



Clarksville, Tennessee

Architect: Gould Turner Group

ATTRACTIVE AND SUSTAINABLE BUILDINGS



SAFE THERAPEUTIC ENVIRONMENTS



WINDOWS AND CURTAINWALL FOR HEALTH CARE

PATIENTS, DOCTORS AND MEDICAL STAFF AGREE THAT VIEWS AND DAYLIGHTING HELP REDUCE HOSPITAL STAYS, INCREASE PATIENTS' SENSE OF WELL-BEING, AND EXPEDITE THE HEALING PROCESS - OPERABLE WINDOWS PROVIDE EMERGENCY VENTILATION IN PATIENT ROOMS, AND ALL WAUSAU PRODUCTS HELP SUPPORT LEED® FOR HEALTH CARE SUSTAINABILITY GOALS



WAUSAU

WINDOW AND WALL SYSTEMS

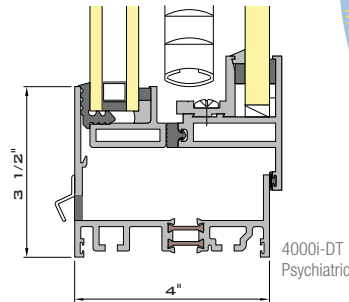
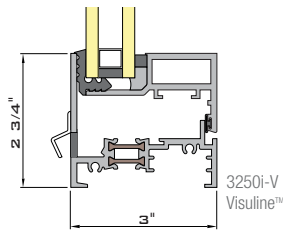
HIGH-PERFORMANCE WINDOWS

FEATURED PRODUCTS 3250i-V AND 4250i-V VISULINE™- 4000i-DT PSYCHIATRIC

FOR OVER 50 YEARS, HEALTH CARE DESIGN PROFESSIONALS HAVE RELIED ON WAUSAU'S OPERABLE WINDOWS TO PROVIDE EMERGENCY VENTILATION, CONTROLLED CLEANING ACCESS, SECURITY, ENERGY PERFORMANCE, CONDENSATION RESISTANCE, AND NOISE CONTROL - VIEWS AND DAYLIGHTING ENHANCE THE THERAPEUTIC ENVIRONMENT



- 3" and 4½" frame depth with polyamide thermal barrier
- AAMA AW-100 Architectural Performance Class
- Fixed, project-in hopper, or project-in casement
- Equal sightlines at vents and fixed lites
- Structural "no-sag" glazing allows for large vents
- Multi-lock hardware option for improved accessibility
- 1/8" principal wall thickness
- No vent joinery exposed to the exterior
- 4000i-DT Psychiatric windows are "drop-tested" for human impact, and fitted with tamper-resistant hardware



Allowable Air	Water	NFRC U-Factor	CRF _f	STC
0.10 cfm/sqft at 6.24 psf	15 psf	0.39 to 0.66 BTU/hr.sqft. °F	54 to 62	33 to 48



4000i-DT Psychiatric

- Available with 1" or 5/8" aluminum slats
- Occupant tilt control with slip-clutch feature
- Concealed raise-lower cords for uniform exterior appearance
- Hinged interior access doors for custodial access
- 16 standard slat colors

BETWEEN-GLASS VENETIAN BLINDS

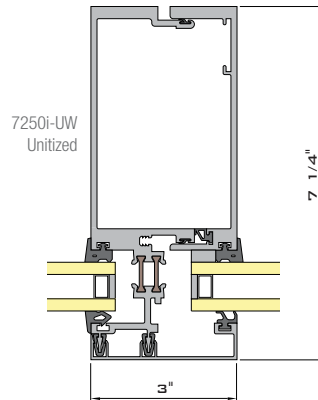
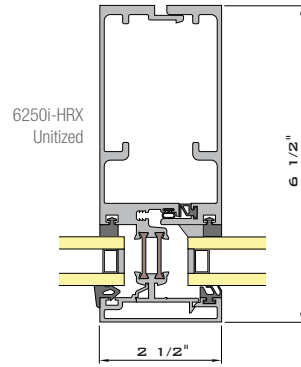
AVAILABLE WITH MOST WAUSAU PRODUCTS

