

# UNIVERSAL SERIES™

## TECHNICAL DATA (METRIC)

The Universal Series™ offers a patented, high-performance fiberglass solution for window walls, windows and doors, and storefront glazing.

Designed and manufactured in North America, the Universal Series™ features an innovative, commercial-grade fiberglass frame boasting 150% improved thermal performance compared to traditional aluminum windows.

Custom configured and built-to-suit project requirements—and available in virtually any color—the Universal Series™ allows developers and architects to dramatically improve the overall thermal performance of buildings, without sacrificing glazing area.

- Custom sizes & configurations
- AW Performance Class designation (casements, awnings, fixed windows)
- Low-VOC standard & custom colors meet AAMA 625 performance criteria
- Double (one Low-E) & Triple (two Low-E)
- LBC Red List Free and Energy-Star rated

# UNIVERSAL SERIES™

Technical Data Sheet (Metric)



## DOUBLE GLAZED - NFRC THERMAL PERFORMANCE SUMMARY VISION AREAS WITH 90% ARGON & 10% AIR (METRIC UNITS)



WINDOWS & DOORS - DOUBLE GLAZED										
LOW-E OPTIONS	CENTER-OF-GLASS DATA			U <sub>w</sub> (U-VALUE OF WINDOW) PER NFRC METHOD [W / M <sup>2</sup> -K]						
CARDINAL (90% ARGON FILL)	U <sub>g</sub>	SHGC	VT	FIXED	CASEMENT	AWNING	TILT & TURN	HOPPER	SWING DOOR	SLIDING DOOR
<b>STANDARD DOUBLE GLAZED (ONE LOW-E ON SURFACE #2 OR #3 / STAINLESS STEEL SPACER)</b>										
180 (#3)	1.47	0.64	0.77	1.47	1.42	1.43	1.43	1.43	1.34	1.38
270 (#2)	1.40	0.36	0.67	1.41	1.38	1.39	1.38	1.38	1.30	1.33
366 (#2)	1.36	0.27	0.63	1.38	1.36	1.37	1.36	1.37	1.28	1.30
340 (#2)	1.38	0.18	0.38	1.40	1.37	1.38	1.37	1.38	1.29	1.32
<b>PREMIUM DOUBLE GLAZED (TWO LOW-E ON SURFACES #2 &amp; #4 / STAINLESS STEEL SPACER)</b>										
180/i89	1.18	0.58	0.75	1.22	1.25	1.28	1.22	1.28	1.15	1.16
270/i89	1.13	0.35	0.66	1.18	1.22	1.25	1.18	1.25	1.12	1.12
366/i89	1.10	0.26	0.61	1.16	1.21	1.23	1.16	1.23	1.10	1.11
340/i89	1.12	0.17	0.37	1.17	1.21	1.24	1.17	1.24	1.11	1.12

**Note:** Triple Glazed with 90% Argon & 10% Air information can be found on page 3

**Glass:** 6mm-13mm-6mm

# UNIVERSAL SERIES™

Technical Data Sheet (Metric)



## TRIPLE GLAZED - NFRC THERMAL PERFORMANCE SUMMARY VISION AREAS WITH 90% ARGON & 10% AIR (METRIC UNITS)



### WINDOWS & DOORS - TRIPLE GLAZED

LOW-E OPTIONS	CENTER-OF-GLASS DATA			U <sub>w</sub> (U-VALUE OF WINDOW) PER NFRC METHOD [W / M <sup>2</sup> -K]						
CARDINAL (90% ARGON FILL)	U <sub>g</sub>	SHGC	VT	FIXED	CASEMENT	AWNING	TILT & TURN	HOPPER	SWING DOOR	SLIDING DOOR

#### STANDARD TRIPLE GLAZED (TWO LOW-E ON SURFACES #2 & #5 / STAINLESS STEEL SPACER)

180/180	0.74	0.52	0.67	0.84	0.97	0.97	0.87	0.94	0.85	0.85
270/180	0.72	0.32	0.58	0.83	0.95	0.96	0.86	0.92	0.84	0.84
366/180	0.71	0.24	0.54	0.81	0.95	0.95	0.85	0.92	0.83	0.83
340/180	0.71	0.15	0.33	0.82	0.95	0.96	0.85	0.92	0.83	0.83

