

Wood

products

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PHI Certified Triple-Pane Window



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PH Performance Triple-Pane Window



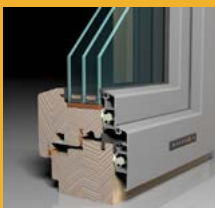
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Top Performance Double-Pane Window



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Entry, Patio, Lift-Slide & Tilt-Slide Doors



EUROPEAN
ARCHITECTURAL
SUPPLY

FINE WINDOWS FOR ALL SEASONS

Lakes Region, NH Residence

Design: Moskow Linn Architects
MacArthur Construction Co.

Product:

Makrowin MW78 Wood Windows

Glass: R-5 Double-Pane



Makrowin MW88 G2

As the most recent addition to our Passive House fenestration offering, the MW88 G2 window represents the state-of-the-art in engineered wood frame technology. This window was recently certified at the Passivhaus Institute (PHI) in Darmstadt, achieving $U_f = 0.13 \text{ Btu}/(\text{hr}\cdot\text{ft}^2 \cdot ^\circ\text{F})$. At 88 mm thickness, this window profile represents the thinnest PHI-certified wood window design.

The annual heating demand in an energy efficient passive house is limited to 15kWh/m² or 4.75 kBtu/ft². The requirements on window frames suitable for passive houses are extremely strict. Heat loss in such houses during the coldest days of the year is estimated at 1.4 to 1.6 kW. Considering how small this value is, a single heat recovery ventilation system with a small heating element is sufficient to provide thermal comfort in such buildings.

PHI Certified Product

Our highest performing wood window frame certified by the Passivhaus Institute in Darmstadt achieving $U_f=0.13 \text{ Btu}/(\text{hr}\cdot\text{ft}^2 \cdot ^\circ\text{F})$.

Strongest Insulated Frame

Insulation can compromise the strength of PH window frames. Structural integrity was of paramount importance when designing the MW88 G2 frame. Our goal was to create a Passive House window that can handle large panes of heavy glass for years of trouble-free operation.

Glass Up to R-14, SHGC to 0.62

Partnering with Saint Gobain Glass, we use the most innovative glass substrates in the world. Our triple-pane glass reaches up to R-14 and SHGC=0.62, giving PH designers greater flexibility when modeling projects in PHPP.

Premium Aluminum Cladding

MW88 G2 is available with the option of aluminum cladding on the exterior making the windows virtually maintenance free. No thin sheet metal used; our cladding is 100% extruded and all corners are welded for years of watertight protection.

Certificate
 Certified Passive House component
 for cool, temperate climate, valid until 31.12.2015

Category: Window Frame
 Manufacturer: Makrowin s.r.o.
 Product name: 962 12 Detva, SLOVAKIA
 MAKROWIN 88 G2

The following comfort criteria were used in awarding this certificate:

Given a U_g value of 0.70 W/(m²K) and a window size of 1.23 m by 1.48 m,
 $U_{w,e} = 0.79 \text{ W}/(\text{m}^2\text{K}) \leq 0.80 \text{ W}/(\text{m}^2\text{K})$

Taking into account the installation based thermal bridges, and provided that the installation is, with regard to the thermal bridges, equal or better than shown in the data sheet, the window meets the following criterion:
 $U_{w,thermal} \leq 0.65 \text{ W}/(\text{m}^2\text{K})$

Thermal data of the window frame

Spacer	U-value [W/(m ² K)]	Width [mm]	Ψ_{sp} [W/(m ² K)]	$f_{sp,0.25}$ [1]
Bottom	0.80	151	0.031	0.80
Side/top	0.75	131	0.020	0.80

*Spacers of lower thermal quality, especially those made of aluminum, lead to significantly higher thermal losses and lower temperature factors.

