



PRODUCT CATALOG

Built for you, the visionary

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Welcome

Over 40 years ago, encouraged by master architect Louis I. Kahn, founder Philip Cole began custom-crafting monumental wood window systems and doors. Since then, our reputation for superior quality and design innovation has made Duratherm the first choice of leading architects. We appreciate your interest and look forward to our creative collaboration with you.

What you'll find here—and what you won't.

In the following pages you'll find answers to most of your questions about Duratherm products and services. You'll also see examples of projects we've worked on with some of our long-time customers. You won't find as many design and construction specifics here as you might expect, however. We know from experience how much architects rely on us to design and build to unique requirements. So we've tried to give you just enough specifics to lay the groundwork without giving you so many that they constrain your creativity. After all, some of architects' best ideas—like a rolling door with fixed-frame sidelights, multi-panel pocket doors set at 90° to each other, or the WinDoor™—have joined our repertoire of innovative designs.

If you don't find the answer to your questions in these pages, chances are it's because the answer is, "It depends." Please call us to talk about your requirements with a qualified professional. Or email your questions to info@durathermwindow.com.

Want to know more? Visit our website: durathermwindow.com



Phillips Exeter Academy Library

Louis Kahn

Photo © Steve Rosenthal

Completed: 1971 Exterior: Teak (Unfinished)
Interior: White Oak (Clear Lacquer)

WORKSHOP FOR ARCHITECTURE
Millerton, New York



Workshop for Architecture

MILLERTON, NY

Photo © Scott Frances/OTTO

Completed: 2010 Exterior: Teak (Bleaching Stain)
Interior: Teak (Clear Lacquer)



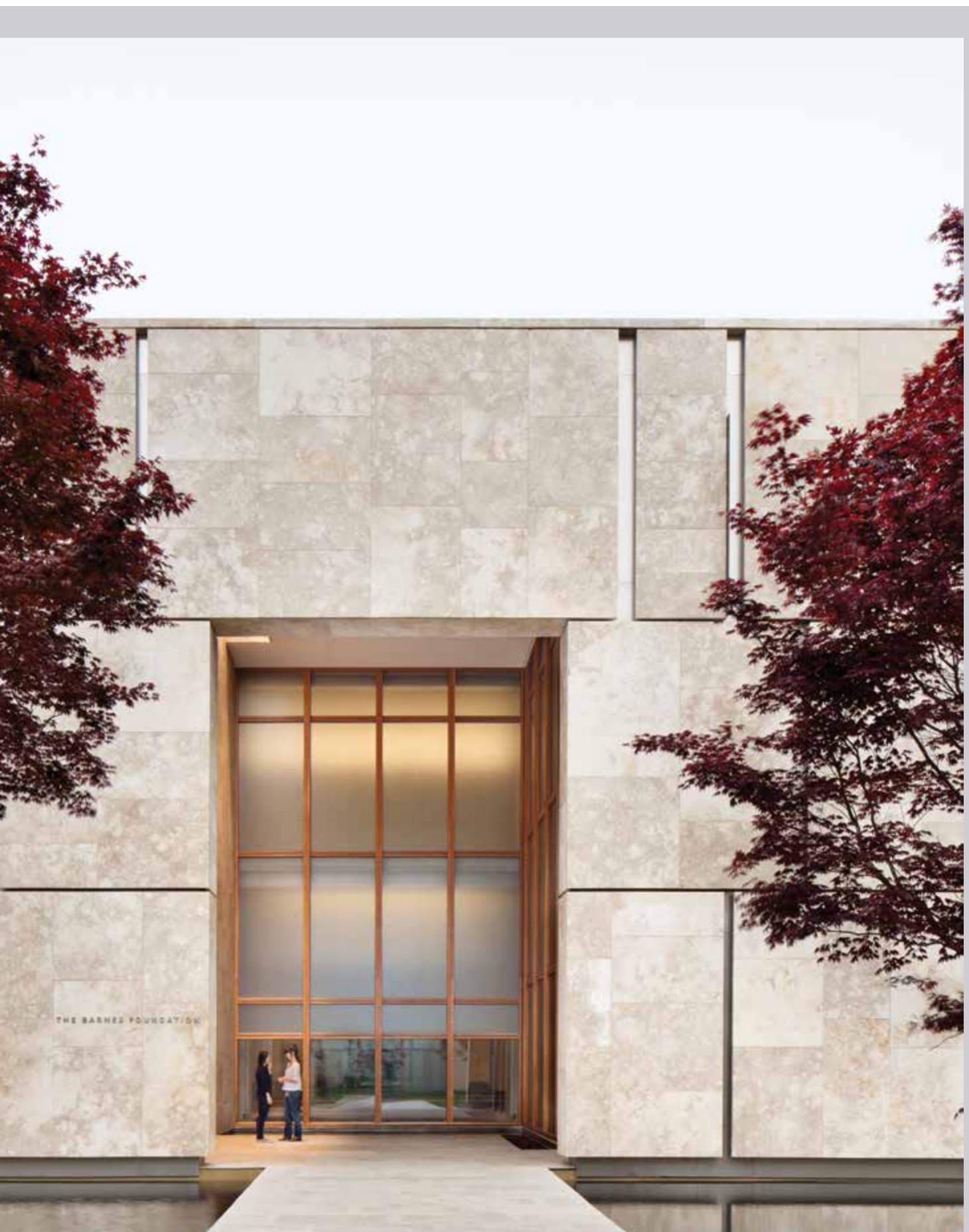
BARNES MUSEUM

Philadelphia, Pennsylvania

The Barnes Museum and Art Education Center opened in May 2012 to universal praise from the design community. Duratherm was consulted early in the process since we were the only supplier capable of designing the highly specialized forced entry units in the Galleries (units as large as 8'-0" wide by 17'-0" high) and the enormous entry window walls (21'-0" x 33'-0"). FSC™ certified White Oak throughout helped to recreate the look of the old Barnes Museum while contributing to the projects LEED certification.

Barnes Museum
Photo © Michael Moran/OTTO





PRIVATE RESIDENCE



Sutton Suzuki Architects

Photo © David Livingston

Completed: 2009 Exterior: Sapele
Mahogany (Paint) Interior: Sapele
Mahogany (Clear Lacquer)





PRIVATE RESIDENCE

For this project, the architects' past experience with Duratherm told them that they would once again be able to push the limits. "There's great communication with Duratherm as far as detailing projects in such a way that we're both comfortable," says architect Mark Weber. The architects were confident that Duratherm would meet thorny challenges such as weather-sealing the large exterior pivot doors. "They kept working until they figured out how to handle it," says Weber.

As a result of their collaborative relationship, Duratherm's huge-pane window and door systems enable this environmentally conscientious home to effectively mediate between two very different views: toward Lake Michigan in one direction, and into dense woodland in the opposite direction.

"The clients love the house. They embraced the whole project, and the windows and doors are a huge part of that," states Weber. "We've always liked that we could push Duratherm's limits, such as having large expanses of glass or requesting non-typical operations that other companies haven't really developed. It's been a nice dialogue with respect to marrying their products to our projects."



Wheeler Kearns Architects
Private Residence, Michigan
Photos © Christopher Barrett



THE ALDRICH CONTEMPORARY ART MUSEUM Ridgefield, Connecticut

Duratherm products blended the warmth of mahogany, Yankee sturdiness, and contemporary scale to help the architects solve the thorny challenge of building a contemporary art museum in the middle of traditional New England surroundings. "The project was of a residential scale, but we felt it needed the monumental quality of Duratherm, and the level of craftsmanship and fine detailing was so suitable," says Meliti Dikeos, project architect. The architects and client reviewed other options, but kept coming back to Duratherm. Dikeos recalls thinking, "This is what's going to make the lobby, the special gallery, and the connection between these two spaces really have an identity."

"The Duratherm product struck us as ideal, because the materials and craftsmanship speak to tradition, but the proportions speak to the contemporary nature of the museum," says Harry Philbrick, museum director. "A number of people have said that the solidity and craftsmanship in the doors and windows remind them of a wooden ship. Despite a very tight budget, you've really got to go for the best with the things people look at."



THE ALDRICH CONTEMPORARY ART MUSEUM
Ridgefield, CT
Tappé Associates, Boston, Massachusetts
Photos © Peter Aaron/Esto



ATLANTIC CENTER FOR THE ARTS Florida

THE CRAFT OF BUILDING

Charles Rose explains that his firm's designs "celebrate the craft of building." It was this philosophy that drove their decision to choose Duratherm. Windows and doors were designed to meet the triple challenges of the architect's vision, the scale, and the Florida climate.

It was a five-phase project. The first phase required a butt-glazed window-wall, sloping on two planes, with no vertical muntins. Other window units had shapes and angles requiring muntins to be joined along two planes. Yet, remarks Rose, "Duratherm is an easy company to work with during the shop drawing stage.

They're very thorough, and tech support helps a lot with structural reinforcement. We've found other window companies more difficult to communicate with." Later phases included monumental windows and sliding doors with large muntin-free expanses of glass

CONNECT TO THE LANDSCAPE

"Our intent was to create a powerful connection between the interior spaces and the surrounding landscape," explains Rose. "The monumental scale and uninterrupted glass of Duratherm's windows and doors let us do that." The result: an AIA award-winning project. Rose elaborates on the aesthetic qualities of

"Duratherm windows are a statement of quality. They look as substantial and as well-crafted as they are. And we really like the way the wood's minimal dimensions maximize the glass." He adds that after six years, the windows "still look incredible. Every time we go to Florida, visitors to the Center comment on the windows and ask us where we got them."



Photo © Chuck Choi

Environmental Stewardship

Duratherm Window Company, LLC realizes that environmental stewardship is not simply good policy—it is good business. We aim to fulfill our role as good corporate and global citizens by vigorously pursuing goals in recycling, waste management, energy usage reduction, and respect for our natural environment. We provide long-lasting, renewable and recyclable wood products that minimize our clients' carbon footprint.

Our primary raw material—solid stock lumber from both tropical and native sources—makes us, perhaps more than other manufacturers, acutely conscious of the need to use this resource wisely. Wood remains one of the few truly renewable resources in the building industry. But we as a company still need to be cognizant of the species we use, how we source them, and how we use them. Duratherm's comprehensive approach to sustainable design allows us to be good stewards of the environment as well as proud manufacturers of the highest quality products

Lumber Sourcing / FSC® Certification

We are increasingly able to source lumber from responsibly managed forests with the highly sought after Forest Stewardship Council® (FSC®) Certification. Virtually all domestic woods and many tropical species—including Sapele Mahogany—are now harvested and marketed according to the high standards of the FSC®.

NFRC Product

Our windows are tested according to the exacting standards of the National Fenestration Rating Council (NFRC). Our products meet strict energy efficiency guidelines as set forth by the EPA and the US Department of Energy.

LEED Certification Results

The Leadership in Energy and Environmental Design (LEED) system was developed by the United States Green Building Council to recognize projects that excel in their energy performance and sustainable design initiatives. Duratherm's window and door components, critical parts of the building envelope, have helped our clients obtain LEED credits in categories such as Optimized Energy Performance, Certified Wood, Local and Regional Materials, and Ventilation Effectiveness. A list of our LEED-certified projects is available on request.

Company-wide Recycle Procedures and Green Initiatives

Duratherm makes a concerted effort to prevent as much of our by-product as possible from entering the waste stream. Virtually all our sawdust is recycled or used as fuel to heat our plant. Wood scraps are likewise used for fuel, or donated to the local citizenry for use in hobbies or crafts. In addition to these recycling and reuse procedures, we are continually researching new and innovative ways to maintain a leadership position in environmental stewardship. Recent initiatives include:

- Procedures to use low-VOC finish products and minimize the volume of solvents required in finish operations.
- State of the art ventilation in our finish room to insure a safe work environment and to filter exhaust air.
- Upgraded factory lighting utilizing high-efficiency T-8 fixtures throughout the facility.
- A high-efficiency, variable-speed compressor that senses demand for air, reducing our electricity usage for our compressed air needs by more than 50%.
- A clean-burn wood furnace (carbon neutral) that uses clean waste wood to heat our facility, reducing our need for #2 fuel oil by at least 10,000 gallons per year.
- A wood briquette machine that compresses generated sawdust into clean-burning wood briquettes that are both utilized on site and marketed as fuel in the local area.



The mark of
responsible forestry



*Source: LEED Reference Guide for Green Building Design and Construction - 2009 Edition (www.usgbc.org)

Elements of Fenestration Performance

In addition to aesthetics and ventilation, there are numerous performance criteria that are important when selecting or specifying windows and doors. Among them are:

- Air, Water & Structural Performance
- Thermal Performance & Glazing
- Security & Forced Entry Resistance
- Operating Force and Accessibility
- Sound Transmission Resistance
- Wind-borne Debris Protection
- Exterior Finish Durability
- Warranty

Air, Water & Structural Performance

The International Building Code (IBC) and the International Residential Code (IRC) state that exterior windows and doors must be tested and labeled as conforming to the AAMA/WDMA/CSA101/I.S./2/A440 standard (also known as the North American Fenestrations standard (NAFS)) or, at a minimum, be designed and/or tested to resist the appropriate wind load design pressures.

NAFS uses product type, performance class and performance grade (PG) designators to categorize products and their performance levels. In order for a product to meet a given performance class and/or grade, a number of requirements must be met. For example, to achieve a C-R50 (Performance Class R, Performance Grade 50) rating, a casement with a minimum frame size of 24" x 60" must surpass all of the air, water, structural and hardware sub-requirements pertaining to that class and grade. The following tables are intended to provide an overview of the NAFS requirements:

Product Type Designators

Product Type I.S. 2-97	Product Type 101/ I.S.2 / A440-05, 08 and 11	Performance Class	Sample Product Designation
AP = Awning Windows	AP = Awning Windows	R	C- R 50
C = Casement Windows	C = Casement Windows	LC	50 = Performance Grade (Design Pressure, psf)
F = Fixed Windows	FW = Fixed Windows	CW	R = Performance Class
H = Hung Windows (single, double)	H = Hung Windows (single, double)	AW	C = Product Type
HGD = Hinged Glass Doors	SHD = Side-Hinged Doors		
SGD = Sliding Glass Doors	SD = Sliding Doors		

Duratherm tests to the AW performance class.

Minimum Performance Class Requirements

	Standard	Class / Rating / Grade	Performance Requirement		
			Maximum Air Infiltration ₁	Minimum Water Test Pressure (psf)	Minimum Design Pressure (psf)
Current Standards	AAMA/WDMA/CSA 101/I.S.2/ A440-17	R	0.3 cfm/sq.ft. @ 1.57 psf	2.93	15.1
		LC	0.3 cfm/sq.ft. @ 1.57 psf	3.76	25.1
		CW (sliding seal)	0.2 cfm/sq.ft. @ 1.57 psf	4.6	30.1
		CW (compression seal)	0.1 cfm/sq.ft. @ 1.57 psf	4.6	30.1
		AW (sliding seal)	0.3 cfm/sq.ft. @ 6.24 psf	8.15	40.1
		AW (Compression seal)	0.1 cfm/sq.ft. @ 6.24 psf	8.15	40.1
Previous Standards	AAMA/WDMA/CSA 101/I.S.2/ A440-08 AAMA/WDMA/CSA 101/I.S.2/ A440-11	R	0.3 cfm/sq.ft.	2.93	15.1
		LC	0.3 cfm/sq.ft.	3.76	25.1
		CW	0.3 cfm/sq.ft.	4.6	30.1
		AW	0.3 cfm/sq.ft.	8.15	40.1
	101 / I.S.2 / NAFS-02 WINDOWS, SKYLIGHTS AND GLASS DOORS & AAMA / WDMA / CSA 101 / I.S.2 / A440-05	Residential (R)	0.3 cfm/sq.ft.	2.93	15.1
		Light Commercial (LC)	0.3 cfm/sq.ft.	3.76	25.1
		Commercial (C)	0.3 cfm/sq.ft.	4.60	30.1
		Heavy Commercial (HC)	0.3 cfm/sq.ft.	6.06	40.1
		Architectural (AW)	0.3 cfm/sq.ft.	8.15	40.1
	101 / I.S.2-97 WINDOWS AND GLASS DOORS	Residential (R)	0.3 cfm/sq.ft.	2.86	15.0
		Light Commercial (LC)	0.3 cfm/sq.ft.	3.75	25.0
		Commercial (C)	0.3 cfm/sq.ft.	4.50	30.0
		Heavy Commercial (HC)	0.3 cfm/sq.ft.	6.00	40.0
		Architectural (AW)	0.1 or 0.3 cfm/sq.ft.	8.00	40.0

Optional Performance Grade Requirements

Optional Performance Grade	Product Performance Class	Design Pressure (psf)	Structural Test Pressure (psf)	Water Resistance Test Pressure	
				R, LC, CW (psf)	AW (psf)
20	R	20	30.10	3.13	—
25	R	25	37.60	3.76	—
30	R, LC	30	45.11	4.59	—
35	R, LC, CW	35	52.63	5.43	—
40	R, LC, CW	40	60.15	6.06	7.94
45	R, LC, CW, AW	45	67.67	6.75	8.98
50	R, LC, CW, AW	50	75.19	7.50	10.03
55	R, LC, CW, AW	55	82.71	8.25	11.07
60	R, LC, CW, AW	60	90.23	9.00	12.11
65	R, LC, CW, AW	65	97.74	9.75	13.03
70	R, LC, CW, AW	70	105.26	10.50	14.04
75	R, LC, CW, AW	75	112.78	11.25	15.04
80	R, LC, CW, AW	80	120.30	12.00	15.04
85	R, LC, CW, AW	85	127.82	12.00	15.04
90	R, LC, CW, AW	90	135.34	12.00	15.04
95	R, LC, CW, AW	95	142.86	12.00	15.04
100	R, LC, CW, AW	100	150.38	12.00	15.04
105	AW	105	157.50	12.00	15.04

