



Dow Building Solutions

1 PRODUCT NAME STYROFOAM™ Highload 40, 60 and 100 Extruded Polystyrene Insulation

2 Manufacturer

The Dow Chemical Company
Building Solutions
200 Larkin
Midland, MI 48674
1-866-583-BLUE (2583)
Fax 1-989-832-1465
www.dowstyrofoam.com/architect

Dow Chemical Canada Inc.
Building Solutions
250 – 6th Ave. SW, Suite 2200
Calgary, AB T2P 3H7
1-866-583-BLUE (2583) (English)
1-800-363-6210 (French)
www.dowstyrofoam.ca/4architects

3 Product Description

STYROFOAM™ Highload extruded polystyrene insulation is a closed-cell foam insulation. Available in compressive strengths of 40, 60 and 100 psi (275, 415 and 690 kPa),

STYROFOAM Highload insulation features superior moisture resistance and R-value* retention. All three STYROFOAM Highload insulation products resist compressive creep and fatigue, delivering long-term compressive strength. Like all STYROFOAM insulation products, STYROFOAM Highload 40, 60 and 100 are durable, versatile and reusable – making them the preferred choices for a variety of high-load applications.

BASIC USE

STYROFOAM™ Highload insulation is ideal for use in low-temperature (freezer floor) applications, highways, airport runways, bridge abutments, parking decks, utility lines, ice rinks and plaza decks. It is the responsibility of the designer to select the proper STYROFOAM Highload insulation product based on the dead and live loads expected in the application.

SIZES

IN THE U.S.:

Butt Edge Thickness:

2" or 3" STYROFOAM™
Highload 40 and 60
2" STYROFOAM™ Highload 100

Width and length:

2' x 8' STYROFOAM
Highload 40, 60 and 100
4' x 8' STYROFOAM
Highload 40

IN CANADA:

Butt Edge

Thickness:

1", 1.5", 2" or 3" (25 mm,
38 mm, 50 mm or 75 mm)
STYROFOAM Highload
40 and 60
2" or 3" (50 mm or 75 mm)
STYROFOAM Highload 100

Width and length:

2' x 8' (600 mm x 2,400 mm)
STYROFOAM Highload
40, 60 and 100

U.S. PROPERTY CHART

TABLE 1

Physical Properties of STYROFOAM™ Highload 40, 60 and 100 Insulation			
Property and Test Method	Value		
	Highload 40	Highload 60	Highload 100
Thermal Resistance ⁽¹⁾ , per inch, ASTM C518, C177, @ 75°F mean temp., ft ² •h•°F/Btu, R-value, min.	5.0	5.0	5.0
Compressive Strength ⁽²⁾ , ASTM D1621, psi, min.	40	60	100
Water Absorption, ASTM C272, % by volume, max. (24hr water immersion)	0.1	0.1	0.1
Water Vapor Permeance ⁽³⁾ , ASTM E96, perms	0.8	0.8	0.8
Maximum Use Temperature, °F	165	165	165
Coefficient of Linear Thermal Expansion, ASTM D696, in/in•°F	3.5 x 10 ⁻⁵	3.5 x 10 ⁻⁵	3.5 x 10 ⁻⁵
Flexural Strength, ASTM C203, psi, min.	60	75	100
Complies with ASTM C578, Type	VI	VII	V

(1) For 1" material

(2) Vertical compressive strength is measured at 5 percent deformation or at yield, whichever occurs first. Since STYROFOAM insulations are visco-elastic materials, adequate design safety factors should be used to prevent long-term creep. For static loads, 3:1 is suggested. For dynamic loads, call 1-866-583-BLUE (2583) for safety factor recommendation.

(3) Water vapor permeance varies with product type and thickness. Values are based on the desiccant method and they apply to insulation 1" or greater in thickness.

CANADA PROPERTY CHART

TABLE 2

Physical Properties of STYROFOAM™ Highload 40, 60 and 100 Insulation			
Property and Test Method	Value		
	Highload 40	Highload 60	Highload 100
Thermal Resistance ⁽¹⁾ , per inch (25 mm), ASTM C518, C177, @ 75°F (24°C) mean temp., ft ² •h•°F/Btu (m ² •°C/W), R-value (RSI), min.	5.0 (.88)	5.0 (.88)	5.0 (.88)
Compressive Strength ⁽²⁾ , ASTM D1621, psi (kPa), min.	40 (275)	60 (415)	100 (690)
Water Absorption, ASTM D2842, % by volume, max. (96hr water immersion)	0.7	0.7	0.7
Water Vapour Permeance ⁽³⁾ , ASTM E96, perms (ng/Pa•s•m ²)	0.6 (35)	0.6 (35)	0.6 (35)
Maximum Use Temperature, °F (°C)	165 (74)	165 (74)	165 (74)
Coefficient of Linear Thermal Expansion, ASTM D696, in/in•°F (mm/m•°C)	3.5 x 10 ⁻⁵ (6.3 x 10 ⁻²)	3.5 x 10 ⁻⁵ (6.3 x 10 ⁻²)	3.5 x 10 ⁻⁵ (6.3 x 10 ⁻²)
Flexural Strength, ASTM C203, psi (kPa), min.	70 (480)	85 (585)	85 (585)
Compressive Modulus (typical), ASTM D1621, psi (kPa)	1,400 (9,650)	2,200 (15,170)	3,700 (25,510)
Complies with CAN/ULC S701, Type	4	4	4

(1) For 1" (25 mm) material

(2) Vertical compressive strength is measured at 5 percent deformation or at yield, whichever occurs first. Since STYROFOAM insulations are visco-elastic materials, adequate design safety factors should be used to prevent long-term creep. For static loads, 3:1 is suggested. For dynamic loads, call 1-866-583-BLUE (2583) for safety factor recommendation.