Further information see data sheet
www.passivehouse.com 0563w103

Passive House Institute
 Dr. Wolfgang Feist
 64283 Darmstadt
 GERMANY

Passive House Efficiency Class

pA
pB
pC

CERTIFIED COMPONENT
 by Passive House Institute

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Makrowin MW88 G2 Passive House Certified Wood Window

Design

- Frame profiles can be manufactured from a variety of wood species, including clear spruce, clear pine, oak, mahogany, and European larch, with a wide selection of finishes
- Three-step factory finishing system surpassing any finish applied on the job site
- Both the frame and sash include thermal break layers of cork, a natural material with great sound, thermal and anti-vibration properties
- Narrow face width of 131 mm highlights the slim-lined look of the window
- Soft-line contours with radii of 8 mm contribute to a timeless look and improve adhesion of the finishing layers
- Sloping exposed faces and aluminum drip edges protect the surfaces that would otherwise be vulnerable to ice and water damage
- Pre-finished glazing stop on the interior side with the invisible pins concealed under the seal
- Glazing ventilation removes moisture that may condense around the perimeter of the glazing
- Decompression groove prevents penetration of water and air between the glazing bead and the glazing

Energy Efficiency

- Wood profile construction with thermal break and basic frame depth of 88 mm for excellent thermal insulation
- U_f value of 0.773 W/(m²K) for jamb and head profiles and 0.826 W/(m²K) for sill
- Vent overlap of 6 mm minimizes heat loss
- Glass edge cover of more than 20 mm guarantees minimal heat loss in the glass edge seal area
- Triple glazing with a glass thickness of 44 mm

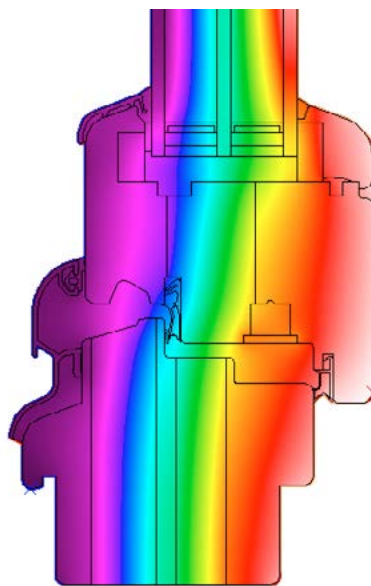
Security

- Compact geometry of the frame ensures that the windows are highly robust and durable
- Fitting groove secures engagement of the locking elements along the perimeter of the window
- All hardware components are protected from corrosion and against dirt by the outer-frame rebate gasket

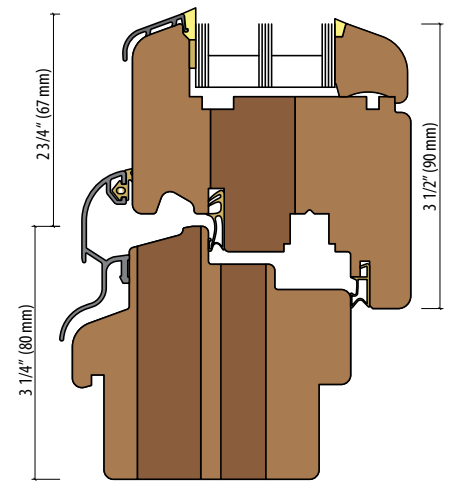
Comfort

- Narrow face widths ensure maximum light penetration
- Excellent sound reduction values
- Flush glazing bead makes the windows easy to clean
- Gasket clearance of 5 mm ensures the windows close smoothly

Parameters	
Frame depth	88 mm 3.46 in
Frame width (sill/head/jamb)	151 / 131 / 131 mm 5.94 / 5.15 / 5.15 in
Possible glazing thickness	44 mm 1.73 in
Thermal insulation U_f	0.773 W/(m ² .K) 0.132 Btu/(hr.ft ² .°F)
Thermal bridge coefficient Ψ_{spacer}	0.030 W/(m.K) 0.017 Btu/(hr.ft.°F)



Isothermal flow in MW88 G2



Vertical section of sill in MW88 G2



Makrowin MW88

Makrowin produces some of the most energy efficient wood windows in Europe. MW88 is their most widely used window frame for applications utilizing high-performance triple-pane glass. At 88 mm deep, the sash frame is capable of utilizing insulated glass up to R-14, enabling the frame to achieve PH-level U_w values. The sash and frame are exceptionally strong, making them suitable for extra large window assemblies up to 8 ft in height.

