

# Technical and safety information (Updated: January 2023)

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## 1. Safety instructions

### 1.1. DANGER OF FALLING

When the window is open, there is a risk of falling. Here pay special attention to children! Insect screens are not suitable as fall protection. However, children often cannot realize this. **Never leave children unattended when the window is open!** We recommend lockable window handles, which can also be attached later.

### 1.2. TILT SASH WITH MOTOR

If the upper edge of a tilt sash with motor is located below a height of 2.5 m over the standing surface, there is a risk of injury and death if getting caught in the gap between the frame and the sash during motorized closing.

Do not attempt an automatic control in such cases. The switch must be located in the line of sight of the tilt sash, and in this case only those switches are permissible that stop the closing process as soon as the switch is released.

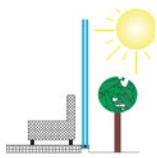


## 2. Glass

### 2.1. GLASS THERMAL STRESS BREAKAGE

The use in certain situations, specially in case of large-area glass panes, can give rise to uneven heating with temperature differences of above 40° C in the glass. This can result in a thermal stress breakage in case of normal glass which does not constitute a product defect.

#### Hard shadow



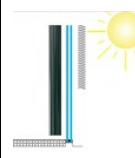
Always keep a distance of at least 20 cm between full-surface objects (upholstered furniture, plants, curtains, etc.) and the glazing, inside and outside.

#### Heating sources



Between heating sources and insulated glass, a distance of at least 30 cm should be maintained. If TSG is used, the distance to the glass pane can be reduced to 15 cm.

#### Shading



For shading systems (inner and outer), only partially cover the glass surface. Partial shading can lead to glass breakage.

By ordering the TSG / PTG glass you can largely prevent thermal stress breakage and increase the durability and use safety of your glass surfaces with comparatively little cost. Unfortunately, in case of TSG unavoidable, tiny and undetectable inclusions (Nickel sulphide inclusions) in the basic glass during the glass production sometimes result in glass breakage without external influence for which Josko is not liable. This risk can be minimised during glass production by means of a "Heat-Soak-Test" for an extra charge. This reduces the structural glass breakage risk to a breakage per 400 tons of basic glass, but even then, it cannot be fully excluded, which also excludes Josko liability (Surcharge on request).

### 2.2. RIPPLE AND ANISOTROPIES IN CASE OF TSG AND PTG

Since the glass is placed on rollers during the TSG and PTG production, slight surface changes may occur. This ripple is physically unavoidable and does not constitute a ground for complaint.

In the course of the tempering process, stress fields are generated in the glass which under certain circumstances are visible as superimposed light waves, "anisotropies".

When ordering large number of the same glasses a few façade glass manufacturers can reduce anisotropies by adjusting the production parameters during processing of production batch. However, this is not feasible because of the small number of the same glasses, standard market delivery times and cost efficiency in the window industry.

Any occurrence of anisotropies in TSG and PTG therefore does not constitute a ground for complaint (see EN 1279-1 and EN-12150-1).

### 2.3. ALL-GLASS JOINTS AND ALL-GLASS CORNERS

Exposed spacers of insulating glass are usually covered on the weather side with an aluminium profile or an enamel layer. On the room side, the visible spacers have optical features such as air pockets, layer residues, splitting, colour differences between spacers and insulating glass sealants and deviations of the parallelism. These optical features are state of the art and do not constitute a ground for complaint. As a remedy, we can also enamel the glass edges on the room side with a special procedure for several glass types upon request. Surcharge for "TEA enamel outside and inside" upon request!

In planning, attention must be paid to an increased heating effect with All-Glass Joints and All-Glass Corners, as well as in general against large glass surfaces in order to reduce the risk of condensation.

### 2.4. OPTICAL DIFFERENCES IN INSULATION GLASS

For technical, economic and logistical reasons different glass types, glass thicknesses, positions of glass coating, etc. are used which can result in colour differences.

The different coatings can result in differences in colour impressions in the exterior view between normal glasses and TSG / PTG glasses in cloudy skies.

Also, for technical reasons (e.g. Structural, fall protection) different single glass types might be needed. In case of side-by-side insulating glass panes this can result in different colour impressions in the exterior view when in cloudy skies. Such differences do not constitute a ground for complaint.