VIRTUALLY MAINTENANCE-FREE INTEGRAL BLINDS, PROTECTED BY HINGED INTERIOR ACCESS DOORS, REDUCE SOLAR HEAT GAIN, WHILE OFFERING OCCUPANT DAYLIGHT CONTROL AND PRIVACY

CURTAINWALL SYSTEMS

FEATURED PRODUCTS 7250I-UW AND 6250I-HRX UNITIZED WALLS

WAUSAU UNITIZED CURTAINWALL SYSTEMS ARE FACTORY GLAZED FOR LONG-TERM WEATHER RESISTANCE AND SPEED OF INSTALLATION. POLYAMIDE THERMAL BARRIERS REDUCE CONDUCTIVE HEAT LOSS AND ENHANCE CONDENSATION RESISTANCE. MULLIONS ARE DESIGNED TO SPAN MOST HOSPITAL FLOOR HEIGHTS WITHOUT REINFORCEMENT.

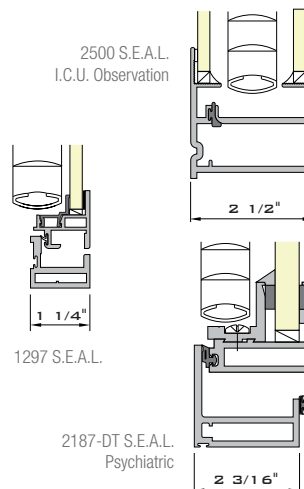


- 2 1/2" or 3" face width - 6 1/2" or 7 1/4" frame depth with polyamide thermal barrier
- Interlocking frame design accommodates seismic, live load, and thermal building movements
- Pressure-equalized rain screen design
- Captured, vertical or four-side structural glazed
- Glazing and sealing in a controlled factory environment
- Zero sightline vents, exterior sun shades, and interior light shelves available
- Recycled aluminum framing available upon request

Allowable Air	Water	NFRC U-Factor	CRF _f	STC
0.06 cfm/sqft at 6.24 psf	15 psf	0.32 to 0.54 BTU/hr.sqft.*F	70 to 74	31 to 34



- Often used as a curtainwall and storefront add-on for 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
- Mitered frame construction, corner-blocked tubular vents
- Dual glazed 2500 Series I.C.U. observation windows
- Drop tested 2187-DT Series accepts psychiatric glazing, ideal for adaptive re-use



S.E.A.L. INTERIOR PRIME WINDOWS

WHEN EXISTING WINDOWS ARE WEATHER-TIGHT, AND VENTILATION IS UNNECESSARY, S.E.A.L. INTERIOR PRIME WINDOWS CAN IMPROVE SOUND, ENERGY, AIR AND LIGHT CONTROL - ECONOMICALLY, AND WITH A MINIMUM OF OCCUPANT DISRUPTION





BEYOND LEED®

SUSTAINABLE MANUFACTURING PROCESSES

- Minimized packaging materials in receiving and shipping
- Scrap recycling: Aluminum, steel, cardboard, wood, glass, fluorescent bulbs, paper, beverage containers, toner cartridges, electronic equipment
- “Paperless” environment supported by Wausau ShopView™ software
- 98% VOC-capture spray painting of durable AAMA 2605-tested fluoropolymer
- No-VOC finish options: Powder coatings and durable Class I anodic finishes with eco-friendly etch
- Resource-wasting internal rework minimized through Lean/Six Sigma

SUSTAINABLE BUSINESS PRACTICES

- Leadership within industry trade organizations and research groups
- Design charettes supported with engineering resources
- All operable windows are durable, cycle-tested AW-Class
- LEED-AP on staff

HOW CAN WINDOWS CONTRIBUTE TO LEED® FOR HEALTH CARE?

