



the SmartShield packages



Technical Guide
presented by **joyee**

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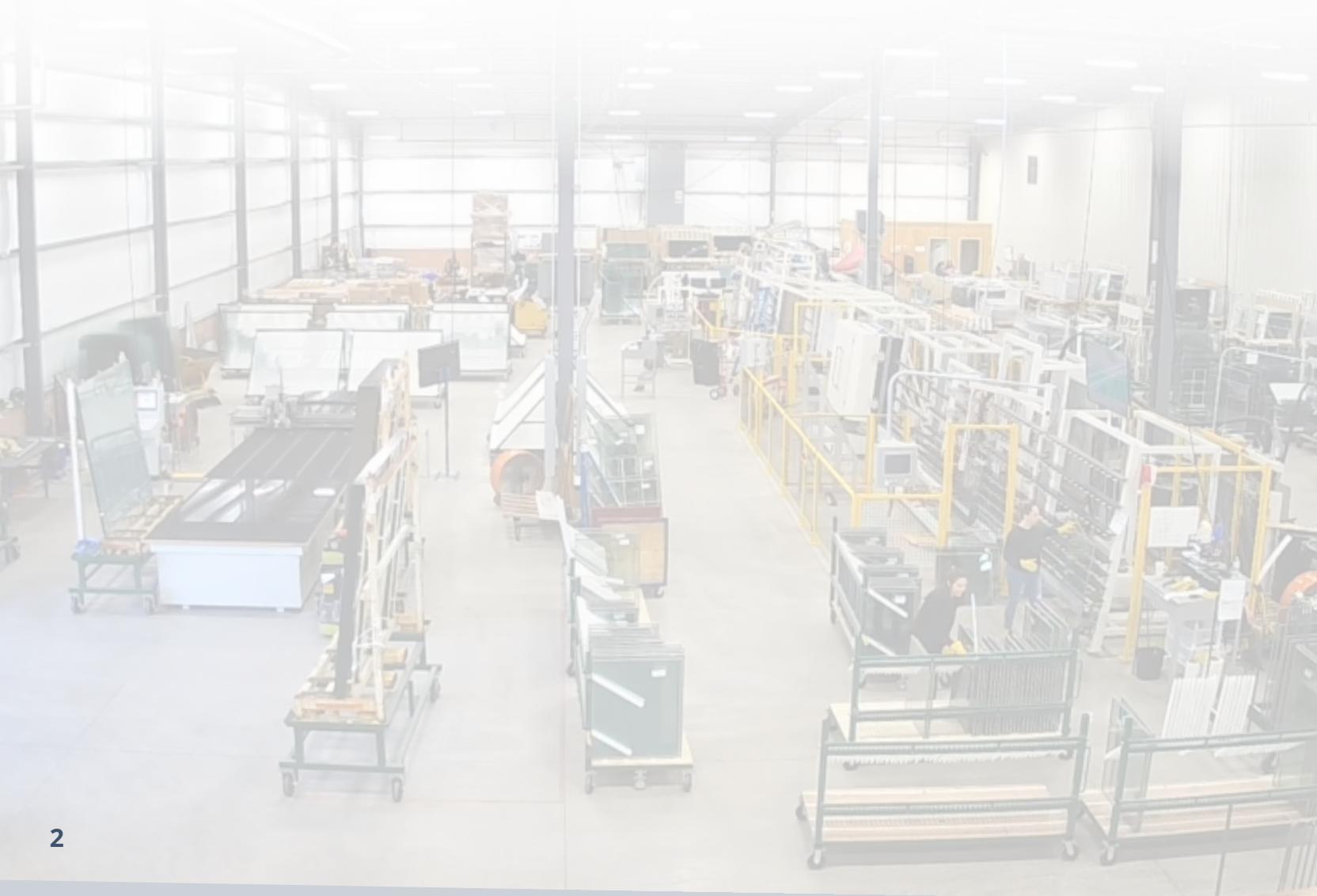
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The Joyce Promise

Since 1955, we have been committed to excellence through product innovation, state-of-the-art manufacturing facilities, and the lifetime warranties we stand behind. Founded on the principles of the company namesake, Joyce (our co-founder's late wife), we continue providing you with quality products that are crafted to enhance your home and last for generations - just as our company has.



joyceTM
mfg. co.