Minimum Performance Class & Grade Requirements Summary

Product Type	Performance Class	Minimum Performance Grade	Gateway Minimum Frame Test Size		Minimum Design Pressure (lb/ft ²)	Minimum Structural Pressure (lb/ft ²)	Minimum Water Pressure (lb/ft ²)	Air Leakage Resistance		Maximum Operating Force (lb)		Max Lock Force (lb)	Max Deflection at Design Pressure	Max Permanent Set After STP	Minimum ASTM Security Grade
			Width (inches)	Height (inches)				Pressure (lb/ft ²)	Allowable (cfm/ft ²)	Start	Run				
AP Awning	R	15	48	16	15	22.5	2.86	1.57	0.3	15	6	22	—	0.4% L	10
	LC	25	48	32	25	37.5	3.75	1.57	0.3	15	6	22	—	0.4% L	10
	CW	30	48	32	30	45	4.5	1.57	0.3	15	6	22	L/ 175	0.3% L	10
	AW	40	59	36	40	60	8	6.24	0.1	20	10	—	L/ 175	0.2% L	10
C Casement	R	15	24	59	15	22.5	2.86	1.57	0.3	15	6	22	—	0.4% L	10
	LC	25	32	60	25	37.5	3.75	1.57	0.3	15	6	22	—	0.4% L	10
	CW	30	32	60	30	45	4.5	1.57	0.3	15	6	22	L/ 175	0.3% L	10
	AW	40	36	60	40	60	8	6.24	0.1	20	10	—	L/ 175	0.2% L	10
FW Fixed Window	R	15	48	48	15	22.5	2.86	1.57	0.3	—	—	—	—	0.4% L	10
	LC	25	55	55	25	37.5	3.75	1.57	0.3	—	—	—	—	0.4% L	10
	CW	30	59	59	30	45	4.5	1.57	0.3	—	—	—	L/ 175	0.3% L	10
	AW	40	59	99	40	60	8	6.24	0.1	—	—	—	L/ 175	0.2% L	10
H Hung	R	15	40	63	15	22.5	2.86	1.57	0.3	45	30	22	—	0.4% L	10
	LC	25	44	75	25	37.5	3.75	1.57	0.3	51	34	22	—	0.4% L	10
	CW	30	55	91	30	45	4.5	1.57	0.3	51	45	22	L/ 175	0.3% L	10
	AW	40	59	98	40	60	8	6.24	0.3	51	45	—	L/ 175	0.2% L	10
SW Sliding Windows	R	15	63	43	15	22.5	2.86	1.57	0.3	30	20	22	—	0.4% L	10
	LC	25	71	55	25	37.5	3.75	1.57	0.3	30	20	22	—	0.4% L	10
	CW	30	71	59	30	45	4.5	1.57	0.3	—	25	22	L/ 175	0.3% L	10
SHD Side Hinged Doors	AW	40	98	79	40	60	8	6.24	0.3	—	25	—	L/ 175	0.2% L	10
	R	15	36	79	15	22.5	2.86	1.57	0.3	—	—	22	—	0.4% L	—
	LC	25	36	83	25	37.5	3.75	1.57	0.3	—	—	22	—	0.4% L	—
SD Sliding Doors	CW	30	40	83	30	45	4.5	1.57	0.3	—	—	22	L/ 175	0.3% L	—
	R	15	71	79	15	22.5	2.86	1.57	0.3	30	20	22	—	0.4% L	10
	LC	25	87	83	25	37.5	3.75	1.57	0.3	30	20	22	—	0.4% L	10
	CW	30	95	83	30	45	4.5	1.57	0.3	30	20	22	L/ 175	0.3% L	10
	AW	40	122	95	40	60	8	6.24	0.3	40	25	—	L/ 175	0.2% L	10

Specifying Air, Water & Structural Performance

When specifying performance class and grade requirements for a project, the performance grade (PG) should be greater than or equal to the design pressure for components and cladding as determined using the ASCE 7 calculation method. The design pressure (DP) increases as the importance factor/ risk category and design wind speed for the building increases. Exposure category, building height, topographical factors and location of the window or door on the wall of the building also affect the design pressure. Fenestration in the corner zones (as defined by ASCE 7) have higher negative design pressures. The window or door must meet or exceed those negative pressures structurally, but not necessarily the corresponding water resistance test pressures, since water resistance acts against positive pressures.

In the product information pages of this manual, the air, water and structural performance summary can be found.

Insulated Glass Unit Sizing

General

The following guidelines apply to most commercial insulated glass manufacturers. Specific glass companies have variations to the following, so it is advisable to contact them directly.

1. Keep overall insulated glass unit sizes to 50 sq. ft. or less to obtain a 10-year seal failure warranty.
2. Tints, coatings, and/or films within the insulated unit may result in more restrictive maximum unit sizing.
3. Keep at least one dimension (either width or height) of the unit under 96".
4. We recommend a length-to-width ratio of 4 to 1 or less to avoid excessive stress in the unit.

Tempered IG Units

Most manufacturers require that tempered glass have one dimension at least 16". This requirement is based on production/fabrication restrictions determined by the typical support roller spacing within the tempering ovens. However, this may vary among manufacturers; contact specific fabricators for their limitations.

Low E Coatings

We use either pyrolytic (hard coat) or sputtered (vacuum deposition or soft coat) products.

In pyrolytic glass, the coating is chemically bonded to the glass at the molecular level while it is still in the semimolten stage. This results in an extremely durable and stable coating that is impregnated right into the surface of the glass.

Pyrolytic coats have an unlimited shelf life, and can be tempered, laminated, or bent after coating. Because of these properties, many fabricators keep pyrolytic coated glass in inventory.

Soft coat Low E, or sputter coating, is applied in multiple layers of optically transparent silver sandwiched between layers of metal oxide in a vacuum chamber. This process provides the highest level of performance with a nearly invisible coating, high visible light transmission and very low emissivity giving optimum winter U-values.

Glazing Methods

Dry Glazing

High performance, commercial grade system for long life and easy maintenance and reglazing. Consists of compressible extruded silicone exterior gasket and dense wedge rubber interior. This glazing system is recommended by all major commercial insulated glass manufacturers.

Wet Glazing

Norseal V994 glazing tape with black silicone heal bead at exterior, clear silicone bedding bead at interior.

Typically used for traditional window configurations, true divided light applications, and painted sashes.

Breather Tubes

All insulated glass units delivered to elevations 4,000 feet above sea level or higher include breather tubes to equalize pressure within the insulated unit. These tubes are to be sealed within two days of arrival at the jobsite. Capillary tubes do not require sealing upon arrival, but are primarily used for high elevation mountainous areas with low humidity.

Glass Manufacturers

Specific glass companies, and specific products from each company, can have more restrictive sizing requirements, variable lead times, etc. We strongly advise that you contact them directly for product-specific specifications and limitations. Insulated glass manufacturers we have worked with include:

Cardinal cardinalcorp.com 952.935.1722

Heat Mirror southwall.com 800.365.8794

Pilkington pilkington.com 800.523.0133

Viracon viracon.com 800.533.2080

Agnora agnora.com 705.444.6654

There are several elements of thermal and glazing performance, including U-Factor, Solar Heat Gain Coefficient (SHGC), Visible Light Transmission (VLT %) and Condensation Resistance (CR). Thermal and glazing performance is measured at the center of glass or across the whole unit. The NFRC 100, 200 and 500 standards control the calculation procedures.

Glazing performance data is based on the WINDOW 5.2 and THERM 5.2 computer programs for analyzing energy performance. When comparing performance with other manufacturers, it is important to verify how the values were determined.



The National Fenestration Rating Council (NFRC) develops and administers energy-related rating and certification programs and their goal is to serve the public by providing fair, accurate, and credible information on fenestration performance. Duratherm products labeled with the NFRC Energy Performance label are rated in accordance with NFRC standards. This allows for direct comparisons with other NFRC labeled products. NFRC ratings are based on a combination of computer simulations and physical testing of product samples. For details go to www.NFRC.org.

Thermal Performance Definitions

U-Factor	The rate of heat transfer (BTU per hour-sq. ft.) through a window or door (total-unit) or glazing system (center-glass) (Assumes 0° F outside at night with an approximate 15 mph wind and 70° F inside). The lower the U-Factor, the better the insulating properties of the unit or glazing system. $R \text{ value} = 1/U$.
Solar Heat Gain Coefficient	The amount of solar heat that enters a room through a window or door (total unit) or glazing system (center-glass), divided by the amount that is actually contacting the exterior of the unit (Assumes 89° F outside and 75° F inside). The lower the value, the better the unit or glazing keeps out solar heat.
Visible Light Transmission	The percentage of visible light that is transmitted through the window or door (total-unit) or glazing system (center-glass).
Condensation Resistance	A relative indicator of a fenestration product's ability to resist the formation of condensation at a specific set of environmental conditions. The higher the Condensation Resistance value the greater the resistance to the formation of condensation. Actual condensation performance is a function of temperature, humidity and air movement. For more information see NFRC 501-2010, "User Guide to the Procedure for Determining Fenestration Product Condensation Resistance Rating Values".
Shading Coefficient	The amount of solar heat that passes through a particular glazing system divided by the amount that passes through a single piece of 1/8" thick clear glass (Assumes 89° F outside and 75° F inside). The lower the value, the better the glass keeps out solar heat.
Relative Heat Gain	The actual amount of heat energy (BTU per hour-sq. ft.) that enters a room through a glazing system (Assumes typical daytime summer conditions of 89° F outside and 75° F inside). The lower the value, the better the unit keeps out heat energy.
Inside Glass Surface Temperature	The temperature on the inside surface of the glass at the center of the glass. It is based on an outside temperature of 0° F, inside temperature of 70° F, and an approximate 15 mph outside wind. Room side barriers to interior air flow (blinds, shades, drapes, screens) tend to lower inside glass surface temperature and humidity levels at which condensation occurs. Outside screens tend to raise inside glass surface temperature and level of humidity at which condensation occurs.
UV Transmission	The percentage of ultra violet rays that enter a room through the glazing system. It is a predictor of potential fading damage. Lower percentages indicate less fading potential (UV rays are those with a wavelength ranging from 0.30 to 0.38 microns).
LBL Damage Function	This function, developed by Lawrence Berkeley Laboratories, is another way of expressing UV Transmission. It is a better predictor of potential fading damage than UV Transmission. Lower values indicate less fading potential.

High Altitude Glazing

When standard insulating glass manufactured at one altitude is shipped to a higher altitude, the decreased air pressure will cause the glass to deflect. The amount of glass deflection depends upon many factors, such as glass thickness, air space width, air space temperature, difference in altitude, and size of the piece of glass. The following table can serve as a guideline for when high altitude glazing for standard insulating glass is required:

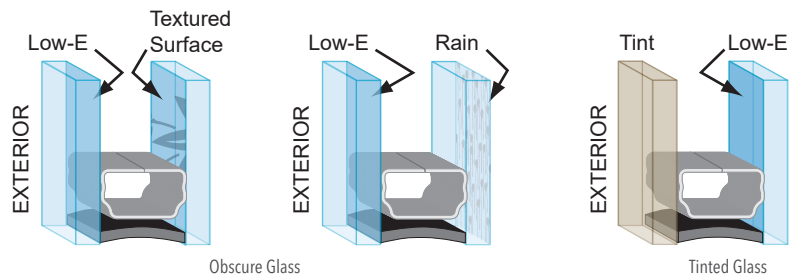
5/8" or 3/4" Insulating Glass		1" Dual-pane or Triple-pane Glazing	
Shortest Glass Dimension (inches)	Altitude Limit for Standard Glass (feet above sea level)	Shortest Glass Dimension (inches)	Altitude Limit for Standard Glass (feet above sea level)
≤ 10	3,000	≤ 15	3,000
≥ 10 and < 15	5,000	≥ 15 and < 20	3,500
≥ 15 and < 20	6,000	≥ 20 and < 30	4,500
≥ 20 and < 25	7,000	≥ 30 and < 40	6,000
≥ 25 and < 30	9,000	≥ 40 and < 50	8,000
≥ 30	10,000	≥ 50	10,000

The above table is a guideline for standard insulating glass only. Laminated Glass and Asymmetrical glass should use high altitude glazing when above 3,500 feet from sea level.

Additional Glazing Options

Obscure Glass	Commonly used in intimate spaces such as the bathroom and bedroom. Creates privacy while allowing natural light to enter. Available in a variety of textured surfaces, will let sunshine in to increase comfort. Thermal and SHGC of obscure IG is equal to clear glass when combined in IG with the same Low-E coatings.
Tempered Glass	Duratherm windows can be glazed with annealed glass design to meet a minimum of 20 psf design pressure. Tempered glass is available where safety glass is required by code or to increase glazing strength as required.
Tinted Glass (Bronze, Gray and Green)	Commonly used in rooms that receive a lot of sun exposure. Like sunglasses, windows with tinted glass block the sun's rays, so they're useful in controlling glare; plus, they keep rooms that get direct sun cooler. The tint also helps block the view into a home.
Spandrel Glass	Commonly used between sections of a building including the area between floors, columns, ceilings, and other small or large spaces. The main aesthetic purpose of spandrel glass is to create an overall uniform appearance. Spandrel is created using fired-on frit methods. This process includes a ceramic frit that is fused to the glass using high-heat fusing methods. This technique creates a glass that will not fade over time. In addition, spandrel is up to five times stronger than annealed glass.
Laminated Glass	Commonly used in locations in need of added security, ultraviolet (UV) protection and noise reduction. A polymer layer sandwiched between two layers of glass that cuts outside noise and harmful UV rays and offers added protection against intruders and forced entry. The interlayer holds the glass together if it's shattered.
Impact-Resistant Glass	Available in Impact-Resistant products, commonly used in locations that endure hurricane-force winds or where additional security or noise reduction is desired. An advanced polymer layer is sandwiched between two layers of glass, offering strong protection from flying debris - while increasing the safety, security, ultraviolet protection and energy efficiency of a home.
High altitude	For locations at high altitude the air filled insulating glass assembly is typically vented to prevent over pressurization of the system. If argon gas fill is used, the IG is filled to a pressure level tailored for higher elevations.

Refer to the product information pages for more detailed information.



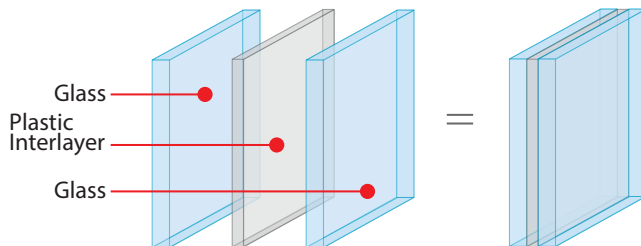
Impact Resistant Glazing

Impact-resistant glazing is a high-performance, laminated glass with either SentryGlas® Plus (SGP) technology from DuPont® or PVB technology, also from DuPont. This laminated glass is designed to offer outstanding protection to keep the glazing intact after the glass is impacted by hurricane wind-driven flying debris, as tested per industry standards listed below. SGP has a laminate interlayer made from an advanced material called ionoplast. SGP is much stronger than PVB. PVB is a DuPont Butacite® polyvinyl butyral laminate traditionally used in automotive windshields since 1938.

Impact-resistant products are designed and tested to meet or exceed many but not all Gulf Coast and Atlantic Coast hurricane building code requirements.

Impact-resistant windows and doors are tested to numerous industry standards consistent with the intended application. These standards include:

- ASTM E1886-13a (and previous versions)
- ASTM E1996-14a (and previous versions)
- Miami-Dade County Florida TAS 201-94
- Miami-Dade County Florida TAS 202-94
- Miami-Dade County Florida TAS 203-94



Impact Resistant Glass

Impact-resistant windows and doors feature heavy duty impact-resistant glass that consists of a tough laminated interlayer bonded between two panes of glass. This resistant layer helps prevent flying debris from entering the building in strong/severe windstorms.

Sound Transmission Resistance

The ability of a window or door to reduce outside noise is an important consideration in product selection. Both Sound Transmission Class (STC) and Outdoor - Indoor Transmission Class (OITC) measure the amount of noise reduction that can be achieved with a given product.

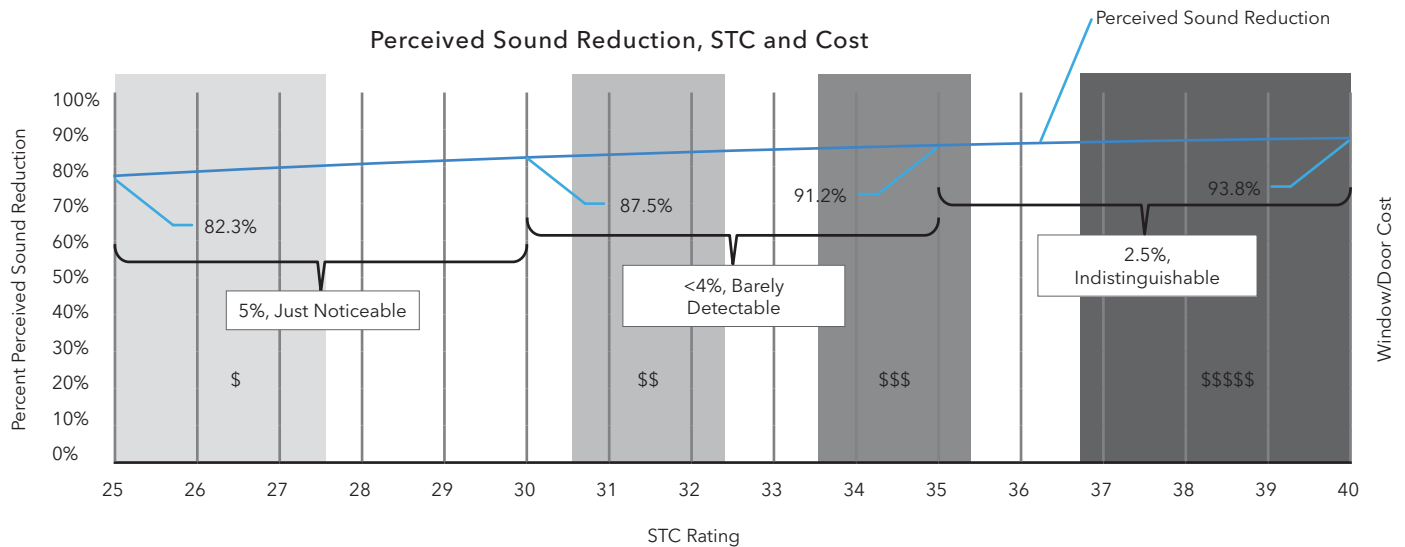
STC ratings give an indication of noise reduction that can be achieved with typical indoor (high frequency) noises such as human speech, computers, printers, etc. However, some specifiers and other manufacturers use STC ratings for exterior products because until recently, that is all that was available. OITC ratings are a much better indicator of exterior noise reduction. That is because OITC ratings include lower frequency noises such as traffic, construction equipment, and lawn and garden equipment, therefore, OITC ratings are usually a few points lower than STC ratings, because the lower frequency sounds are more difficult to attenuate.