- LOW U-FACTOR
- LOW SOLAR HEAT GAIN
- NATURAL VENTILATION
- DAYLIGHTING AND VIEWS
- NOISE CONTROL
- RECYCLED ALUMINUM FRAMES



WHY ALUMINUM WINDOWS ?

- LONG-TERM DURABILITY
- WEATHER RESISTANCE
- MATERIAL STABILITY
- LARGE OPERATING VENTS
- RECYCLED CONTENT
- ECO-FRIENDLY FINISHES
- THERMAL BARRIER FRAMES

DOWNLOAD COMPREHENSIVE DETAILS AND SPECIFICATIONS AT WWW.WAUSAUWINDOW.COM

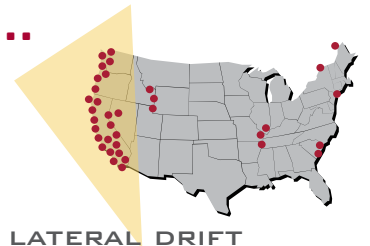


WAUSAU
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SYSTEMS

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TOLL FREE 1 877 678 2983 FAX 1 715 843 4350
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...OF REGIONAL INTEREST IN HEALTH CARE...

DESIGN FOR SEISMIC EVENTS



ACCOMMODATE LATERAL DRIFT
AND TRANSFER INERTIAL LOADS

To properly engineer windows and curtainwall to withstand earthquakes, parameters specific to the building and site must be considered. Hospitals are Occupancy Category IV, considered essential facilities, with the highest Importance Factor multipliers applied to movements and forces.

Windows and curtainwall must elastically accommodate lateral seismic drift without loss of weather resistance or glass breakage. Under inelastic movements, safety of occupants and passersby is critical. In addition, inertial forces must be safely transferred to the building structure.

Early design coordination with adjacent wall system movement and anchorage provisions is essential, to maintain overall envelope integrity.

Allowable Story Drift Δa (Where h is story height)			
Structure	Occupancy Category		
	I or II	III	IV
Structures, other than masonry shear wall, four stories or less with interior walls, partitions, ceilings and exterior wall systems that have been designed to accommodate the story drift.	0.025h	0.020h	0.015h
Masonry cantilever shear wall structures	0.010h	0.010h	0.010h
Other masonry shear wall structures	0.007h	0.007h	0.007h
All other structures	0.020h	0.015h	0.010h

Design movements may be less than these maximum allowable design movements.

Occupancy Importance Factor (I) (Table 11.5-1)	
Occupancy Category	Importance Factor I
I or II	1.00
III	1.25
IV	1.50

Importance Factor is a direct multiplier when forces for the building are determined.

Source: ASCE/SEI 7-05 Standard: Minimum Design Loads for Buildings and Other Structures.



UCLA Ambulatory Care Pavilion
DMJM (AECOM) Architects



INTEGRATED DESIGN SUPPORT FOR OSHPD

Wausau systems have been approved by the California Office of Statewide Health Planning and Development (OSHPD) on more than 40 hospital projects in the past 10 years, helping ensure health care services remain available during and after major seismic events.

