



1. PRODUCT NAME: ThermoShield

A specially manufactured fibrous insulation, refined to take maximum advantage of its inherent physical properties.

2. SALES OFFICES

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3. PRODUCT DESCRIPTION

ThermoShield is a loose fill, fibrous thermal and acoustical insulation manufactured from selected post-consumer and post-industrial recycled paper stock. Each bag of ThermoShield displays Environment Canada's ECOLOGO, classifying it as an "environmentally friendly" product. ThermoShield may be hand-poured or pneumatically blown using a blowing machine and delivery hose. Machine application ensures that the material is properly conditioned and installed at the required design density.

Basic Uses: ThermoShield is a Type 1 product intended for dry applications only, and is appropriate for horizontal or moderately sloped attic areas up to 4.5-in-12 pitch. Injection may be used to fill areas such as flat or sloped ceiling and vertical walls. Choose the most appropriate method of installation to achieve the desired thermal and/or acoustical performance. Used for new construction or retrofit applications.

ThermoShield offers greater performance value (P Value) than other fibrous insulations. P Value has been adjusted for the detrimental effects of air leakage and moisture accumulation. Because of the higher density and perfect fit of ThermoShield (which dramatically reduces air leakage and air convection), its P Value is substantially better than other types of insulation having a similar R Value. In addition, ThermoShield's basic R Value remains more constant than mineral fibre throughout a wide range of ambient temperatures (refer to Part 4 "Technical Data" under Thermal Resistance Comparison), which makes it a superior insulation for reducing summer heat gain.

ThermoShield does not settle below its design density or lose its fire retardant properties with the passage of time. Thermal resistance and noise absorption properties are also permanent features of this material.

Limitations: ThermoShield (like other insulation products) should not be placed in direct contact with heat sources such as chimney flues, electric motors or light fixtures.

Maintain building, electrical, gas and oil safety code clearances between the insulation and heat emitting devices, such as fuel burning appliances, chimney pipes, ducts and vents to these appliances (at least 50 mm) and recessed light fixtures (at least 75 mm) unless approved for insulation contact.

ThermoShield should not be used where the ambient temperature is above 90°C (194°F) continuously.

Composition: ThermoShield is manufactured from selected post-consumer & post-industrial recycled paper fibres, impregnated with borate additives to resist mold, wood decay, insects, corrosion and combustion. A special fiberizing process is employed to obtain the thermal and acoustical properties required.

Applicable Standards: ThermoShield is UL Certified and manufactured in accordance with CAN/ULC-S703 "Standard for Cellulose Fibre Insulation for Buildings" and has been evaluated by the Canadian Construction Materials Centre (CCMC #8251).

4. TECHNICAL DATA

Product Standard CAN/ULC-S703 Test Criteria (supersedes CAN/CGSB 51.60 M90):

Open-Flammability	>0.12 W/cm ²
Open-Flammability Permanency	>0.12 W/cm ²
Surface Burning Characteristics	
(CAN/ULC S102)	FSC <25
(CAN/ULC S102.2)	FSC <150
Smoulder Resistance	<15%
Moisture Vapour Sorption	<20%
Corrosiveness	No perforations of coupons
	<25% mass loss (truss plate)
Fungal Resistance	<growth than control
Separation of Chemicals	<1.5%
Thermal Resistivity	>18.5 (m -K)/W
	(R = 3.8/in)
Design Density	
Attic (Settled)	23.78 kg/m ³ (1.6 lb/ft ³)
Wall	48.1 kg/m ³ (3.0 lb/ft ³)

Thermal Resistance Comparison: The following values for thermal resistance of cellulose insulation at seasonal temperature extremes were taken from the ASHRAE "Handbook of Fundamentals" (Re: BNL50862):

Winter value at 5°C	RSI 0.678 (R3.85)
Design value at 24°C	RSI 0.652 (R3.70)
Summer value at 43°C	RSI 0.629 (R3.57)

The above values indicate that the change in ThermoShield's R Value between winter and summer attic temperatures is only 7%, whereas a continuation of the tables for other types of insulation indicate the loss for mineral fibre under the same circumstances would be 21.4%. Consequently, ThermoShield offers the advantage of keeping a home cooler during hot summer months.

Acoustical Properties: ThermoShield, compared to other insulation products, has superior properties for improving noise suppression in wall, floor or ceiling construction. There are four performance factors to consider; mass, damping, absorption and sealing.

