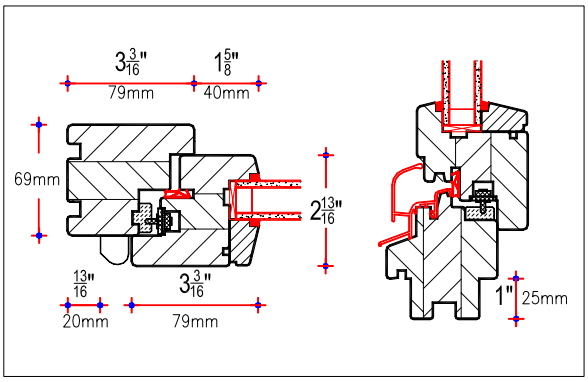
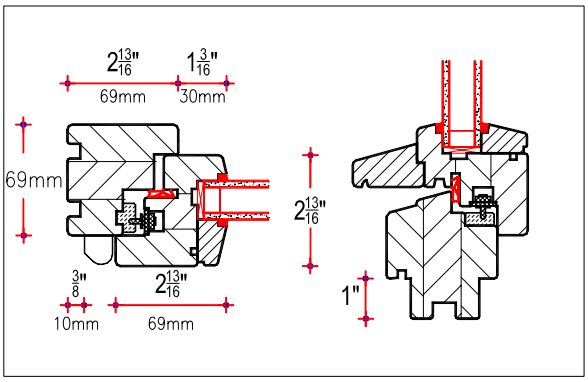
Technical Specifications No. 116

Profiles



Profil IV68 Standard Tilt-Turn Casement with Insulated Glass Unit

- In accordance with DIN 68121 (German Industrial Norms), standard frame components are 3 3/32” (79 mm) wide and 2 23/32” (69 mm) thick.



Profil IV68 Tilt-Turn Casement with reduced-width sash + jamb profile and wood drip sill

- The sash profile width can be reduced to 2 23/32” (69 mm) except aluminum cladded wood components. Window profiles under 3 3/32” (79 mm) however do not meet recommended window construction specifications.
- Window dimensions are taken from the outside edge of the jamb and the axis of mullions, rails, astragals and muntins.
- Dimensions of accessories such as casing or brick moulding, extension jambs and the such will be listed separately.
- Boxes for roller-blinds are not included in the dimensions shown for each item.
- Profiles on the *outer edges* of the frame can be modified.
- Railings, mullion caps, wooden drip sills (on historical designs) and other accessories can be profiled according to construction and design specifications.
- Edges of blunt joints are protected with a joint sealant. An alternative to this is to have grooves milled and caulked at the joint. Color deviations between the caulking and finish coat may occur.
- Profile samples can be sent on request.

Window Hardware

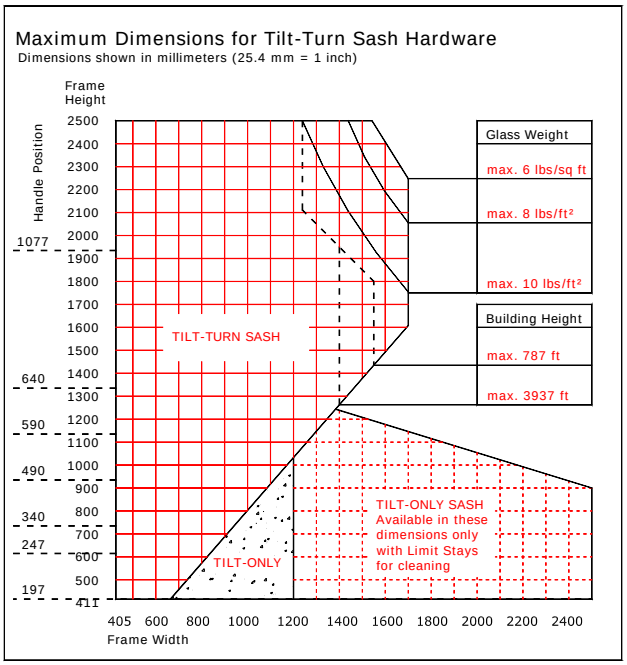
- ROTO NT hardware system or equivalent
- Standard window handle position is in the lower half of the sash. Deviations must be clearly expressed in the order.
- Aluminum window handles and tilt-disengagement-restrictors are included as accessories.
- Silver-color aluminum drip sills with a large rainwater channel are standard for windows (with optional condensation gutter)
- Hinge caps in vinyl for windows are included. Standard color is silver or brown.