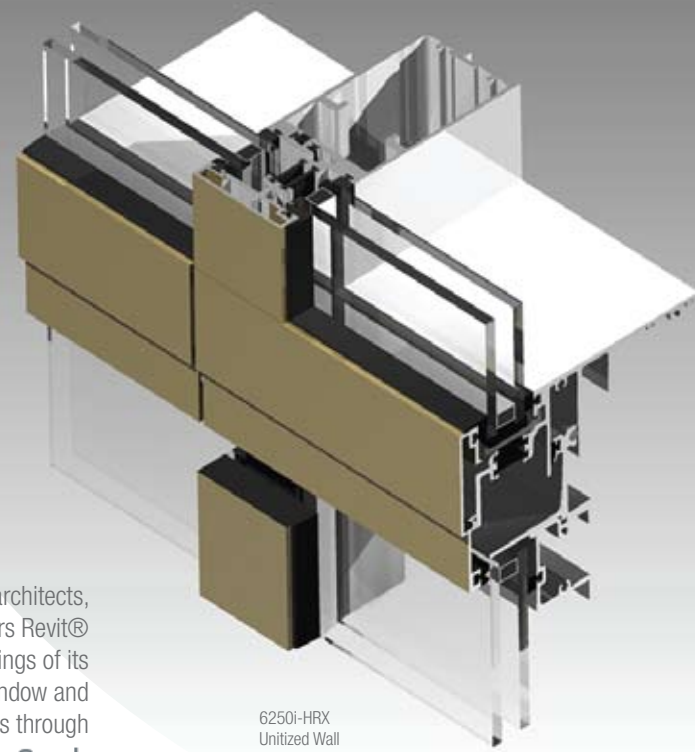
Through strict adherence to OSHPD administrative and technical requirements, project approvals are obtained in a timely manner.

Special attention is given to integrated design aspects of system interface, coordination of detailing and structural calculations, and Building Information Modeling (BIM) protocols. Wausau is often called on to take the technical lead in envelope seismic design.

In addition, Wausau offers high-performance, NFRC-certified products, to address the most stringent energy efficiency requirements of California Code of Regulations (CCR) Title 24.

Wausau offers architects, engineers and designers Revit® 3D models and 2D drawings of its most popular window and curtainwall systems through

Autodesk® Seek



6250I-HRX
Unitized Wall

RECENT PROJECTS - CALIFORNIA

CEDARS SINAI
COTTAGE HOSPITAL
EL CAMINO HOSPITAL
HOAG HOSPITAL
HOLY CROSS HOSPITAL
HOWARD KECK CENTER
HUNTINGTON MEMORIAL HOSPITAL
KAISER PERMANENTE
LAGUNA HONDA HOSPITAL
LUMA LINDA HOSPITAL
LOS ANGELES CHILDRENS HOSPITAL
LUCILLE PACKARD CHILDRENS HOSPITAL
MILLER CHILDREN'S HOSPITAL
MISSION HOSPITAL
REGIONAL MEDICAL CENTER SAN JOSE
SALINAS VALLEY HOSPITAL
SAN BERNARDINO MEDICAL CENTER
SAN FRANCISCO GENERAL HOSPITAL
SANTA CLARA VALLEY MEDICAL CENTER
SANTA MONICA HOSPITAL
SHRINERS HOSPITAL FOR CHILDREN
ST JUDE MEDICAL CENTER
STANFORD UNIVERSITY MEDICAL CENTER
VACAVILLE SURGERY CENTER
WEST HILLS MEDICAL CENTER

Mission Hospital Mission Viejo, California RBB Architects



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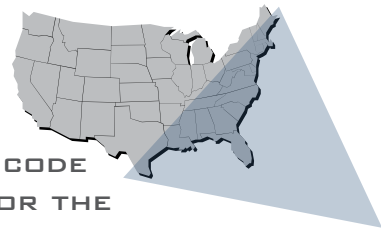
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...OF REGIONAL INTEREST IN HEALTH CARE...

HURRICANE IMPACT



SAFETY AND CODE COMPLIANCE FOR THE ATLANTIC AND GULF COASTS

In hurricane-prone regions of the U.S., up and down the Atlantic coast and along the Gulf of Mexico, wind-borne debris protection is essential. Keeping hospital windows intact keeps hospital buildings serviceable, and protects occupants, since evacuation is not usually a realistic option. Hospitals in these regions require "large missile"-tested products. Basic hurricane wind speeds vary widely by location, even within the same code jurisdiction.