Focus on Quality

Manufacturing of wood windows requires a continuous focus on quality at every stage of production. Attention to detail is critical when selecting wood materials, assembling window frames and preparing them for finishing. Makrowin demonstrates the highest quality of craftsmanship in every window that they make. Their products are completely finished prior to glazing, assuring long life for the sash and frame. The company employs expert finishers to give their windows a long-lasting, furniture-like finish.

Cladding Options

Makrowin windows are available with exterior aluminum cladding, providing the window frame with decades of protection from rain, ice and harmful UV radiation. The aluminum cladding is available in a wide range of RAL colors, starting with a basic palette of 26 colors and 210 premium color options.

Matching Insect Screens

Makrowin also offers aluminum insect screens in matching RAL color options. The screens clip directly to the window frame, providing for easy installation and removal.

Passive House Performance

Combined with R-10 triple-pane glass, MW88 is capable of achieving Passive House performance metrics with an all-wood frame, making for a more affordable PH wood window option. The added strength of all-wood frames enables the use of even larger operable window openings up to 8ft in height.

Glass up to R-14, SHGC 0.62

Partnering with Saint Gobain Glass, we use the most innovative glass substrates in the world. Our triple-pane glass reaches up to R-14 and SHGC=0.62, giving PH designers greater flexibility when modeling projects in PHPP.

Professional Wood Finish

Europeans rely on window manufacturers for long-lasting wood finishes. Our wood frames receive a 3-coat professionally applied finish under controlled conditions. No painting contractor can replicate such a finish at the jobsite. Our acrylic polymer wood finishes perform beyond the four- to seven-year expected lifetime of conventionally painted windows, and our 10-year customers can prove it.

Premium Aluminum Cladding

MW88 is available with the option of aluminum cladding on the exterior, making the windows virtually maintenance free. No thin sheet metal is used; our cladding is 100% extruded and all corners are welded for years of water-tight protection.

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SCHÜCO

MAKROWIN®

Makrowin MW88 Triple-Pane Wood Window with PH Performance

Design

- Frame profiles can be manufactured from a variety of wood species including clear spruce, clear pine, oak, mahogany, and European larch, with a wide selection of finishes
- Three-step factory finishing system surpassing any finish applied on the job site
- Narrow face width of 119 mm highlights the slim-lined look of the window
- Soft-line contours contribute to a timeless look and improve adhesion of the finishing layers
- Sloping exposed faces and aluminum drip edges protect the surfaces that would otherwise be vulnerable to ice and water damage
- Pre-finished glazing stop on the interior side with the invisible pins concealed under the seal
- Glazing ventilation removes moisture that may condense around the perimeter of the glazing
- Decompression groove prevents penetration of water and air between the glazing bead and the glazing

- Fitting groove secures flawless engagement of the locking element tips along the whole perimeter of the window
- All hardware components are protected from corrosion and against dirt by the outer-frame rebate gasket

Comfort

- Narrow face widths ensure maximum light penetration
- Excellent sound reduction values
- Flush glazing bead makes the windows easy to clean
- Gasket clearance of 5 mm ensures the windows close smoothly

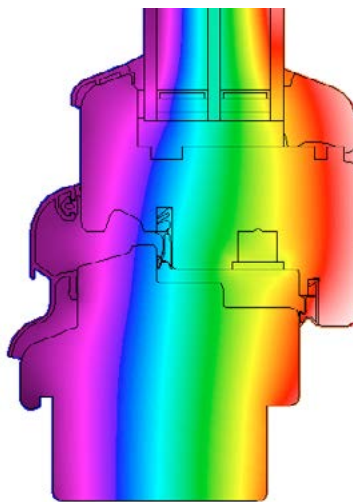
Energy Efficiency

- Wood profile construction and basic frame depth of 88 mm for excellent thermal insulation
- U_f value of 1.014 W/(m²K) for jamb and head profiles and 1.125 W/(m²K) for sill
- Vent overlap of 6 mm minimizes heat loss
- Glass edge cover of more than 20 mm guarantees minimal heat loss in the glass edge seal area
- Triple glazing with a glass thickness of 44 mm

