Building & Construction

TUFF-R™ and Super TUFF-R™ Polyisocyanurate Insulation

TUFF-R™ and Super TUFF-R™ polyisocyanurate insulation products consist of a high-insulating-value, closed-cell polyisocyanurate foam core sandwiched between a choice of durable exterior facers.

On TUFF-R insulation, one facer is a continuous sheet of aluminum foil; the other Tri-Plex facer is a three-ply laminate of durable virgin kraft with aluminum foil on both sides. Where additional durability is required, Super TUFF-R insulation is the product of choice. The Super Tri-Plex facers are three-ply laminates of durable polyester, virgin kraft and reinforced aluminum foil. One side is blue; the other side is radiant barrier-quality reflective foil.

Install TUFF-R and Super TUFF-R insulation products in residential construction where they will be covered with a minimum of 1/2" gypsum board, or equivalent, thermal barrier.

Applications include:

- New frame wall construction behind masonry, siding, exterior stucco or other compatible finishes
- Interior retrofit of existing walls under a new interior finish of 1/2" (minimum) gypsum board
- Exterior retrofit of existing walls under new exterior sidings
- Over roof decks and in cathedral type ceilings

TABLE 1

Features and Benefits of TUFF-R™ and Super TUFF-R™ Insulation

Feature	Benefit
High R-value(1)	• Enhances thermal efficiency, reducing energy cost
Choice of durable facers depending on design requirements	• Contribute to durable surface that can be nailed, stapled or glued
Facers prevent air penetration and water vapor intrusion	• Allow products to be detailed as a weather-resistive barrier • Allow foam R-value to stabilize at higher value
Products can be cut with utility knife or any sharp blade; Tri-Plex facers on Super TUFF-R improve shipping, storage and job-site durability	• Easy to handle and install • Less damage and job-site waste
Compatible with most exterior siding treatments	• Versatile • Ideal for brick, stone, aluminum, vinyl, wood, composite, fiber cement and stucco(2)
Hydrocarbon blowing agent	• Environmentally friendly (no ozone depletion potential)

(1) R means resistance to heat flow. The higher the R-value, the greater the insulating power.
(2) Siding manufacturers may restrict warranties as applied to sheathing underlayment.

TABLE 2

Physical Properties of TUFF-R™ and Super TUFF-R™ Insulation

Property and Test Method	Value
Compressive Strength(1), ASTM D1621, psi, min.	25.0
Flexural Strength, ASTM C203, psi, min. for 1" core foam	55
Water Absorption, ASTM C209, % by volume, max.	0.05
Water Vapor Permeance(2), ASTM E96 (dessicant method), perms	0.03
Nominal Density, ASTM D1622, pcf	2
Operation Temperature Range, °F	-50 to +190

(1) Vertical compressive strength is measured at 10 percent deformation or at yield, whichever occurs first.
(2) Based on 1" thickness.

PROPERTIES

TUFF-R™ and Super TUFF-R™ insulation products offer high R-value. The polyisocyanurate insulation is created by an exclusive free-rise manufacturing process, which produces a uniform, closed-cell foam for better insulation performance. As with all Dow polyisocyanurate insulations, TUFF-R and Super TUFF-R insulation products are manufactured with hydrocarbon blowing agents, which have no ozone depletion potential.

For features and benefits of TUFF-R and Super TUFF-R insulation products, refer to Table 1.

TUFF-R and Super TUFF-R insulation products exhibit the properties indicated in Tables 2 and 3 when tested as represented.

For chemical resistance properties of TUFF-R and Super TUFF-R insulation products, see Table 4.

TUFF-R and Super TUFF-R Polyisocyanurate Insulation

TABLE 3

TUFF-R™ and Super TUFF-R™ Insulation R–Values

Nominal Foam Thickness, in.	Product R-Value(1)	System R-Value(2)
1/2	3.3	6.1
5/8	4.1	6.9
3/4	5.0	7.8
1	6.5	9.3

(1) Product R-values @ 75°F mean temperature determined in accordance with ASTM C1289 and ASTM C236/C518 on full-sized product.
(2) System R-value is the sum of the product R-value plus additional R-value calculated when the aluminum foil surface is installed next to a non-ventilated 3/4" air space (R-value = 2.8). All values from the ASHRAE Fundamentals Handbook.

TABLE 4

Chemical Resistance of TUFF-R™ and Super TUFF-R™ Insulation

Acid, inorganic	Not recommended	Hydrocarbons	Excellent
Acid, organic	Excellent	Insecticides	Excellent
Alcohol	Excellent	Kerosene	Excellent
Asphalts, water-based	Good	Mineral oil USP	Excellent
Bases (caustics)	Poor	Naphtha	Excellent
Brines and other salts	Excellent	Paints, alcohol-based	Excellent
Cements and mortar	Poor (aluminum foil facers)/ Excellent (other facers)	Paints, water-based	Excellent
		Polyglycols, including propylene glycol	Excellent
Gases, carbon dioxide (CO_2)	Excellent		
Gasoline	Excellent	Water(1)	Good

(1) Water may cause discoloration of aluminum facers. This does not impact the R-value of dry, core insulation.
NOTE: This table should be used as a guide only. For design purposes, specific test data on the intended application may be needed.

SIZES

Width and length:
4' x 8', 4' x 9'
Edge treatment:
Square edge

Product thicknesses and R-values are shown in Table 3. Not all products are available in all parts of the country. Additional products sizes are available by custom order. Contact your Dow representative about other sizes and lead-time requirements.

INSTALLATION

Boards of TUFF-R™ and Super TUFF-R™ insulation are easy to handle, cut and install. The lightweight boards can be cut with a knife or any sharp blade. Contact a local Dow representative or visit the literature library at www.insulateyourhome.com or www.insulateyourhome.ca for more specific instructions.

CODE COMPLIANCES

TUFF-R™ and Super TUFF-R™ insulation products comply with the following codes and standards:

- International Residential Code (IRC) and International Building Code (IBC); see ICC-ES Evaluation Report NER-616
- ASTM C1289 Type I, Class 1
- Calif. Std. Reg. # CA-T383

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

IN THE U.S.:
- For Technical Information: **1-866-583-BLUE (2583)**
- For Sales Information: **1-800-232-2436**

THE DOW CHEMICAL COMPANY
• Building & Construction • 200 Larkin • Midland, MI 48674
www.insulateyourhome.com

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