#### STANDARD TRIPLE GLAZED (TWO LOW-E ON SURFACES #2 & #5 / TRISEAL SUPER SPACER)

180/180	0.74	0.52	0.67	0.82	0.94	0.94	0.85	0.91	0.83	0.87
270/180	0.72	0.32	0.58	0.80	0.92	0.93	0.83	0.89	0.82	0.85
366/180	0.71	0.24	0.54	0.79	0.92	0.92	0.83	0.89	0.81	0.84
340/180	0.71	0.15	0.33	0.80	0.92	0.93	0.83	0.89	0.81	0.84

#### PREMIUM TRIPLE GLAZED (THREE LOW-E ON SURFACES #2, #4 & #6 / STAINLESS STEEL SPACER)

180/180/i89	0.65	0.49	0.65	0.76	0.91	0.92	0.80	0.89	0.79	0.78
270/180/i89	0.63	0.30	0.57	0.74	0.90	0.91	0.79	0.88	0.78	0.77
366/180/i89	0.62	0.23	0.53	0.73	0.89	0.90	0.78	0.87	0.77	0.76
340/180/i89	0.63	0.15	0.32	0.74	0.90	0.91	0.79	0.88	0.78	0.77

#### TRIPLE GLAZED (THREE LOW-E ON SURFACES #2, #4 & #6 / TRISEAL SUPER SPACER)

180/180/i89	0.65	0.49	0.65	0.74	0.89	0.90	0.78	0.86	0.77	0.80
270/180/i89	0.63	0.30	0.57	0.72	0.87	0.88	0.77	0.85	0.76	0.78
366/180/i89	0.62	0.23	0.53	0.71	0.87	0.88	0.76	0.84	0.75	0.77
340/180/i89	0.63	0.15	0.32	0.72	0.87	0.88	0.77	0.85	0.76	0.78

**Note:** Double Glazed with 90% Argon & 10% Air information can be found on page 2

**Glass:** 6mm-13mm-6mm-13mm-6mm

# UNIVERSAL SERIES™

Technical Data Sheet (Metric)

CASCADIA  
WINDOWS & DOORS

## DOUBLE GLAZED - NFRC THERMAL PERFORMANCE SUMMARY VISION AREAS WITH AIR



WINDOWS & DOORS - DOUBLE GLAZED										
LOW-E OPTIONS	CENTER-OF-GLASS DATA			U <sub>w</sub> (U-VALUE OF WINDOW) PER NFRC METHOD [W / M <sup>2</sup> -K]						
CARDINAL (AIR FILL)	U <sub>g</sub>	SHGC	VT	FIXED	CASEMENT	AWNING	TILT & TURN	HOPPER	SWING DOOR	SLIDING DOOR
<b>STANDARD DOUBLE GLAZED (ONE LOW-E ON SURFACE #2 OR #3 / STAINLESS STEEL SPACER)</b>										
270 (#2)	1.66	0.36	0.67	1.62	1.52	1.54	1.56	1.53	1.46	1.50
366 (#2)	1.63	0.28	0.63	1.60	1.50	1.52	1.54	1.51	1.44	1.48
<b>PREMIUM DOUBLE GLAZED (TWO LOW-E ON SURFACES #2 &amp; #4 / STAINLESS STEEL SPACER)</b>										
270/i89	1.31	0.35	0.66	1.32	1.32	1.35	1.30	1.35	1.22	1.24
366/i89	1.29	0.27	0.61	1.30	1.31	1.34	1.29	1.34	1.21	1.23

**Note:** Triple Glazed with Air information can be found on page 5

**Glass:** 6mm-13mm-6mm

# UNIVERSAL SERIES™

Technical Data Sheet (Metric)