Miami-Dade Product Control approval criteria are explicit with regard to size, configuration and anchorage variations. Authorities having jurisdiction in other areas, for example, the Florida Building Code (FBC) and Florida Agency for Health Care Administration (AHCA), adopt, interpret and enforce the International Building Code (IBC), as well as the requirements of ASTM 1996.

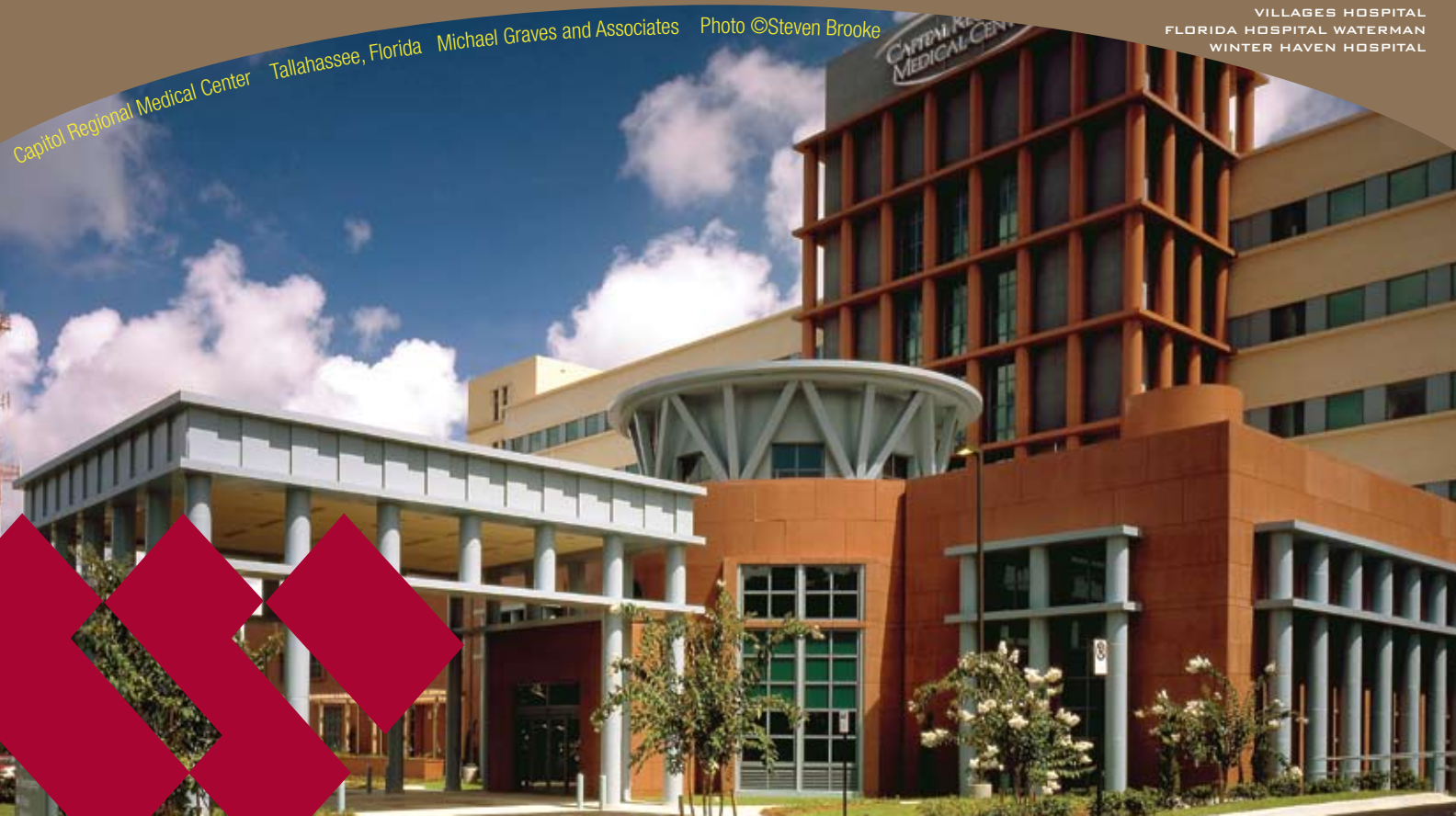
Wausau's registered professional engineers help navigate the technical and administrative details of codes and testing requirements for specific projects, ensuring compliance verification in a timely manner.