(a) Mass (Density): Increased mass per unit thickness of ThermoShield compared to other fibrous or foam insulation adds to the overall effectiveness of a wall, floor or ceiling assembly in improving STC (Sound Transmission Class) value.

(b) Damping: Unlike other types of insulations, ThermoShield incorporates itself as an integral part of a wall, roof or ceiling assembly. The natural ability of ThermoShield to fill crevices and gaps produces a significant improvement in the sound damping characteristics of the assembly.

(c) Absorption: ThermoShield, because of the unique porosity of its interwoven fibres, will exhibit a NRC (Noise Reduction Coefficient) of 0.75 at 25 mm (1 inch) thickness. Increased attenuation in both low and high frequency ranges is achieved due to absorption within an enclosed wall or ceiling cavity.

(d) Sealing: Field reliability of ThermoShield's noise reduction capabilities is realized through its natural ability to fill crevices and voids normally occurring in wall, floor, ceiling or attic construction. ThermoShield will completely seal around complex shapes such as pipes, conduit and electrical boxes thereby ensuring its ability to minimize sound transmission through such interruptions.

Infiltration/Convection Properties (Natural movement of air either by convection from warm to cold environments or movement by pressure differential): ThermoShield, due to its perfect fit and greater density, inhibits air movement whereas tests have proven that air movement through and around light-density, poorly fitted light density insulation can reduce its effective insulation value by up to one half.

In retrofit conditions where additional attic insulation is desired and where air leakage is occurring through other insulation types, ThermoShield can be used as a blanket cover to significantly reduce air movement, fill gaps in existing insulations and between the insulation and adjacent framing members. This can substantially increase the overall insulation value.

Thermal Resistance vs. Applied Bulk Density: ThermoShield maintains an almost constant R Value over the full range of densities at which it can be installed, whereas light-density glass fibre loose fill suffers a drastic loss in R Value if the density is only slightly less (a consequence of "fluffing") than the required design density.

Fire Resistance: ThermoShield exhibits a fire resistance capability identified in the Technical Data chart. ThermoShield will not melt or degrade like most other insulations when exposed to flame or high temperatures. Because ThermoShield will only char under direct fire exposure, it provides longer heat protection to adjacent building materials and will therefore allow building occupants more time to escape than would be the case with most other insulation materials.

Moisture: ThermoShield has the unique ability to slowly

absorb and dissipate excess moisture, thereby reducing the risk of potential condensation problems.

Canadian homes and buildings can experience loss of warm moist air from interior environments to the colder exterior air by several means such as ripped, unsealed or discontinuous vapor barrier, or by piping or electrical wiring and boxes penetrating the vapor barrier.

During the heating season, these disruptions to the vapor barrier permit escaping warm air to condense within the insulation layer or on the cold roof or wall sheathing. To combat this occurrence, insulations should be used which exhibit an ability to dissipate that moisture. ThermoShield's ability to transport moisture to a surface where it can evaporate is most important in keeping moisture levels low and insulation effectiveness high.

5. INSTALLATION

Preparatory Work: In new construction, ensure that all spaces set to receive insulation are free of foreign objects and are reasonably clean. In retrofit work, prepare installation holes, vents and access for installation equipment. Verify that the vapor retarder, if used, is installed with joints sealed and without tears or punctures. Install insulation stops, roof turbines or other devices to ensure attic space is adequately ventilated.

Installation: Install insulation by dry, pneumatic application methods in accordance with the most recent installation instructions.

ThermoShield will not settle when machine injected into a vertical wall cavity at its proper design density.

6. AVAILABILITY AND COST

ThermoShield is available across Eastern Canada. Contact our representative for advice on special or unusual conditions or geographic locations. ThermoShield offers lower cost for comparative performance.

7. WARRANTY

Thermo-Cell warrants that ThermoShield is manufactured to meet published specifications and retain its thermal performance for the normal life of the building. The applicator must warrant a specific product installation.

8. MAINTENANCE

ThermoShield requires no specific maintenance. A building owner should periodically inspect the insulation to ensure that traffic has not displaced the insulation or disturbed natural attic ventilation or permitted insulation to contact heat sources.

9. TECHNICAL SERVICES

Thermo-Cell Industries has Field Representatives, Plant Technicians and Engineers available to assist and advise. Extensive technical research data and test reports are available to assist designers and applicators in addressing unique situations.

A master guide specification on ThermoShield is available upon request. This section is written to permit specifiers to quickly edit a pre-organized specification section to suit any project.

10. FILING SYSTEMS MASTERFORMAT

(1983 Edition) Section No. 07212 (For filing data or specifying).