heat loss.

The graph (below) compares effective R-Values for wall and roof assemblies constructed with the Insulspan SIP System versus stick-frame and steel stud construction methods.

Higher effective R-Value translates to reduction in heat loss and lower long-term energy costs.

Typical Effective Thermal Resistance

Insulspan SIP Thickness	SIP Joint Type	Effective R-Value		
4-1/2"	OSB Spline	16.5		
	Wood Stud	15.5		
6-1/2"	OSB Spline	23.3		
	Wood Stud	22.3		
8-1/4"	OSB Spline	30.3		
	Wood Stud	29.2		
10-1/4"	OSB Spline	37.9		
	Wood Stud	35.8		
12-1/4"	OSB Spline	45.4		
	Wood Stud	40.8		



Building Code Compliance

The Insulspan SIP System meets Code requirements for residential and commercial applications. Test results and assessments confirm compliance with Code requirements for structural design, heat transfer, air leakage and condensation control. See ICC Evaluation Service Legacy Report NER-520 (USA) and CCMC Evaluation Report 13016-R (Canada) for additional information.

Insulspan Ready-to-Assemble (RTA)

The Insulspan SIP System is available as an industry leading ready-to-assemble (RTA) system that gives builders a real competitive edge over traditional stick-frame construction. The Insulspan RTA process reduces construction time and improves efficiency. Blueprints for your home are loaded into our computerized factory equipment where the Insulspan SIP System is manufactured to your exact specifications, then delivered to your location as a ready-to-assemble building system. All accessories necessary to complete installation of the Insulspan SIP system are included.

Structural Integrity

The Insulspan SIP System is designed to provide building owners with long-term strength, safety and security. Design charts for wind, snow and seismic load resistance capacity have been prepared using an industry leading proprietary reliability-based computer model with benchmark testing conducted to produce design values meeting the reliability targets of US and Canadian codes.

A third party certification program monitored by an accredited certification body ensures the Insulspan SIP System panel is manufactured to consistent quality standards.

Reduced Air Leakage

Air leakage is one of the biggest sources of energy loss in most buildings. This is why an air leakage test on the finished building is often used by energy efficiency experts to confirm the energy efficiency rating of new building construction. The air leakage rate for building construction is quantified in terms of air changes per hour (acph). An air change is defined as one air volume change.

Air leakage rates vary widely for different types of house construction. The Insulspan SIP system "closed-cavity" design results in significant reduction in air leakage with values of 0.2 acph or lower achievable. This compares to a value of 1.5 acph required by some rating systems for energy efficient construction.

Insulspan is Green

Frank Baker, President of Insulspan, stated, "We are proud to be part of the Build-Green community. In fact, all of our building products are manufactured in an environmentally sensitive and responsible way. It makes sense to us to use our non-renewable resources to manufacture durable, recyclable products like the Insulspan SIPs building system that saves energy on a long-term basis rather than burning them."

PlastiSpan Insulation Properties

			CAN/ULC-S701			CAN/ULC-S701			
MATERIAL PROPERTIES	TEST METHOD	METRIC (SI) UNITS	TYPE 1	TYPE 2	TYPE 3	IMPERIAL UNITS	TYPE 1	TYPE 2	TYPE 3
Thermal Resistance ¹ Minimum	ASTM C 518	$\frac{\text{m}^2 \cdot {}^\circ\text{C}}{\text{W}}$	0.65	0.70	0.74	<u>ft² • hr • °F</u> BTU	3.75	4.04	4.27
Compressive Resistance Minimum @ 10% Deformation	ASTM D 1621	kPa	70	110	140	psi	10	16	20
Flexural Strength Minimum	ASTM C 203 Procedure B	kPa	170	240	300	psi	25	35	44
Water Vapour Permeance ² Maximum	ASTM E 96	ng Pa•s•m²	300	200	130	perms	5.2	3.5	2.3
Dimensional Stability Maximum	ASTM D 2126 7 days @ 70 ± 2° C	% linear change	1.5	1.5	1.5	% linear change	1.5	1.5	1.5
Water Absorption Maximum	ASTM D 2842	% by volume	6.0	4.0	2.0	% by volume	6.0	4.0	2.0
Limiting Oxygen Index ³ Minimum	ASTM D 2863	%	24	24	24	%	24	24	24

NOTES: 1. Thermal resistance measured at mean temperature of 24°C (75°F) for 25 mm (1 inch) thick material.

- 2. Values quoted are maximum for 25 mm (1 inch) thick material. Lower values will result for thicker materials.
- 3. PlastiSpan insulation board has a maximum Flame Spread Rating of 290 and a Smoke Developed Rating greater than 500 for minimum thickness of 25 mm classified in accordance with CAN/ULC—S102.2M.

For more information on Plasti-Fab EPS Product Solutions, consult the following brochures:

Roof & Deck Insulation

- □ Roof & Deck Insulation: Selection, Application & Specification
- Built Up Roofing
- $\hfill\Box$ Cathedral Ceilings
- □ Fire Rated Roof Assemblies
- Single Ply Roofing
- Sloped Roof Insulation
- Standing Seam Roofing

Building Insulation

WALL INSULATION

- □ Wall Insulation:
 - Selection, Application & Specification
- Commercial / Industrial Applications
- Exterior Insulation Finish Systems
- Exterior Insulation Sheathing New or Retrofit Construction
- Interior Systems
- □ PlastiSpan M Insulation
- Precast Concrete Wall Panels
- □ Rain Screen (Cavity) Walls

FLOOR INSULATION

- Floor Insulation: Selection, Application & Specification
- □ Floor Insulation Systems
- Insulation for Radiant Floor Heating Systems
- Split Floor Slabs

FOUNDATION INSULATION

- Foundation Insulation: Selection, Application & Specification
- Exterior and Interior Foundation Walls
- Exterior Perimeter Foundation Insulation Systems
- □ Frost Protected Shallow Foundation
- □ GeoDrain Foundation Insulation Board

ICE RINKS

Ice Rink Slab Insulation

Concrete Formwork

Advantage ICF System[®]

Roof & Wall Panels

□ Insulspan® SIP System

Mechanical Insulation

- Cold Storage Applications
- Pipe and Vessel Insulation
- Utilities Insulation

Buoyancy Systems

- Buoyancy Systems: Selection, Application & Specification
- Floating Dock or Marina
- Floating Rafts

Geotechnical Engineered Applications

- Geotechnical Engineered Applications:
 Selection, Application & Specification
- ☐ GeoSpan Compressible Fill Material
- GeoSpec Lightweight Fill Material for Landscape Applications
- GeoSpec Lightweight Fill Material for Road Embankments
- □ GeoVoid Compressible Fill Material

For more information about using PlastiSpan Insulation for Residential & Commercial Construction visit www.plastifab.com



MADE IN CANADA

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