ASTM E 1996-08 WIND ZONE TYPE	
Wind Zone 1	110 MPH ≤ Basic Wind Speed < 120 MPH, and Hawaii
Wind Zone 2	120 MPH ≤ Basic Wind Speed < 130 MPH at greater than 1 mile from coastline ¹
Wind Zone 3	130 MPH ≤ Basic Wind Speed ≤ 140 MPH ---of--- 120 MPH ≤ Basic Wind Speed ≤ 140 MPH and within 1 mile from coastline ¹
Wind Zone 4	Basic Wind Speed > 140 MPH
¹ Coastline is measured from the mean high water mark	

RECENT PROJECTS - FLORIDA

- BAPTIST MEDICAL CENTER
- BLAKE MEDICAL CENTER
- BROWARD GENERAL MEDICAL CENTER
- CAPITAL REGIONAL MEDICAL CENTER
- CARILLON MEDICAL
- COLLIER REGIONAL MEDICAL CENTER
- FLAGLER HOSPITAL
- HEART OF FLORIDA MEDICAL CENTER
- HEARTLAND MEDICAL
- KINDRED HOSPITAL
- LRMC WINDOW REPLACEMENT
- MANATEE MEMORIAL HOSPITAL
- MARTIN MEMORIAL MEDICAL CENTER
- MAYO CLINIC
- MEMORIAL HOSPITAL NICU EXPANSION
- MEMORIAL HOSPITAL MIRAMAR
- MORTON PLANT HOSPITAL
- NORTH FLORIDA REGIONAL HOSPITAL
- NORTHSIDE HOSPITAL
- OAK HILL HOSPITAL
- OKALOOSA MEDICAL CENTER
- ORANGE PARK MEDICAL CENTER
- VILLAGES HOSPITAL
- FLORIDA HOSPITAL WATERMAN
- WINTER HAVEN HOSPITAL

Capitol Regional Medical Center Tallahassee, Florida Michael Graves and Associates Photo ©Steven Brooke



COASTAL SAFETY AND CODE COMPLIANCE

Wausau's AAMA AW-120 rated 3250-HP Hurricane windows have been the product of choice for dozens of hospitals in hurricane-prone regions, and are Miami Dade Product Control Approved:

- Fixed window, large missile
Notice of Acceptance (NOA) #07-0423.10
Miami-Dade County, Florida, 25Apr12
- Fixed window, small missile
Notice of Acceptance (NOA) #08-0513.06
Miami-Dade County, Florida, 25Apr12
- Casement window, large missile
Notice of Acceptance (NOA) #07-0719.01
Miami-Dade County, Florida, 25Apr12
- Casement window, small missile
Notice of Acceptance (NOA) #08-0513.05
Miami-Dade County, Florida, 25Apr12