Specifying Sound Transmission Resistance

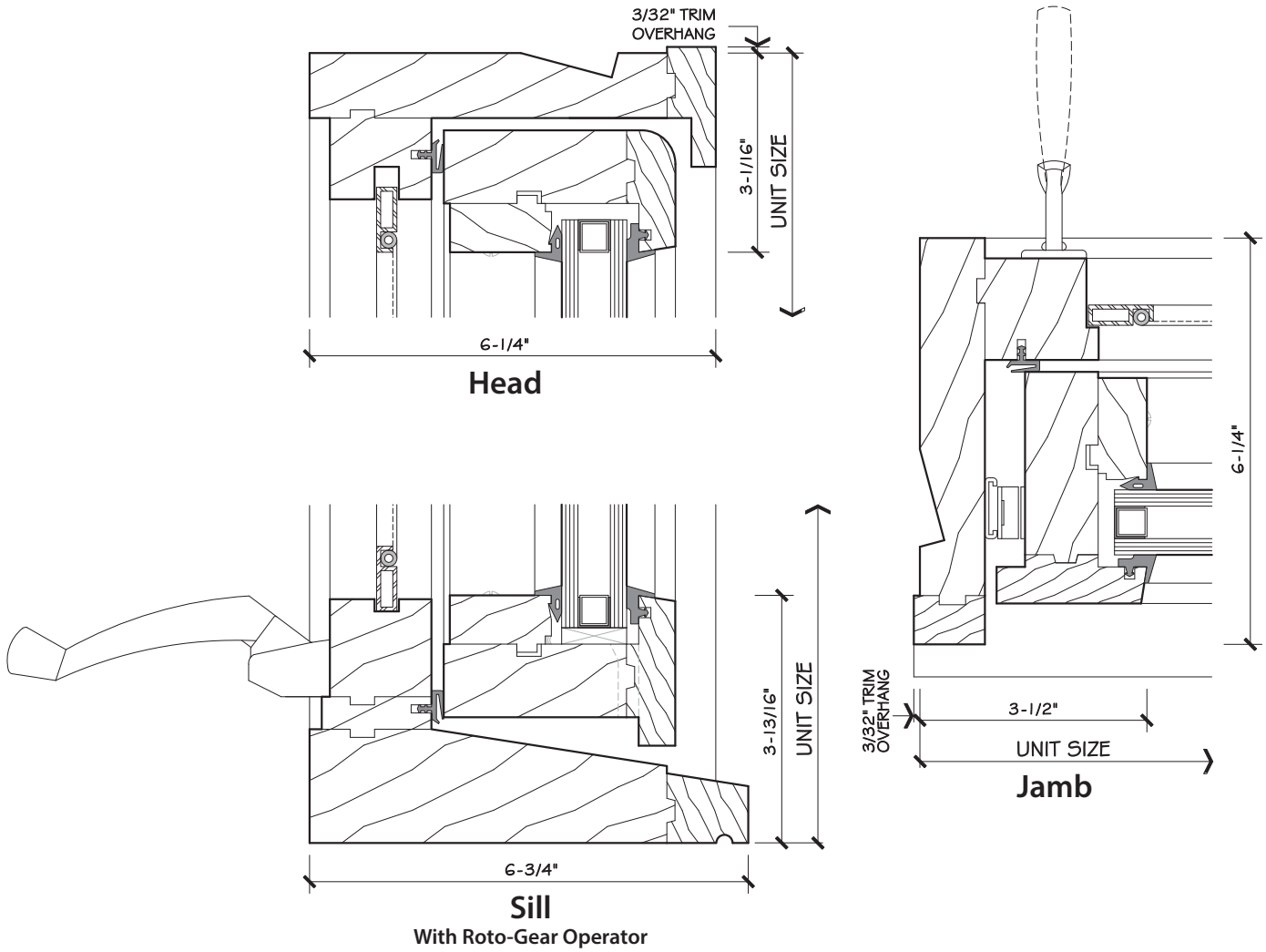
An STC rating is a rating of an assembly's ability to reduce sound (in decibels) across a range of tested frequencies. Scientifically speaking, a reduction of 3dB is a halving of acoustical energy. However, studies show that it takes a change of 5dB before humans perceive a difference and 10 dB before the average listener perceives that the change in sound has doubled. If a noise reduction of 10 decibels represents cutting the noise level in half, as interpreted by the human ear, an STC rating of 25 means that the product reduces the outside noise by approximately 25 decibels, cutting the noise in half 2-1/2 times, or cutting it by over 80 percent.

Since the tested assembly's sound reduction performance varies across the frequency range, actual in-service sounds have varying frequencies, and the human ear gives different "weight" to different frequencies, there is no guarantee that an assembly with a given STC rating will reduce that particular sound by the number of decibels equal to its STC rating. Therefore, the specifier should use STC and OITC ratings as a tool for general comparison between assemblies and be aware that an STC or OITC increase of two or three can mean a significant cost increase with little or no change in perceived noise reduction.

The graph below illustrates the relationship between perceived sound reduction (based on studies), STC rating and cost at a conceptual level. A chart for OITC would show similar results. This graph is an illustration of the diminishing returns on the investment in sound reduction technologies in windows. While a significant difference in perceived sound reduction would occur when comparing an STC 25 to an STC 40 window, each technology considered carries a cost associated with an incremental improvement in performance. After a greater amount of perceived sound reduction using cost effective technology any incremental improvements will result in less perceived sound reduction at a much higher cost.



Awning



Standard frame depth: $6\text{--}1/4"$

Minimum frame depth: $5\text{--}1/2"$

Maximum frame depth: $10"$

Contact factory for frame depths less than $6\text{--}1/4"$



Awning

Air, Water, & Structural Performance

Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
AW - PG60 - C	12 psf	0.07 psf	+/- 90 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

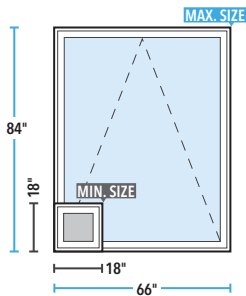
Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 72" x 72", Unit size cannot exceed these dimensions.

Thermal Performance Whole Unit

Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star [®] Capable
		Ext	Mid	Int						
1" CS63 Low-E IG	DUR-K-1-00028-00001	6		6	Argon	0.3	0.35	0.48	50	NC
1" ENADV Low-E IG	DUR-K-1-00029-00001	6		6	Argon	0.32	0.42	0.46	48	–
1" ENADV Low-E IG	DUR-K-1-00030-00001	6		6	Air	0.34	0.42	0.46	46	–
1" Solar-E Low-E IG	DUR-K-1-00031-00001	6		6	Argon	0.32	0.4	0.33	48	–
1" SB70 Low-E IG	DUR-K-1-00032-00001	6		6	Argon	0.29	0.18	0.4	50	NC, SC, S
1" SB60 Low-E IG	DUR-K-1-00033-00001	6		6	Argon	0.29	0.25	0.44	50	NC, SC, S
1" SB60 Low-E IG	DUR-K-1-00034-00001	6		6	Air	0.32	0.25	0.44	48	S
1" VE1-2M Low-E IG	DUR-K-1-00035-00001	6		6	Argon	0.29	0.24	0.44	50	NC, SC, S
1" VE15-2M Low-E IG	DUR-K-1-00036-00001	6		6	Argon	0.29	0.24	0.45	50	NC, SC, S
1" SB60 Low-E IG	DUR-K-1-00037-00001	6		6	Argon	0.27	0.24	0.43	41	N, NC, SC, S
1" E366 Low-E IG	DUR-K-1-00038-00001	6		6	Argon	0.29	0.18	0.39	50	NC, SC, S
1-1/4" Clear Lami, VE1-2M Low-E IG	DUR-K-1-00039-00001	6	6	9	Argon	0.29	0.24	0.43	50	NC, SC, S
1-1/4" Clear Lami, SB60 Low-E IG	DUR-K-1-00040-00001	10	6	6	Air	0.31	0.27	0.42	50	–
1-3/4" VE1-2M, VE1-85 Low-E IG	DUR-K-1-00041-00001	6	6	6	Argon	0.2	0.21	0.38	67	N, NC, SC, S
1-3/4" E366 Low-E IG	DUR-K-1-00042-00001	6	6	6	Argon	0.22	0.16	0.35	66	N, NC, SC, S

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR[®] values are updated to 2016 (Version 6) criteria.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 6-7/8",
unit width minus 7".

Egress:

Minimum unit width: 27"

Minimum unit height: 36" with use of egress extension hinges

Egress Based on 20" clear width, 24" clear height, 5.7 sq ft clear opening

At minimum unit width of: 27", height must be at least: 48"

At minimum unit height of: 48", width must be at least: 27"

Check all applicable local codes for emergency egress requirements.

Hardware

Pushbar Operator: Duratherm proprietary pushbar comprised of oxidized bronze alloy components and a solid brass bar, copper plated and oxidized to match bronze. The sill-mounted pushbar operator is designed to be manually operated for the entire length and to hold the sash at intermediate points. Available in one piece or hinged at mid-point.

Finishes: Oil-rubbed Bronze (US10B), Lacquered Red Bronze (US20A), White Bronze (US26D).

Egress: Available as quick-release pin at sash connection.

Roto-Gear Operator: Truth Maxim[®] stainless steel or EntryGard[®] steel roto gear operator with hardened steel drive worm and plastic slider for smooth operation. Cover and crank handle in high pressure die-cast zinc.

Finishes: Oil-rubbed Bronze (US10B), Satin Nickel (US15).

Egress: Available as quick-release lever at sash connection.

Sash Locks: Oxidized bronze alloy latches ensure positive, uniform locking action.

Finishes: Oil-rubbed Bronze (US10B), Lacquered Red Bronze (US20A), White Bronze (US26D).

Hinges

Heavy duty extension hinges, solid brass or zinc chromate coated steel. Hinges are designed to help the operator hold the sash in open positions, and to permit ready removal and replacement of the sash. Truth Maxim[®] 300 series stainless steel hinges are available for appropriate-sized units.

Optional Hardware

Custodial locks, sash restrictors, electric or manual remote operators.

Insect Screens

1" x 1/4" tubular extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum. Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72". Wood-framed screens are available.

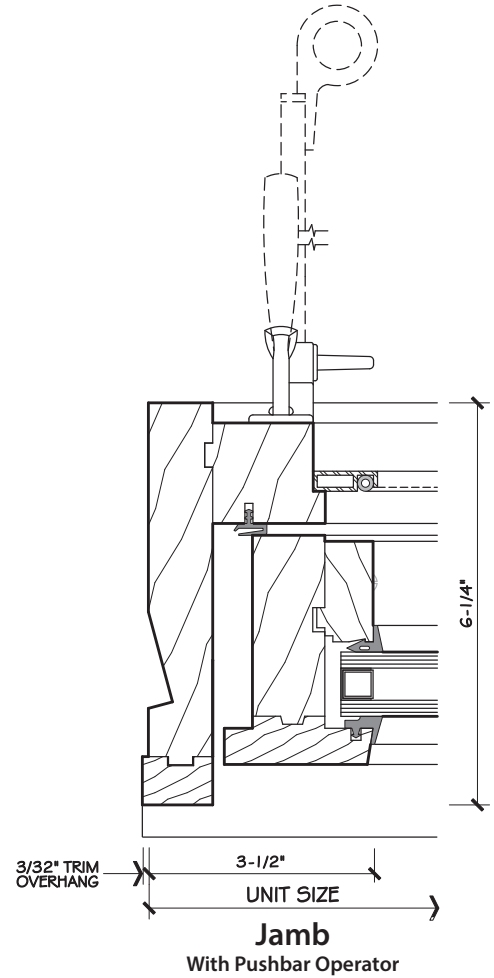
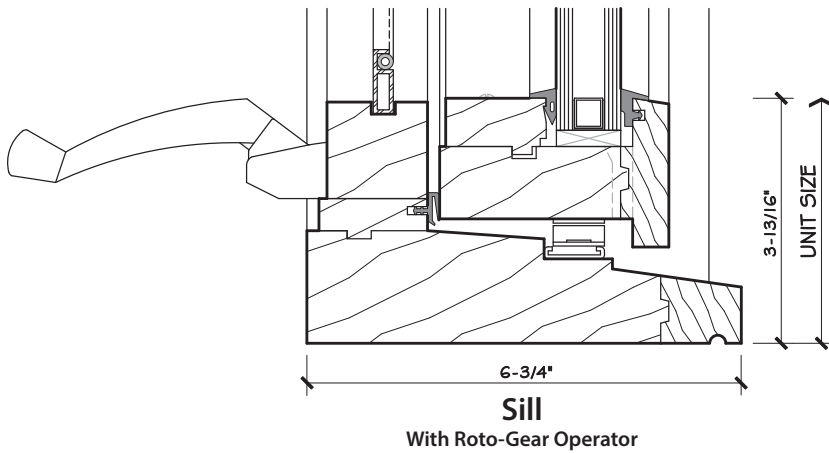
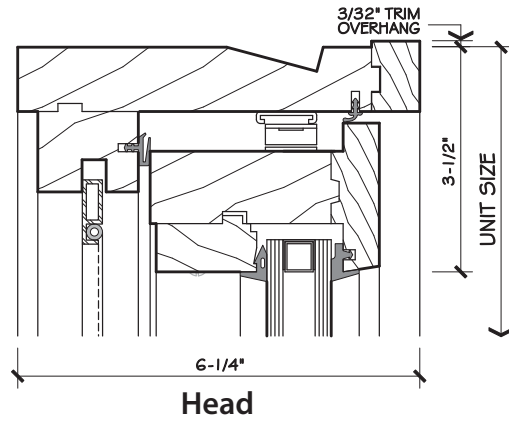
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1 3/4" security glass. Refer to Glass and Glazing Guide.

Weather-Stripping

Continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Engaging the sash locks compresses the weather-strip to ensure a tight seal.

Out-Swing Casement



Standard frame depth: 6-1/4"

Minimum frame depth: 5-1/2"

Maximum frame depth: 10"

Contact factory for frame depths less than 6-1/4"

Not to scale. All dimensions are approximate.



Out-Swing Casement

Air, Water, & Structural Performance

Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
AW - PG60 - C Impact Glass: C - CW60	12 psf	0.07 psf	+/- 90 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

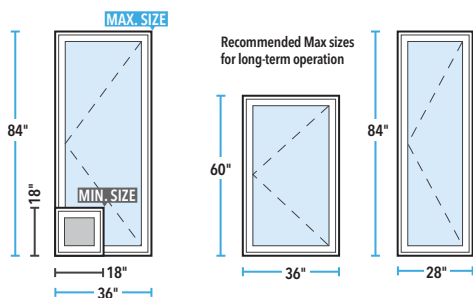
Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 36" x 60", Unit size cannot exceed these dimensions.

Thermal Performance Whole Unit

Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star [®] Capable
		Ext	Mid	Int						
1" CS63 Low-E IG	DUR-K-2-00028-00001	6	—	6	Argon	0.30	0.35	0.48	50	NC
1" ENADV Low-E IG	DUR-K-2-00029-00001	6	—	6	Argon	0.32	0.42	0.45	49	—
1" ENADV Low-E IG	DUR-K-2-00030-00001	6	—	6	Air	0.35	0.42	0.45	46	—
1" Solar-E Low-E IG	DUR-K-2-00031-00001	6	—	6	Argon	0.33	0.40	0.33	48	—
1" SB70 Low-E IG	DUR-K-2-00032-00001	6	—	6	Argon	0.30	0.17	0.39	51	NC, SC, S
1" SB60 Low-E IG	DUR-K-2-00033-00001	6	—	6	Argon	0.30	0.24	0.43	51	NC, SC, S
1" SB60 Low-E IG	DUR-K-2-00034-00001	6	—	6	Air	0.32	0.25	0.43	48	S
1" VE1-2M Low-E IG	DUR-K-2-00035-00001	6	—	6	Argon	0.30	0.24	0.43	51	NC, SC, S
1" VE15-2M Low-E IG	DUR-K-2-00036-00001	6	—	6	Argon	0.30	0.24	0.45	51	NC, SC, S
1" SB60 Low-E IG	DUR-K-2-00037-00001	6	—	6	Argon	0.27	0.24	0.42	41	N, NC, SC, S
1" E366 Low-E IG	DUR-K-2-00038-00001	6	—	6	Argon	0.30	0.17	0.39	51	NC, SC, S
1-1/4" Clear Lami, VE1-2M Low-E IG	DUR-K-2-00039-00001	6	6	9	Argon	0.29	0.24	0.43	51	NC, SC, S
1-1/4" Clear Lami, SB60 Low-E IG	DUR-K-2-00040-00001	10	6	6	Air	0.31	0.27	0.42	51	—
1-3/4" VE1-2M, VE1-85 Low-E IG	DUR-K-2-00041-00001	6	6	6	Argon	0.21	0.21	0.37	66	N, NC, SC, S
1-3/4" E366 Low-E IG	DUR-K-2-00042-00001	6	6	6	Argon	0.22	0.16	0.35	65	N, NC, SC, S

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR[®] values are updated to 2016 (Version 6) criteria.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 7 3/8",
unit width minus 7".