(3) Water vapour permeance varies with product type and thickness. Values are based on the desiccant method and they apply to insulation 1" (25 mm) or greater in thickness.

4 Technical Data

APPLICABLE STANDARDS

STYROFOAM™ Highload 40, 60 and 100 insulation meets ASTM C578 – Standard Specification for Rigid Cellular Polystyrene Thermal Insulation. Applicable ASTM standards include:

- C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- C177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
- D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- D2842 – Standard Test Method for Water Absorption of Rigid Cellular Plastics
- E96 – Standard Test Methods for Water Vapor Transmission of Materials
- C272 - Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions
- D696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer

TABLE 3

Chemical Resistance ⁽¹⁾ of STYROFOAM™ Highload 40, 60 and 100 Insulation	
Acid, inorganic, weak	Excellent
Acid, inorganic, strong	Excellent
Acid, organic, weak	Excellent
Acid, organic, strong	Good
Bases	Excellent
Alcohols, including isopropyl alcohol	Excellent
Methyl ethyl ketone	Not recommended
Polyglycols, including propylene glycol	Excellent
Hydrocarbons	Not recommended
Salts	Excellent
Insecticides	Not recommended
Kerosene	Poor
Mineral oil USP	Excellent
Naphtha (VMP)	Not recommended
Turpentine	Not recommended
Beer	Good
Gasoline	Not recommended
Fruit juices	Good

(1) Explanation of ratings:

Excellent = The plastic was unaffected for the duration of the test.

Good = A very slight clouding or discoloration of the plastic.

Poor = Considerable change in plastic during exposure.

Not recommended = Severe attack of the plastic. Became soft and unusable after a few hours of exposure.

NOTE: This table should be used as a guide only. For design purposes, specific test data on the intended application may be needed.

- C203 – Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

CODE COMPLIANCE

STYROFOAM™ Highload 40, 60 and 100 insulation complies with the following codes:

- International Residential Code (IRC) and International Building Code (IBC); see ICC-ES NER-699, BOCA-ES RR 21-02

- ICBO-ES ER-2275
- Calif. Std. Reg. #CA T064
- Underwriters Laboratories, Inc. (UL) Classified, see Classification Certificate D369

Contact your Dow sales representative or local authorities for state/provincial and local building code requirements and related acceptances.

PHYSICAL/CHEMICAL PROPERTIES

STYROFOAM™ Highload 40, 60 and 100 insulation products exhibit the physical properties indicated in Tables 1 and 2 when tested as represented.

For chemical resistance properties of STYROFOAM Highload 40, 60 and 100 insulation products, see Table 3.

ENVIRONMENTAL DATA

STYROFOAM™ Highload 40, 60 and 100 insulation is manufactured with HCFC blowing agents which have 94 percent less ozone depletion potential than standard CFC blowing agents.

STYROFOAM extruded polystyrene insulation products are reusable in many applications.

FIRE PROTECTION

STYROFOAM™ Highload 40, 60 and 100 insulation is combustible; protect from high heat sources. Local building codes may require a protective or thermal barrier. For more information, consult MSDS, call Dow at 1-866-583-BLUE (2583) or contact your local building inspector.

5 Installation

STYROFOAM™ Highload 40, 60 and 100 insulation boards are easy to handle and install. They can be cut with a utility knife or any sharp blade. Contact a local Dow representative or access the literature library at www.dowstyrofoam.com/architect or www.dowstyrofoam.ca/4architects for more specific instructions.

6 Availability

STYROFOAM™ Highload 40, 60 and 100 insulation products are distributed through an extensive network. For more information, call:
1-800-232-2436 (English)
1-800-565-1255 (French)

7 Warranty

In the United States, a 15-year limited thermal warranty is available.

8 Maintenance

Not applicable.

9 Technical Services

Dow can provide technical information to help address questions when using STYROFOAM™ 40, 60 and 100 insulation products. Technical personnel are available to assist with any insulation project. For technical assistance call:
1-866-583-BLUE (2583) (English)
1-800-363-6210 (French)

10 Filing Systems

- www.dowstyrofoam.com/architect
- www.dowstyrofoam.ca/4architects
- www.sweets.com

IN THE U.S.:

- For Technical Information: **1-866-583-BLUE (2583)**
- For Sales Information: **1-800-232-2436**

THE DOW CHEMICAL COMPANY

- Building Solutions • 200 Larkin • Midland, MI 48674
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IN CANADA:

- For Technical Information: **1-866-583-BLUE (2583)** (English); **1-800-363-6210** (French)
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DOW CHEMICAL CANADA INC.

- Building Solutions • Suite 2200 • 250 – 6th Ave. SW • Calgary, AB T2P 3H7
- www.dowstyrofoam.ca/4architects**

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COMBUSTIBLE: Protect from high heat sources. Local building codes may require a protective or thermal barrier. For more information, consult MSDS, call Dow at 1-866-583-BLUE (2583) or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.

Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including Dow can give assurance that mold will not develop in any specific system.

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