Wood Components

- Standard timber is 3-ply laminated vertical grain wood with finger joining for opaque surface coatings and continuous grain jointing (plane jointing) for transparent or clear surface treatments, i.e. transparent stains.
- Excerpt from DIN 18355, 3.2.4: “Finger-jointed wood components (DIN 68140) are only permissible with transparent surface coatings with confirmation of the Customer”
- Visible surfaces are strictly knot-free on both sides.
- Independent from color or surface coating, it is not possible to avoid the appearance of resin when using resin-rich woods. Wood types belonging to this group include Pine, Larch, and Red Miranti. Availability of woods with minimal resin-content is extremely limited naturally and is not warranted against.
- Due to the varying behaviour of wood, the relief-like appearance of annual rings is possible, including at any finger joining.

Maximum Window Sizes

- The following diagram indicates the maximum allowed window dimensions under warranty from the hardware manufacturer for windows with Profile IV 68. These values apply to a single sash.



- Bildau & Bussmann GmbH offers no guarantee for items constructed at larger dimensions than those shown in the above diagram. Please contact Bildau & Bussmann for specific information concerning your window design should it not be represented in the diagram.

Preservation of Window Multi-point Hardware

In order to permanently preserve the hardware's surface quality and to avoid deterioration by corrosion, it is imperative to observe the following points:

- The hardware and/or the rebate areas are to be ventilated sufficiently in particular during the building phase so that they are not exposed either to direct wetness or condensation.
- The hardware is to be kept free from deposits and soiling from building materials (building dust, plaster, cement etc.)
- Aggressive vapors in the rebate area (for example: by means of formic acid or acetic acid, ammonia, amine or phenols, tannic acid etc.) in connection with small formations of condensation can lead to fast corrosion of the hardware. In the case of such aggressive vapor occurring, a general adequate ventilation of the rebate areas of windows and balcony doors is to be ensured. This is particularly valid for windows and balcony doors made of oak or other types of timber with high concentration of (tannic) acid.
- Furthermore no acetic-acid or cross-linked acidic sealing compounds or those with the above mentioned contents may be used, since both the direct contact with the sealing compound and it's vaporisation can attack the surface.
- The hardware may only be cleaned with mild, pH-neutral cleaning agent in diluted form. Under no circumstances may aggressive, acidiferous cleaners or abrasive cleaning agents whose contents are listed in the above paragraph be used.
- In conditions of increased potential of corrosion, we recommend the use of suitable anti-corrosion oil spray for the hinges and multi-point hardware.
- The hardware manufacturer requires that transom windows operated by means of a side-lever are installed with limit stays to prevent the damage of the lower sash through malfunction of the inward-tilting transom.
- Retain all copies of Maintenance and Installation guidelines included with the order invoice for any warranty servicing.

Weathering Exposure Levels for Wood Units

Roof Overhang	Window Position in Opening	Location of Unit: Ground and 2-3 Storey	Free-Standing or Hill-Side or above 4th Storey	Mountaineous or Coastal
long	Recessed	0	0	1
	Flush w/ Exterior	1	1	2
mid	Recessed	1	2	3
	Flush w/ Exterior	2	3	4
short	Recessed	2	3	4
	Flush w/ Exterior	3	3	4

0 = no weathering exposure
1 = low weathering exposure
2 = mild weathering exposure
3 = heavy weathering exposure
4 = extreme weathering exposure

Annual Maintenance Intervals based on Surface Coatings and Exposure Levels

Wood	Softwoods				Tropical and Hardwoods			
Finish Coating	stain		opaque		stain		opaque	
Color Tone	light	medium and dark	light and medium	dark	light	medium and dark	light and medium	dark
Exposure Level								
0								
1								
2								
3								
4								