Egress:

Minimum unit width: 28"
Minimum unit height: 30"

Egress Based on 20" clear width, 24" clear height, 5.7 sq ft clear opening
At minimum unit width of: 28", height must be at least: 48"
At minimum unit height of: 30", width must be at least: 36"

Check all applicable local codes for emergency egress requirements.

Hardware

Pushbar Operator: Duratherm proprietary pushbar comprised of oxidized bronze alloy components and a solid brass bar, copper plated and oxidized to match bronze. The sill-mounted pushbar operator is designed to be manually operated for the entire length and to hold the sash at intermediate points. Available in one piece or hinged at mid-point.

Finishes: Oil-rubbed Bronze (US10B), Lacquered Red Bronze (US20A), White Bronze (US26D).

Egress: Available as quick-release pin at sash connection.

Roto-Gear Operator: Truth Maxim[®] stainless steel or EntryGard[®] steel roto gear operator with hardened steel drive worm and plastic slider for smooth operation. Cover and crank handle in high pressure die-cast zinc.

Finishes: Oil-rubbed Bronze (US10B), Satin Nickel (US15).

Egress: Available as quick-release lever at sash connection.

Sash Locks: Oxidized bronze alloy latches ensure positive, uniform locking action.

Finishes: Oil-rubbed Bronze (US10B), Lacquered Red Bronze (US20A), White Bronze (US26D).

Hinges: Heavy duty extension hinges, solid brass or zinc chromate coated steel. Hinges are designed to help the operator hold the sash in open positions, and to permit ready removal and replacement of the sash. Truth heavy duty 4-bar stainless steel hinges are available for appropriate-sized units. Solid brass 4" five-knuckle flush ball-bearing butt hinges available for egress units.

Optional Hardware

Custodial locks, sash restrictors, electric or manual remote operators, adjustable friction stays.

Insect Screens

1" x 1/4" tubular extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum. Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72". Wood-framed screens are available.

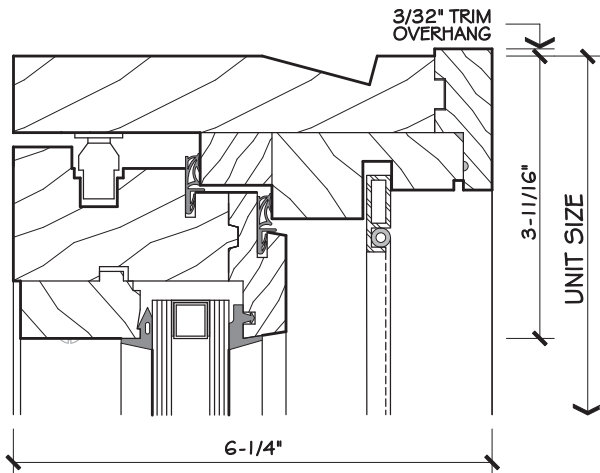
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1 3/4" security glass. Refer to the Glass and Glazing Guide.

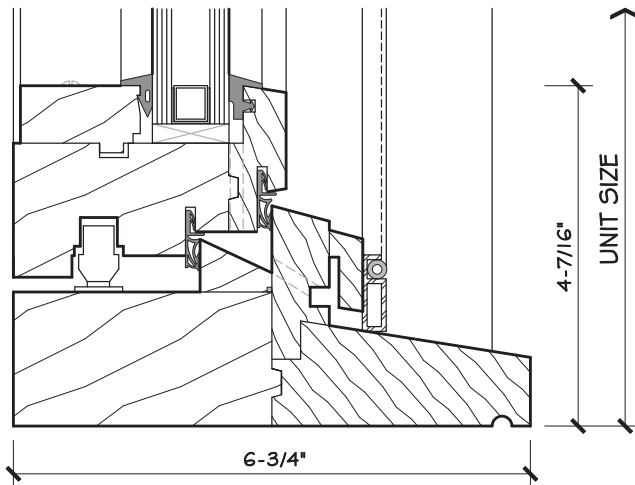
Weather-Stripping

Continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Engaging the sash locks compresses the weather-strip to ensure a tight seal.

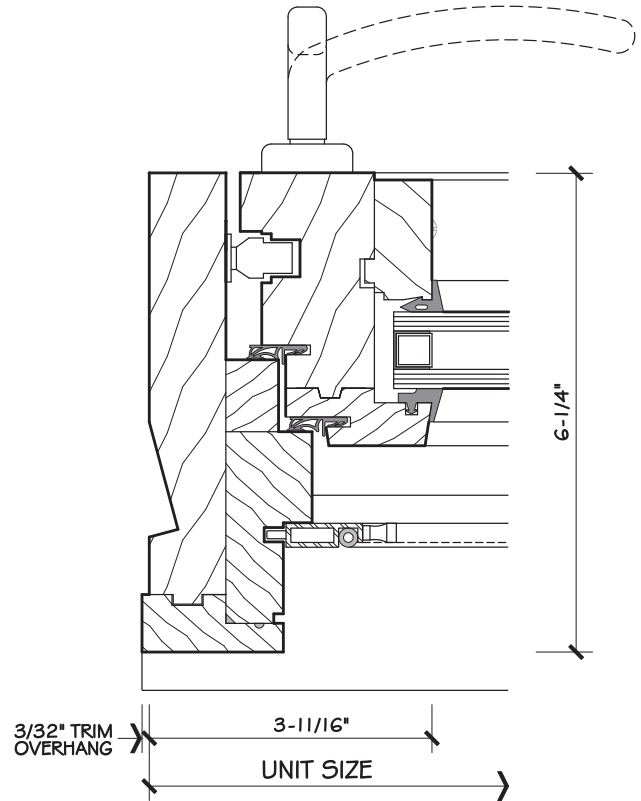
In-Swing Casement



Head



Sill



Jamb

Standard frame depth: 6-1/4"

Minimum frame depth: 4-3/4"

Maximum frame depth: 10"

Contact factory for frame depths less than 6-1/4"

Not to scale. All dimensions are approximate.



In-Swing Casement

Air, Water, & Structural Performance

Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
CW - PG55 - DAW	8 psf	0.01 psf	+/- 82.5 psf	NA

Maximum performance for single unit when glazed with the appropriate glass thickness.

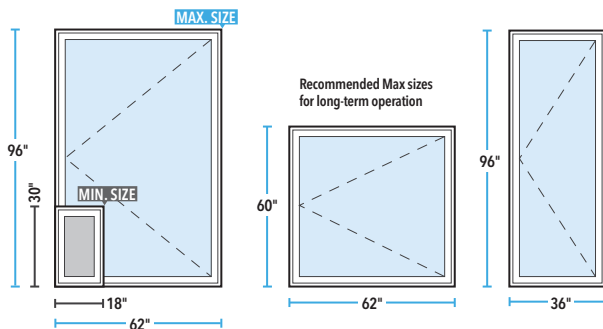
Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 48" x 72", Unit size cannot exceed these dimensions.

Thermal Performance Whole Unit

Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star [®] Capable
		Ext	Mid	Int						
1" CS63 Low-E IG	DUR-K-5-00001-00001	6		6	Argon	0.28	0.4	0.56	52	N, NC
1" ENADV Low-E IG	DUR-K-5-00002-00001	6		6	Argon	0.3	0.49	0.52	50	N
1" ENADV Low-E IG	DUR-K-5-00003-00001	6		6	Air	0.33	0.48	0.52	48	
1" Solar-E Low-E IG	DUR-K-5-00004-00001	6		6	Argon	0.3	0.46	0.38	50	N
1" SB70 Low-E IG	DUR-K-5-00005-00001	6		6	Argon	0.27	0.2	0.46	53	N, NC, SC, S
1" SB60 Low-E IG	DUR-K-5-00006-00001	6		6	Argon	0.27	0.28	0.51	53	N, NC
1" SB60 Low-E IG	DUR-K-5-00007-00001	6		6	Air	0.3	0.28	0.51	50	NC
1" VE1-2M Low-E IG	DUR-K-5-00008-00001	6		6	Argon	0.27	0.27	0.51	52	N, NC
1" VE15-2M Low-E IG	DUR-K-5-00009-00001	6		6	Argon	0.27	0.28	0.52	52	N, NC
1" SB60 Low-E IG	DUR-K-5-00010-00001	6		6	Argon	0.24	0.27	0.49	43	N, NC
1" E366 Low-E IG	DUR-K-5-00011-00001	6		6	Argon	0.27	0.2	0.45	53	N, NC, SC, S
1-1/4" Clear Lami, VE1-2M Low-E IG	DUR-K-5-00012-00001	6	6	9	Argon	0.27	0.27	0.5	52	N, NC
1-1/4" Clear Lami, SB60 Low-E IG	DUR-K-5-00013-00001	10	6	6	Air	0.29	0.31	0.49	53	NC
1-3/4" VE1-2M, VE1-85 Low-E IG	DUR-K-5-00014-00001	6	6	6	Argon	0.18	0.24	0.43	70	N, NC, SC, S
1-3/4" E366 Low-E IG	DUR-K-5-00015-00001	6	6	6	Argon	0.2	0.18	0.41	68	N, NC, SC, S

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR[®] values are updated to 2016 (Version 6) criteria.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 7-5/8",
unit width minus 6-7/8".

Egress:

Minimum unit width: 28"
Minimum unit height: 30"

Egress Based on 20" clear width, 24" clear height, 5.7 sq ft clear opening

At minimum unit width of: 28", height must be at least: 48"

At minimum unit height of: 30", width must be at least: 40"

Check all applicable local codes for emergency egress requirements.

Hardware

Operator: Multi-latchpoint fully-concealed locking hardware controlled by single lever handle control. Horizontal and vertical perimeter locking points ensure weather-tight performance and security. An adjustable friction stay holds window in any open position from 0° to 90°.

Egress: Available as quick-release pin at sash connection.

Lever Handle: Operating hardware accepts any lever handle with 43mm attachment spacing and 7mm sq. spindle. A wide variety of styles and finishes are available from various manufacturers.

Optional Hardware

Custodial locks, sash restrictors, removable operating handle.

Insect Screens

1" x 1/4" tubular extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum. Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72". Wood-framed screens are available.

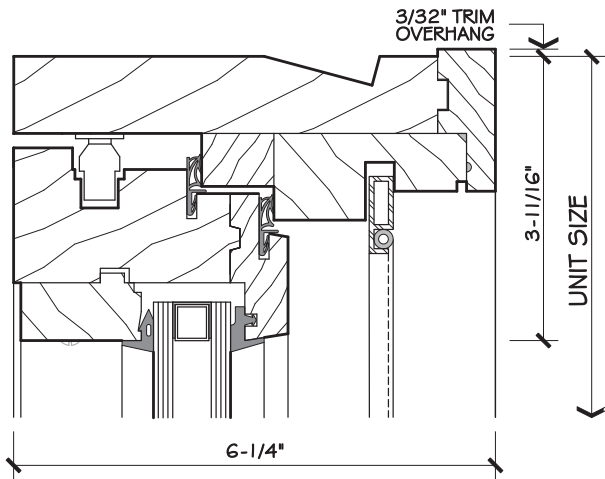
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1 3/4" security glass. Refer to the Glass and Glazing Guide.

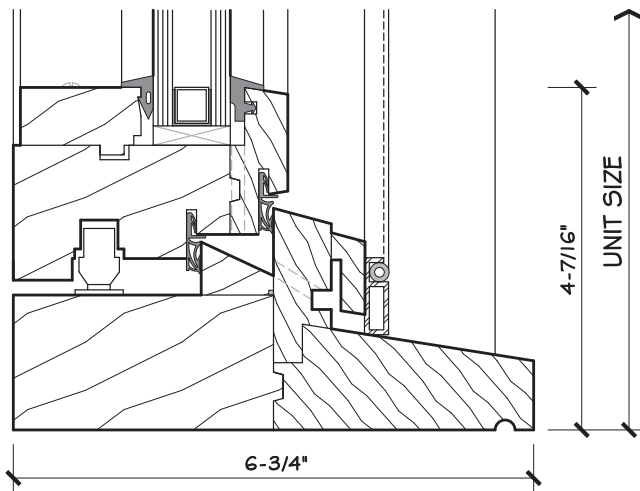
Weather-Stripping

Double continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Engaging the multilatchpoint espagnolettes compresses the weather-strip to ensure a tight seal.

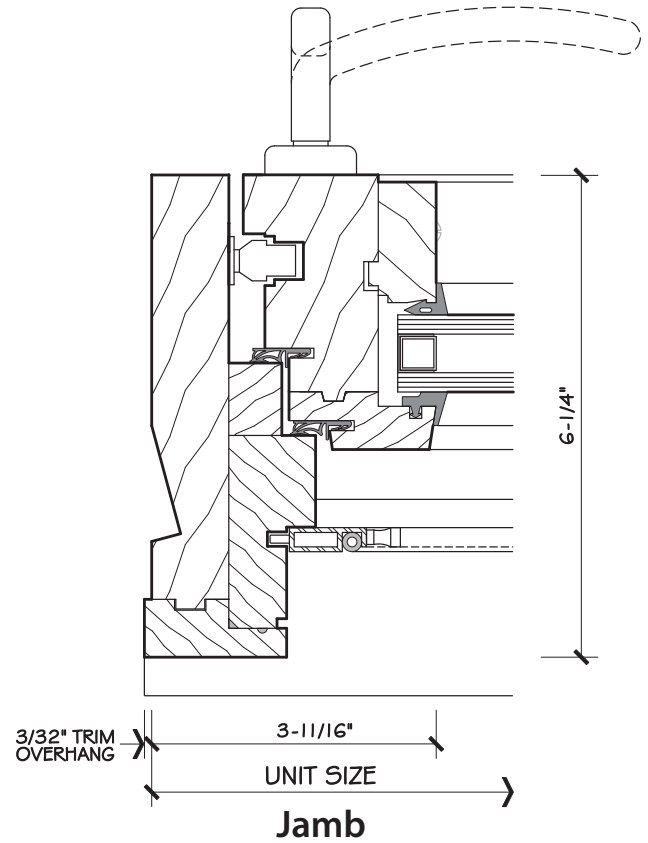
Tilt-Turn



Head



Sill



Jamb

Standard frame depth: 6-1/4"

Minimum frame depth: 4-3/4"

Maximum frame depth: 10"

Contact factory for frame depths less than 6-1/4"

Not to scale. All dimensions are approximate.



Tilt-Turn

Air, Water, & Structural Performance

Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
CW - PG55 - DAW	8 psf	0.01 psf	+/- 82.5 psf	NA

Maximum performance for single unit when glazed with the appropriate glass thickness.

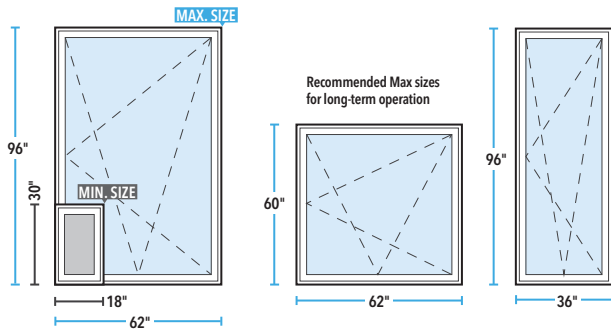
Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 48" x 72", Unit size cannot exceed these dimensions.

Thermal Performance Whole Unit

Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star [®] Capable
		Ext	Mid	Int						
1" CS63 Low-E IG	DUR-K-5-00001-00001	6		6	Argon	0.28	0.4	0.56	52	N, NC
1" ENADV Low-E IG	DUR-K-5-00002-00001	6		6	Argon	0.3	0.49	0.52	50	N
1" ENADV Low-E IG	DUR-K-5-00003-00001	6		6	Air	0.33	0.48	0.52	48	
1" Solar-E Low-E IG	DUR-K-5-00004-00001	6		6	Argon	0.3	0.46	0.38	50	N
1" SB70 Low-E IG	DUR-K-5-00005-00001	6		6	Argon	0.27	0.2	0.46	53	N, NC, SC, S
1" SB60 Low-E IG	DUR-K-5-00006-00001	6		6	Argon	0.27	0.28	0.51	53	N, NC
1" SB60 Low-E IG	DUR-K-5-00007-00001	6		6	Air	0.3	0.28	0.51	50	NC
1" VE1-2M Low-E IG	DUR-K-5-00008-00001	6		6	Argon	0.27	0.27	0.51	52	N, NC
1" VE15-2M Low-E IG	DUR-K-5-00009-00001	6		6	Argon	0.27	0.28	0.52	52	N, NC
1" SB60 Low-E IG	DUR-K-5-00010-00001	6		6	Argon	0.24	0.27	0.49	43	N, NC
1" E366 Low-E IG	DUR-K-5-00011-00001	6		6	Argon	0.27	0.2	0.45	53	N, NC, SC, S
1-1/4" Clear Lami, VE1-2M Low-E IG	DUR-K-5-00012-00001	6	6	9	Argon	0.27	0.27	0.5	52	N, NC
1-1/4" Clear Lami, SB60 Low-E IG	DUR-K-5-00013-00001	10	6	6	Air	0.29	0.31	0.49	53	NC
1-3/4" VE1-2M, VE1-85 Low-E IG	DUR-K-5-00014-00001	6	6	6	Argon	0.18	0.24	0.43	70	N, NC, SC, S
1-3/4" E366 Low-E IG	DUR-K-5-00015-00001	6	6	6	Argon	0.2	0.18	0.41	68	N, NC, SC, S

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR[®] values are updated to 2016 (Version 6) criteria.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 7-3/4",
unit width minus 6-3/4".

Egress:

Minimum unit width: 28"
Minimum unit height: 30"

Egress Based on 20" clear width, 24" clear height, 5.7 sq ft clear opening
At minimum unit width of: 28", height must be at least: 48"
At minimum unit height of: 30", width must be at least: 40"

Check all applicable local codes for emergency egress requirements.