## 2.5. ONE-WAY MIRROR GLASS AND SUNSILVER GLASS

“One-way mirror glass” is an umbrella term for a highly reflective coating on float glass. This intense mirroring greatly darkens the interiors. That is why often interior artificial lighting is required.

Due to this darkening and mirror reflection, the view from light to dark is clearly limited (privacy screen). This privacy protection works, however, only from bright to dark: If the light is on the inside at night, there is no privacy protection from the outside. One-way mirror glass also has a sun screening effect and therefore a lower g-value.

“SUN silver glass” has a highly reflective, silvery coating with a similar effect.

Through these special highly reflective coating small flaws like little scratches or lints, dirt, etc. are optically highlighted. Defects that are permitted by the standard, are distracting due to the strong mirror reflection.

Spot defects as local deposits or local layer chipping in the hardening process are partially unavoidable and up to the adjoining size/accumulation permissible. According to the manufacturer's guidelines, linear defects or scratches up to 20 mm in length up to 2 pieces per m<sup>2</sup> are permissible. In addition, due to the unavoidable deflection of the insulated glass panes, the reflection appears ‘skewed’ in the view. There may be deviations in the colour shade when reordering as well as within the ordering process. We cannot prevent these effects and they therefore do not constitute defects.

Fehlergröße	Fehleranzahl
$\varnothing \leq 0,3 \text{ mm}$	Keine Einschränkung
$0,3 < \varnothing \leq 1,0 \text{ mm}$	Max. 10 Fehler pro m <sup>2</sup> . Keine Nestbildung*
$1,0 < \varnothing \leq 3,0 \text{ mm}$	Max. 1 Fehler pro m <sup>2</sup> . Keine Nestbildung*
$\varnothing > 3,0 \text{ mm}$	Keine erlaubt

\*Nestbildung: Mehr als 4 Fehler innerhalb eines Kreises mit Durchmesser 20 cm

## 2.6. FIRE RESISTANCE GLASS

Due to the special manufacturing process for fire-resistant glasses (special gel fillings), significantly more and larger optical blemishes are unavoidable and permissible for production-related reasons. The assessment is not made on the basis of the general glass guidelines, but rather the special manufacturer guidelines. Among other things, these stipulate that fire-resistant glass must be assessed at a viewing distance of 2 m. The following points are only extracts from the manufacturer's guidelines, without claiming to be exhaustive.

In the case of fire-resistant glass, dot-like blemishes (e.g., the formation of bubbles) can be visible in the fire-resistant gel between the panes. These are only permissible for fire resistant glass in both the edge and the main zone up to a maximum size of 3 mm.

There is no visual assessment of blemishes in the rebate zone, i.e. this zone is excluded from the assessment for fire resistant glass.

Depending on the production, the closure of the filling opening for the fire-resistant gel may be visible a few millimetres on a glass corner.

Depending on the production process, individual micro-bubbles up to approx.  $\varnothing$  0.5 mm can appear in the fire-resistant gel. These cannot be avoided, but are usually not visible when viewed in accordance with standards.

Increased ambient temperatures (e.g., heating, direct sunshine, etc.) can lead to cloudiness in the fire-resistant glass, which is visible regardless of the respective light and viewing conditions.

Fire resistant glass must be stored in such a way that it is only exposed to temperatures between a maximum of -10° C and + 45° C (including during the construction phase). If the glazing is carried out on site, the fire-resistant glass must be stored protected from the weather (rain, snow, sun), as otherwise the fire-resistant gel may react. The pane must not be placed with the inside in the sun, even during installation.

Fire resistance glasses that are exposed to the sun must not be covered on the room-side by internal Venetian blinds, heavy drapes, etc. Room temperatures of >28°C must be reliably avoided! Heat sources (including lamps) must have a distance of at least 1 m to the fire-resistant glass. This can lead to heat build-up and the fire-resistant glass reacting (the formation of bubbles)!



## 2.7. FULL-SURFACE ENAMELLED GLASS FOR ENTRANCE DOORS

For technical reasons, the manufacture of full-surface enamelled glass is possible only in limited optical quality.

Due to the burn-in process in the furnace, there appear bright points on the surfaces and in edge area, bright spots in the corners and small see-through holes in the enamel paint. Unfortunately, it is not possible to prevent or exclude these characteristics and therefore they do not constitute a ground for complaint.