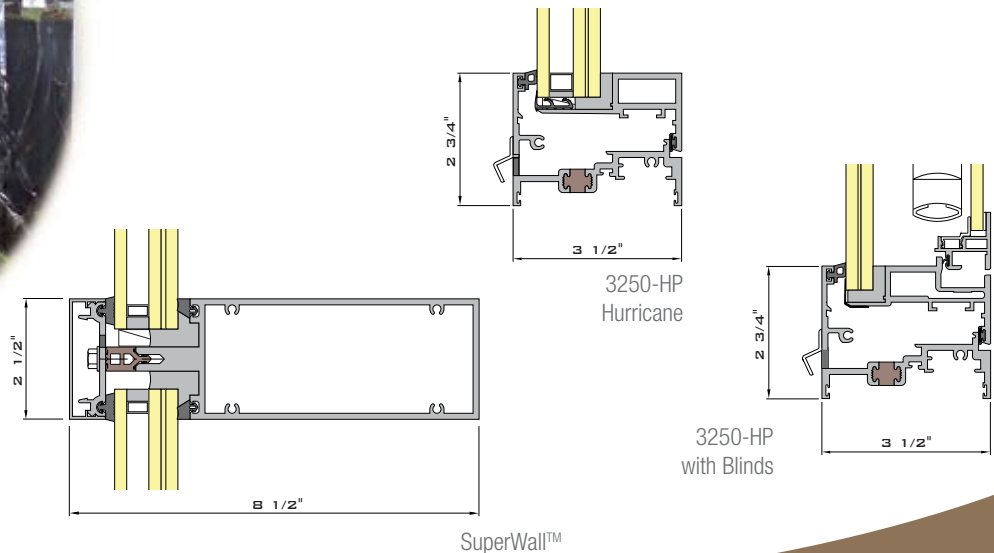
3250-HP Hurricane

Wausau's 6250 and 8250 Series SuperWall™ systems have been tested to meet the large missile requirements of ASTM 1996 for Wind Zone 1, including module sizes up to 5'-6" x 10'-1".



Miami-Dade Product Control Approval WAUSAU 3250-HP LARGE MISSILE IMPACT-RESISTANT FIXED WINDOWS												
Short Dimension	Design Load Capacity (Positive and Negative psf)											
	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg
30"	80.0	90.0	80.0	90.0	80.0	90.0	80.0	90.0	80.0	90.0	80.0	90.0
36"	80.0	90.0	80.0	90.0	80.0	90.0	80.0	90.0	80.0	90.0		
42"	80.0	90.0	80.0	90.0	80.0	90.0	80.0	90.0				
49"	80.0	90.0	80.0	90.0	80.0	90.0						
54"	72.6	81.7	72.6	81.7								
59"	66.4	74.7										
Long Dimension	59"		65"		72"		84"		98"		117"	

1. All window dimensions are frame dimensions +/- 1/2".
 2. Sizes listed are maximum allowable at load indicated. If no load is listed for a given size, the size exceeds allowable and is not acceptable.
 3. Casement size maximum is 4'-0" wide by 6'-0" high with allowable design pressures of +80 psf and -90 psf.



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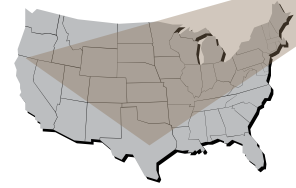
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CONDENSATION RESISTANCE

HIGH INTERIOR HUMIDITY
IN COLD CLIMATES



Finite element computer models, and the AAMA 1503 Condensation Resistance Factor (CRF) can both be useful in comparing products, or as a basis for performance specifications. Exercise caution when using these to predict or prevent condensation on installed products.

Field condensation on interior surfaces is affected by many variables, including component thermal performance, thermal mass of surrounding materials, interior trim coverage, as well as air flow conditions, weather and mechanical system design.

CRF applies only to pre-defined configurations under controlled and steady-state laboratory conditions, and assumes some condensation is acceptable under the severest of wintertime conditions.

