





LEED® RATINGS and GREEN BUILDING PROJECTS

PERFORMANCE UPGRADE TABLES

PERFORMANCE UPGRADE TABLE FIXED WINDOWS

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.



 WAUSAU <small>WINDOW AND WALL SYSTEMS</small>				PRODUCT FAMILY: FIXED WINDOWS with insulating glass		ADVANTAGE  <small>BY WAUSAU</small>	
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product				
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago					
Overall U Factor (BTU/sqft-hr-°F per NFRC 102)	0.32	0.32	0.44				
SHGC (Center of Glass)	0.17	0.27	0.61				
VT (Center of Glass %)	18%	65%	74%				
Approx. Installed Cost Premium	+10%	+24%	-				
Product Description	2250-LP Low Profile 4' x 6' Fixed	2250-LP Low Profile 4' x 6' Fixed	2250 Flagship 4' x 6' Fixed				
Glass Selection	Viracon VRE3-38 on Grey HS Glass Stainless Spacer ½" Argon Fill	Viracon VNE15-63 on Ultra-White® Glass Stainless Spacer ½" Argon Fill	PPG Sungate 500 on Clear HS Aluminum Spacer ½" Air Space				

NOTES:

1. Estimated test results and costs are representative of a broad range of products, to help in identifying sustainable design targets. Consult Wausau for specific performance and cost attributes on your project.
2. The maximization of LEED® points is dependent on integrated design, involving all disciplines and design professionals. Please share design goals, preliminary product selection, and proposed performance levels with architects, HVAC, lighting, and structural engineers, as well as interior designers, for appropriate coordination.
3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE PROJECTED WINDOWS

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.



 PRODUCT FAMILY: PROJECTED WINDOWS with insulating glass 			
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago	
Overall U Factor (BTU/sqft-hr-°F per NFRC 102)	0.43	0.42	0.53
SHGC (Center of Glass)	0.17	0.27	0.61
VT (Center of Glass %)	18%	65%	74%
Approx. Installed Cost Premium	+4%	+11%	-
Product Description	2250-LP Low Profile 3' x 5' PI Casement	2250-LP Low Profile 3' x 5' PI Casement	2250 Flagship 3' x 5' Fixed/PO Awning
Glass Selection	Viracon VRE3-38 on Grey HS Glass Stainless Spacer ½" Argon Fill	Viracon VNE15-63 on Ultra-White® Glass Stainless Spacer ½" Argon Fill	PPG Sungate 500 on Clear HS Aluminum Spacer ½" Air Space

NOTES:

1. Estimated test results and costs are representative of a broad range of products, to help in identifying sustainable design targets. Consult Wausau for specific performance and cost attributes on your project.
2. The maximization of LEED® points is dependent on integrated design, involving all disciplines and design professionals. Please share design goals, preliminary product selection, and proposed performance levels with architects, HVAC, lighting, and structural engineers, as well as interior designers, for appropriate coordination.
3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE BLINDED WINDOWS

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.



 PRODUCT FAMILY: BLINDED WINDOWS  with dual and triple glazing			
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago	
Overall U Factor (BTU/sqft-hr-°F per NFRC 102)	0.42	0.42	0.55
SHGC (Center of Glass)	<0.30	<0.30	<0.40
VT (Center of Glass %)	Varies Occupant-Controlled	Varies Occupant-Controlled	Varies Occupant Controlled
Approx. Installed Cost Premium	+5%	+5%	-
Product Description	2250 Triple Glazed 3' x 5' PI Case w/ Blinds	2250 Triple Glazed 3' x 5' PI Case w/ Blinds	2250 Flagship 3' x 5' Fixed/PO Awning
Glass Selection	LOF Energy Advantage Light 5/8" Blinds ¾" air space Clear HS	LOF Energy Advantage Light 5/8" Blinds ¾" air space Clear HS	PPG Sungate 500 Light 1" Blinds 1-½" air space Clear HS

NOTES:

1. Estimated test results and costs are representative of a broad range of products, to help in identifying sustainable design targets. Consult Wausau for specific performance and cost attributes on your project.
2. The maximization of LEED® points is dependent on integrated design, involving all disciplines and design professionals. Please share design goals, preliminary product selection, and proposed performance levels with architects, HVAC, lighting, and structural engineers, as well as interior designers, for appropriate coordination.
3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE HUNG WINDOWS

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.



 WAUSAU <small>WINDOW AND WALL SYSTEMS</small>		PRODUCT FAMILY: HUNG WINDOWS with insulating glass		ADVANTAGE  <small>BY WAUSAU</small>	
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product		
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago			
Overall U Factor <small>(BTU/sqft-hr-°F per NFRC 102)</small>	0.45	0.45	0.58		
SHGC <small>(Center of Glass)</small>	0.17	0.27	0.61		
VT <small>(Center of Glass %)</small>	18%	65%	74%		
Approx. Installed Cost Premium	+7%	+15%	-		
Product Description	310i Series 4' x 6' Single Hung	310i Series 4' x 6' Single Hung	3100 Series 4' x 6' Double Hung		
Glass Selection	Viracon VRE3-38 on Grey HS Glass Stainless Spacer ½" Argon Fill	Viracon VNE15-63 on Ultra-White® Glass Stainless Spacer ½" Argon Fill	PPG Sungate 500 on Clear HS Aluminum Spacer ½" Air Space		

NOTES:

1. Estimated test results and costs are representative of a broad range of products, to help in identifying sustainable design targets. Consult Wausau for specific performance and cost attributes on your project.
2. The maximization of LEED® points is dependent on integrated design, involving all disciplines and design professionals. Please share design goals, preliminary product selection, and proposed performance levels with architects, HVAC, lighting, and structural engineers, as well as interior designers, for appropriate coordination.
3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE SLIDING (HORIZONTAL ROLLING) WINDOWS

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.