## TRIPLE GLAZED - NFRC THERMAL PERFORMANCE SUMMARY VISION AREAS WITH AIR



WINDOWS & DOORS - TRIPLE GLAZED										
LOW-E OPTIONS	CENTER-OF-GLASS DATA			U <sub>w</sub> (U-VALUE OF WINDOW) PER NFRC METHOD [W / M <sup>2</sup> -K]						
CARDINAL (AIR FILL)	U <sub>g</sub>	SHGC	VT	FIXED	CASEMENT	AWNING	TILT & TURN	HOPPER	SWING DOOR	SLIDING DOOR
<b>STANDARD TRIPLE GLAZED (TWO LOW-E ON SURFACES #2 &amp; #5 / STAINLESS STEEL SPACER)</b>										
180/180	0.92	0.51	0.67	0.99	1.07	1.08	1.00	1.04	0.97	0.98
270/180	0.90	0.32	0.58	0.97	1.06	1.06	0.98	1.03	0.95	0.97
366/180	0.89	0.24	0.54	0.96	1.05	1.06	0.98	1.02	0.94	0.96
<b>STANDARD TRIPLE GLAZED (TWO LOW-E ON SURFACES #2 &amp; #5 / TRISEAL SUPER SPACER)</b>										
180/180	0.92	0.51	0.67	0.97	1.04	1.05	0.98	1.01	0.94	0.99
270/180	0.90	0.32	0.58	0.95	1.03	1.03	0.96	1.00	0.93	0.98
366/180	0.89	0.24	0.54	0.94	1.02	1.03	0.96	0.99	0.92	0.97
<b>PREMIUM TRIPLE GLAZED (THREE LOW-E ON SURFACES #2, #4 &amp; #6 / STAINLESS STEEL SPACER)</b>										
180/180/i89	0.80	0.48	0.65	0.88	0.99	1.01	0.91	0.98	—	0.89
270/180/i89	0.78	0.30	0.57	0.86	0.98	1.00	0.89	0.97	0.87	0.87
366/180/i89	0.77	0.23	0.53	0.86	0.98	0.99	0.89	0.96	0.86	0.87
<b>TRIPLE GLAZED (THREE LOW-E ON SURFACES #2, #4 &amp; #6 / TRISEAL SUPER SPACER)</b>										
180/180/i89	0.80	0.48	0.65	0.86	0.97	0.98	0.89	0.95	—	0.90
270/180/i89	0.78	0.30	0.57	0.84	0.96	0.97	0.87	0.94	0.85	0.88
366/180/i89	0.77	0.23	0.53	0.84	0.95	0.97	0.87	0.93	0.84	0.88

**Note:** Double Glazed Air information can be found on page 4

**Glass:** 6mm-13mm-6mm-13mm-6mm



## INTERNATIONAL PASSIVE HOUSE INSTITUTE [PHI] - THERMAL DATA

LOW-E OPTIONS	CENTER-OF-GLASS DATA PER EN 673			U <sub>w</sub> (U-VALUE OF WINDOW) PER EN ISO 10077 [W / m <sup>2</sup> K]			
	U <sub>g</sub>	G-VALUE	VT	INSWING WINDOW	FIXED WINDOW	INSWING DOOR	SLIDING DOOR
Calibration Panel	0.700			0.805	0.773	0.780	0.756
180/180	0.646	0.557	0.690	0.766	0.728	0.748	0.717
270/180	0.610	0.353	0.606	0.742	0.699	0.725	0.692
366/180	0.591	0.271	0.564	0.729	0.684	0.713	0.678
340/180	0.601	0.171	0.339	0.735	0.691	0.719	0.684
180/180/i89	0.604	0.531	0.675	0.736	0.693	0.720	0.686
270/180/i89	0.572	0.341	0.592	0.715	0.667	0.700	0.664
366/180/i89	0.556	0.262	0.551	0.704	0.654	0.689	0.652
340/180/i89	0.565	0.165	0.331	0.709	0.660	0.694	0.657