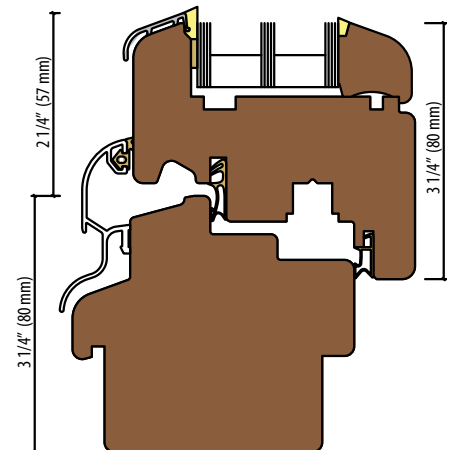
Security

- Compact geometry of the frame ensures that the windows are highly robust and durable

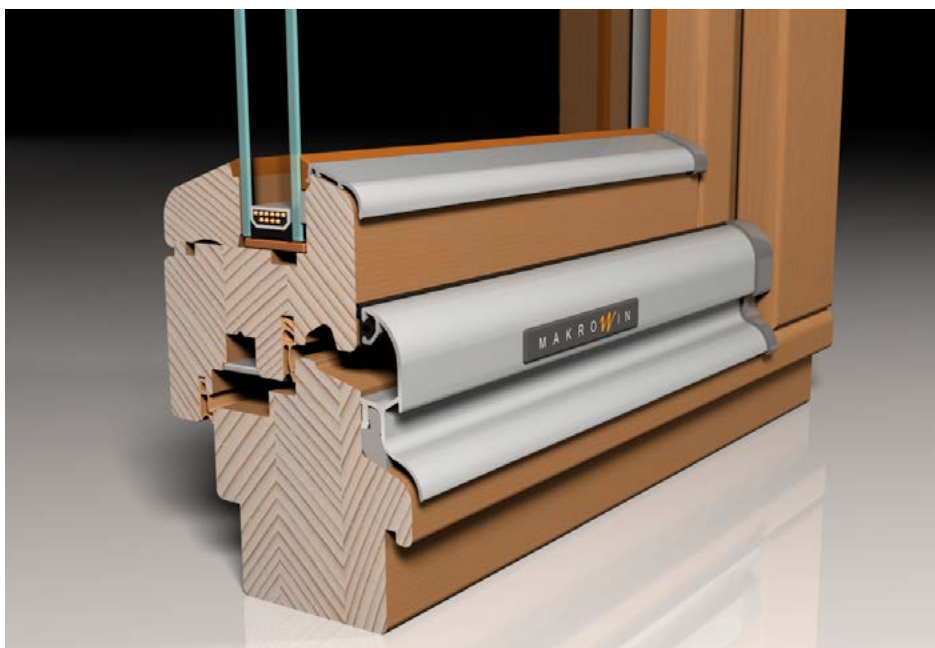
Parameters	
Frame depth	88 mm 3.46 in
Frame width (sill/head/jamb)	137 / 119 / 119 mm 5.39 / 4.69 / 4.69 in
Possible glazing thickness	44 mm 1.73 in
Thermal insulation U_f	1.014 W/(m ² .K) 0.173 Btu/(hr.ft ² .°F)
Thermal bridge coefficient Ψ_{spacer}	0.030 W/(m.K) 0.017 Btu/(hr.ft.°F)



Isothermal flow in MW88



Vertical section of sill in MW88



Makrowin MW78

Makrowin produces some of the most energy efficient wood windows in Europe. MW78 is their most widely used window frame for applications utilizing high-performance double-pane glass. At 78 mm depth, the sash frame is capable of utilizing insulated glass up to R-6, enabling the frame to achieve top energy performance metrics in the double-pane category. The sash and frame are exceptionally strong, making them suitable for extra large window assemblies up to 8ft in height.