Hardware

Operator: Multi-latchpoint fully-concealed locking hardware controlled by single lever handle control. Horizontal and vertical perimeter locking points ensure weather-tight performance and security. In the tilt mode, an adjustable friction stay holds window in any open position from 0° to 90°. In the tilt mode, the sash projects in at head approximately 10° to provide controlled ventilation without compromising security.

Egress: Available as quick-release pin at sash connection.

Lever Handle: Operating hardware accepts any lever handle with 43mm attachment spacing and 7mm sq. spindle. A wide variety of styles and finishes are available from various manufacturers.

Optional Hardware

Custodial locks, sash restrictors, removable operating handle.

Insect Screens

1" x 1/4" tubular extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum. Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72". Wood-framed screens are available.

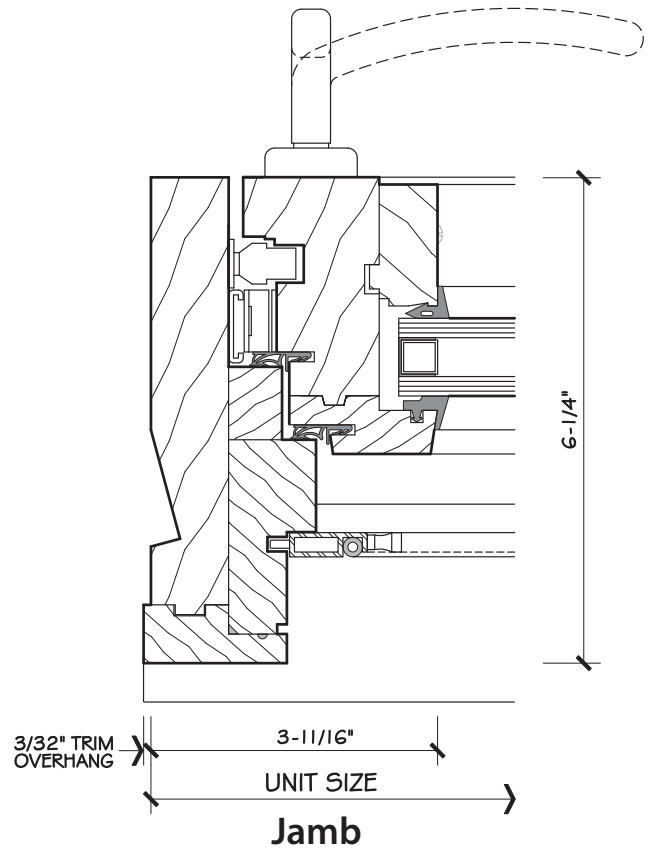
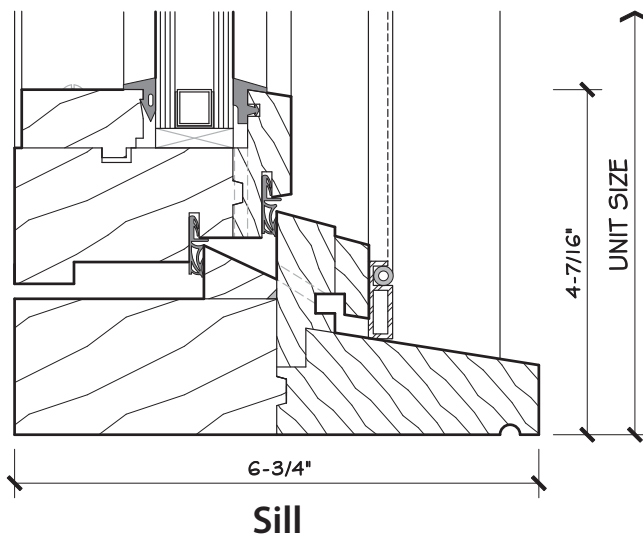
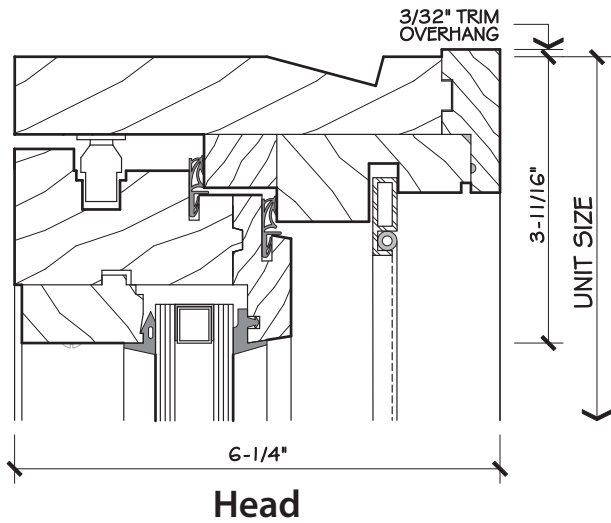
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1-3/4" security glass. Refer to the Glass and Glazing Guide.

Weather-Stripping

Double continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Engaging the multilatchpoint espagnolettes compresses the weather-strip to ensure a tight seal.

Hopper



Standard frame depth: 6-1/4"

Minimum frame depth: 5-1/2"

Maximum frame depth: 10"

Contact factory for frame depths less than 6-1/4"

Not to scale. All dimensions are approximate.



Hopper

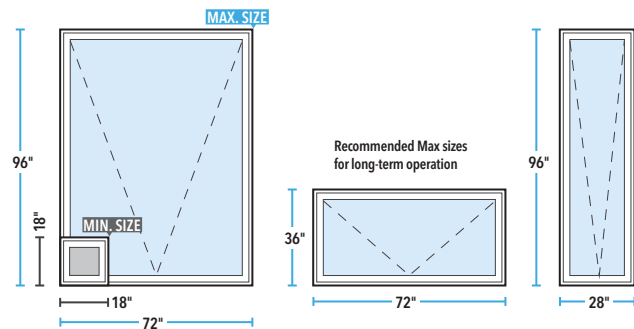
Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	AW - PG60 - AP	12 psf	0.05 psf	+/- 90 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

Thermal Performance Whole Unit	Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star* Capable
			Ext	Mid	Int						
	1" CS63 Low-E IG	DUR-K-6-00001-00001	6		6	Argon	0.29	0.31	0.43	52	NC
	1" ENADV Low-E IG	DUR-K-6-00002-00001	6		6	Argon	0.31	0.38	0.41	50	-
	1" ENADV Low-E IG	DUR-K-6-00003-00001	6		6	Air	0.33	0.38	0.41	48	-
	1" Solar-E Low-E IG	DUR-K-6-00004-00001	6		6	Argon	0.31	0.36	0.3	50	-
	1" SB70 Low-E IG	DUR-K-6-00005-00001	6		6	Argon	0.28	0.16	0.36	52	NC, SC, S
	1" SB60 Low-E IG	DUR-K-6-00006-00001	6		6	Argon	0.28	0.22	0.39	52	NC, SC, S
	1" SB60 Low-E IG	DUR-K-6-00007-00001	6		6	Air	0.31	0.22	0.39	49	S
	1" VE1-2M Low-E IG	DUR-K-6-00008-00001	6		6	Argon	0.28	0.21	0.39	52	NC, SC, S
	1" VE15-2M Low-E IG	DUR-K-6-00009-00001	6		6	Argon	0.28	0.22	0.4	52	NC, SC, S
	1" SB60 Low-E IG	DUR-K-6-00010-00001	6		6	Argon	0.26	0.22	0.39	42	N, NC, SC, S
	1" E366 Low-E IG	DUR-K-6-00011-00001	6		6	Argon	0.28	0.16	0.35	52	NC, SC, S
	1-1/4" Clear Lami, VE1-2M Low-E IG	DUR-K-6-00012-00001	6	6	9	Argon	0.28	0.21	0.39	52	NC, SC, S
	1-1/4" Clear Lami, SB60 Low-E IG	DUR-K-6-00013-00001	10	6	6	Air	0.3	0.24	0.38	52	NC, SC, S
	1-3/4" VE1-2M, VE1-85 Low-E IG	DUR-K-6-00014-00001	6	6	6	Argon	0.2	0.19	0.34	70	N, NC, SC, S
	1-3/4" E366 Low-E IG	DUR-K-6-00015-00001	6	6	6	Argon	0.22	0.14	0.32	69	N, NC, SC, S

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR® values are updated to 2016 (Version 6) criteria.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 7-3/4",
unit width minus 6-3/4".

Egress:

Minimum unit width: 25"
Minimum unit height: 72"

Egress Based on 20" clear width, 24" clear height, 5.7 sq ft clear opening

At minimum unit width of: 25", height must be at least: 72"

At minimum unit height of: 72", width must be at least: 25"

Check all applicable local codes for emergency egress requirements.

Hardware

Operator: Zinc chromate shoot bolt connected to lever handle controls. For tall, narrow units, shoot bolt is rebated into sash stiles (one each stile); short, wide units have shoot bolt rebated into top rail. Turning the lever handle engages the shoot bolts into strike plates at the head or jams depending on configuration.

Egress: Properly-sized units meet egress requirements using standard hardware configuration.

Lever Handle: Operating hardware accepts any lever handle with 43mm attachment spacing and 7mm square spindle. A wide variety of styles and finishes is available from various manufacturers.

Optional Hardware

Custodial locks, sash restrictors, removable handles, remote pole operation.

Insect Screens: 1" x 1/4" tubular extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum.

Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72". Wood-framed screens are available.

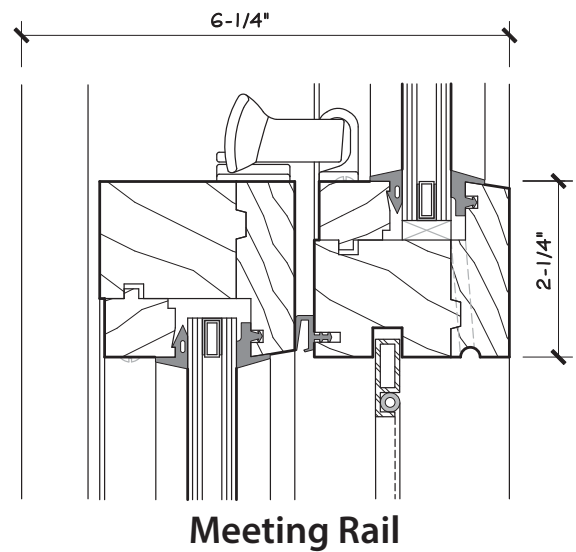
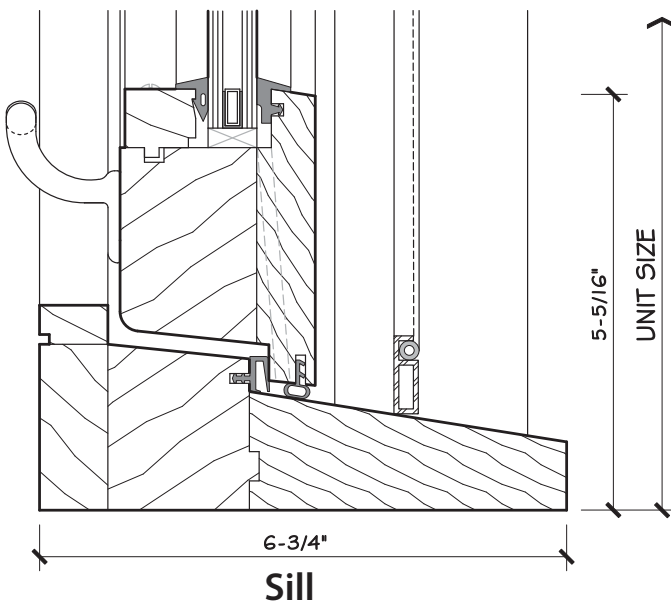
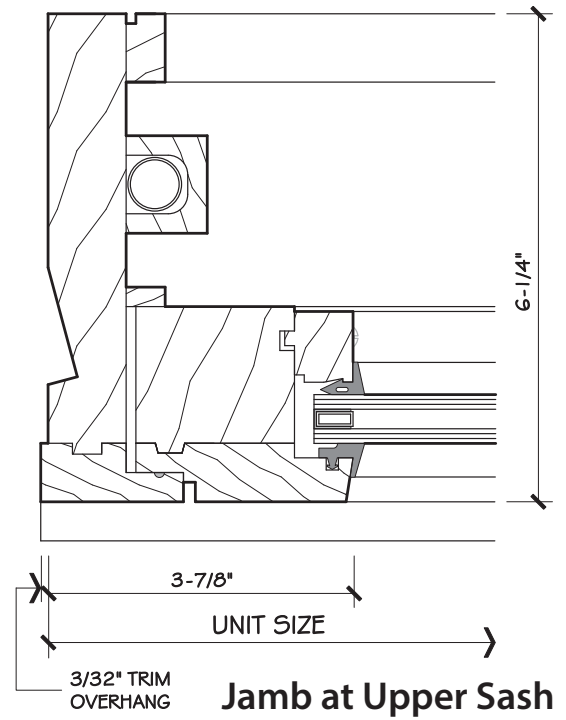
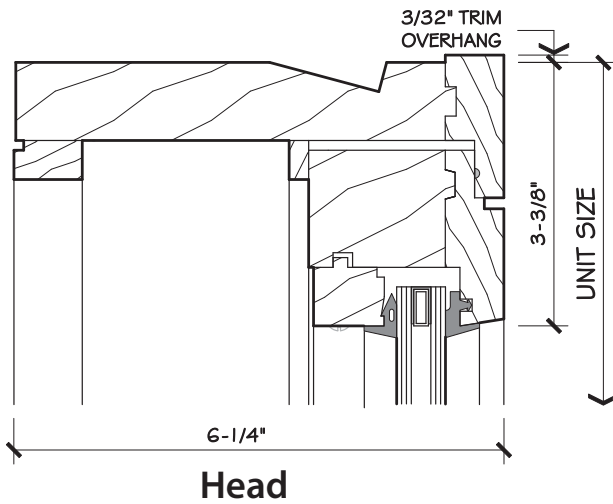
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1 1/4" security glass. Weather-Stripping

Weather-Stripping

Double continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Engaging the lever handle compresses the weather-strip to ensure a tight seal.

Single-Hung



Standard frame depth: 6-1/4"

Minimum frame depth: 6-1/4"

Maximum frame depth: 10"

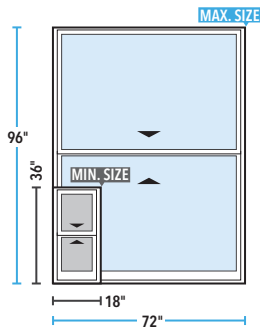
Contact factory for frame depths less than 6-1/4"



Single-Hung

Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	CW - PG60 - H	8 psf	0.02 psf	+/- 90 psf	NA

Maximum performance for single unit when glazed with the appropriate glass thickness.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus $9\frac{1}{4}" \div 2$,
unit width minus $5\frac{3}{4}"$.

Egress:

Minimum unit width: 25"

Minimum unit height: 68"

Egress Based on 20" clear width, 24" clear height, 5.7 sq ft clear opening
At minimum unit width of: 25", height must be at least: 68"
At minimum unit height of: 68", width must be at least: 25"

Check all applicable local codes for emergency egress requirements.

Hardware

Meeting Rail Latch: Oxidized bronze alloy. Located at the center of the meeting rail, the latch's cam action manually draws the sash into a locked position.

Finishes: Oil-rubbed Bronze (US10B), Lacquered Red Bronze (US20A), White Bronze (US26D).

Balances

Standard: Ultralift 88L series 670 heavy duty tube / spring balances, Heavy Duty BSI, or Amesbury Group fully concealed block and tackle balances mortised into the stiles of the operable sash.

Custom: Traditional weight and chain or clock spring balance systems are available on a custom basis. Contact factory for more information

Sash Locks (Included for oversized units.) Oxidized bronze alloy at midpoint of sash stiles. Turning the side latch compresses the weather-strip and locks the sash at each jamb.

Finishes: Oil-rubbed Bronze (US10B), Lacquered Red Bronze (US20A), White Bronze (US26D).

Egress: Properly-sized units meet egress requirements using standard hardware configuration.

Optional Hardware

Custodial locks, sash restrictors.

Insect Screens

1" x $\frac{1}{4}"$ tubular extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum. Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72". Wood-framed screens are available.

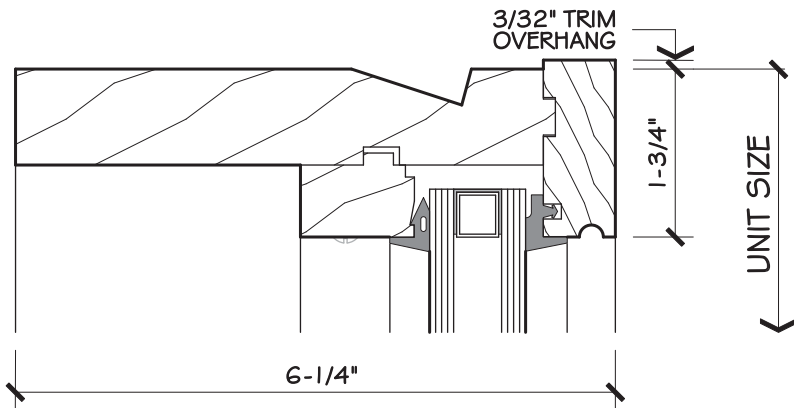
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from $\frac{1}{8}"$ single glazed to a maximum of $1\frac{3}{4}"$ security glass. Refer to the Glass and Glazing Guide

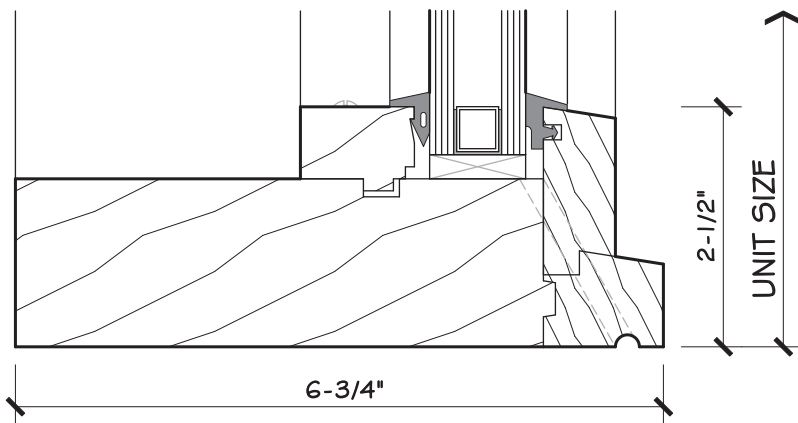
Weather-Stripping

Continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Engaging the sash locks compresses the weather-strip to ensure a tight seal.