**Modeled Size:** Windows 1230W x 1480H | Swing Door 1100W x 2200H | Sliding Door 2400W x 2500H

**Spacer:** SuperSpacer® TriSeal™ by Edgetech

**Glass:** 4mm-16mm-4mm-16mm-4mm



## INTERNATIONAL PASSIVE HOUSE INSTITUTE [PHI] - FRAME DATA

		WIDTH [MM]	U-VALUES [W / m <sup>2</sup> K]	Psi VALUES [W / mK]
INSWING WINDOW		105	0.88	0.021
FIXED WINDOW		58	0.81	0.020
INSWING DOOR	Sides & Head	132	0.79	0.022
	Sill	146	0.86	0.022
SLIDING DOOR	Bottom Sash	168	0.74	0.021
	Bottom Fixed	81	0.74	0.022
	Side Fixed	58	0.81	0.020
	Side Sash	158	0.73	0.020
	Top Sash	168	0.79	0.021
	Top Fixed	81	0.76	0.023
	Mullion	202	0.74	0.020

**Modeled Size:** Windows 1230W x 1480H | Swing Door 1100W x 2200H | Sliding Door 2400W x 2500H

**Spacer:** SuperSpacer® TriSeal™ by Edgetech

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## ADDITIONAL CENTER-OF-GLASS DATA INTERNATIONAL PASSIVE HOUSE INSTITUTE [PHI] - 5/14.5/5/14.5/5



LOW-E OPTIONS	CENTER-OF-GLASS DATA PER EN 673		
	U <sub>g</sub>	G-VALUE	VT
Calibration Panel	0.700		
180/180	0.689	0.547	0.680
270/180	0.653	0.349	0.598
366/180	0.635	0.269	0.556
340/180	0.645	0.171	0.335
180/180/i89	0.641	0.521	0.664
270/180/i89	0.611	0.337	0.583
366/180/i89	0.595	0.260	0.542
340/180/i89	0.604	0.164	0.326

**Spacer:** SuperSpacer® TriSeal™ by Edgetech

**Glass:** 5mm-14.5mm-5mm-14.5mm-5mm

## ADDITIONAL CENTER-OF-GLASS DATA INTERNATIONAL PASSIVE HOUSE INSTITUTE [PHI] - 6/13/6/13/6



LOW-E OPTIONS	CENTER-OF-GLASS DATA PER EN 673		
	U <sub>g</sub>	G-VALUE	VT
Calibration Panel	0.700		
180/180	0.740	0.529	0.666
270/180	0.706	0.343	0.585
366/180	0.688	0.267	0.544
340/180	0.698	0.170	0.327
180/180/i89	0.686	0.503	0.651
270/180/i89	0.656	0.330	0.572
366/180/i89	0.641	0.258	0.532
340/180/i89	0.650	0.164	0.320

**Spacer:** SuperSpacer® TriSeal™ by Edgetech

**Glass:** 6mm-13mm-6mm-13mm-6mm

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## PASSIVE HOUSE INSTITUTE US [PHIUS - ISO 15099] - WINDOWS

LOW-E OPTIONS	CENTER-OF-GLASS DATA			UW (U-VALUE OF WINDOW) [ W / m²K ]							
	U <sub>g</sub>	G-VALUE	VT	FIXED EXT GLAZED		FIXED INT GLAZED		OUTSWING: CASEMENT, AWNING		INSWING: TILT & TURN, HOPPER	
				U <sub>w</sub>	U <sub>f</sub>	U <sub>w</sub>	U <sub>f</sub>	U <sub>w</sub>	U <sub>f</sub>	U <sub>w</sub>	U <sub>f</sub>
180/180	0.128	0.514	0.690	0.16	0.18	0.16	0.19	0.17	0.19	0.16	0.18
366/180	0.120	0.239	0.563	0.15	0.17	0.15	0.19	0.16	0.19	0.16	0.18
180/180/i89	0.111	0.487	0.675	0.14	0.20	0.15	0.22	0.16	0.20	0.15	0.20
366/180/i89	0.105	0.230	0.550	0.14	0.20	0.14	0.22	0.15	0.20	0.15	0.20

**Spacer:** Stainless Steel Endur Spacer by Cardinal

**Zones:** Values for climate zone4, zone Marine North, and/or zone Marine South. Request full PHIUS certificates for PSI values, additional performance data, and climate zone recommendations.