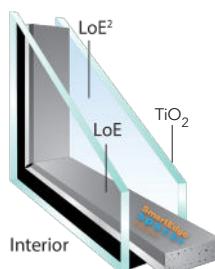
SmartShield Glass Packages



Using SmartShield Glass, Joyce Windows provides the best value and performance for homeowners. The glass packages illustrated below exceed ENERGY STAR ratings and standards as they come equipped with SmartEdge Spacer and LoE coated glass insulated with Argon gas. SmartShield has specially formulated window glass packages for any climate or budget, so no matter which ENERGY STAR climate zone you are located in, Joyce will have you covered.

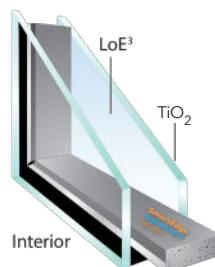
J2 with SmartClean

all around performance



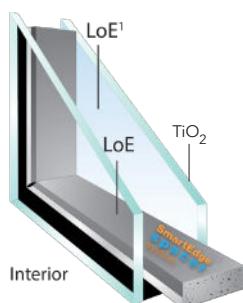
J3 with SmartClean

solar all around performance



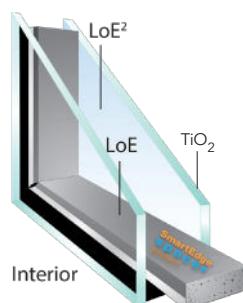
J11 with SmartClean

northern dual glaze performance



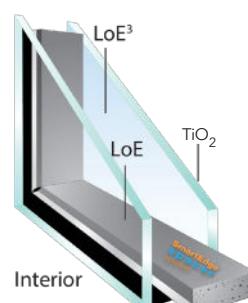
J21 with SmartClean

high dual glaze performance



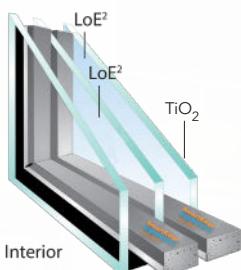
J31 with SmartClean

solar high dual glaze performance



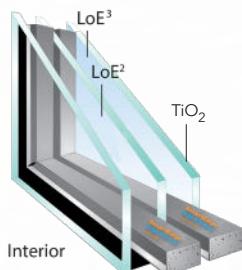
TJ22 with SmartClean

triple performance



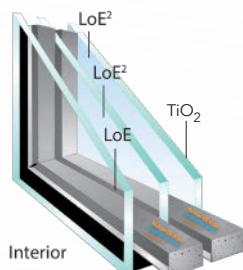
TJ32 with SmartClean

solar triple performance



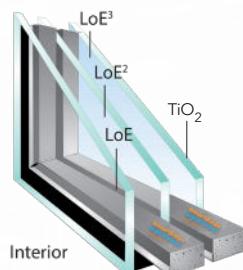
TJ221 with SmartClean

high triple performance



TJ321 with SmartClean

solar high triple performance



SmartShield Glass is formulated with SmartClean, an advanced and permanent coating infused with titanium dioxide (TiO_2). SmartClean helps reduce dirt and debris particles to provide windows with a naturally cleaner view. This anti-static technology delivers up to 40% less buildup of grime and dust without homeowners having to intervene. Water sheets off the surface more quickly, reducing water spots and helping the glass dry faster. By smoothing microscopic imperfections, the TiO_2 layer also makes the glass significantly easier to clean—offering lasting clarity with minimal maintenance. This low-impressive coating comes as a standard on all glass packages.

Heritage Double-Hung

craftsmanship that lasts for generations

J2

with
SmartClean


Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.27** Solar Heat Gain Coefficient **0.29**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.54** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

Although J2 is not an ENERGY STAR® certified glass, this option is still an excellent choice for homes in any area of the country. It offers enhanced energy efficiency that will make your home more comfortable and help keep your home energy bills lower.

