



R-Value Comparison

The Dow Chemical Company is working to meet regulations implemented by the Environmental Protection Agency based on the Montreal Protocol. To this end, Dow is replacing the blowing agent used in polyisocyanurate insulation, using hydrocarbons instead of HCFC-141b. This change in the blowing agent affects the R-value** of polyisocyanurate foam insulation.

To ensure that you have complete product information, this chart shows R-values of products made with HCFC-141b and with the hydrocarbon blowing agent. Other physical properties are presented on the reverse. Please use this information when specifying Dow polyisocyanurate insulation. For more information, visit www.dowstyrofoam.com or contact your Dow representative. Or call 1-866-583-BLUE (2583).

Dow Polyisocyanurate Insulation Products

Product	R-Values ⁽¹⁾											
CELO-VENT* Insulated Shingle Deck Board Size: 4' x 8'	Nominal Product Thickness (in.)	2.5	3.5	4.5	5.0	5.5						
	Nominal ⁽²⁾ Core Foam Thickness (in.)	1.0	2.0	3.0	3.5	4.0						
	Product R-Value ⁽³⁾ Hydrocarbon LTTR	7.1	13.2	19.6	22.8	26.1						
	Product R-Value ⁽⁴⁾ HCFC-141b	7.1	15.4	22.8	26.9	31.3						
HY-THERM* AP¹ Roof Insulation Board Size: 4' x 4'; 4' x 8'	Nominal Board Thickness (in.)	1.0	1.5	1.8	2.0	2.5	2.7	3.0	3.5	4.0		
	R-Value ⁽³⁾ Hydrocarbon LTTR	6.0	9.0	10.9	12.1	15.3	16.6	18.5	21.7	25.0		
	R-Value ⁽⁴⁾ HCFC-141b	6.0	10.0	12.5	14.3	18.2	19.7	21.7	25.8	30.2		
HY-THERM Composite¹ Roof Insulation Board Size: 4' x 4'	Nominal Product Thickness (in.)	1.5	1.8	2.0	2.1	2.3	2.5	3.0	3.5	4.0		
	R-Value ⁽³⁾ Hydrocarbon LTTR	7.4	9.2	10.4	11.0	12.3	13.5	16.7	19.9	23.1		
	R-Value ⁽⁴⁾ HCFC-141b	7.2	9.6	10.9	12.1	13.8	15.2	19.5	23.0	27.0		
HY-THERM NAIL-LINE* Roof Insulation Board Size: 4' x 8'	Nominal Product Thickness (in.)	1.5	2.0	2.4	3.0	4.0						
	R-Value ⁽³⁾ Hydrocarbon LTTR	6.6	9.6	12.1	15.9	22.3						
	R-Value ⁽⁴⁾ HCFC-141b	6.6	10.7	14.3	18.9	27.0						
QUIK-R* Board Size: 4' x 8'; 4' x 9'; 4' x 10'; 4' x 12'	Nominal Board Thickness (in.)	0.625	0.75	1.0	1.5							
	R-Value ⁽³⁾ Hydrocarbon	3.0	3.7	5.0	7.4							
	R-Value ⁽⁴⁾ HCFC-141b	3.5	4.2	5.6	8.4							
STURDY-R** Board Size: 4' x 8'; 4' x 9'	Nominal Board Thickness (in.)	0.5	0.625	0.75	1.0							
	R-Value ⁽³⁾ Hydrocarbon	2.8	3.0	3.7	5.0							
	R-Value ⁽⁴⁾ HCFC-141b	3.0	NA	4.0	5.6							
Super TUFF-R* Board Size: 1.3' x 8'; 4' x 8'; 4' x 9'	Nominal Board Thickness (in.)	0.5	0.625	0.75	1.0							
	R-Value ⁽³⁾ Hydrocarbon	3.3	4.1	5.0	6.5							
	R-Value ⁽⁴⁾ HCFC-141b	3.6	5.0	5.6	7.2							
Super TUFF-R C Board Size: 1.3' x 8'; 4' x 8'; 4' x 9'	Nominal Board Thickness (in.)	1.0	1.5	1.55	1.75	1.875	2.0					