**Glass:** 6mm-13mm-6mm-13mm-6mm

## ACOUSTIC PERFORMANCE

WINDOWS				
	GLAZING	SAMPLE SIZE	STC	OITC
FIXED WINDOW (ASTM E90)	Double 6/4	47.25" x 59.00"	34	28
FIXED WINDOW (ASTM E90)	Triple 6Lami/4/6	47.25" x 59.00"	37	27
TILT & TURN (ASTM E90)	Double 6/4	47.25" x 59.00"	35	28
TILT & TURN (ASTM E90)	Triple 6Lami/4/6	47.25" x 59.00"	37	28
GLASS-ONLY (CALCULATED VALUES) 1" IGU NOMINAL	Double 6/6	Center-of-glass	35	28
GLASS-ONLY (CALCULATED VALUES) 1" IGU NOMINAL	Double 6Lami/6	Center-of-glass	38	31
GLASS-ONLY (CALCULATED VALUES) 1" IGU NOMINAL	Double 6Lami/6Lami	Center-of-glass	40	34
GLASS-ONLY (CALCULATED VALUES) 1.25" IGU NOMINAL	Double 6/6	Center-of-glass	38	31
GLASS-ONLY (CALCULATED VALUES) 1.25" IGU NOMINAL	Double 6Lami/6	Center-of-glass	39	32
GLASS-ONLY (CALCULATED VALUES) 1.25" IGU NOMINAL	Double 6Lami/6Lami	Center-of-glass	41	35
GLASS-ONLY (CALCULATED VALUES) 1.70" IGU NOMINAL	Triple 6/4/6	Center-of-glass	39	31
GLASS-ONLY (CALCULATED VALUES) 1.70" IGU NOMINAL	Triple 6Lami/4/6	Center-of-glass	41	34
GLASS-ONLY (CALCULATED VALUES) 1.70" IGU NOMINAL	Triple 4/4/4	Center-of-glass	36	28

**NOTE:** Glass-only calculated values for STC and OITC represent approximate values.



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Technical Data Sheet (Metric)



## NAFS KEY PERFORMANCE DATA - WINDOWS & DOORS

TYPE		TESTED SIZE [MM]	DESIGN WIND PRESSURE PA (PSF)	WATER INFILTRATION PA (PSF)	NAFS DESIGNATORS	AIR INFILTRATION [L/s*M <sup>2</sup> ]	AIR EXFILTRATION [L/s*M <sup>2</sup> ]
OUTSWING	CASEMENT	1524 x 914	2880 (60)	730 (15)	AW-PG60-C	0.01	0.06
	CASEMENT	914 x 2134	2160 (45)	730 (15)	CW-PG45-C	0.06	0.02
	AWNING	1524 x 914	2880 (60)	730 (15)	AW-PG60-AP	0.05	0.29
	AWNING	2134 x 914	2880 (60)	730 (15)	CW-PG60-AP	0.00	0.00
	AWNING	1219 x 2134	2640 (55)	730 (15)	CW-PG55-AP	0.01	0.01
	AWNING	1930 x 1524	1680 (35)	730 (15)	CW-PG35-AP	0.00	0.00
INSWING	TILT & TURN	1219 x 2134	3840 (80)	730 (15)	CW-PG80-DAW	0.00	0.01
	TILT & TURN	1524 x 2515	2160 (45)	730 (15)	LC-PG45-AP	0.00	0.00
	HOPPER	2134 x 914	85 (4080)	730 (15)	CW-PG85-AP	0.07	0.06
	HOPPER	1930 x 1524	2880 (60)	730 (15)	CW-PG60-AP	0.11	0.13
FIXED	FIXED	1930 x 3048	2880 (60)	730 (15)	AW-PG60-FW	0.01	0.01
	FIXED	3658 x 1524	4800 (100)	730 (15)	CW-PG100-FW	0.00	0.00
	FIXED	2591 x 2134	4320 (95)	730 (15)	CW-PG95-FW	0.00	0.00
DOORS	OUTSWING (SINGLE)	1524 x 3048	1920 (40)	730 (15)	CW-PG40-SHD	0.21	0.18
	OUTSWING (DOUBLE)	2438 x 2743	960 (20)	730 (15)	R-PG20-SHD	0.21	0.18
	INSWING (SINGLE)	1524 x 3048	2160 (45)	730 (15)	R-PG45-DASHD	0.09	0.03
	INSWING (DOUBLE)	2438 x 2743	1680 (35)	730 (15)	R-PG35-SHD	0.02	0.02
	SLIDING (SINGLE)	2438 x 2438	2160 (45)	730 (15)	CW-PG45-SD	0.05	0.07
	SLIDING (DOUBLE)	6096 x 2743	960 (20)	730 (15)	R-PG20-SD	0.01	0.02
	SLIDING (DOUBLE)	5029 x 2438	30 (1440)	730 (15)	CW-PG30-SD	0.00	0.00