J3

with
SmartClean


Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.27** Solar Heat Gain Coefficient **0.21**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.49** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions




ENERGY STAR


joyce

J11

with
SmartClean

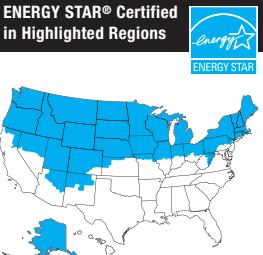

Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.24** Solar Heat Gain Coefficient **0.48**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.59** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions




ENERGY STAR


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J21

with
SmartClean


Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.23** Solar Heat Gain Coefficient **0.28**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.52** Air Leakage (U.S./P) **≤0.3**

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www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions




ENERGY STAR


joyce

J31

with
SmartClean


Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.23** Solar Heat Gain Coefficient **0.21**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.48** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

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ENERGY STAR


joyce

TJ22

with
SmartClean

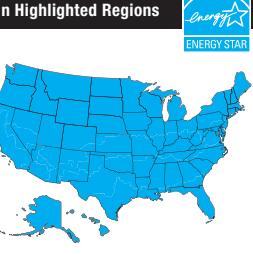

Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • Triple Glazing
LoE(284) • Argon • SS
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.22** Solar Heat Gain Coefficient **0.22**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.42** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

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ENERGY STAR


joyce

TJ32

with
SmartClean

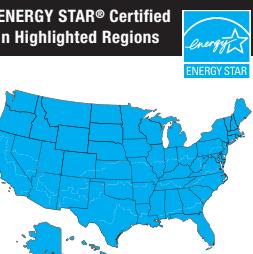

Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • Triple Glazing
LoE(2) • LoE(4) • Argon
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.21** Solar Heat Gain Coefficient **0.18**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.39** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions




ENERGY STAR


joyce

TJ221

with
SmartClean

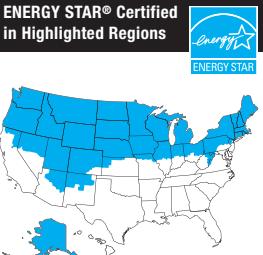

Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • Triple Glazing
LoE(284)/LoE(6) • SS
Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.20** Solar Heat Gain Coefficient **0.22**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.41** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

Northern Zone
North Central Zone
South Central Zone
Southern Zone




ENERGY STAR


joyce

TJ321

with
SmartClean

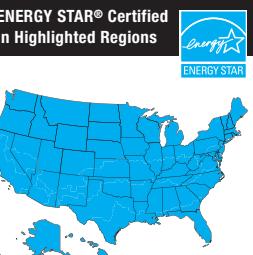

Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • Triple Glazing
LoE(2)/LoE(4)/LoE(6)
Argon • Vertical Slider Window

ENERGY PERFORMANCE RATINGS
 U-Factor (U.S./I-P) **0.19** Solar Heat Gain Coefficient **0.17**
ADDITIONAL PERFORMANCE RATINGS
 Visible Transmittance **0.38** Air Leakage (U.S./P) **≤0.3**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. Consult manufacturer's literature for other product performance information.
www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions




ENERGY STAR


joyce

Performance ratings for J3, J11, J21, and J31 are calculated using 1/8" double-strength glass unless noted on product series page.

Performance ratings for J2, TJ22, TJ32, TJ221, and TJ321 are calculated using 3/32" single-strength glass unless noted on product series page.

Trinity Double-Hung

performance that lasts for a lifetime (non foam filled)

J2

with
SmartClean

	Joyce Manufacturing Company 800.824.7988
Trinity Double Hung (TNTDH) Vinyl Frame • LoE/Clear Argon • SuperSpacer Vertical Slider Window	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.29	0.29
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.54	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product. Actual performance may vary based on actual environmental conditions, and a specific product. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

Although J2 is not an ENERGY STAR® certified glass, this option is still an excellent choice for homes in any area of the country. It offers enhanced energy efficiency that will make your home more comfortable and help keep your home energy bills lower.

J21

with
SmartClean

	Joyce Manufacturing Company 800.824.7988
Trinity Double Hung (TNTDH) Vinyl Frame • LoE/LoE Argon • SuperSpacer Vertical Slider Window	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.25	0.28
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.52	≤0.3

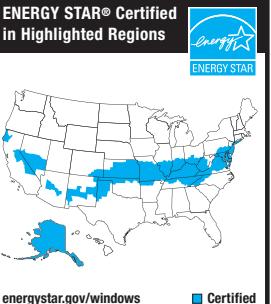
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Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window



ENERGY STAR® Certified in Highlighted Regions



J3

with
SmartClean

	Joyce Manufacturing Company 800.824.7988
Trinity Double Hung (TNTDH) Vinyl Frame • LoE/Clear Argon • SuperSpacer Vertical Slider Window	
ENERGY STAR® Certified in Highlighted Regions	
	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.28	0.21
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.49	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product. Actual performance may vary based on actual environmental conditions, and a specific product. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions



energystar.gov/windows



J31

with
SmartClean

	Joyce Manufacturing Company 800.824.7988
Trinity Double Hung (TNTDH) Vinyl Frame • LoE/LoE Argon • SuperSpacer Vertical Slider Window	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.24	0.21
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.48	≤0.3