## 2.8. LSG FROM PTG

Due to structural requirements LSG made of PTG might be necessary for some windows and doors. For technical reasons the manufacture of these glasses is possible only in limited optical quality.

We would like to point out that only general glass standards are consulted for the visual assessment of the glass defects and that we are not liable for a higher standard than the one specified therein.

## 3. Alu surfaces

### 3.1. ANODISED ALU-SURFACES

Anodising is an electrolytic process that creates an oxide layer on the aluminium surface. This oxide layer is reinforced by over a hundred times compared to the naturally formed layer. This ensures resistance to the effects of the weather and also to attack by chemical exposures. In addition, the metallic character of the profiles is preserved for a long time.

Following optical features are typical for this method, cannot be excluded and do not constitute a defect:

#### Anodised stripiness in profiles

Due to the transparent oxide layer, structural differences in the aluminium that arise as a result of the pressing process can be seen in the form of vertical stripes. (Fig.1)

#### Thread-like strips in sheet metal (for entrance door cover or fillings)

Occasionally, after the anodising process, "material cracks" in the form of thread-like stripes can be seen that cannot be removed. In case of "natural anodised" the stripes appear dark; with the other anodised colours they appear as light stripes. (Fig.2)



Fig. 1



Fig. 2

## 4. Wood surfaces

In times of high humidity during the construction phase you must permanently ventilate to avoid condensation on the glass. Nevertheless, occurring condensation must be wiped off completely several times a day.

If the high building moisture (plaster and screed works) occurs in the cold season even permanent ventilation is often unable to prevent the formation of the room-side condensation.

Oak is due to its open porosity very sensitive to moisture. It can only be used when there are special requirements on site against water deposits of several hours on the surface. Support a quick drying by using dehumidification systems, especially in the cold season!

Direct contact between the wood surface and plaster/screed material must be avoided at all costs. Use plaster connection profiles that avoid masking to the wood surface when plastering and completely cover the wood surface during plastering/screed work. Be sure to point this out to the plastering/screeding company.

#### 4.1. (HAND) OILED WOOD SURFACES

(Hand)oiled wood surfaces with their special raw materials, the smaller layer thickness and the irregular paint application with brush strokes when hand-oiled, give the wood its natural look and slight roughness.

The grain, absorption and shade vary depending on the location of the tree and the point on the trunk from which the wood was cut. This makes the wood look lively and pleasant. Larger surfaces of some products are manufactured using veneering technique. This traditional handicraft technique also creates variations in growth and grain.

The parts merge with their natural differences in Josko solid-wood processing. Colour and growth differences are not discarded, but are rather desired features of the natural material wood that make our hand-oiled surfaces so popular. The various lighting in the completed building (artificial lighting, horizontal or vertical position, shadow impact) allow for a nuanced surface appearance.

Structural differences between house and interior doors can be reduced on request at extra cost by processing veneer from the same log.

All the described properties make the (hand)oiled windows and doors into one of a kind and do not constitute grounds for complaint.

(Hand)oiled wood surfaces do not comply with ÖNORM B 3803 in respect of layer thickness and UV protection. The dimensional constancy of the thick layer glazed is not achieved and they are therefore especially sensitive to moisture. They can only be used only if special precautions have been taken by the customer in order to **protect against exposure to high humidity during the construction phase.**

#### TAKE SPECIAL CARE DURING THE CONSTRUCTION PHASE

##### Interiors

Hand-oiled surfaces are particularly sensitive to moisture. They can only be used if special precautions have been taken by the customer to protect against water deposits on the surface lasting several hours.

##### Exteriors

Oiled surfaces are only to a limited extent suitable for exteriors.

The (hand)oiled wood surfaces N07 nature, N08 beach and N09 white heaven, N13 pearl grey, N14 bog-look Oak nature and N16 black pearl should usually be used only in installation positions protected against driving rain.

All other (hand)oiled surfaces approved for the exteriors are suitable only to a limited extent for installation exposed to driving rain.

Close to the ground level and above the outside window sills, the splashing water can lead to the occurrence of spot mould discolouration, which does not pose a threat to the wood, but can at best be perceived as visually disturbing.