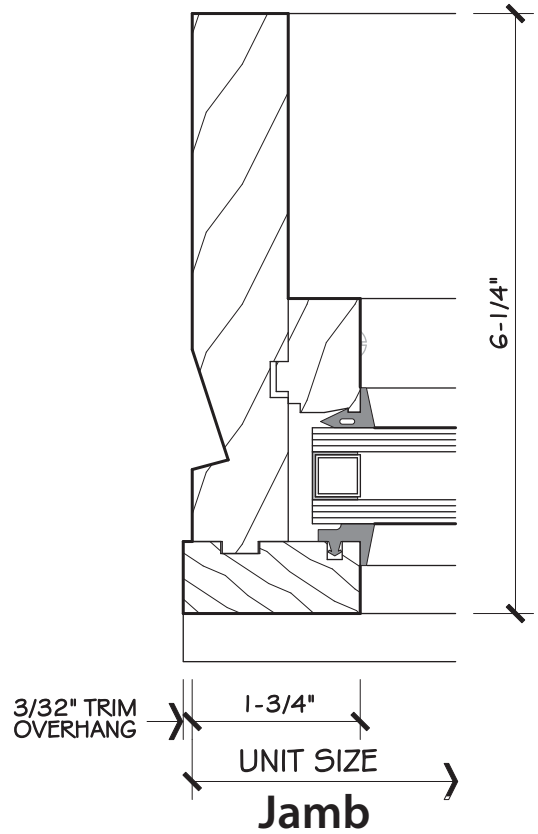
Fixed Frame



Head



Sill



Standard frame depth: 6-1/4"
 Minimum frame depth: 4"
 Maximum frame depth: 10"
 Contact factory for frame depths less than 6-1/4"



Fixed Frame

Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	AW - PG60 - FW	12 psf	0.00 psf	+/- 90 psf	Passed ASTM F588

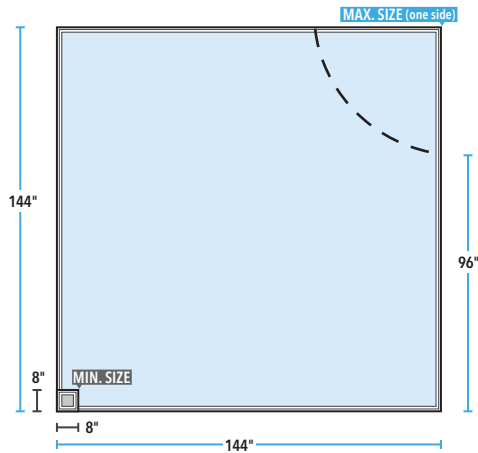
Maximum performance for single unit when glazed with the appropriate glass thickness.

Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 72" x 118", Unit size cannot exceed these dimensions.

Thermal Performance Whole Unit	Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star [®] Capable
			Ext	Mid	Int						
	1" CS63 Low-E IG	DUR-K-3-00058-00001	6		6	Argon	0.28	0.47	0.66	52	N
	1" ENADV Low-E IG	DUR-K-3-00059-00001	6		6	Argon	0.31	0.57	0.62	51	—
	1" ENADV Low-E IG	DUR-K-3-00060-00001	6		6	Air	0.35	0.57	0.62	48	—
	1" Solar-E Low-E IG	DUR-K-3-00061-00001	6		6	Argon	0.32	0.54	0.45	50	—
	1" SB70 Low-E IG	DUR-K-3-00062-00001	6		6	Argon	0.27	0.23	0.54	53	N, NC, SC, S
	1" SB60 Low-E IG	DUR-K-3-00063-00001	6		6	Argon	0.28	0.33	0.6	53	N, NC
	1" SB60 Low-E IG	DUR-K-3-00064-00001	6		6	Air	0.31	0.33	0.6	50	—
	1" VE1-2M Low-E IG	DUR-K-3-00065-00001	6		6	Argon	0.28	0.32	0.6	53	N, NC
	1" VE15-2M Low-E IG	DUR-K-3-00066-00001	6		6	Argon	0.28	0.33	0.61	53	N, NC
	1" SB60 Low-E IG	DUR-K-3-00067-00001	6		6	Argon	0.24	0.32	0.58	43	N, NC
	1" E366 Low-E IG	DUR-K-3-00068-00001	6		6	Argon	0.27	0.23	0.53	53	N, NC, SC, S
	1-1/4" Clear Lami, VE1-2M Low-E IG	DUR-K-3-00069-00001	6	6	9	Argon	0.27	0.32	0.59	52	N, NC
	1-1/4" Clear Lami, SB60 Low-E IG	DUR-K-3-00070-00001	10	6	6	Air	0.30	0.36	0.57	52	NC
	1-3/4" VE1-2M, VE1-85 Low-E IG	DUR-K-3-00071-00001	6	6	6	Argon	0.17	0.28	0.51	69	N, NC
	1-3/4" E366 Low-E IG	DUR-K-3-00072-00001	6	6	6	Argon	0.20	0.21	0.48	68	N, NC, SC, S

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR[®] values are updated to 2016 (Version 6) criteria.



Typical size Maximum 70 sq. ft. with one side at 96" or less.

Larger sizes available using specialized glazing,

The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

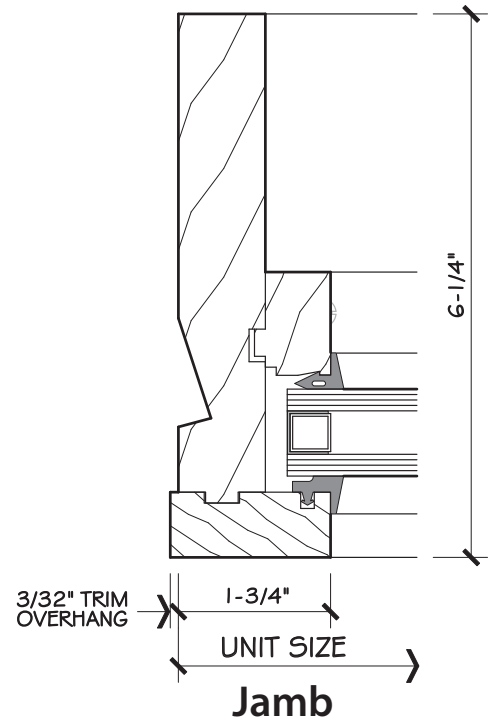
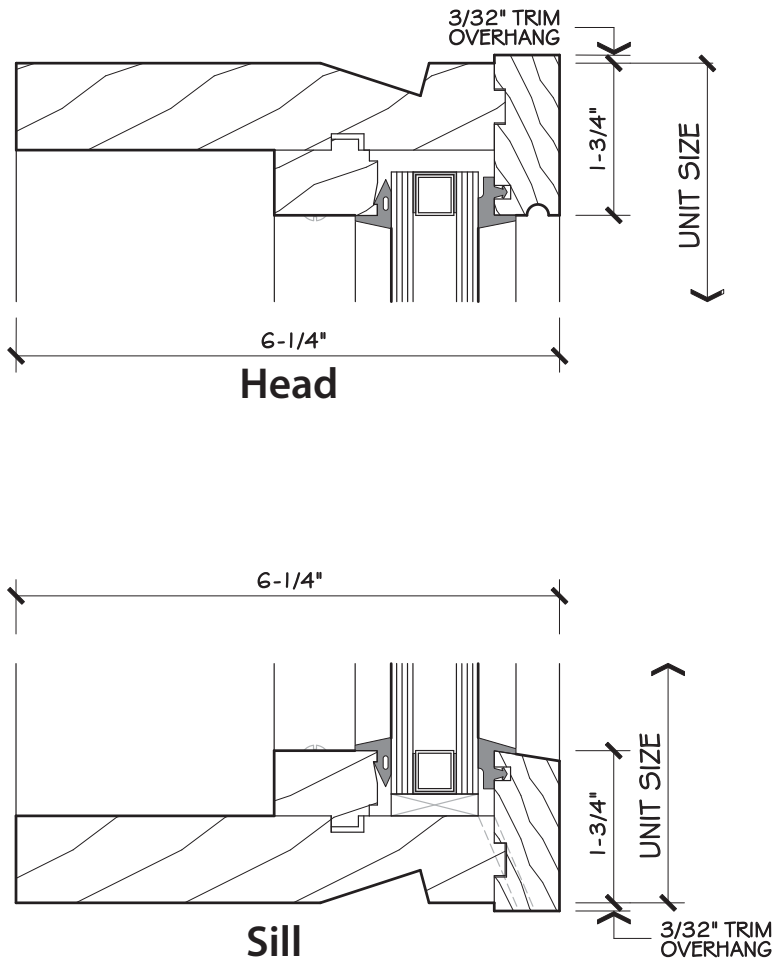
Unit height minus 4-1/4",

unit width minus 3-1/2"

Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1 3/4" security glass. Refer to the Glass and Glazing Guide

Storefront



Standard frame depth: 6-1/4"
 Minimum frame depth: 4"
 Maximum frame depth: 10"
 Contact factory for frame depths less than 6-1/4"



Storefront

Air, Water, & Structural Performance

Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
AW - PG60 - FW	12 psf	0.00 psf	+/- 90 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

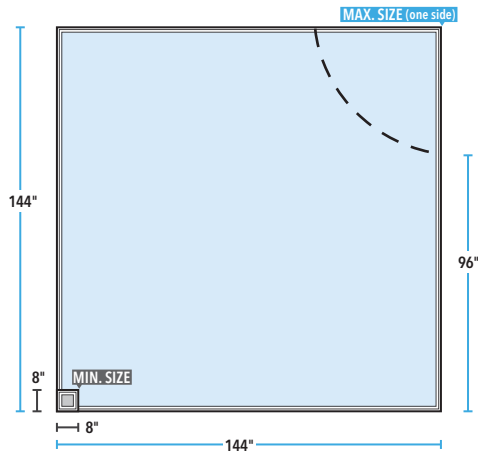
Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 72" x 118", Unit size cannot exceed these dimensions.

Thermal Performance Whole Unit

Type of Glazing	CPD #	Glass Thickness			Gap Fill	U-Factor	SHGC	VLT %	CR	Energy Star* Capable
		Ext	Mid	Int						
1" CS63 Low-E IG	DUR-K-3-00073-00001	6		6	Argon	0.29	0.48	0.67	52	N
1" ENADV Low-E IG	DUR-K-3-00074-00001	6		6	Argon	0.32	0.58	0.63	50	—
1" ENADV Low-E IG	DUR-K-3-00075-00001	6		6	Air	0.35	0.58	0.63	48	—
1" Solar-E Low-E IG	DUR-K-3-00076-00001	6		6	Argon	0.32	0.55	0.46	50	—
1" SB70 Low-E IG	DUR-K-3-00077-00001	6		6	Argon	0.27	0.24	0.55	53	N, NC, SC, S
1" SB60 Low-E IG	DUR-K-3-00078-00001	6		6	Argon	0.28	0.33	0.61	53	N, NC
1" SB60 Low-E IG	DUR-K-3-00079-00001	6		6	Air	0.32	0.34	0.61	50	—
1" VE1-2M Low-E IG	DUR-K-3-00080-00001	6		6	Argon	0.28	0.32	0.61	52	N, NC
1" VE15-2M Low-E IG	DUR-K-3-00081-00001	6		6	Argon	0.28	0.33	0.62	52	N, NC
1" SB60 Low-E IG	DUR-K-3-00082-00001	6		6	Argon	0.24	0.33	0.59	43	N, NC

R-Value = 1/U-Factor; SHGC = Solar Heat Gain Coefficient; VLT % = Visible Light Transmission; CR = Condensation Resistance

Glazing performance values are calculated using NFRC 100, NFRC 200 and NFRC 500. Thermal performance of other wood species may vary. ENERGY STAR® values are updated to 2016 (Version 6) criteria.



Typical size Maximum 70 sq. ft. with one side at 96" or less.

Larger sizes available using specialized glazing,

The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

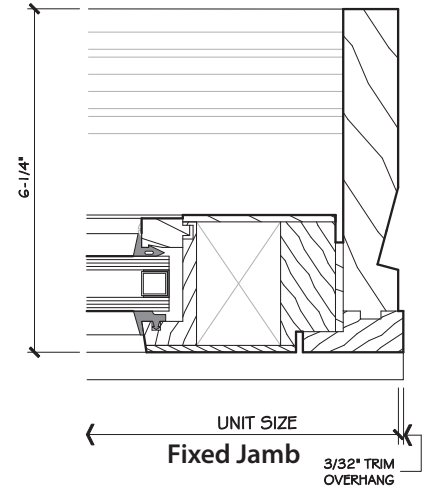
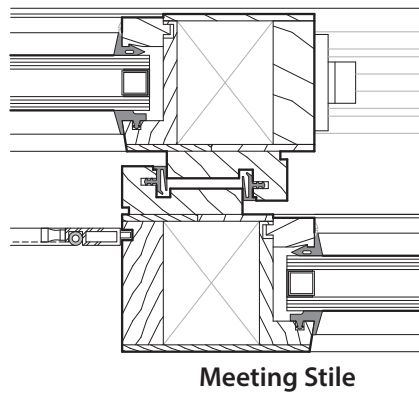
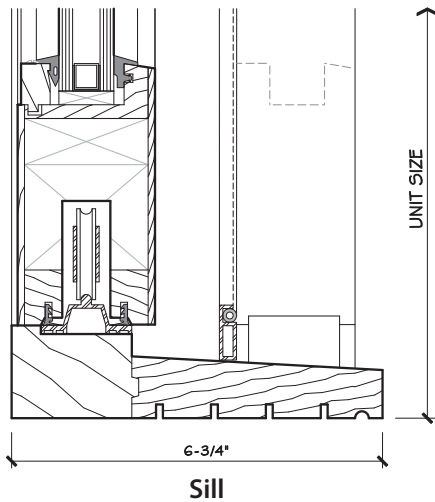
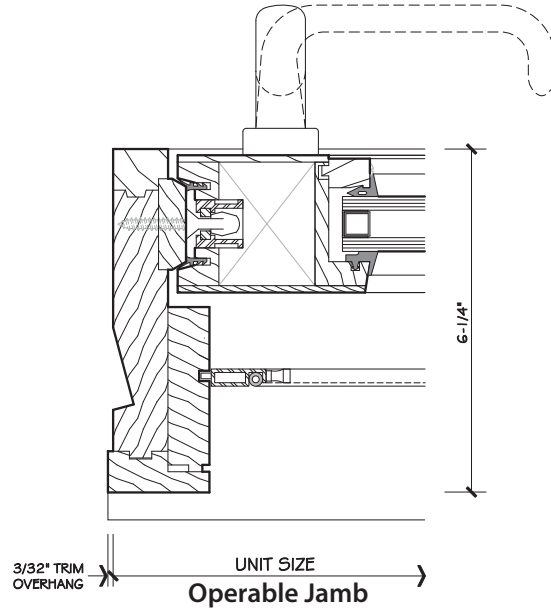
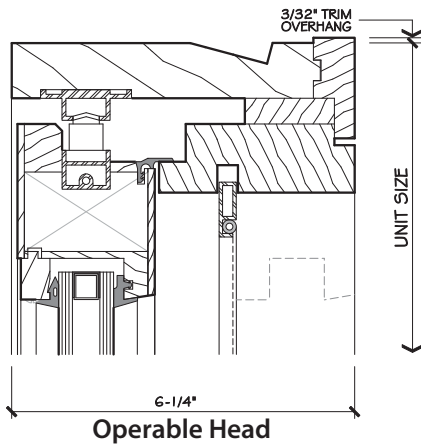
Unit height minus 3-1/2",

unit width minus 3-1/2"

Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1 3/4" security glass. Refer to the Glass and Glazing Guide

Lift-Roll Window



Standard frame depth (OX configuration): 6-1/4"

Minimum frame depth: 6-1/4"

Maximum frame depth: 10"

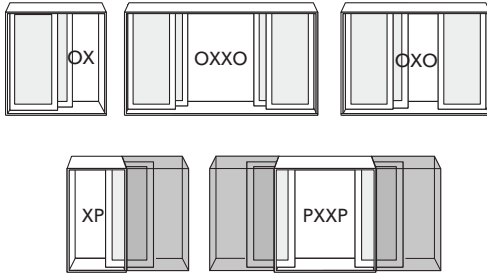


Lift-Roll Window

Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	–	–	–	–	–

Maximum performance for single unit when glazed with the appropriate glass thickness.

Standard Configurations



WIDTH:

Minimum: 36" for OX configuration.
Maximum varies per configuration.

HEIGHT: Minimum: 36"
Maximum: 66"

The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 10-1/4",
unit width varies by configuration, contact factory for details

Egress:

Minimum unit width: 50"
Minimum unit height: 36"

Egress Based on OX configuration with equal sashes, 20" clear width, 24" clear height, 5.7 sq ft clear opening
At minimum unit width of: 50", height must be at least: 56"
At minimum unit height of: 36", width must be at least: 61"

Check all applicable local codes for emergency egress requirements.

Hardware

Operating Assembly: Window sashes ride on carriages consisting of two sets of twin rollers mortised into the bottom of each moving sash. The sash is raised onto its carriage by rotating the operating lever handle 180°. Lifting gear connected to a tie rod transmits motion to the carriage, lifting sash. Based on G-U 933 or FFI Lift/Roll operating hardware.