= 5 Years + (highly recommended)
= 3 - 4.5 years (recommended)
= 2 - 2.5 years (recommended)
= more than every 2 years (not recommeded)
= significantly more often than every 2 years (not permissable under IFT Rosenheim Standards)

Surface Treatments

- Surface coatings will be applied based on item specifications as listed in the order.
- We work with a water-based satin-gloss coating system, Sikkens Cetol WF 955 or equivalent.
- Colorless or lightly-pigmented glazes do not offer the necessary UV protection and are unsuitable for directly weathered areas. Please refer to the above diagrams when making finish coating color decisions
- The surface temperature of dark-coated wood can reach up to 176 degrees Fahrenheit (80 degrees Celcius). The raised temperature of the wood surface results in significant stress on the wood, the construction and the adhesives which can lead to any of the following:
  - Appearance of resin
  - Damage to the finish coats
  - Extreme drying and cracking of the wood resulting in increased moisture absorption
- To avoid damage to the coated surface, we highly recommend following the above guidelines. This includes selecting a suitable surface treatment and adhering to the coating manufacturer's maintenance instructions.
- Wood is a natural product and variations in absorption rates, grain color and characteristics of solid woods can and do effect the final wood color. Different pieces of the same species of wood may have the different color or tone when finished with the same transparent coating. The same transparent coatings show different results on different types of woods. These variations are considered normal and are not cause for replacement. Always request a sample for an accurate example.
- Mortar or cement debris on the wood surface should be avoided and must be removed immediately.
- The thickness of the finish coat must be at least 30 µ in covered areas (weather-strip dado, glazing bed, under the drip sill, etc). This thickness is achieved only after a second coat has been applied.
- Units delivered without the final finish coat must be finished within 4-6 weeks after *departure* from the factory. The final coat must have the following thickness:
  - Transparent finish coat: 80-100 µ
  - Opaque finish coat: 100-120 µ
- We cannot guarantee the durability of wood components finished, stained or painted by anyone other than us.

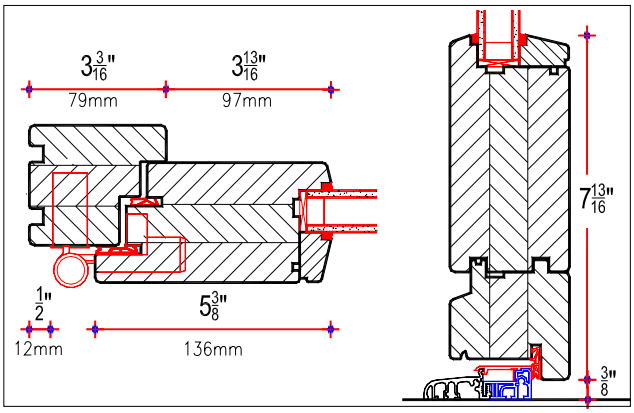
Glazing

- Our standard Insulated glass units have the following performance values:

SGG Climaplus N... Ar	
Thickness	4 / 16 / 4 mm
U-Value	0.21
Inert Gas	Argon
Weight	4.1 lbs/sq ft (20 kg/sq m)
Light Transmission	79 %
g-value	63 %
b-factor	0.79

- Dual-glazed units are available with an U-value of 0.17 on request
- Triple-glazed units are available with an U-value of 0.08
- Specialty glazing, including ornament glass, could exhibit different actual performance values.
- Partial shade cast on glass surfaces can lead to inconsistent surface temperatures which may result in glass breakage or other glass damage.
- Materials used for glazing have their own color based on the raw materials. Slight color variations in glazing components can occur.
- Imperfections on the glass surface in addition to light dents or unevenness in the glass spacer bar are possible.
- Possible damage or imperfections in the insulated glass units must be reported within 4 months of delivery.
- Immediately remove any plaster or mortar or similar debris that may land on the glass surface during installation.
- Never use water with high-alkaline content or acidic agents or sharp-edged instruments/tool to clean glass.
- In locations with high levels of humidity, the appearance of mould particularly at the caulking grooves can occur. This does not constitute a claim under warranty. Prevent the potential appearance of mould by keeping these areas dry and well ventilated.
- With insulated glass, it is possible under specific circumstances that spacers built into the IGU can begin to rattle or appear to cling to the pane.
- The manufacturer should be consulted if the insulating glass is to be installed in areas located above 1625 ft (500m) above sea level. This also applies to elevation changes that exceed 1300 ft (400m) during transportation.
- Installation of capillary tubes in Insulated Glass Units may affect the effectiveness of the inert gas
- Fogging of insulated units manufactured with capillary tubes may occur.
- Units manufactured with capillary tubes incur an upcharge per glass pane.