Oil has only a limited effect in the pore area of the oak wood. In combination with the wood material of the oak, this results in a few millimetres wide irregular black discolouration around the wood pores, particularly in the lower window/door area, which can also be perceived as visually disturbing. With more intensive exposure to water the brownish tannic acid is washed out!

The external natural greying of the wood starts from the time of installation. Due to the different weathering intensity on windows and doors, the lower thirds of which are much more heavily weathered, while the upper part is normally better protected from the effects of water by the installation depth, uniform weathering cannot be achieved.

Due to the exposure to sunlight and rain the oil is degraded and the surface must therefore be maintained once to twice a year with ADLER Pullex wood oil depending on the intensity of the exposure to weather conditions. For this purpose, the product is applied thin with a cotton cloth. If the follow-up care is neglected and wood is partially grey and/or infected with wood-discolouring fungi, the restoration of a visually even surface is very difficult and no longer possible with a colourless oiled surface.

#### 4.2. IMPREGNATED WOOD SURFACES A00, D00, G00, N00

On the weather side, these wood surfaces do not yet offer any protection against sunlight and weather conditions. Without surface treatment weathering and greying and subsequent deterioration of the wood surface may already appear after a few weeks. Window- and door sash exposed to driving rain may be permanently deformed due to exposure to damp, on account of which their operation may become difficult.

There is no warranty for these consequences of surface treatment that was not carried out immediately. To maintain your warranty rights under the guarantee it is absolutely essential to coat the impregnated delivered window with suitable paints immediately after installation.

Since in the realm of silicone sealing a reduced absorption on-site of the final application is to be expected, we recommend you to align the impregnated colour shade with the final colour shade, through which colour variations in the realm of silicone sealing are reduced.

## 5. Installation and general planning topics

### 5.1. IMPERMEABILITY OF BUILDINGS

The modern, energy-saving construction methods result in lower air exchange rates in the buildings. Usual ventilation practices often provide insufficient air flow as a result of which condensation, moisture damages and mould growth can occur even with normal usage. Even low-temperature heating system (e.g., underfloor or wall heating) particularly if they are not installed close enough in the area of the external walls (building shell), can result in condensation in the window area even with normal living space usage.

Therefore, we recommend an immediate planning and preparation of a heating and ventilation concept for every new building and for each renovation. This makes it possible to reduce or completely avoid the occurrence of structurally unavoidable condensation on windows and doors. The heating and ventilation concept must be drawn up by a specialist who takes into account not only the thermal insulation values of all building parts but the air exchange rate of the entire building and the intended use. Whoever prepares the heating and ventilation concept must also be familiar with the thermal insulation values and structural properties of your JOSKO windows. Therefore, we recommend that you pass on the order documents.

Room air moisture must be kept under 55% rel. air humidity at all times, otherwise damages to the window elements cannot be excluded.

In addition, we recommend the following measures in order to avoid or reduce the condensation build-up, especially in fitting rebates:

- Correct and periodic intensive ventilation.
- Avoiding overpressure in the building (in air-tight buildings the overpressure arises in the upper floors due to thermal buoyancy of the warm air. This can be avoided by a correctly mounted and adjusted ventilation system).
- The best possible air circulation in wind area. Deep window reveals, screens, inner blinds and windows obstructed by objects (e.g. Plants) restrict the warm air flow of the windows.
- Regular maintenance and adjustment of windows if needed, regular cleaning of the windows.

In case of deep window reveals e.g. seat window sills or corners, in which in combination with the low temperature-heating systems poor air circulation is to be expected, we recommend the supply of heat using appropriate conducting materials or mounting heating systems directly on the window or in the reveal. Your Josko expert consultant would be happy to inform you.

Condensation can also occur on the external side of modern glazing and building components. This is a sign of particularly good thermal insulation.

### 5.2. GENERAL INSTALLATION NOTES

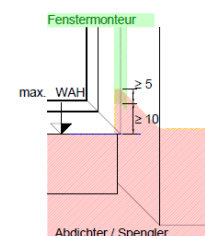
When installing windows and exterior doors an air-tight sealing must be created on the room side and a driving rain and wind-proof sealing on the weather side. In the absence of these seals possible building damages and therefore impairment of the indoor climate is to be expected.

If installation is commissioned, this will be carried out in accordance with ÖNORM B 5320 (Edition: 01/10/2020) Item 5 **"Standard Window Connection"**, unless agreed otherwise. The window connection will be carried out in accordance with Item 4.1.1 of this standard (mounting of the window elements, joint filling, inner and outer sealing).