Focus on Quality

The manufacturing of wood windows requires continuous focus on quality at every stage of production. Attention to detail is critical when selecting wood materials, assembling window frames and preparing them for finishing. Makrowin demonstrates the highest quality of craftsmanship in every window they make. Their products are completely finished prior to glazing, assuring long life for the sash and frame. The company employs expert finishers to give their windows a long-lasting furniture-like finish.

Cladding Options

Makrowin windows are available with exterior aluminum cladding, providing the window frame with decades of protection from rain, ice and harmful UV radiation. The aluminum cladding is available in a wide range of RAL colors, starting with a basic palette of 26 colors and 210 premium color options.

Matching Insect Screens

Makrowin also offers aluminum insect screens in matching RAL color options. The screens clip directly to the window frame, providing for easy installation and removal.

Top Double-Pane Performance

MW78 is currently the best double-pane wood window on the market. Combined with R-6 glass, it provides performance that rivals triple-pane performance from US window manufacturers.

Simulated Divided Lites

Unparalleled double-pane performance makes MW78 a great choice for historically sensitive projects requiring simulated divided lites. SDL muntins can be awkward with triple-pane glass. MW78 enables architects to achieve peak energy performance without aesthetic compromises with SDLs in triple-pane glass.

Professional Wood Finish

Europeans rely on window manufacturers for long-lasting wood finishes. Our wood frames receive a 3-coat professionally applied finish under controlled conditions. No painting contractor can replicate such a finish at the jobsite. Our acrylic polymer wood finishes perform beyond the 4-7yr expected lifetime of conventionally painted windows and we have 10-year customers to prove it.

Premium Aluminum Cladding

MW78 is available with the option of aluminum cladding on the exterior, making the windows virtually maintenance free. No thin sheet metal used; our cladding is 100% extruded and all corners are welded for years of watertight protection.



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Makrowin MW78 Top Double-Pane Wood Window

Design

- Frame profiles can be manufactured from a variety of wood species including clear spruce, clear pine, oak, mahogany, and European larch, with a wide selection of finishes
- Three-step factory finishing system surpassing any finish applied on the job site
- Narrow face width of 140 mm highlights the slim-lined look of the window
- Soft-line contours contribute to a timeless look and improve adhesion of the finishing layers
- Sloping exposed faces and aluminum drip edges protect the surfaces that would otherwise be vulnerable to ice and water damage
- Pre-finished glazing stop on the interior side with the invisible pins concealed under the seal
- Glazing ventilation removes moisture that may condense around the perimeter of the glazing
- Decompression groove prevents penetration of water and air between the glazing bead and the glazing

Energy Efficiency

- Wood profile construction with thermal break and basic frame depth of 78 mm for excellent thermal insulation
- U_f value of 1.212 W/(m²K) for jamb and head profiles and 1.407 W/(m²K) for sill
- Vent overlap of 6 mm minimizes heat loss
- Glass edge cover of more than 20 mm guarantees minimal heat loss in the glass edge seal area
- Double glazing with glass thickness of 26 mm and triple glazing with a glass thickness of 36 mm

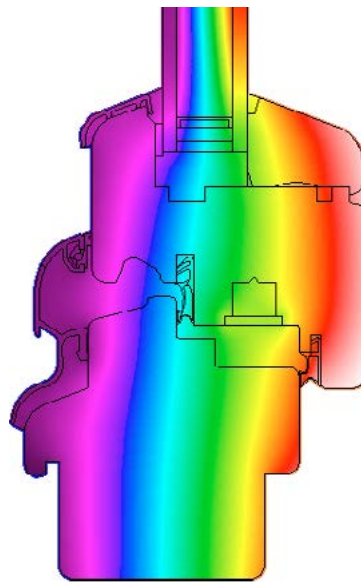
Security

- Compact geometry of the frame ensures that the windows are highly robust and durable
- Fitting groove secures flawless engagement of the locking element tips along the whole perimeter of the window
- All hardware components are protected from corrosion and against dirt by the outer-frame rebate gasket