**NOTE:** Dimensions above indicate NAFS performance tested sizes which may exceed common size limits available. For minimum/maximum sizes available, please consult Cascadia's Vent Size Charts.

Air Infiltration and Exfiltration tests the overall assembly at 75 Pa. All windows meet and surpass the US and Canadian air leakage performance requirements for A3/Fixed

## GLASS WEIGHTS

GLASS THICKNESS	GLASS WEIGHTS (KG / M <sup>2</sup> )		
	MONOLITHIC	DOUBLE GLAZED	TRIPLE GLAZED
3.9 mm	10.64	21.28	31.93
4.7 mm	12.71	25.43	38.15
5.7 mm	15.40	30.80	42.21

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## AVAILABLE WINDOW SIZES

	OUTSIDE-OF-FRAME				PERFORMANCE GRADE	MAX. WEIGHT (KG)
	MIN. WIDTH (CM)	MIN. HEIGHT (CM)	MAX. WIDTH (CM)	MAX. HEIGHT (CM)		
Fixed Glazing	15.24	22.86	213.36	259.08	PG 95	181.43
Fixed Glazing	15.24	22.86	152.40	365.76	PG 100	181.43
Fixed Glazing	15.24	22.86	193.04	304.8	PG 60	181.43

*Dimensions can be rotated 90 degrees*

OPERABLE WINDOWS						
Casement (outswing)	47.625	57.468	91.44	182.88	PG 60	99.79
Awning (outswing)	50.80	57.468	139.70	119.38	PG 55	79.83
Tilt & Turn (inswing)	60.69	76.20	152.40	251.46	PG 80 up to 121.92"x182.88" / PG 45 at larger sizes	99.79
Hopper (inswing)	60.69	60.69	139.70	119.38	PG 60	79.83
SWING DOORS						
Single door (outswing)	60.69	152.40	152.40	304.80	PG 40	99.79
Single door (inswing)	60.69	152.40	147.32	266.70	PG 45	99.79
Double door (outswing)	121.38 (60.69/panel)	152.40	243.84 (121.92/panel)	274.32	PG 20	99.79/sash
Double door (outswing)	121.38 (60.69/panel)	152.40	203.20 (101.60/panel)	220.98	PG 40	99.79/sash
Double door (inswing)	121.38 (60.69/panel)	152.40	238.76 (119.38/panel)	266.70	PG 35	99.79/sash
SLIDING DOORS						
Sliding single door (XO)	137.16 (68.58/panel)	152.40	243.84 (121.92/panel)	243.84	PG 45	99.79/sash
Sliding single door (XO)	137.16 (68.58/panel)	152.40	299.72 (149.86/panel)	266.70	PG 20	99.79/sash
Sliding single door (OXO)	205.74 (68.58/panel)	152.40	365.76 (121.92/panel)	243.84	PG 30	99.79/sash
Sliding single door (OXO)	205.74 (68.58/panel)	152.40	449.58 (149.86/panel)	266.70	PG 20	99.79/sash
Sliding double door (OXXO)	274.32 (68.58/panel)	152.40	487.68 (121.92/panel)	243.84	PG 30	99.79/sash
Sliding double door (OXXO)	274.32 (68.58/panel)	152.40	599.44 (149.86/panel)	266.70	PG 20	99.79/sash

*Double door widths shown include 2 sashes*