	R-Value ⁽³⁾ Hydrocarbon	6.5	9.8	10.0	11.4	12.0	13.0					
	R-Value ⁽⁴⁾ HCFC-141b	7.2	10.8	NA	12.0	NA	14.4					
THERMAX* Heavy Duty Board Size: 4' x 8'; 4' x 10'	Nominal Board Thickness (in.)	0.5	0.75	1.0	1.25	1.55	1.75	2.0	2.5	3.0		
	R-Value ⁽³⁾ Hydrocarbon	3.3	5.0	6.5	8.0	10.0	11.4	13.0	15.8	19.0		
	R-Value ⁽⁴⁾ HCFC-141b	3.6	5.4	7.2	9.0	11.0	12.6	14.4	18.0	21.6		
THERMAX Heavy Duty Plus Board Size: 4' x 8'; 4' x 10'	Nominal Board Thickness (in.)	0.5	0.75	1.0	1.25	1.55	1.75	2.0	2.5	3.0		
	R-Value ⁽³⁾ Hydrocarbon	3.3	5.0	6.5	8.0	10.0	11.4	13.0	15.8	19.0		
	R-Value ⁽⁴⁾ HCFC-141b	3.6	5.4	7.2	9.0	11.0	12.6	14.4	18.0	21.6		
THERMAX Light Duty Board Size: 4' x 8'; 4' x 10'	Nominal Board Thickness (in.)	0.5	0.75	1.0	1.25	1.55	1.75	2.0	2.5	3.0		
	R-Value ⁽³⁾ Hydrocarbon	3.3	5.0	6.5	8.0	10.0	11.4	13.0	15.8	19.0		
	R-Value ⁽⁴⁾ HCFC-141b	3.6	5.4	7.2	9.0	11.0	12.6	14.4	18.0	21.6		
THERMAX Metal Building Board Board Size: 4' x 8'; 4' x 10'	Nominal Board Thickness (in.)	0.5	0.75	1.0	1.25	1.55	1.75	2.0	2.5	3.0	3.5	4.0
	R-Value ⁽³⁾ Hydrocarbon	3.3	5.0	6.5	8.0	10.0	11.4	13.0	15.8	19.0	22.1	25.3
	R-Value ⁽⁴⁾ HCFC-141b	3.6	5.4	7.2	9.0	NA	12.6	14.4	18.0	21.6	25.2	28.8
THERMAX Sheathing Board Size: 1.3' x 8'; 1.3' x 9'; 1.3' x 10'; 2' x 8'; 2' x 9'; 2' x 10'; 4' x 8'; 4' x 9'; 4' x 10'	Nominal Board Thickness (in.)	0.5	0.75	1.0	1.25	1.55	1.75	2.0	2.5	3.0	3.5	4.0
	R-Value ⁽³⁾ Hydrocarbon	3.3	5.0	6.5	8.0	10.0	11.4	13.0	15.8	19.0	22.1	25.3
	R-Value ⁽⁴⁾ HCFC-141b	3.6	5.4	7.2	9.0	NA	12.6	14.4	18.0	21.6	25.2	28.8
TUFF-R Board Size: 4' x 8'; 4' x 9'	Nominal Board Thickness (in.)	0.4375	0.5	0.625	0.75	1.0						
	R-Value ⁽³⁾ Hydrocarbon	3.0	3.3	4.1	5.0	6.5						
	R-Value ⁽⁴⁾ HCFC-141b	NA	3.6	5.0	5.6	7.2						
TUFF-R C Board Size: 1.3' x 8'; 4' x 8'; 4' x 9'	Nominal Board Thickness (in.)	1.0	1.5	1.55	1.8125	2.0						
	R-Value ⁽³⁾ Hydrocarbon	6.5	9.8	10.0	12.0	13.0						
	R-Value ⁽⁴⁾ HCFC-141b	8.0	12.0	NA	NA	16.0						
VALUE-R*¹ Board Size: 4' x 8'; 4' x 9'	Nominal Board Thickness (in.)	2.0	2.5	3.0	3.5	4.0						
	R-Value ⁽³⁾ Hydrocarbon	13.0	15.8	19.0	22.1	25.3						
	R-Value ⁽⁴⁾ HCFC-141b	14.4	18.0	21.6	25.6	30.0						

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 **R means resistance to heat flow. The higher the R-value, the greater the insulating power.
¹Only available west of the Rockies.
²R-3 STURDY-R 0.5' available in the state of Georgia.
 Note: Representative thicknesses

NOTES:
 1. Aged R-value of core foam @ 75°F mean temperature; R-values are expressed in ft²-h²-F/Btu.
 2. Includes facers.
 3. Expected results for foam pending confirmation using Long-Term Thermal Resistance (LTTR) – ASTM C1289 Annex method.
 4. R-value determined by ASTM C518.