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Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window



ENERGY STAR® Certified in Highlighted Regions



energystar.gov/windows



J11

with
SmartClean

	Joyce Manufacturing Company 800.824.7988
Trinity Double Hung (TNTDH) Vinyl Frame • LoE/LoE Argon • SuperSpacer Vertical Slider Window	
ENERGY STAR® Certified in Highlighted Regions	
	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.25	0.48
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.59	≤0.3

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ENERGY STAR® Certified in Highlighted Regions



energystar.gov/windows



Performance ratings for J3, J11, J21, and J31 are calculated using 1/8" double-strength glass unless noted on product series page.

Performance ratings for J2 is calculated using 3/32" single-strength glass unless noted on product series page.



Trinity Double-Hung

performance that lasts for a lifetime

(foam filled frames and sashes)

J2

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.27	0.29

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.54	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

Although J2 is not an ENERGY STAR® certified glass, this option is still an excellent choice for homes in any area of the country. It offers enhanced energy efficiency that will make your home more comfortable and help keep your home energy bills lower.

J3

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.27	0.21

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.49	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org



J11

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

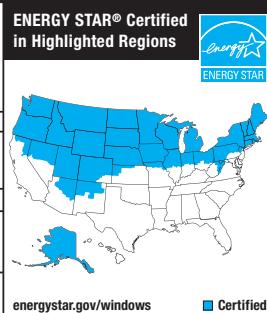
ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.24	0.48

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.59	≤0.3

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J21

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

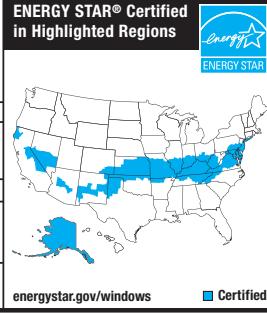
ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.23	0.28

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.52	≤0.3

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J31

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.23	0.21

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.48	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org



TJ22

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

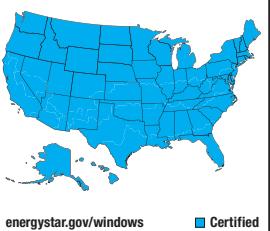
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.22	0.22

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.42	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions



TJ32

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • Triple Glazing
LoE(2)/LoE(4) • SS
Argon • Vertical Slider Window

ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.21	0.18

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.39	≤0.3

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ENERGY STAR® Certified in Highlighted Regions



TJ221

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • Triple Glazing
LoE(2)/LoE(4)/LoE(6) • SS
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.20	0.22

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.41	≤0.3

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ENERGY STAR® Certified in Highlighted Regions



TJ321

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Trinity Double Hung (TNTDH)
Vinyl Frame • Triple Glazing
LoE(2)/LoE(4)/LoE(6)
Argon • Vertical Slider Window

ENERGY PERFORMANCE RATINGS

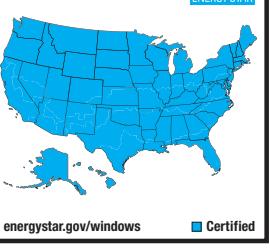
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.19	0.17

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.38	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions



Performance ratings for J3, J11, J21, and J31 are calculated using 1/8" double-strength glass unless noted on product series page.

Performance ratings for J2, TJ22, TJ32, TJ221, and TJ321 are calculated using 3/32" single-strength glass unless noted on product series page.

Casement

timeless durability with exceptional efficiency

J2

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.27	0.25

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.46	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

Although J2 is not an ENERGY STAR® certified glass, this option is still an excellent choice for homes in any area of the country. It offers enhanced energy efficiency that will make your home more comfortable and help keep your home energy bills lower.

