



S.E.A.L.

Interior Accessory Windows

When existing windows are weather-tight, and ventilation is unnecessary, Wausau Window and Wall Systems® S.E.A.L.™ interior accessory windows can improve Sound, Energy, Air and Light control - economically, and with a minimum of occupant disruption.



WAUSAU

WINDOW AND WALL
SYSTEMS

Features and Benefits

- Minimal frame depth to fit within existing window frame openings
- Also used as a curtainwall and storefront add-on for integral blinds or enhanced performance
- Side-hinged access doors with custodial locks
- 5/8" or 1" between-glass Venetian blinds available, with slip-clutch tilt control knob and concealed raise-lower controls
- Mitered frame construction, corner-blocked tubular vents
- 1297 Series for interior monolithic glass and optional blinds
- 1437 IGU Series for interior insulating glass units (no blinds)
- Dual glazed 2500 Series I.C.U. observation windows
- Drop tested 2187-DT Series accepts psychiatric glazing, ideal for adaptive re-use
- Wausau extruded aluminum frames contain recycled content averaging 70% or greater
- Covered by Wausau's Standard Limited Warranty of up to 10 years



Performance

U-FACTORS - 1297 SERIES S.E.A.L. INTERIOR ACCESSORY WINDOWS				
Exterior Glass Type	Nominal Air Space (in.)	Estimated Center-of-Glass U-Factor (Thermal Transmittance - BTU/hr.sq.ft.*F)		
		Interior Glass Type		
		1/4" Uncoated (annealed or heat-treated)	1/4" Pyrolytic Low-E (facing air space)	7/16" Laminated
1/4" Uncoated (annealed or heat-Treated)	2 1/2"	0.49	0.37	0.47
	5"	0.49	0.37	0.47
1" Insulating Glass	2 1/2"	0.31	0.25	0.30
	5"	0.31	0.25	0.30

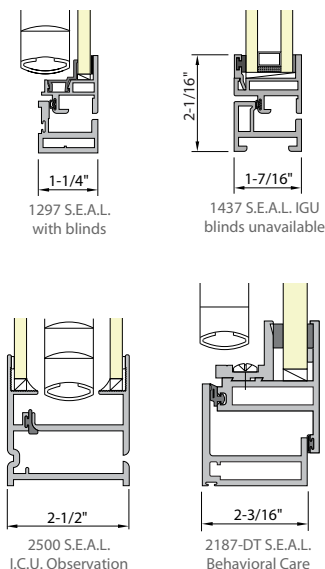
All estimates calculated using WINDOWS 6.0 software.
Results will change with exterior glass and frame type, as well as air space and wall cavity conditions.
Test results may vary. Refer to standard Wausau disclaimers and qualifications.

ACOUSTIC PERFORMANCE - 1297 SERIES S.E.A.L. INTERIOR ACCESSORY WINDOWS					
Exterior Glass Type	Nominal Air Space (in.)	Estimated Acoustic Performance Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC)			
		Interior Glass Type			
		1/4" Uncoated or Low-E (annealed or heat-treated)		7/16" Laminated	
		STC	OITC	STC	OITC
1/4" Uncoated (annealed or heat-Treated)	2 1/2"	40	31	44	33
	5"	42	33	46	35
1" Insulating Glass	2 1/2"	45	36	48	37
	5"	48	37	50	39

All estimates inferred from Wausau test data on similar glazing make-ups.
Results will change with exterior glass and frame type, as well as air space and wall cavity conditions.
Test results may vary. Refer to standard Wausau disclaimers and qualifications.

Estimated performance values are NOT test results. As noted, actual performance will vary. Validation may require project-specific testing, adding cost and impacting schedule.

Details



Scope Specification

S.E.A.L. 1297 and 1437 IGU SERIES

[NOTE: WAUSAU recommends that a representative sample of SEAL Series interior accessory windows (IAWs) be provided in situ, at least one seasonal cycle prior to installation. This will allow stakeholders to verify the suitability of operation, maintenance, existing glass type(s), and surrounding conditions. Internal fogging and thermal stress in existing annealed glass are of particular concern.]