If a construction connection is required in accordance with ÖNORM B 5320 (Edition: 01/10/2020) Item 6 **"Building-specific window installation"**, a fully planned construction connection in accordance with Item 4.1.2 of this standard must be prepared by the planning manager (Building contractor, Planner,...), so that the responsibility for the respective measures and a corresponding price can be determined. This includes the installation of windows in the area of the insulating layer or a barrier-free execution in accordance with ÖNORM B 1600.

The lower, external driving rain-tight connection for floor-to-ceiling windows and door elements do not replace the sealing as defined in ÖNORM B 3691 and ÖNORM B 3692 (Flat roof or building waterproofing). This driving rain-tight sealing with a lateral elevation of 10 cm is dispensed with in the course of the installation as this can at times impeded the work of the subsequent works. This at times water-proof sealing is not included in the scope of the offered installation service, it must be created as soon as possible by subsequent works (sealer, plumber) and must be ordered separately by the customer. Until the final water-proof sealing, including the connection to the window elements, this connection is also not driving rain-tight. There might be water ingress within this period.

Schematic representation of the exterior driving rain-tight sealing by the window fitter and the occasionally backwater-tight sealing by the subsequent works, sealer, plumber.



(Source: Building waterproofing Directive - Connection to floor-to-ceiling windows and doors - Part 2 Execution, Item 3.2)

When replacing a window, the driving rain-tight level is connected to the facade (e.g. External plaster). Connections to the flat roof or building waterproofing or to the windowsill must be remade.

### 5.3. MEASUREMENT AND INSTALLATION

A mandatory and irrevocable meter marking (Marking 1000 mm above the upper edge of the finished floor) must be attached in every floor. Construction site access roads must be passable for 24-ton trucks, no liability is assumed for damages to insufficiently paved roadways.

At the request of the client the Josko elements can also be produced without the actual measurements. The measurements specified by the client must be basic dimensions (= minimum dimensions of the wall opening). This means that undershoot of the notified dimensions is not permissible; the overshoot is permissible within the usual tolerances. The client assumes the risk for the compliance with the agreed measurements.

### 5.4. CONDITION AND DEFLECTION OF THE BUILDING STRUCTURE

The building structure must be able to support the loads introduced through windows and doors and allow for a sufficient fixing.

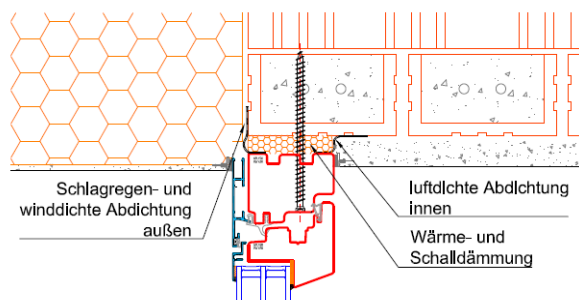
The surfaces of the adjoining components must be created as even, stable, not-sanded, dry, crack-free (hair-line cracks of up to max. 0.2 mm are permissible) and suitable for the connection of the sealants used. Attach a smooth mortar if needed. This must have the depth of the window frame profile and exceed it on both side by at least 6cm and have a grain size of max. 1.5 mm. The smooth mortar might be required in the reveal and/or on the external surface of the building. The cavities in the balustrade and lintel area (e.g. Perforated bricks) must be closed in order to prevent harmful convection in this area.

Please note, that the deflection of lintels, supports and ceilings, which arises after the installation of the window in the area of our components may be a max. 3 mm. Should this value be exceeded, the ordered will be responsible for the ensuing impairments and damages (e.g. breakage of glass, etc.). For spans > 3 m, the actual measurements can be carried out only after a period of 14 days following the removal of the shuttering props. Otherwise, functioning will be impaired or damaged.

### 5.5. EXTERIOR WEATHER-PROOFING

Weather-side sealing between window- and door elements and the wall structure must be water proof. The windows must be protected against water ingress during the construction phase, particularly in the case of shell-construction-flush or pre-assembled installation or in case of pre-assembled sunscreen boxes these must be sealed towards the shell-construction against water ingress.