Finishes: Internal carriage assembly (drive bars, wheel hub, shafts, rivets), lock kit, link rods, and connectors are zinc chromate coated steel or 304 stainless steel. Lock face and edge stile cover are clear anodized (EV-1) or dark bronze anodized (EV-5) aluminum. External guides and tracks are clear anodized (EV-1) or dark bronze anodized (EV-5) aluminum.

Egress: Properly-sized units meet egress requirements using standard hardware configuration.

Lever Handle

Standard handles are solid brass.

Finishes: Satin Nickel (US15), Polished Brass (US3), Satin Anodized Aluminum (US28).

Optional Hardware

Keyed locks.

Insect Screens: 3/4" x 1/4" tubular extruded frames set in wood frame surround. Extruded frames in anodized bronze, mill finish aluminum or custom color painted aluminum. Mesh of 18 x 16 screen cloth held with vinyl spline, available in charcoal finished aluminum, mill finish aluminum, stainless steel or bright brass. Maximum width of screen mesh is 72".

Standard Configurations:

X = Operable sash, O = Fixed sash, P = Pocket
OX OXXO OXO XP PXXP

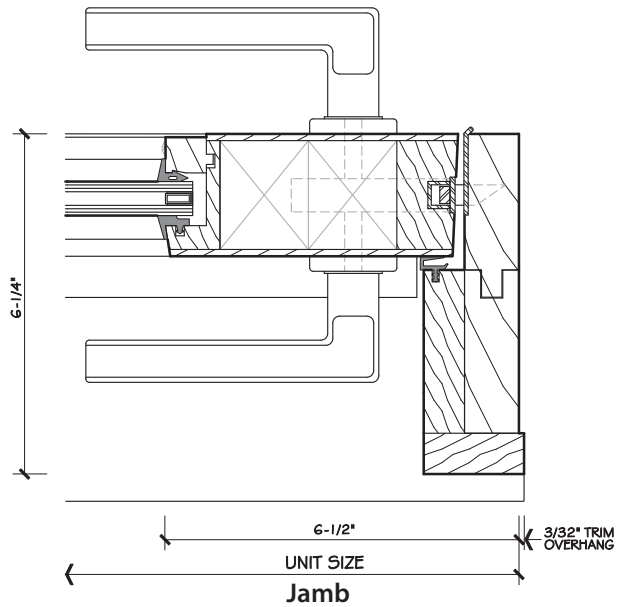
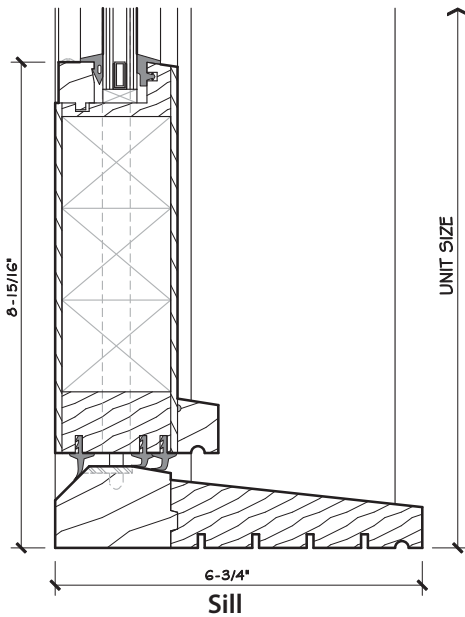
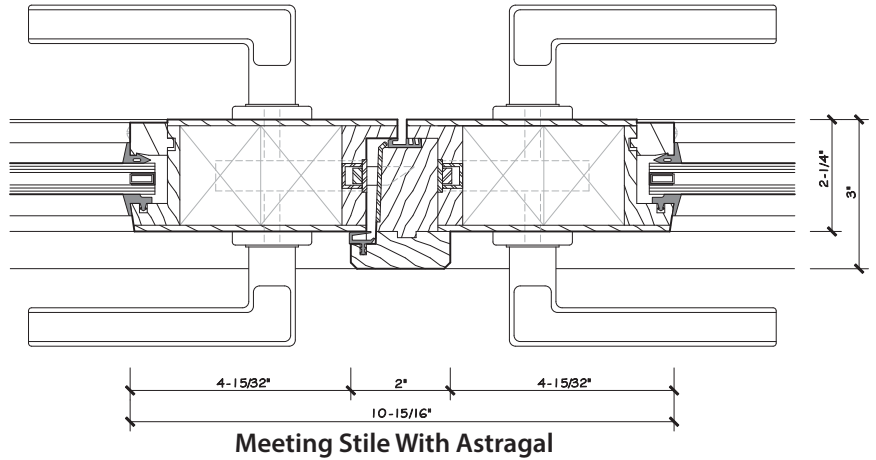
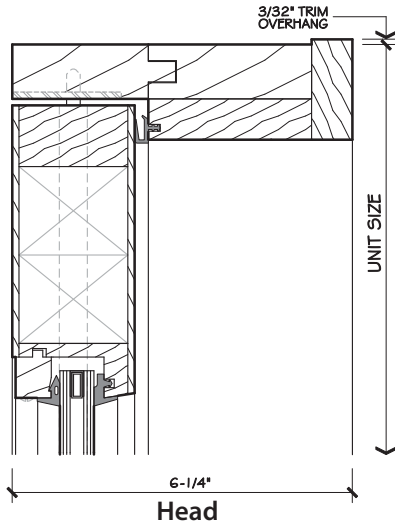
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1" security glass. Refer to the Glass and Glazing Guide

Weather-Stripping

Doubled, continuous extruded silicone flap gasket set in rebate around the perimeter of the sash. Rotating the multilatchpoint lever handle lowers the sash and compresses the weather-strip to ensure a tight seal.

In-Swing Door



Standard frame depth: 6-1/4"
 Minimum frame depth: 4-3/4"
 Maximum frame depth: 10"
 Contact factory for frame depths less than 6-1/4"

Standard primary door leaf thickness: 2-1/4"
 Standard screen door leaf thickness: 1-3/8"
 NOTE: When screen doors are specified, handle clearances must be considered when determining appropriate frame depths.

Shown with standard operating hardware.
 For applications that do not include standard hardware supplied by Duratherm, we can premachine for hardware provided by others.

Not to scale. All dimensions are approximate.

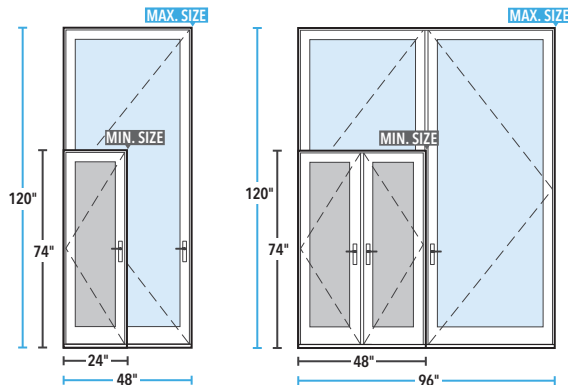


In-Swing Door

Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	AW - PG40 - SHD	8 psf	0.02 psf	+/- 60 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 48" x 102", Unit size cannot exceed these dimensions.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 15-1/2",
unit width minus 12".

ADA Compliance:

Minimum unit width: 35-1/2"

Compliance Based on 180° door swing, clear opening size based on 32" clear width requirement.

Standard wood threshold may not meet ADA maximum height requirements. Doors that are not able to open a full 180° may need to increase in width. Consult factory with specific clearance questions

Check all applicable local codes for access requirements.

Standard Hardware (residential applications only)

Primary Door Lockset: Heavy duty mortise construction. Half-turn lever controls hook bolts, dead bolt, and latch. Hook bolt assembly fully mortised into rail to provide 3- or 4-point latching at frame and adjacent door/frame. Locking mechanism incorporates a standard US cylinder. Based on G-U Cremona or Tripact door bolt system.

Finishes: Yellow Dichromate or black powder coated steel. Cremona locksets are available in stainless steel.

Screen Door Lockset

Heavy duty mortise construction. Single doors have mortised lockset. Paired screen doors have mortised lockset on active leaf, dummy handle and top & bottom shoot bolts on inactive leaf. Based on G-U Monolock operating hardware.

Finishes: Yellow Dichromate or black powder coated steel. Faceplate available in stainless steel.

Escutcheons / Lever Handles: Escutcheons, roses, and lever handles are available in a variety of styles and configurations from various manufacturers. **Finishes:** A variety of finishes are available from various manufacturers.

Hinges

Solid brass five-knuckle ball-bearing butt hinges, minimum 1½ pair per leaf, in manufacturer's standard finishes.

Primary Door: 4½" x 4½" **Screen Door:** 3½" x 3½"

Commercial Hardware

Most commercial hardware can be incorporated into our door panels, including flush bolts, exit devices (rim, mortise, surface vertical rod and concealed vertical rod), door closers, electric strikes, and others.

NOTE: Some hardware installations may require modifications to door leaf or frame detailing, such as concealed closers and meeting rail weather-strip at concealed vertical rod assemblies. Contact factory for assistance. Hardware must be suitable for our standard 2¼" leaf thickness.

Optional Hardware

Screen doors, astragals, ADA-compliant metal thresholds.

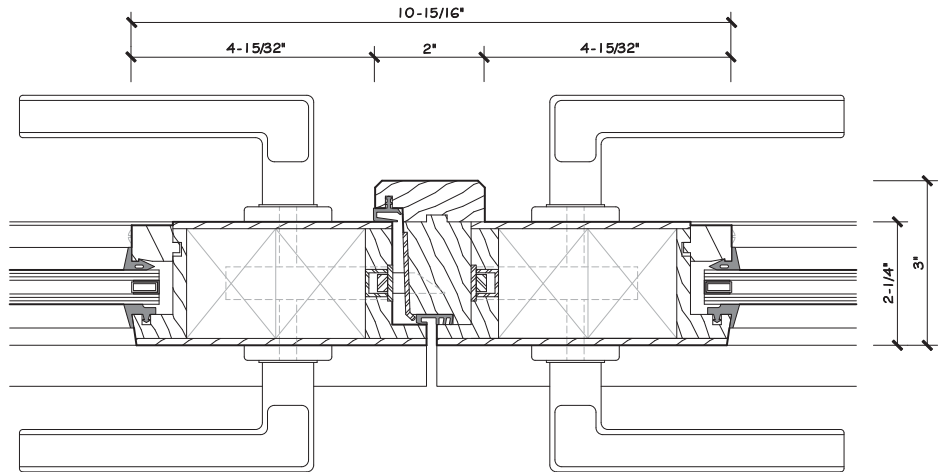
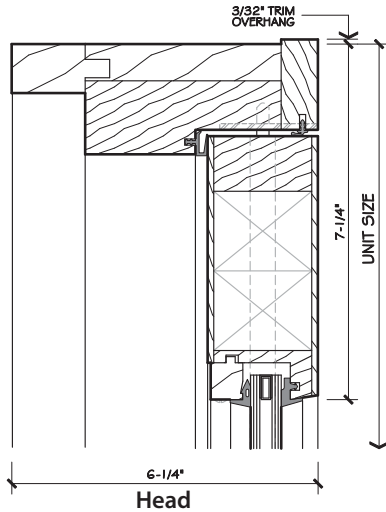
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1" security glass. Refer to the Glass and Glazing Guide.

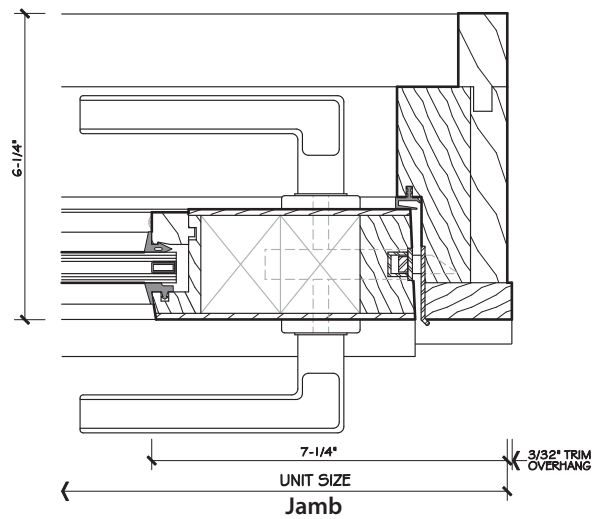
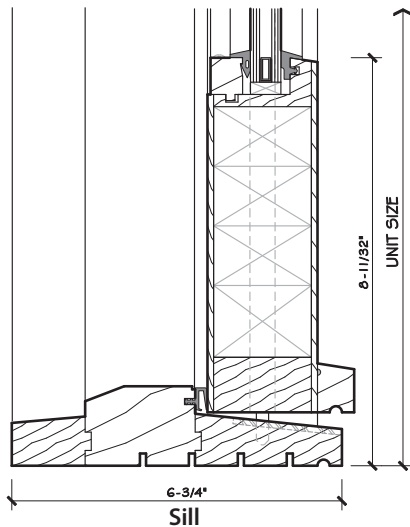
Weather-Stripping

Continuous extruded silicone flap gasket set in rebate in door frame around perimeter of door panel. Engaging the multi-latchpoint espagnolettes (standard hardware) compresses the weather-strip to ensure a tight seal.

Out-Swing Door



Meeting Stile With Astragal



Standard frame depth: 6-1/4"
 Minimum frame depth: 4-3/4"
 Maximum frame depth: 10"
 Contact factory for frame depths less than 6-1/4"

Standard primary door leaf thickness:
 2-1/4"

Shown with standard operating hardware.

For applications that do not include standard hardware supplied by Duratherm, we can premachine for hardware provided by others.

Not to scale. All dimensions are approximate.

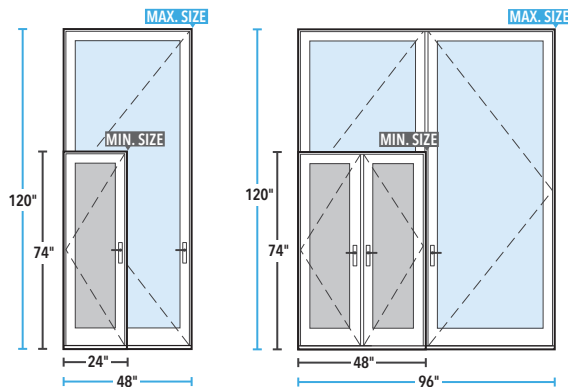


Out-Swing Door

Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	AW - PG40 - SHD	10 psf	0.01 psf	+/- 60 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 48" x 102", Unit size cannot exceed these dimensions.



The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 15-5/8",
unit width minus 14-1/2".

ADA Compliance:

Minimum unit width: 36-1/2"

Compliance Based on 180° door swing, clear opening size based on 32" clear width requirement.

Standard wood threshold may not meet ADA maximum height requirements. Doors that are not able to open a full 180° may need to increase in width. Consult factory with specific clearance questions

Check all applicable local codes for access requirements.

Standard Hardware (residential applications only)

Lockset: Heavy duty mortise construction. Half-turn lever controls hook bolts, dead bolt, and latch. Hook bolt assembly fully mortised into rail to provide 3- or 4-point latching at frame and adjacent door/frame. Locking mechanism incorporates a standard US cylinder. Based on G-U Cremona or Tripact door bolt system.

Finishes: Yellow Dichromate or black powder coated steel. Cremona locksets are available in stainless steel.

Escutcheons / Lever Handles
Escutcheons, roses, and lever handles are available in a variety of styles and configurations from various manufacturers.

Finishes: A variety of finishes are available from various manufacturers.

Hinges: Solid brass 4½" x 4½" five-knuckle ball-bearing butt hinges, minimum 1½ pair per leaf, in manufacturer's standard finishes.

Finishes: A variety of finishes are available from various manufacturers.

Commercial Hardware

Most commercial hardware can be incorporated into our door panels, including flush bolts, exit devices (rim, mortise, surface vertical rod and concealed vertical rod), door closers, electric strikes, and others.

NOTE: Some hardware installations may require modifications to door leaf or frame detailing, such as concealed closers and meeting rail weather-strip at concealed vertical rod assemblies. Contact factory for assistance. Hardware must be suitable for our standard 2¼" leaf thickness.

Optional Hardware

Screen doors, astragals, ADA-compliant metal thresholds.