Dow Polyisocyanurate Insulation Products

Physical Properties ⁽¹⁾	Property (units)	Compressive strength ⁽²⁾ (lb/ft ²), min., core foam	Flexural strength (lb/ft ²), min., for 1" core foam	Water absorption (% increase by volume, 2-hr. results), max., core foam	Water vapor permeance ⁽³⁾ (perm)	Dimensional stability (% linear change), max.	Complies with ASTM Type	Maximum use temperature (°F)	Flame spread ⁽⁴⁾ , max., core foam/smoke development, blowing agent; HCFC-141b	Flame spread ⁽⁴⁾ , max., core foam/smoke development, blowing agent
ASTM Method	D1621	C203	C209	E96	D2126	C1289		E84	E84	
CELO-VENT Insulated Shingle Deck	16	40	1.0	-	2.0	V	-	25/<250	55/150	
HY-THERM AP Roof Insulation	16	40	1.5	1.0	2.0	II Class 1	-	25/<250	55/150	
HY-THERM Composite Roof Insulation	16	40	2.0	-	2.0	IV	-	25/<250	55/150	
HY-THERM NAIL-LINE Roof Insulation	16	40	1.0	-	2.0	V	-	25/<250	55/150	
QUIK-R	25	75	0.8	3.0	1.0	II Class 2	190	25/<250	30/185	
STURDY-R	20 ^(†)	75	0.5	3.0	1.0	II Class 2	190	25/230	30/185	
Super TUFF-R	25	55	0.05	<0.03	1.0	I Class 1 or 2 ⁽⁵⁾	190	25/230	40/70	
Super TUFF-R C	25	55	0.05	<0.03	1.0	I Class 2	190	25/230	40/70	
THERMAX Heavy Duty	25	55	0.05	<0.03	0.1	I Class 2	250	25/<200	25/250	
THERMAX Heavy Duty Plus	25	55	0.05	<0.03	0.1	I Class 2	250	25/<200	25/250	
THERMAX Light Duty	25	55	0.05	<0.03	0.1	I Class 2	250	25/<200	25/250	
THERMAX Metal Building Board	25	55	0.05	<0.03	0.1	I Class 2	250	25/<200	25/250	
THERMAX Sheathing	25	55	0.05	<0.03	0.1	I Class 2	250	25/<200	25/250	
TUFF-R	25	55	0.05	<0.03	1.5	I Class 1 or 2 ⁽⁵⁾	190	25/230	40/70	
TUFF-R C	25	55	0.05	<0.03	1.5	I Class 2	190	25/230	40/70	
VALUE-R	20	-	0.3	<0.03	2.0	I Class 1	190	25/<125	55/150	

NOTES:

- Data reflect product with hydrocarbon blowing agent, except flame spread and smoke development as indicated.
- Vertical compressive strength is measured at 10% deformation or at yield, whichever occurs first. Since Dow polyisocyanurate insulation products 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, 5-1 is suggested.
- Water vapor permeance varies with product type and thickness. Values are based on the desiccant method, and they apply to insulation 1" in thickness. Thicker products have lower permeance.
- These numerical flame spread ratings are not intended to reflect hazards presented by this or any other material under actual fire conditions.
- Varies with thickness. ^(†)ASTM D1622

IN THE U.S.:

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

THE DOW CHEMICAL COMPANY

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Dow Polyisocyanurate Insulation Other Than THERMAX Products

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.

THERMAX Products

COMBUSTIBLE: THERMAX products should be used only in strict accordance with product application instructions. THERMAX products, when used in a building containing combustible materials, may contribute to the spread of fire. For more information, consult MSDS and/or call Dow at 1-866-583-BLUE (2583). In an emergency, call 1-989-636-4400.

WARNING: THERMAX insulation/finish boards do not constitute a working walkable surface or qualify as a fall protection product.



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