Exterior Doors

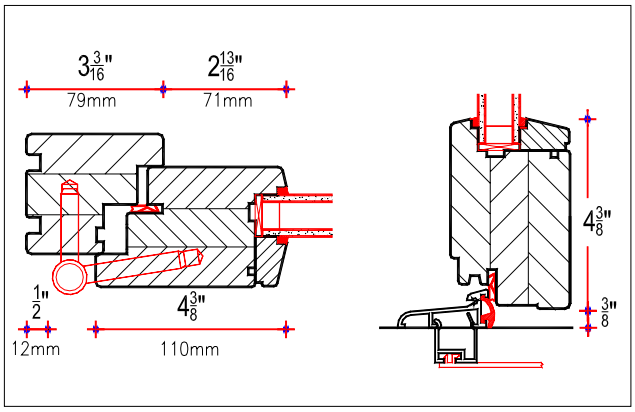


Entry Door technical details:

- Stile + Head Rail Width: 4 ½" – 5 3/8"
- Mitred panel joinery
- Mortise Case: 65/92/20/10 mm
- Adjustable Striker Plate
- 3-way adjustable heavy-duty BAKA hinges or equivalent
- Inswing Door sill: *Eifel*-style
- Surrounding weather-stripping on four sides at leaf/frame interior rebate
- Interior interlocking weather-stripping at sides and head

- Entry doors with multi-point lock systems should be bolted during the night to prevent any potential of door panel warpage.
- The varying of temperatures seasonally affects the moisture content of wood and the ability of panel components to maintain their form. This may lead to changes in the functioning of the multi-locking hardware components. To help prevent this, our entry doors are manufactured with aluminum-reinforcements in the bolt-side stile.
- Exterior doors with a metal sill are limited in their protection against driving rain conditions. The addition of a wood drip sill at the lower rail can improve protection. Nonetheless minor water leakage in storm conditions with driving rain and high winds cannot be 100% avoided.
- We recommend an additional wood drip sill for entry doors installed where they are exposed to extreme conditions. An alternative is for doors be installed in covered areas.

French Doors



French Door technical details:

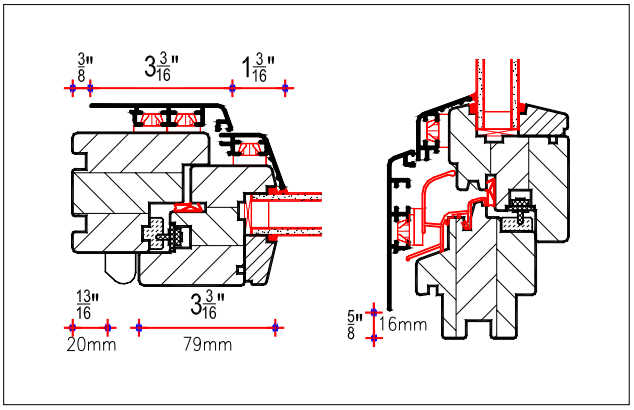
- Stile + Head Rail Width: 4 3/8"
- Double mortise-tenon joinery
- Mortise Case: 50/92/16/10 mm
- Adjustable Striker Plate with U-profile
- Single-Bore Hinge *BAKA C1-20* or equivalent
- Inswing Door sill: *Weser*-style
- Interior interlocking weather-stripping on all four sides

- The same recommendations apply to French Doors as given for Entry Doors
- Due to seasonal influences on wood, we highly recommend ordering aluminum-reinforced door stiles.
- The smaller stile profile (width) of French Doors requires trim with a backplate width no greater than 1 ¾ in. wide (44mm)