The standard window connection may be exposed to direct weathering for a maximum of 2 months. The client must notify if the standard window connection is not covered with a façade system within a period of 2 months. Appropriate measures must be taken e.g. temporary protection for the standard window connection or suitable material choice, which allow for prolonged exposure to weathering.



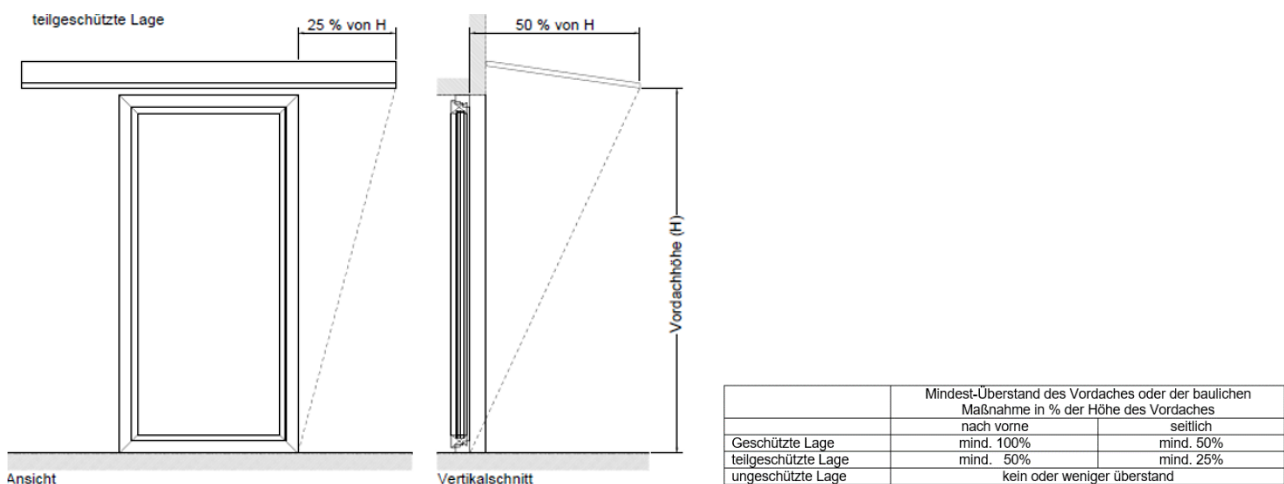
### 5.6. CONNECTION OF THE GROUND-LEVEL WINDOWS AND DOOR ELEMENTS

Increasingly, the extreme weather conditions require planning measures in order to drain large water quantities in a controlled manner. The connection of the ground-level windows and door elements e.g. patio doors, sliding doors, fixed glazing, require an immediate planning and in certain circumstances a protected installation position as well.

Entrance doors - due to their low threshold - are only protected against driving rain to a limited extent. By installation in west-facing facades they should, therefore, urgently be at least partially protected against driving rain, through construction measures such as porches or a set-back facade. Two-sash entrance doors can be used only in protected locations.

In accordance with ÖNORM B 3691 "Planning and execution of roof waterproofing", the connection of ground-level windows and door elements, both under porches (protected or partially protected installation position) as wells in case of unprotected installation positions, can be created barrier-free with careful planning and execution.



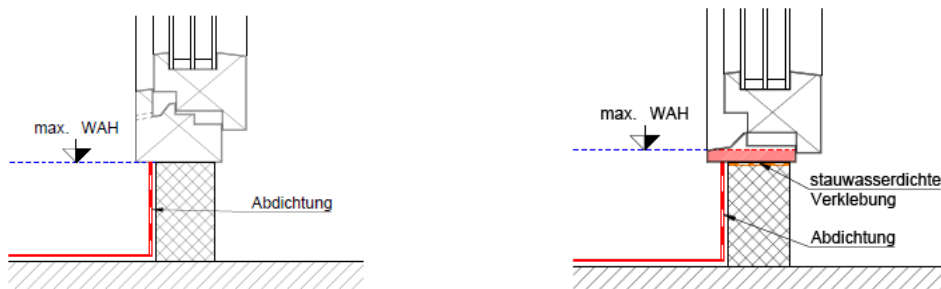


The schematic representation of a partially protected position definition of the installation position (Source: ÖNORM B 3691)

(Source: Building Waterproofing Directive - Connection to floor-to-ceiling windows and doors - Part 1 Planning)