J3

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

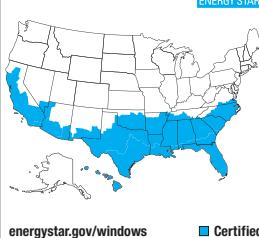
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.27	0.18

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.42	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions



TJ22

with
SmartClean



Southern Zone

Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • Triple Glazing
LoE(284) • Argon • SS
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

ADDITIONAL PERFORMANCE RATINGS

ENERGY STAR® Certified in Highlighted Regions



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J11

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • LoE/Clear
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

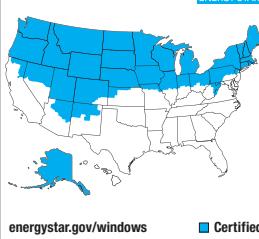
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.24	0.41

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.50	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

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TJ32

with
SmartClean



Southern Zone

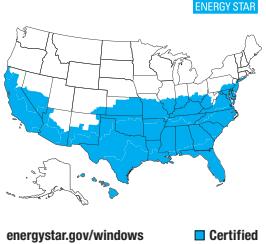
Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • Triple Glazing
LoE(284)/LoE(4) • Argon
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

ADDITIONAL PERFORMANCE RATINGS

ENERGY STAR® Certified in Highlighted Regions



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J21

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

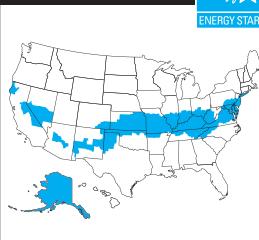
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.24	0.24

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.45	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

ENERGY STAR® Certified in Highlighted Regions



TJ221

with
SmartClean



North Central Zone
South Central Zone
Southern Zone

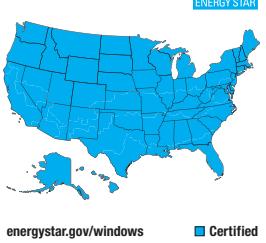
Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • Triple Glazing
LoE(284)/LoE(4) • SS
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

ADDITIONAL PERFORMANCE RATINGS

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TJ321

with
SmartClean



North Central Zone
South Central
Southern Zone

Joyce Manufacturing Company
800.824.7988

Heritage Double Hung (HTDH)
Vinyl Frame • Triple Glazing
LoE(284)/LoE(4)/LoE(6)
Argon • Vertical Slider Window

ENERGY PERFORMANCE RATINGS

ADDITIONAL PERFORMANCE RATINGS

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J31

with
SmartClean

Joyce Manufacturing Company
800.824.7988

Casement (CSMT)
Vinyl Frame • LoE/LoE
Argon • SuperSpacer
Vertical Slider Window

ENERGY PERFORMANCE RATINGS

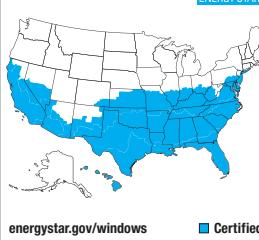
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.24	0.18

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S/I-P)
0.41	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

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Performance ratings for J3, J11, J21, and J31 are calculated using 1/8" double-strength glass unless noted on product series page.

Performance ratings for J2, TJ22, TJ32, TJ221, and TJ321 are calculated using 3/32" single-strength glass unless noted on product series page.

Arete Patio Doors

excellence in every way possible

J2

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Arete (JPD) Vinyl Frame • LoE/Clear Argon • SuperSpacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.28	0.30
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.56	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

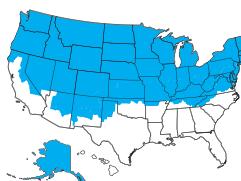
J21

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Arete (JPD) Vinyl Frame • LoE/LoE Argon • SuperSpacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.24	0.29
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.55	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

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J3

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Arete (JPD) Vinyl Frame • LoE/Clear Argon • SuperSpacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.27	0.22
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.52	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

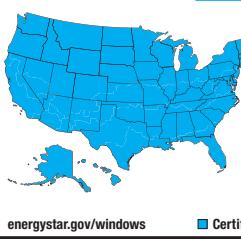
J31

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Arete (JPD) Vinyl Frame • LoE/LoE Argon • SuperSpacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.23	0.22
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.51	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

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Sillesia Patio Doors

unrivaled versatility and performance

J2

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Sillesia (JPD) Vinyl Frame • LoE/Clear Argon • Endur Spacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.29	0.27
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.51	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

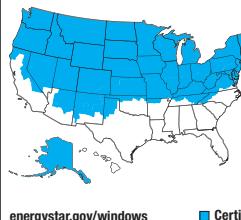
J21

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Sillesia (JPD) Vinyl Frame • LoE/LoE Argon • Endur Spacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.25	0.26
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.50	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

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J3

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Sillesia (JPD) Vinyl Frame • LoE/Clear Argon • Endur Spacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.28	0.20
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.47	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