Installation of Exterior Doors

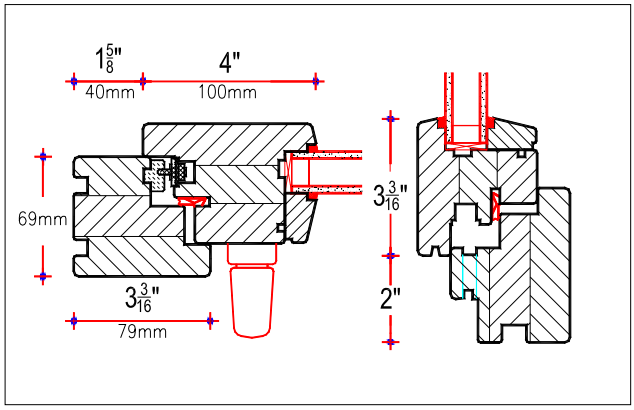
- Please follow these recommendations for proper door installation:
  - remove door panel from frame
  - install, adjust and fix the door frame in the wall opening, making certain the hinge side is plumb and level
  - secure the upper side of the bolt-side of the door frame in the wall opening
  - hang the door panel
  - bring the door frame on the lock-side in alignment with the door panel. This may mean the frame on the bolt-side may not be fixed perfectly plumb.
- Storage of doors must at all times be upright prior to installation. NEVER lean any other units against an uninstalled door.

Aluminum-Clad Wood Products

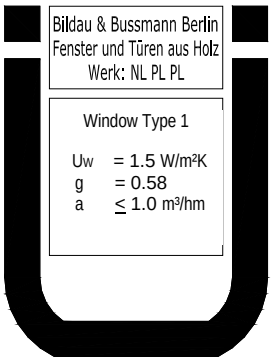


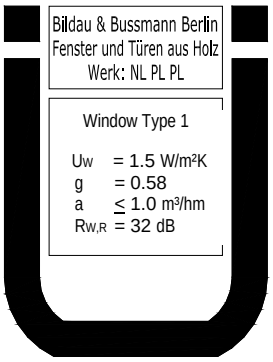
- System AltoNova from the G.S. Stemeseder company.
- Electro-statically applied enamel or anodized coatings in accordance with RAL color standards.
- The aluminum cladding extends up to 1/2” from the edge of the window frame.
- This distance can be changed to these measurements:
  - sides and head : 3/8” or 1 ½”
  - bottom : 5/8” or 1 ½”
- Aluminum cladding at sides and head can also extend to the edge of the frame if requested.
- Alternative styles and methods of construction are possible upon request.
- Corners of aluminum profiles are connected at diagonals for rectangular items and are welded for arched or bowed items

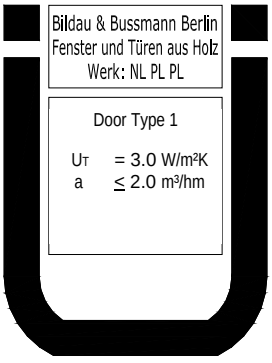
Outswing Windows



- Outswing windows do not meet DIN weather-tight requirements and are only minimally suitable for driving rain conditions.
- Sash stile width on the handle side is at least 3 15/16” (100mm). This applies to AWNING units as well.
- Standard single-bore hinge system is BAKA MSTS C1-15 or equivalent.







Labeling

- Wood windows and doors belong to Building Materials as listed in Building Regulations List issued by the German Institute for Building Technology (Deutschen Institut für Bautechnik - DIBt).
  The labeling of the U-Value follows proof of conformance of the windows and doors with the published technical values.
- The given values are the results of testing and calculations based on specific standards and are not to be assumed as certified characteristics for individual instances.
- The established performance values for a standard tilt-turn window unit are as follows:

  U_W = 1.5 W/m²K (0.26 US)
  g = 0.54
  a ≤ 1.0 m³/hm
  $R_{W,R}$ = 32 dB
  These values are based upon glazing with the following values:
  U_G = 1.2 W/m²K (0.19 US)
  $R_{W,R}$ = 32 dB

Physical Units used for Labeling

- **U-Value**
  The heat transfer coefficient or U_W measures heat loss through all window components from the interior to the exterior in watt per m² Kelvin (W/m²K). Rate of heat loss is inversely related to this value.
  The U-value for the complete window U_W represents the combined heat insulation characteristics of the glass U_G, the frame U_F as well as of the glass edge zone ψ (Psi).