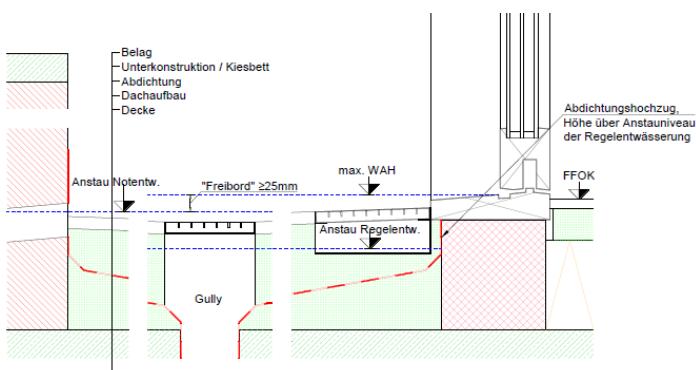
**TIP:** For this, the "Building Waterproofing Directive - Connection to floor-to-ceiling windows and doors" - Part 1 Planning and Part 2 Execution, is a particularly helpful tool. <https://www.fenster-plattform.at/fensterratgeber/>

This refers to a **standard installation** (the maximum water accumulation level "max. WAL" corresponds to the upper edge of the sealing elevation) and a **deepened installation** (under certain circumstances the max. WAL may be over accumulated for "short-term"). If a deepened installation is required due to the installation situation, this requires a particularly careful planning as well as cross-works coordination and execution. **Here particular attention must also be paid to the couplings and joints between the combined windows and door elements, this is also the case for the transitions of driving rain and water-tight waterproofing levels.**



Schematic representation of a standard installation Schematic representation of a deepened installation

(Source: Building Waterproofing Directive - Connection to floor-to-ceiling windows and doors - Part 2 Execution)



Schematic patios and waterproofing structure (warm roof structure)

(Source: Building Waterproofing Directive - Connection to floor-to-ceiling windows and doors - Part 1 Planning)

For FixFrame and FixFrame ONE we offer an elegant solution for sliding doors, fixed glazings and patio doors. A special shaft ensures comfort in combination with barrier-free living experience but does not comply with ÖNORM as the depth is 1.5 cm too small. The version with this drainage shaft was successfully tested based on the ÖNORM B 5321 and the Building Waterproofing Directive Part 2.

The planner and executor must check and decide for himself whether the accepted part is suitable for his respective application in every respect. We do not assume any liability for on-site requirements and circumstances and the performed installation variants!

Contrary to the very generous tolerances of the ÖNORM DIN 18202 the screed and floor laying works in the area of the sliding door thresholds and Isostep floor thresholds must be carried out with significantly lower tolerances, so that doors can be opened without impairment even with lower threshold heights.

## 5.7. EXTERNAL WINDOW SILLS

The transition for the external window sill must be made permanently water tight. **The building contractor is obligated to forward our instructions to the window sill fitter.**

The sealing of the window sill towards the window must be done:

- By the window fitter; if the windows are installed after the external window sills have already been moved (e.g. in subframes and in old buildings)
- By the window sill fitter; if the window sill is installed after the installation of the window.

Seal the space between the window sill and the window with a connection sealing or a self-resetting joint sealing tape. The inclination of the external window sills must be at least 5°. The thermal elongation of the window sills must not be impeded. In case of wood-wall structures apply a tub-shaped second sealing level under the actual window sill which is pulled up to the side accordingly and kept open towards the front. For ETICS wall constructions on solid walls we also recommend such a second sealing level for highly exposed installation positions.

In any case, note the currently valid version of the "Window Sill Directive" of the Austrian Window Sill Working Group <https://fenstereinbau.info/>.

Pay particular attention to the notes on the window frame grooves, corner interface gap and mitres of the aluminium facing shells (capillary joints), here an improper processing can result in significant building damages.

Our windows and attachments e.g. sunscreen and their installation (if offered) are planned for "Slide ALU U-window sill end caps" or an equal system,

in which both the window elements as well as the attachments are drained onto a sliding, leak-proof exterior window sill (see drawing).

All other exterior window sill end caps (including sliding systems such as WDVS U22 or RAG 2) and the connection with a sealing clamp (so-called Viennese method) require separate planning as well as cross-works coordination and execution.