 WAUSAU <small>WINDOW AND WALL</small>				PRODUCT FAMILY: SLIDING WINDOWS with insulating glass		ADVANTAGE <small>BY WAUSAU</small> 	
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product				
	Climate Zones 3 and 4 <small>Charlotte San Francisco</small>	Climate Zones 5 and 6 <small>Boston Chicago</small>					
Overall U Factor <small>(BTU/sqft-hr-°F per NFRC 102)</small>	0.42	0.42	0.56				
SHGC <small>(Center of Glass)</small>	0.17	0.27	0.61				
VT <small>(Center of Glass %)</small>	18%	65%	74%				
Approx. Installed Cost Premium	+8%	+17%	-				
Product Description	410i Series <small>6' x 4' Single Slide</small>	410i Series <small>6' x 4' Single Slide</small>	4100 Series <small>Double Slide</small>				
Glass Selection	<small>Viracon VRE3-38 on Grey HS Glass Stainless Spacer ½" Argon Fill</small>	<small>Viracon VNE15-63 on Ultra-White® Glass Stainless Spacer ½" Argon Fill</small>	<small>PPG Sungate 500 on Clear HS Aluminum Spacer ½" Air Space</small>				

NOTES:

1. Estimated test results and costs are representative of a broad range of products, to help in identifying sustainable design targets. Consult Wausau for specific performance and cost attributes on your project.
2. The maximization of LEED® points is dependent on integrated design, involving all disciplines and design professionals. Please share design goals, preliminary product selection, and proposed performance levels with architects, HVAC, lighting, and structural engineers, as well as interior designers, for appropriate coordination.
3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE WINDOW WALL

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.


 PRODUCT FAMILY: WINDOW WALL with insulating glass			
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago	
Overall U Factor (BTU/sqft-hr-°F per NFRC 102)	0.42	0.41	0.77
SHGC (Center of Glass)	0.17	0.27	0.61
VT (Center of Glass %)	18%	65%	74%
Approx. Installed Cost Premium	+1%	+9%	-
Product Description	4250i-V Visuline 4' x 8' Fixed and In-Swing Casement	4250i-V Visuline 4' x 8' Fixed and In-Swing Casement	6250-RX Series 4' x 8' Fixed with ZSL Vent Inserts
Glass Selection	Viracon VRE3-38 on Grey HS Glass Stainless Spacer ½" Argon Fill	Viracon VNE15-63 on Ultra-White® Glass Stainless Spacer ½" Argon Fill	PPG Sungate 500 on Clear HS Aluminum Spacer ½" Air Space

NOTES:

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3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE STICK CURTAINWALL

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.


 PRODUCT FAMILY: STICK CURTAINWALL With double and triple insulating glass			
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago	
Overall U Factor (BTU/sqft-hr-°F per NFRC 102)	0.32	0.19	0.50
SHGC (Center of Glass)	0.17	0.30	0.61
VT (Center of Glass %)	18%	71%	74%
Approx. Installed Cost Premium	+24%	+62%	-
Product Description	HP Wall 7 1/4" frame depth	HP Wall 7 1/4" frame depth	SuperWall 6 1/4" frame depth
Glass Selection	Viracon VRE3-38 on Grey HS Glass Stainless Spacer 1/2" Argon Fill	2x Viracon VE1-2M on Clr HS - Triple IG 2x Stainless Spacer 2x 1/2" Argon Fill	PPG Sungate 500 on Clear HS Aluminum Spacer 1/2" Air Space

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3. While not specifically cited in the LEED® rating system, condensation resistance can be an important performance attribute of windows and curtainwall in cold climates and high-humidity applications. Similarly, excessive air infiltration can significantly affect energy efficiency.
4. Inherent trade-offs exist between SHGC and VT, even using high-end spectrally-selective glass coatings. Please consult Viracon Technical Services to determine the optimum combination for specific building types in your Climate Zone. Even visually clear and neutral glass can be used in southern Climate Zones if innovative shading is employed. Recommendations above are based on the Climate Zone Chart found on www.viracon.com.
5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.

PERFORMANCE UPGRADE TABLE UNITIZED CURTAINWALL

Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED® certification. Windows and curtainwall play a vital role in overall envelope performance, as quantified by NFRC standardized thermal transmittance (U-Factor), Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT). The following tables, organized by product family, present some leading-edge performers in Wausau’s standard product line, and a comparison with products typically employed.

 PRODUCT FAMILY: UNITIZED CURTAINWALL with insulating glass			
LEED® Attribute	Best-Performing WAUSAU Product		Typical WAUSAU Product
	Climate Zones 3 and 4 Charlotte San Francisco	Climate Zones 5 and 6 Boston Chicago	
Overall U Factor (BTU/sqft-hr-°F per NFRC 102)	0.42	0.37	0.60
SHGC (Center of Glass)	0.17	0.27	0.61
VT (Center of Glass %)	18%	65%	74%
Approx. Installed Cost Premium	+18%	+25%	-
Product Description	7250i-UW Thermal 3" x 7¼" system	7250i-UW Thermal 3" x 7¼" system	7250-UW 3" x 7¼" system thermally-improved
Glass Selection	Viracon VRE3-38 on Grey HS Glass Stainless Spacer ½" Argon Fill	Viracon VNE15-63 on Ultra-White® Glass Stainless Spacer ½" Argon Fill	PPG Sungate 500 on Clear HS Aluminum Spacer ½" Air Space

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5. NFRC labels for SHGC and VT are based on “whole window” results, which will always be lower than the more familiar center-of-glass values reported above, cited for ease of comparison.