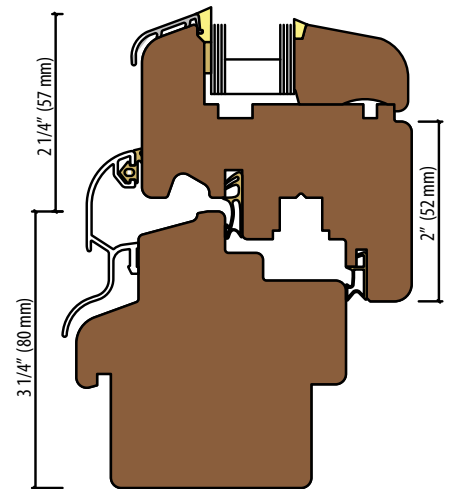
Comfort

- Narrow face widths ensure maximum light penetration
- Excellent sound reduction values
- Flush glazing bead makes the windows easy to clean
- Gasket clearance of 5 mm ensures the windows close smoothly

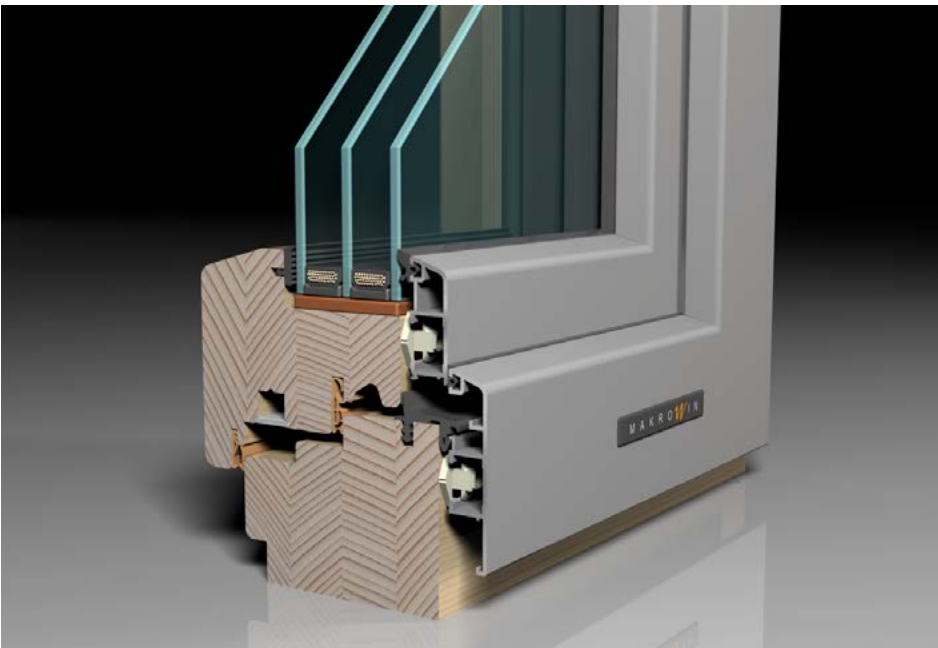
Parameters	
Frame depth	78 mm 3.07 in
Frame width (sill/head/jamb)	137 / 119 / 119 mm 5.39 / 5.15 / 5.15 in
Possible glazing thickness	26, 36 mm 1.02, 1.41 in
Thermal insulation U_f	1.212 W/(m ² K) 0.207 Btu/(hr.ft ² .°F)



Isothermal flow in MW78



Vertical section of sill in MW78



Makrowin MW88 Classic Alu-Clad

For demanding customers who desire the rich warm texture of wood on the inside and the durability of aluminum on the outside, these outstanding windows offer uncompromising performance and beautiful styling.

The aluminum cladding provides the window frame with decades of protection from rain, ice and harmful UV radiation. Our aluminum frames are of the absolute best quality available. We utilize 100% extruded materials, we weld all mitered corners and use the highest quality powder-coated finishes.

Color Flexibility

Tired of choosing windows from a set of eight manufacturer's color options? The Makrowin aluminum cladding is available in a wide range of RAL colors, starting with a basic palette of 26 colors and 210 premium color options.

Matching Insect Screens

Makrowin also offers aluminum insect screens in matching RAL color options. The screens clip directly to the window frame providing for easy installation and removal.