RECENT PROJECTS - MINNESOTA

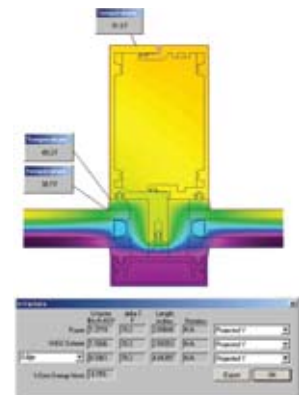
- BOYNTON HEALTH SERVICE
- CAMBRIDGE MEDICAL CENTER
- CENTRA CARE CLINIC
- CORNERSTONE MEDICAL CENTER
- EDISON HOSPITAL BUILDING 2
- FAIRVIEW RIVERSIDE
- KANABEC HOSPITAL
- LAKEWOOD HEALTH SYSTEM
- LONG TERM CARE FACILITY
- MCF VOCATIONAL BUILDING
- MEMORIAL HOSPITAL
- MERCY HOSPITAL
- MINNESOTA CHILDRENS HOSPITAL
- NEW PRAGUE ESC
- NEW ULM HOSPITAL
- NORTH COUNTRY HOSPITAL
- OLMSTED COMMUNITY HOSPITAL
- ORTONVILLE HEALTH SERVICES
- OWATONNA HOSPITAL
- RIVERWOOD HEALTH
- ST ELIZABETH MEDICAL CENTER
- ST GABRIELS HOSPITAL
- ST LOUIS PARK METHODIST HOSPITAL
- SWIFT COUNTY HOSPITAL
- TRI-COUNTY HOSP
- VAMC MINNEAPOLIS
- WELCOME MEMORIAL

AAMA ON-LINE CRF TOOL (www.aamanet.org)							
MINIMUM RECOMMENDED CONDENSATION RESISTANCE FACTOR (CRF)							
Interior Air Temp = 70 °F 15 mph Wind Velocity							
ASHRAE 99.6% Winter Design Temperature	Maximum Recommended Interior RH%	Inside Relative Humidity (RH)					
		15%	20%	25%	30%	35%	40%
-20 °F	20%	45	52	58	63	68	72
-10 °F	25%	38	46	53	59	64	68
0 °F	30%	29	39	47	53	59	64
+10 °F	35%			38	45	52	58
+20 °F	40%				34	42	49

Relative Humidity higher than that shown is not recommended for outside air temperatures equal to or lower than that shown, unless specifically taken into account in the building design. (AAMA Curtainwall Manual #9)



Condensation forms wherever surface temperature falls below the interior dew point.



ENHANCED CONDENSATION PERFORMANCE

In critical applications, where no visible condensation is acceptable, more rigorous analytical methods are recommended. This is especially important in Climate Zones 6, 7, or 8, or when interior Relative Humidity is kept elevated, for specialized occupancy such as ICUs, CCUs, therapy pools, and outpatient surgical suites.

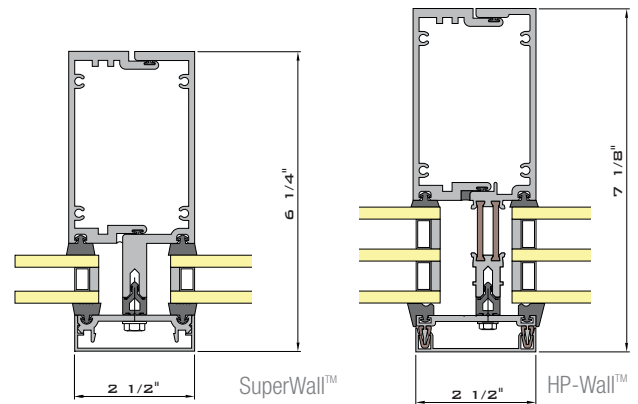
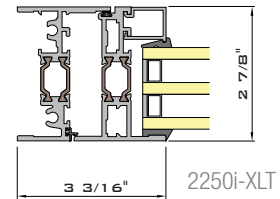
Wausau design engineers have the tools and knowledge to assist the AEC team in product selection and application, including air and vapor barrier interface design.

Wausau offers high-performance, NFRC-certified products, to address the most stringent requirements:

- 2250i-XLT *in.vent*™
- *3250i-V Visuline™
- *4000i-DT
- SuperWall™
- HP-Wall™
- *6250i-HRX
- *7250i-UW

Condensation Resistance Factors (CRFs) up to 83 are available.

* Products featured elsewhere in "Windows and Curtainwall for Health Care"



Minnesota Children's Hospital Jordan Architects



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