1. **Test Assembly:** Tests shall be conducted on an assembly of, a) an exterior fenestration product emulating existing windows, plus b) an interior IAW installed per manufacturer's recommendations.
2. **Air Infiltration/Exfiltration Performance:** For testing purposes, the exterior fenestration product shall be vented to yield 2.5 cfm per sqft of nominal air flow at 1.57 psf pressure differential. IAWs shall exhibit maximum 0.2 cfm per sqft infiltration and maximum 0.3 cfm per sqft exfiltration, both at 1.57 psf cavity pressure differential when tested in accord with ASTM E283.
3. **Structural Test Performance:** No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 15 psf (design test pressure) when tested in accord with ASTM E330. At 1.5 x design test pressures, there shall be no glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.
4. **Life Cycle Testing:** When tested in basic accordance with operating cycle testing provisions of AAMA 910 for SHWs, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of cycling. Test unit and hardware shall be cycled 500 times, in accordance with AAMA 910 requirements for non-venting (custodial) operation.
5. **Vertical Load Test:** A downward vertical load of 150 lbf shall be applied for one minute, with no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of load application.
6. **Materials:** Aluminum framing members shall be extruded aluminum billet, 6063-T5 or T6 alloy meeting ASTM B221. Principal window frame and access panel members shall be a minimum 0.093" in thickness at glazing legs, hardware mounting webs and section flanges. Frame depth 1-1/4" minimum.
7. **Components:** All steel hardware components including attachment fasteners to be 300 Series stainless steel. Extruded aluminum components 6063-T5 or -T6. Locking pawls to be die cast, white bronze or stainless steel. Hardware to be custodial-operated and include concealed pin hinges or butts, Allen-keyed concealed locks, retainer clips, and lift blocks. Operable access panels shall be weather-stripped.
8. **Between-Glass Blinds (Optional):** Blinds shall employ an extruded aluminum head rail, and be fitted with 5/8" or 1" (Select one) wide aluminum slats. Tilt-control knob shall be located on the operable face and incorporate a "slip clutch" feature. Raise and lower pull cords will be located between glass for access only when glazed operable panel is opened.
9. **Fabrication:** Miter all corners and mechanically stake over solid extruded aluminum corner blocks; or miter and weld each corner. Provide locks at maximum 40" spacing.
10. **Finish:** Finish of all exposed areas of interior aluminum windows shall be done in accord with AAMA 611 (anodize) or AAMA 603 (paint). (Specify type and color)
11. **Installation:** Insure that wall cavity air is not allowed to enter the between-glass cavity created by addition of an IAW. Operable windows must be installed to one-half of the tolerances cited in the AAMA Commercial Window and Door Installation Manual. Provide baffled vents to exterior ambient air.

Options

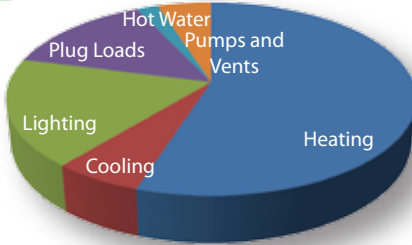
- Hinged or lift-out access panels
- Available with or without optional, integral between-glass blinds
- Glazing options for laminated glass or polycarbonate
- More than 30,000 color choices, in liquid and powder-coat paints, applied with 100% VOC-capture processes
- Frosty matte VOC-free anodize ideal for recycled aluminum
- Patina-free **copper anodize** available



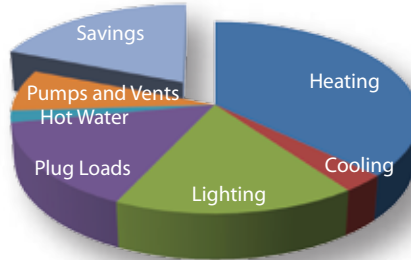
Case Study

195 Church Street

195 Church Street is an 18-story high-rise office building located in New Haven, Connecticut built in 1974, and fitted with Wausau S.E.A.L. interior accessory windows in 2016.

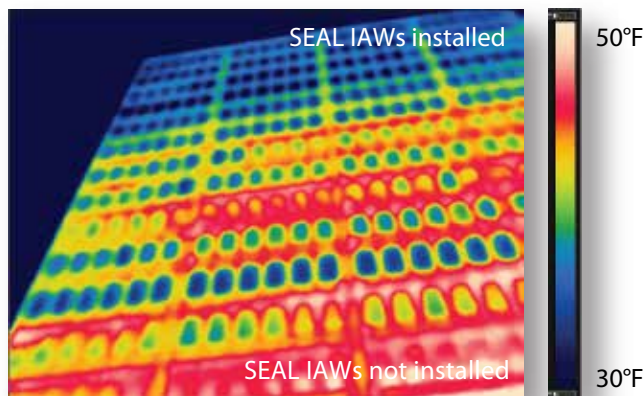


Baseline Energy Usage 5661 MWh per year



Energy Usage after Retrofit 4605 MWh per year

Whole-building energy modeling prepared by the Apogee Renovation Group - using eQuest modeling software - indicates significant savings in heating and cooling, as well as energy required for pumps and vents, totalling 19% of baseline annual energy consumption. In addition to lower U-Factor and SHGC, reduced air infiltration also contributes to savings. 195 Church is heated primarily with electricity. Energy modeling assumptions and details are available in a comprehensive case study.



Wintertime exterior thermal imaging shows reduced heat loss and improvement in surface temperatures - which results in improved occupant comfort inside the building - after installation of Wausau S.E.A.L. interior accessory windows (IAWs).



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