Premium Alu-Cladding

MW78 is available with the option of aluminum cladding on the exterior, making the windows virtually maintenance free. No thin sheet metal used; our cladding is 100% extruded and all corners are welded for years of water-tight protection.

100% Welded Corners

Our competitors import windows with mitered aluminum corners. This exposes aluminum cuts to corrosion and provides for water infiltration behind the cladding. Our corners are welded, sanded and subsequently powder-coated as a complete cladding frame. This makes for durable cladding, providing our wood windows with years of water-tight protection.

Five Cladding Designs

Not everyone likes their cladding the same way. That is why we offer five different cladding designs. Use Classic or Retro for a traditional look or Quadrat or Integral for a sleek modern design.

Bronze Cladding

Bronze cladding is available for the most demanding customers. This is a favorite option for projects involving places of worship and historic restorations. The cladding is available in natural bronze and patina finishes.

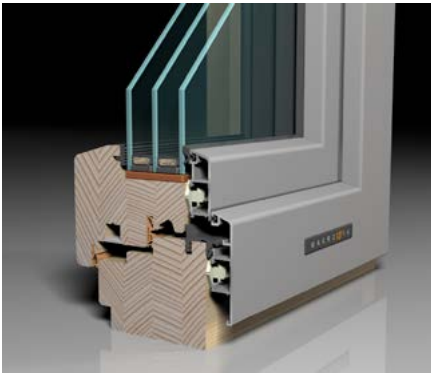


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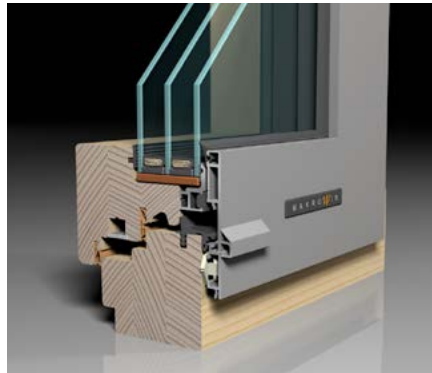


Aluminum Cladding

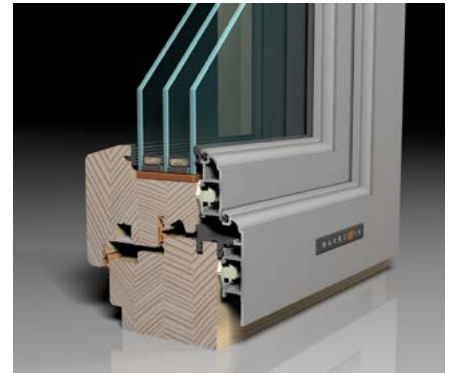
The Ultimate Protection For Wood Windows