- **g-Value**
  The g-value expresses the fraction of the total infrared energy incident on a window that is transmitted from the exterior to the interior.
  The higher the g-value the more energy is being gained from the exterior to the interior.

- **a-Value**
  This is the air and water infiltration coefficient. It expresses the permeability of the window by cubic meter of air (m³) per hour (h) per meter of sealed joint (m) with 1 Pa of differential pressure between the interior and exterior of the window.

  In case of buildings with no more than two full storeys the a-value shall not exceed 2 m³/hm.
  In case of buildings with more than 2 full storeys the a-value shall not exceed 1.0 m³/hm.

- **Sound Insulation Value R**
  The sound insulation value $R_{W.R}$ represents the sound insulation properties of the window components. The larger the value the more effective the sound insulation.

Production Times In weeks based on prodcut type and style		Style						
		Flat		Geometric Flat-Arch Full-Arch		Ellipse	Aluminum Clad	
Wood Type		Pine/ Mer.	Other	Pine/ Mer.	Other	All Woodtypes	All Woodtypes	
							In-swing	Out-swing
Product	Windows	3	4	4	5	5	7	9
	Exterior Doors I	4		5		6	7	9
	Exterior Doors II *	5		5		7	-	
	Historical Windows	5		6		7		
	Bifold Door	4	5	Sliding or Folding Doors not available with arch or ellipse			7	-
	Tilt-Slide Doors	4	5				7	
	Lift-Slide Doors	4	5				7	

Notes:
Two-color Finishes (except Aluminum-Cladding)
- Production time increases 1 week
Entry Door II (one or more options):
- profiled glass stops
- French-style profiled stops
- Solid wood panels

Production Times

- These production time estimates are only for reference and can vary from project to project. Please inquire with Bildau & Bussmann directly for specific production schedule information.
- Production times for projects that include non-standard materials or components are dependent upon the delivery times for the respective materials.
- Estimated production time for an entire production order is based on the most-time consuming component of the production order.
- Production can begin only after the clarification of all technical and payment details.
- Changes made by the Customer after confirmed production orders have already gone into production will affect any completion or ship date listed in the order confirmation.

Care and Maintenance

- Manufacturer instructions for the care and upkeep of the elements are included in the final invoicing.
- The responsibility of regular upkeep and maintenance of the elements per manufacturer's instructions begins immediately upon acceptance of delivery.
- In particular, the regular care and maintenance intervals of the surface coating are to be observed and followed per the coating manufacturer's instructions.
- Not following maintenance and care instructions can lead to the termination of the warranty and product liability requirements.

All products with defects present at time of delivery are covered by our unlimited guarantee for a period of (5) five years.

We advise following these specifications. Furthermore we recommend adhering to the maintenance guidelines of the hardware

manufacturer in order to avoid damage to the hardware components.

Information Concerning Wood Products

- Windows and doors in wood have the ability to absorb and release moisture.
- Prior to installation it is recommenced to measure and record the room temperature and humidity conditions.
- Warping or complications due to disformation may occur if humidity exceeds 40% where wood units are installed. This is also true of doors located near heat sources.
- Wood window and door units manufactured by Bildau & Bussmann have an average moisture content of 13% +/- 1.5% at time of production
- The recommended moisture-content for interior-installed products based on room temperature is 9 – 11% as shown in the table below. Exterior windows and doors will have a higher moisture content because they are in direct contact with external elements.

Fahrenheit		50°	59°	68°	77°	86°
Rel. Humidity %	70%	13,2	13,1	13,0	12,8	12,4
	60%	11,0	10,9	10,8	10,5	10,3
	55%	10,1	10,0	9,9	9,7	9,4
	50%	9,4	9,2	9,0	8,9	8,6
	40%	7,8	7,7	7,5	7,3	7,0