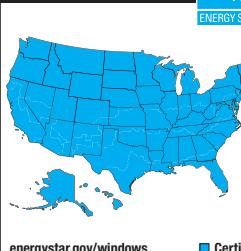
J31

with
SmartClean

	Joyce Manufacturing Company 800.824.7988 Sillesia (JPD) Vinyl Frame • LoE/LoE Argon • Endur Spacer Sliding Doors
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.I-P)	Solar Heat Gain Coefficient
0.24	0.20
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.I-P)
0.46	≤0.3

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions, and a specific product use. NFRC does not recommend any product and does not warrant the suitability of any product for specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

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Performance ratings are for a standard size 5' or 6' patio door using 1/8" double-strength tempered glass.

Glossary

Air Leakage: Measurement of how much outside air comes into a home or building through a product. The lower the air leakage, the better a product is at keeping air out.

Argon: A non-toxic gas used in insulating units to reduce heat transfer.

Climate Zone: A geographical region based on climatic criteria as specified by ENERGY STAR.

ENERGY STAR: A program run by the U.S. Environmental Protection Agency and U.S. Department of Energy to deliver cost-saving energy efficiency solutions that protect the climate and public health through improving air quality. The energy performance of all ENERGY STAR qualified windows, doors, and skylights must be independently tested, certified, and verified according to test procedures established by the National Fenestration Rating Council (NFRC)

LoE: Also known as Low-E, refers to low-emittance coating.

National Fenestration Rating Council (NFRC): A third-party non-profit organization that sponsors certified rating and labeling to help consumers compare the performance of windows, doors, and skylights.

Solar Heat Gain Coefficient: Rating ranges from 0 to 1. Measures fraction of solar radiation admitted through the window. The lower the number, the less solar heat it transmits and the greater its shading ability.

U-Factor: Ratings range from 0 to 1. The lower the number, the better its insulating value.

Visible Transmittance: The fraction of the visible spectrum that is transmitted through the window. The higher the number, the more visible light it transmits.

All ENERGY STAR Ratings are calculated using window style and series noted. Actual ratings may vary by style and size of window.

Performance ratings are shown for windows without grids or mutton bars between the panes and single-strength glass unless noted.

All ratings were calculated using a 90% argon gas fill rate, although Joyce gas chamber average fill percentage routinely exceeds 90%.

NFRC ratings are based on modeling by a third-party agency as validated by an independent test lab in compliance with NFRC program and procedural requirements.

Due to ongoing product changes, updated test results or new industry standards or requirements, this data may change over time and this published technical guide is subject to change without notice. Please consult an authorized Joyce Window Dealer or Joyce Manufacturing Company to verify if any variations exist.

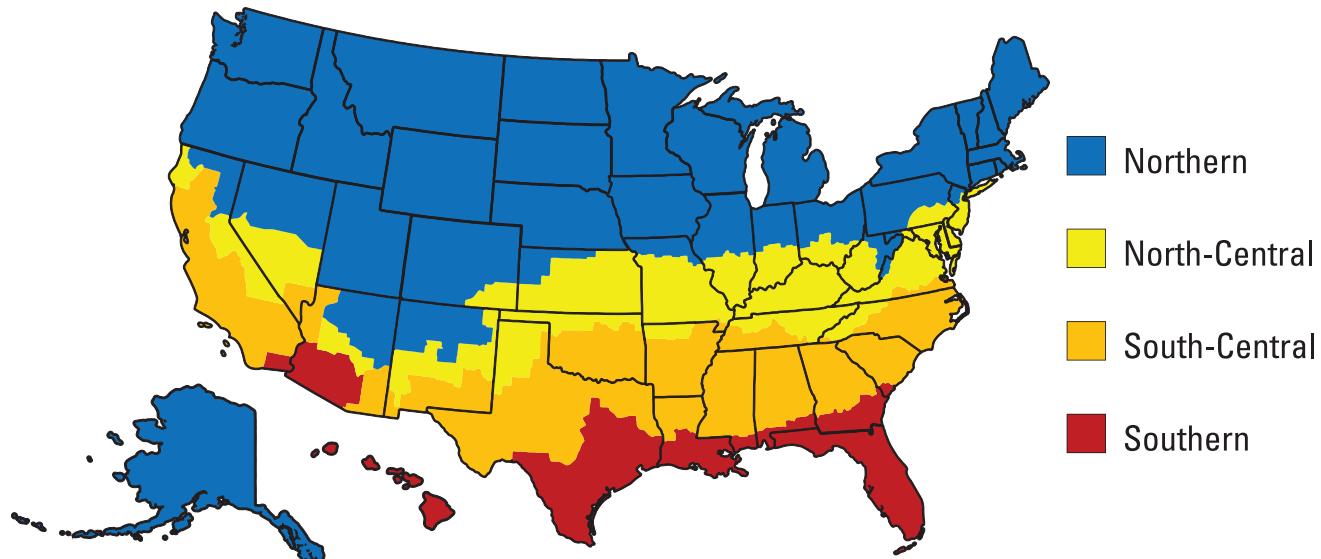
Heritage double-hung windows come standard with foam fill in select interior cavities of the main frame and sash profiles. Trinity double-hung test results reflect same foam fill configuration noted on page 4.