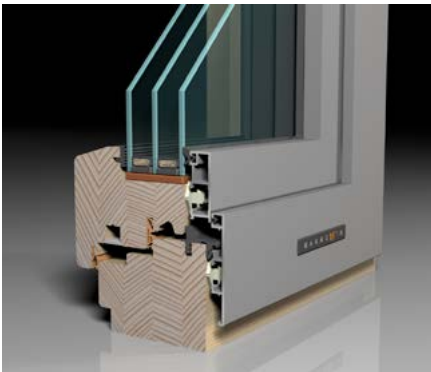
Makrowin MW88 Classic



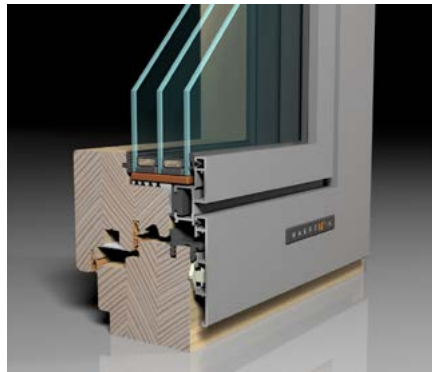
Makrowin MW88 Integral



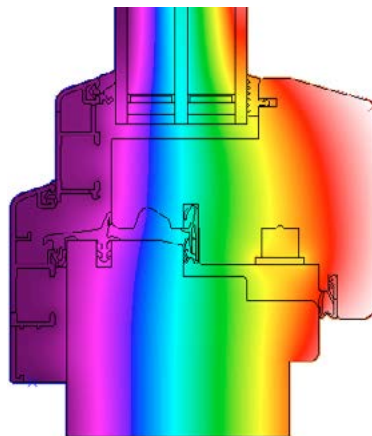
Makrowin MW88 Retro



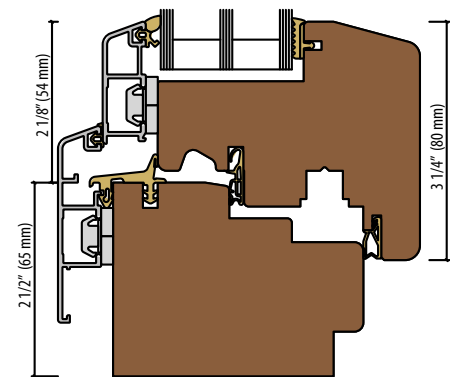
Makrowin MW88 Quadrat



Makrowin MW88 Quadrat FB



Isothermal flow in MW88 Classic



Vertical section of sill in MW88 Classic



Makrowin Entry Doors

Wood is often the preferred material for entry doors. We offer the highest quality wood entry doors on the market. Handcrafted from the finest materials and finished to perfection, these doors become the focal point on each of our projects.

In addition to their high aesthetic quality, our doors rank at the top of energy performance charts, making them a popular choice for Passive House designers. The thickness of the 88 mm sash and frame design enables the use of thick insulated panels for peak thermal performance.



Makrowin Lift-Slide Doors

Lift-slide hardware is the undisputed choice for top quality sliding door manufacturers. Capable of handling ultra large sashes, the system can be used to create openings in excess of 50 ft.

The lift-slide rollers enable easy operation of doors weighing hundreds of pounds. The up and down motion of the sash enables the door to sit tight on its dual gaskets, keeping water and drafts at bay. This creates a high level of comfort in your home and contributes to the overall energy efficiency of the door system.



Makrowin Tilt-Slide, Folding and Inswing Patio Doors

We offer a wide variety of wood patio doors: single and double-sash inswing patio doors, folding patio doors and tilt-slide doors.

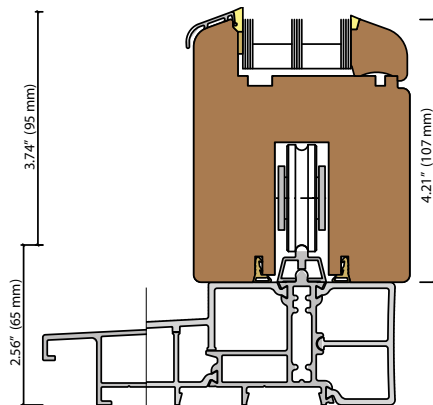
Tilt-slide doors combine the benefits of slide and tilt-turn functions: the door units "float" on ball-bearing rollers and are extremely easy to open and close.

Multi-point perimeter hardware locks the sash on all four sides, providing for maximum security. Additionally, the sliding leaf is secured against being forced open when in the tilt position.

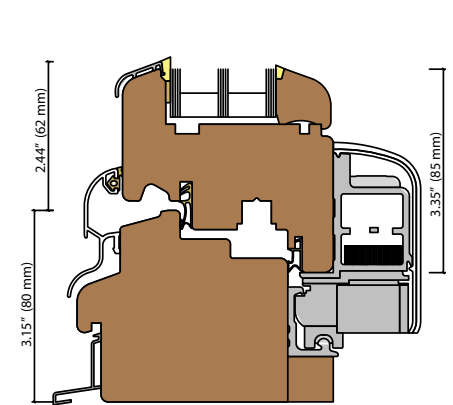
Multi-point locks also provide for the most airtight door sashes on the market, making them suitable for Passive House applications.



Makrowin MW88 Entry Door with Insulated Panel



Makrowin MW88 Lift-Slide Door Section



Makrowin MW88 Tilt-Slide Door Section

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