

CHEMICAL & PHYSICAL PROPERTIES

Tables 1&2 list physical properties of various grades for Canada, respectively. Chemical resistance is listed in Table 3.

MOLD RESISTANCE

ThermalStar X-Grade insulation has been tested against exposure to various mold and fungi via ASTM G21, D3271, C1338 with no growth of spores on the product. X-Grade insulation provides no nutritive value for mold. However, construction practices greatly inhibit mold growth, and fungi have been known to even grow on glass.

FREEZE/ THAW EXPOSURE

ThermalStar X-Grade insulation has been tested via ASTM G154-02 Moisture & Temperature Cycling for Insulation with no loss of physical or thermal performance. This test places the product between a cold chamber and a high humidity chamber with 100% temperature cycling, measuring the effect on the insulation as natural moisture drive occurs.

Table 3 Chemical Compatibility of ThermalStar X-Grade in

Inorganic Acids (Muriatic, Sulfuric, Boric Acid)	Excellent
Organic Acids (Carbolic, Citric, Acetic Acid)	Good
Bases (Sodium Hydroxide, Potassium Hydroxide, Ammonia)	Excellent
Alcohols (Methanol, Ethanol, Isopropyl Alcohol)	Good
Beer, Tea, Coffee, Carbonated Soda, Water, Fruit Juice	Excellent
Household Liquid Spray Insecticides (non-aqueous)	Poor
Cement	Excellent
DECA, Methylene Chloride, Acetone	Poor
Antifreeze (Ethylene Glycol - Green, Propylene Glycol - Orange)	Excellent
Hydrocarbons (Hexane, Gasoline, Diesel, Kerosene)	Poor
Mineral Oil	Excellent
Other Oils (Corn, Motor, Palm, Coconut Oil)	Good
Agricultural (Manure, Feed, Urine, Soil, Fertilizer)	Excellent
Formaldehyde, Turpentine, Chloroform, Naphtha	Poor
Salts (Ammonium, Ferrous, Sodium Chloride, Sulfur)	Excellent
ML-1540 Adhesive (Gorilla Glue, Fast-Tac, Dow Great Stuff)	Good
Bleach, Detergents, Borax	Excellent
Cured Mastic, Construction Adhesive, Hardened Asphalt	Good
Wherever XPS insulation is used	Excellent

Excellent = No degradation, no effect from exposure
 Good = some effect from exposure, but not significant for product performance
 Poor = significant degradation affecting performance, up to completely dissolving product
 This table is a guide only - consult Atlas Technical Services for specific chemical design questions

Table 2 Canadian Physical Properties

Property & ASTM Test Method	X-Grade 15	X-Grade 25	X-Grade 40	X-Grade 60
Compressive Strength (minimum kpa) @10% Deformation ¹ D1621	110	175	275	415
RSI per 25mm (minimum) at 75F mean temperature C518	0.74	0.74	0.74	0.78
CAN/ULC S701 Type	Type 2	Type 3	Type 3	Type 3
RSI per 25mm (minimum) at 40F mean temperature C518	0.78	0.79	0.81	0.83
RSI per 25mm (minimum) at 25F mean temperature C518	0.81	0.83	0.85	0.86
Compressive Strength (minimum kpa) @1% Deformation ¹ D1621	60	80	110	200
Flexural Strength (minimum kpa) C203	276	345	517	655
Water Absorption % by volume, maximum after 96 hr immersion D2842	4.0	2.0	2.0	2.0
Water Vapor Permeance at 25mm thick (ng/PA*s*m ²) - typical E96	200	130	130	130
Surface Burning - Flame Spread and Smoke Developed CAN/ULC S102.2	Flame Spread 290, Smoke Developed Over 500			

Maximum Use Temperature Short Term (10-15 minutes) 82C, Long term 74C

¹ X-Grade is elastic within 1-2% deformation. To prevent long term creep, 3:1 design safety factors for static loads of the 10% deformation values are recommended, or use the tested 1% deformation values for design, whichever is greater

SAFETY

MSDS for this product available at ataseps.com. Dust generated from sanding or cutting ThermalStar X-Grade insulation should be avoided using a dust mask as with other building materials. X-Grade insulation is combustible and the product should be protected from ignition sources such as open flames or welder's torch. Applications not specifically listed in ICC-ES ESR-1962 require permanent separation of X-Grade from the interior of the building by a thermal barrier such as drywall or concrete for fire resistance.

ENVIRONMENTAL

ThermalStar X-Grade insulation uses air in the insulating cells, and no gasses. The ppm levels of termiticide incorporated into the polystyrene wax matrix do not present concerns under typical applications. X-Grade insulation is readily accepted for recycle at many drop off locations.

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ThermalStar X-Grade insulation complies with the following codes when properly installed:

- x Surface Burning - UL BRYX.R16529
- x Cal Std Reg #CA472
- x International Energy Conservation Code/International Building Code (IBC) - ICC-ES ESR-1962
- x ASTM C578 - see product marking for Type
- Physical Properties - UL QORW.R16529
- International Residential Code (IRC) - ICC-ES ESR-1962
- CAN/ULC S102.2, S701 - ULC BOZCC.R16529