LEARN MORE AT
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ENERGY STAR® for Windows, Doors, and Skylights

CLIMATE ZONE MAP



ENERGY STAR® Certification Criteria for Residential Windows

WINDOWS			
Climate Zone	U-Factor ¹	SHGC ²	
Northern	≤ 0.22	≥ 0.17	Prescriptive
	≤ 0.23	≥ 0.35	Equivalent Energy Performance
	≤ 0.24	≥ 0.35	
	≤ 0.25	≥ 0.40	
	≤ 0.26	≥ 0.40	
North-Central	≤ 0.25	≤ 0.40	
South-Central	≤ 0.28	≤ 0.23	
Southern	≤ 0.32	≤ 0.23	

Air Leakage ≤ 0.3 cfm/ft²

¹ Btu/h·ft²·°F

² Solar Heat Gain Coefficient

ENERGY STAR® Certification Criteria for Residential Doors

DOORS			
Glazing Level	Climate Zone	U-Factor ¹	SHGC ²
Opaque	All Zones	≤ 0.17	No Rating
≤ ½-Lite	All Zones	≤ 0.23	≤ 0.23
> ½-Lite	Northern	≤ 0.26	≤ 0.40
	North-Central		
	South-Central		
	Southern	≤ 0.28	≤ 0.23

Air Leakage for Sliding Doors ≤ 0.3 cfm/ft²

Air Leakage for Swinging Doors ≤ 0.5 cfm/ft²

¹ Btu/h·ft²·°F

² Solar Heat Gain Coefficient



The ENERGY STAR Most Efficient 2025 is a designation that truly represents the best of ENERGY STAR. The Most Efficient Mark is designed to recognize a select group of ENERGY STAR products as the "best of the best" for energy savings and innovation. The goal of this effort is to recognize products that deliver cutting-edge energy efficiency along with the latest in technological innovation—a simple choice for those seeking the very best of both.

ENERGY STAR® Most Efficient Recognition Criteria for Windows and Sliding Glass Doors

Climate Zone	U-factor	SHGC
Northern	≤ 0.20	≥ 0.20
North-Central	≤ 0.20	≤ 0.40
South-Central	≤ 0.20	≤ 0.23
Southern	≤ 0.21	≤ 0.23
	= 0.22	≤ 0.21

To earn the ENERGY STAR Most Efficient 2025 designation, products must already qualify for the ENERGY STAR label. Then, each year, the EPA establishes criteria that specific product categories – such as windows and sliding glass patio doors – must meet to earn ENERGY STAR Most Efficient recognition. The above chart shows the 2025 certification criteria for windows and sliding glass doors.

Performance criteria for windows, doors, and skylights are based on 2024 ratings certified by the National Fenestration Rating Council (NFRC), and vary for each of the climate zones shown in the map above. Joyce Manufacturing Company is an ENERGY STAR Partner.



Energy Tax Credits

The federal government and the IRS continue to offer homeowners incentives - in the form of an energy tax credit - for updating their windows to improve energy efficiency or replacing their existing windows entirely. For products purchased and installed in 2025, homeowners can receive a federal tax credit of up to 30% of the project cost, or a maximum amount of \$600, for windows or skylights annually; and up to 30% of the project cost, or a maximum amount of \$500, for doors annually (\$250 per door max). Windows must be designated as an ENERGY STAR 2025 Most Efficient product in order to qualify for the federal tax credit. Sliding patio doors will only need to meet the new ENERGY STAR Version 7.0 criteria in order to qualify for the credit. For more information, visit our web site.

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