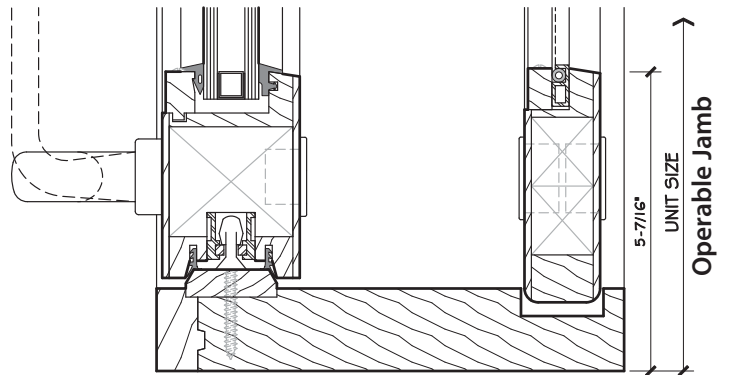
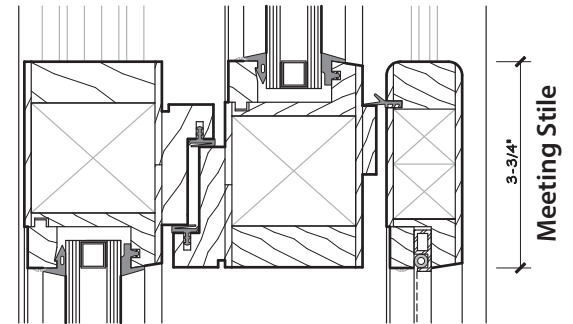
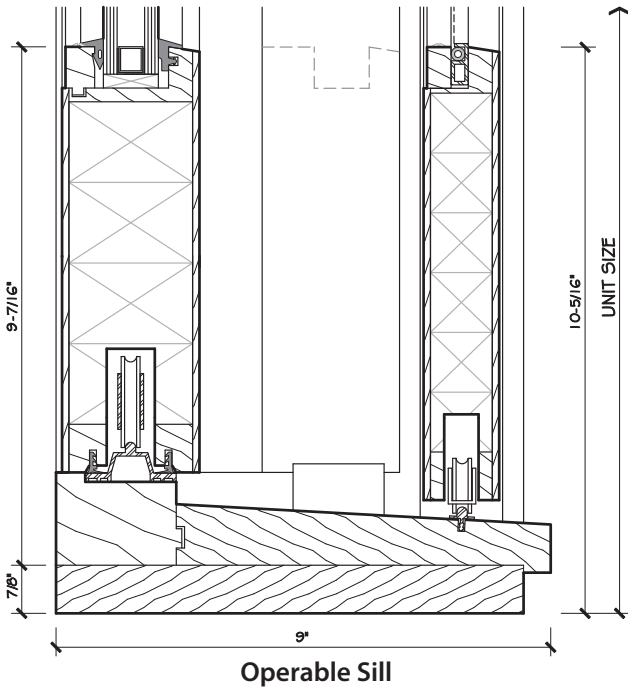
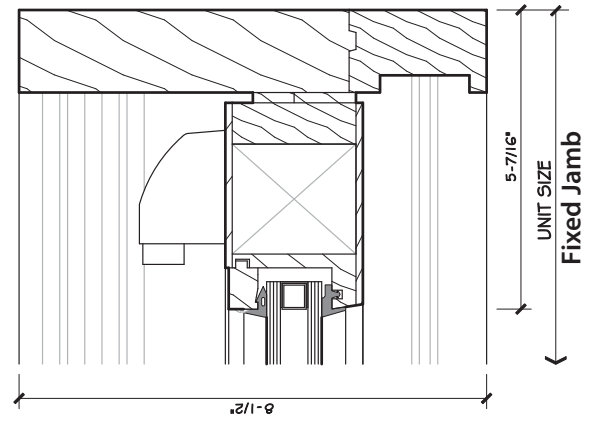
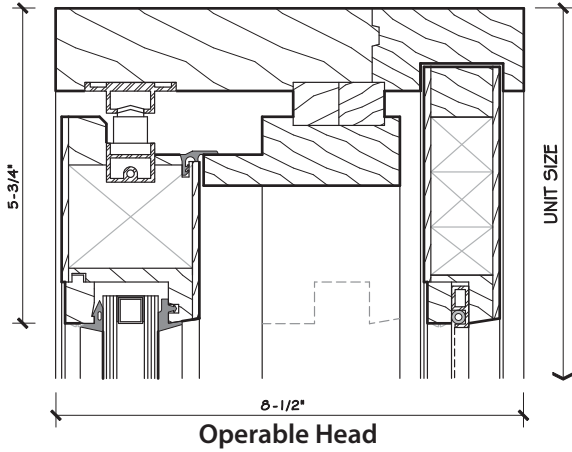
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1" security glass. Refer to the Glass and Glazing Guide.

Weather-Stripping

Continuous extruded silicone flap gasket set in rebate in door frame around perimeter of door panel. Engaging the multi-latchpoint espagnolettes (standard hardware) compresses the weather-strip to ensure a tight seal.

Lift-Roll Door



Standard 'stacking' configuration shown. Not to scale. All dimensions are approximate.



Lift-Roll Door

Air, Water, & Structural Performance	Performance Class & Grade Rating	Water Penetration Resistance	Air Infiltration	Design Pressure	Forced Entry
	AW - PG50 - SD	10 psf	0.08 psf	+/- 60 psf	Passed ASTM F588

Maximum performance for single unit when glazed with the appropriate glass thickness.

Hurricane Impact, Large Missile Impact and Cyclical Air pressure tested to 42 psf, Wind Zone 3, Missile Level D, ASTM E1996-05, ASTM E 1886-05, size tested: 288" x 118", Unit size cannot exceed these dimensions.

The Lift/Roll Door tested was an OXXO configuration 288" wide x 118" high. The certification is applicable to proportionally sized units of different

configurations. For example, the maximum size allowable for an OX configuration would be half the tested width, or 144" wide by 118" high. The maximum size for an OXO configuration would be ¾ the width or 216" x 118".

Standard frame depth: 8-1/2"

(OX configuration with screen door)

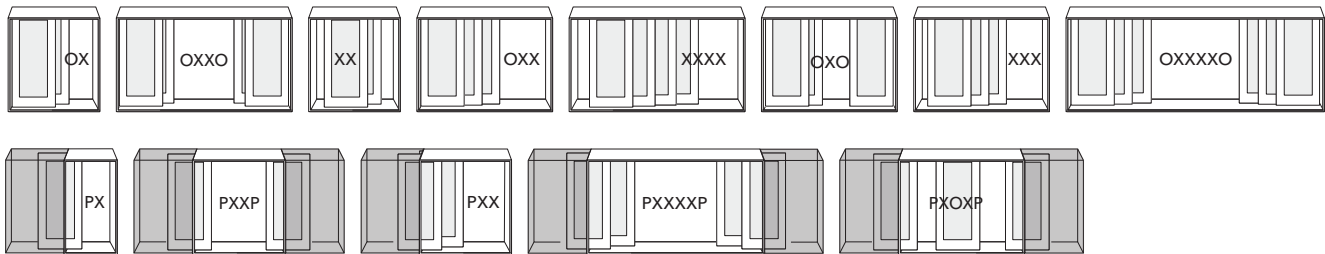
Minimum frame depth: 6-1/4"

(OX configuration without screen door)

Maximum frame depth: varies by configuration

Contact factory for frame depths less than 6-1/4"

Standard Configurations



WIDTH:

Minimum: 48"

for OX or PX configuration.

Maximum varies per configuration

HEIGHT:

Minimum: 74"

Maximum: 120"

The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:

Unit height minus 14-1/8",

ADA Compliance:

Minimum unit width: 70"

(Includes pocket on PX configuration)

Clear-opening sizing assumes a two panel OX or PX configuration with equal sized panels and is based on 32" clear width requirement.

Standard wood threshold may not meet ADA maximum height requirements. Consult factory with specific clearance questions

Check all applicable local codes for access requirements.

Hardware

Operating Assembly: Door panels ride on carriages consisting of two sets of twin rollers mortised into the bottom of each moving panel. The door is raised onto its carriage by rotating the operating lever handle 180°. Lifting gear connected to a tie rod transmits motion to the carriage, lifting door. Based on G-U 933 or FFI Lift/Roll operating hardware.

Finishes: Internal carriage assembly (drive bars, wheel hub, shafts, rivets), lock kit, link rods, and connectors in zinc chromate coated steel or 304 stainless steel. Lock face and edge stile cover are clear anodized (EV-1) or dark bronze anodized (EV-5) aluminum. External guides and tracks are clear anodized (EV-1) or dark bronze anodized (EV-5) aluminum).

Escutcheons / Lever Handles: Escutcheons and lever handles are available in a variety of styles and configurations from various manufacturers. Configurations include levers inside and outside; lever inside, finger pull outside; thumb turn lock inside, profile cylinder outside; profile cylinder inside and outside.

Finishes: A variety of finishes are available from various manufacturers.

Flush Sill / FASTrack Assembly: Flush sill detailing available for pocketing door assemblies. Track system includes stainless steel track blades and solid brass track bridge assemblies. As all flush systems are custom, contact factory for detailing.

Optional Hardware

Screen doors, bronze tracks, aluminum thresholds, removable handles.

Standard Configurations

X = Operable panel, O = Fixed panel, P = Pocket

OX, OXXO, XX, OXX, XXXX, OXO, XXX, OXXXXO
PX, PXXP, PXX, PXXXXP, PXOXP

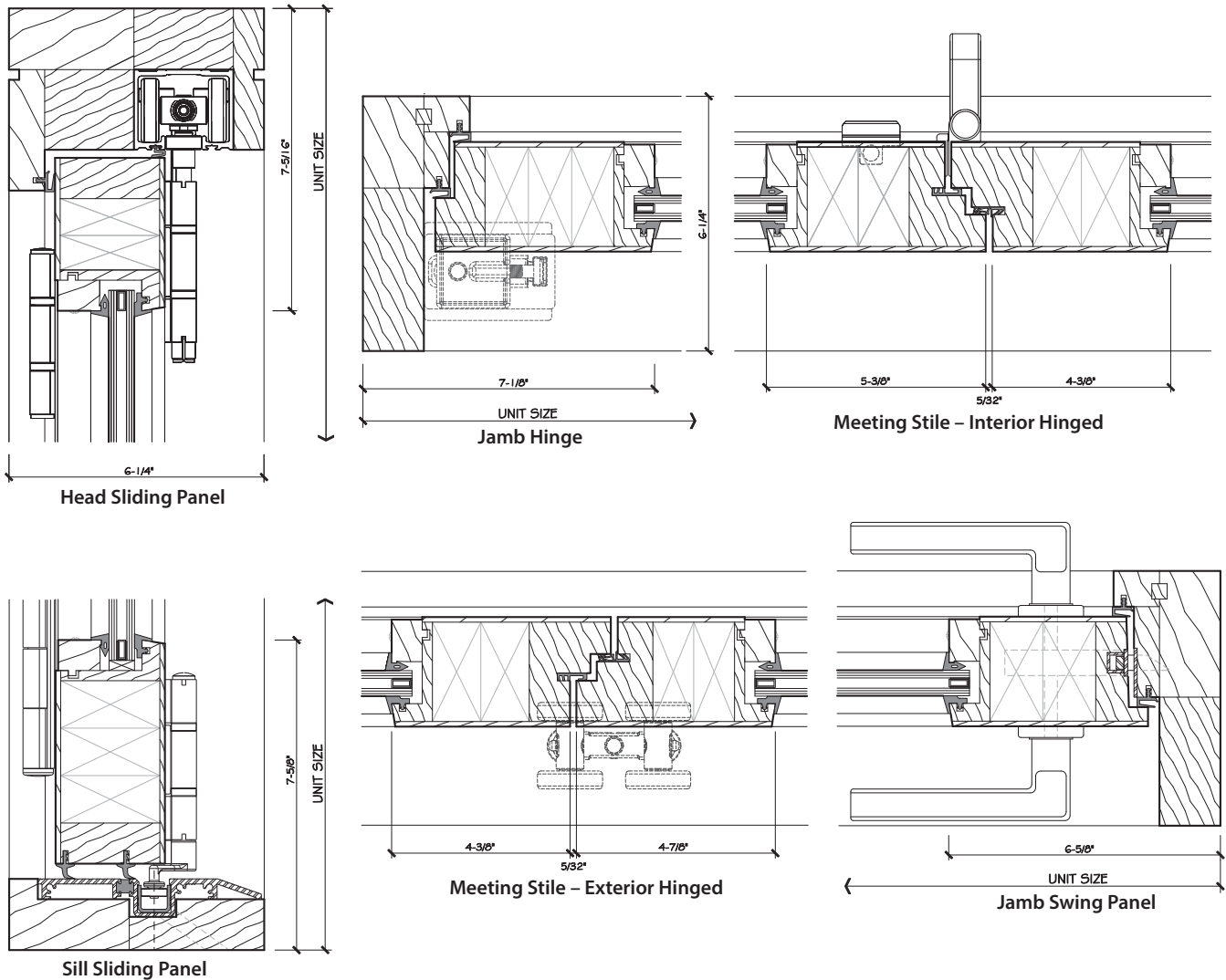
Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1" security glass. Refer to the Glass and Glazing Guide.

Weather-Stripping

Doubled, continuous extruded silicone flap gasket set in rebate around the perimeter of the door leaf. Rotating the multi-latchpoint lever handle lowers the door and compresses the weather-strip to ensure a tight seal.

Slide and Fold Door



Standard frame depth: $6-1/4"$

Minimum frame depth: $5-3/8"$

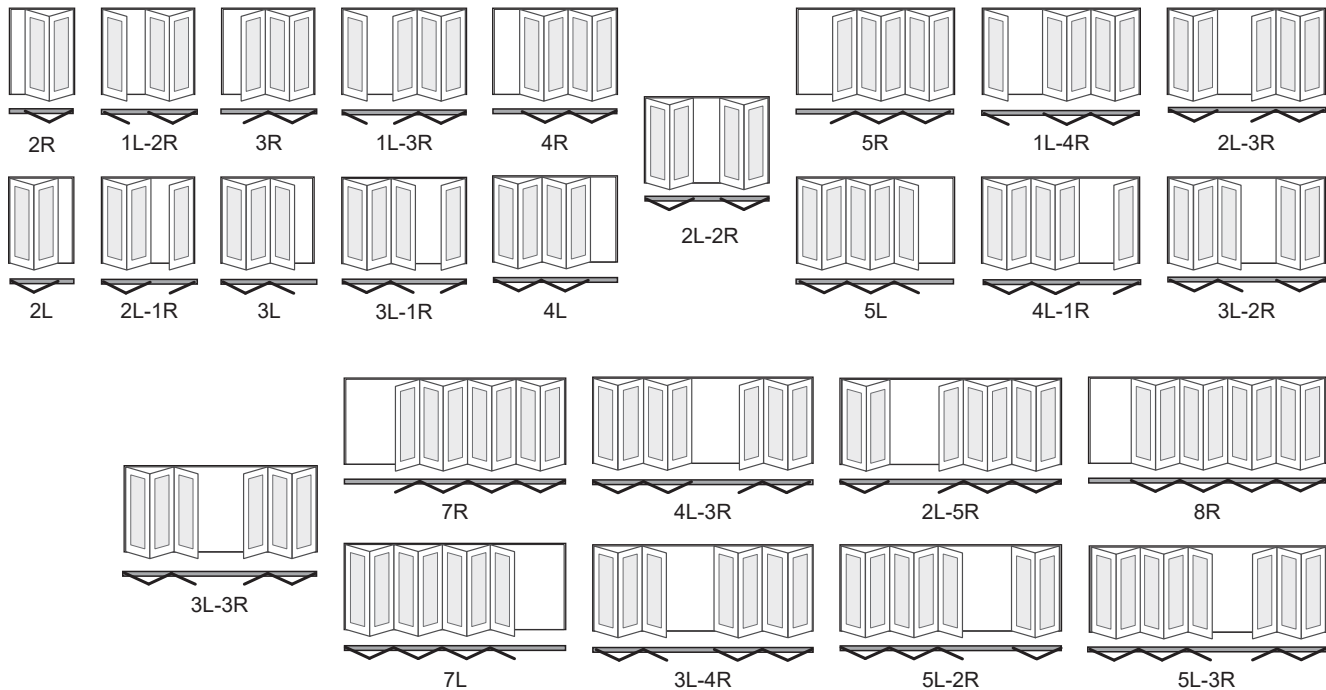
Maximum frame depth: $10"$

Contact factory for frame depths less than $6-1/4"$



Slide and Fold Door

Standard Configurations



WIDTH:
Minimum panel: 16"
Maximum panel: 39"
HEIGHT: Minimum: 34"
Maximum: 118"

The minimums and maximums shown are intended as guidelines. For applications that exceed these ranges, please contact the factory for assistance.

Visible Glass:
Unit height minus 15-5/8"

ADA Compliance:
Minimum unit width: 35-1/2"

Compliance Based on 180" door swing, clear opening size based on 32" clear width requirement.

Standard wood threshold may not meet ADA maximum height requirements. Flush floor channel sill detailing available for ADA compliant installations. Consult factory with specific clearance questions

Check all applicable local codes for access requirements.

Hardware

Operating Assembly: Centor E3 sliding/folding hardware system. Doors are top hung, with carrier assemblies mounted at head of each moving panel. Three-knuckle ball-bearing butt hinges, D ring handle/pulls, top and bottom flush-mount shoot bolts mortised into face of stiles to provide 2-point latching for folding panels. Swing pass door (where applicable) of heavy duty doweled joinery includes GU Eagle multi-latchpoint operating hardware, FSB1035 lever handle and 1410-9005/9006 escutcheons.

Finishes: Centor handles, hinges, carriers, and drop bolts in brushed stainless steel or oil-rubbed bronze powder coat. Head tracks, sills, and floor guide channels in extruded aluminum in bronze or satin anodized finish.

Escutcheons / Lever Handles - Swing Door: FSB escutcheons and lever handles on swing pass door in oil patina bronze or satin stainless steel.

Finishes: Brushed chrome or oil-rubbed bronze.

Hinges: Stainless steel or oil-rubbed bronze powder coat.

Standard Configurations

Configuration designations (as viewed from exterior):

First digit / letter combination: number of panels and direction panels stack (L = left).

Second digit / letter combination: number of panels and direction panels stack (R = right).

Example: 3L4R = 3 panels stacking to left, 4 panels stacking to right.

2L, 2L1R, 3L, 3L1R, 4L, 4L1R, 3L2R, 5L, 3L3R, 7L, 4L3R, 5L2R, 5L3R,

2R, 1L2R, 3R, 1L3R, 2L2R, 1L4R, 4R, 2L3R, 5R, 3L4R, 7R, 2L5R, 8R

Maximum panel weight: 176lbs

Maximum number of doors: Eight in each direction (52'-0")

All configurations are exterior stacking - consult factory for availability of interior stacking.

Glazing

All glazing is per project specifications. Duratherm can accommodate most configurations and make-ups from 1/8" single glazed to a maximum of 1" security glass. Refer to the Glass and Glazing Guide.

Contact the factory for customized glazing and glass stop configurations.

Clear glass opening: Unit height minus 155/8". For clear glass width, contact factory.

Weather-Stripping

Double extruded silicone flap gasket set in rebate in doorframe at head, jambs, meeting stiles, and bottom rails of door panels. Engaging the shoot bolts on sliding panels and the multi-latchpoint lever espagnolettes on swing panel compresses the weather-strip to ensure a tight seal.

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