

Quality Assessment Criteria for ScreenLine® Integral Blinds

The ScreenLine® blinds have a minimum clearance of 2.5 mm on each end, between the lamellas and the glazing spacer. This allows the blind system to move freely and allows for the thermal expansion of the aluminium slats.

ScreenLine® blind manufacturing tolerances:

Width: $> +0 \text{ mm} \leq -1 \text{ mm}$
Height: $> +8 \text{ mm} \leq 0 \text{ mm}$

Notice: The height difference is determined by the pitch of the strap ladder.

Due to the sum of the tolerances of the cable diameters and the internal winder, the bottom rail may tilt slightly while lifting the blind. The tilt is more conspicuous in tall, narrow blinds. As a result of the lifting cables and strap ladder shrinking, the bottom rail will eventually follow the lifting motion. Note that the materials of the cables and strap ladders will shrink as the temperature rises and conversely, expand as the temperature falls. The length variation index for these materials is approximately 0.02% / °C. For example: if the temperature of a 1000 mm blind is 50 °C higher than the factory temperature, the blind will expand by 10 mm. The same principle applies to the density of tilting blinds (which are blinds with the bottom rail retained against movement). When the blinds are lifted, the straps are wound irregularly and at a different pace between the opposite sides, which may cause the slats to be skewed away from the horizontal as they fold against one another.

Lower rail parallelism tolerances

According to EN 13120, the maximum allowed inclination of the lower rail around the central point is +/- 7.5 mm (15 mm in total) for all positions of the blind. The ScreenLine® system production standards specify that the tolerance shall be measured in three different points.

Lower position $\pm 2 \text{ mm}$
Middle position $\pm 5 \text{ mm}$
Upper position $\pm 7 \text{ mm}$

The tolerance is to be calculated relative the central point of the lower rail.

Lower rail deflection tolerances

According to EN 13120, the maximum deflection of the bottom rail and the slats (measured at the central point) depends on the width of the blind. The permitted values of deflection are listed in the table below.

Venetian blind slat width	Deflection of slats and lower rail
$< 1.5 \text{ m}$	5 mm
1.5 m to 2.5 m	10 mm
$> 2.5 \text{ m}$	15 mm

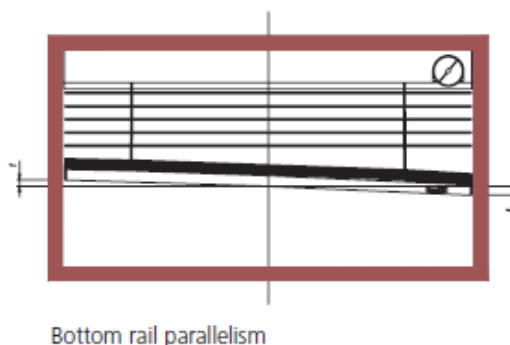


Fig. 1: Lower rail parallelism

Partial tilt of the slats

According to EN 13120, the permitted number of slats that are not fully tilted in position is 2% of the total number of slats in the blind. The slats may become stuck while lowering the blind. The slats will adjust themselves into position when tilted, but only with the blind fully lowered. This is acceptable as long as the number of slats that are misaligned when the blind is down is within the limits listed in the table below.

No. of blind slats	Maximum partially tilted slats
< 50	0
50 to 100	1
100 to 150	3
150 to 200	4
> 200	5

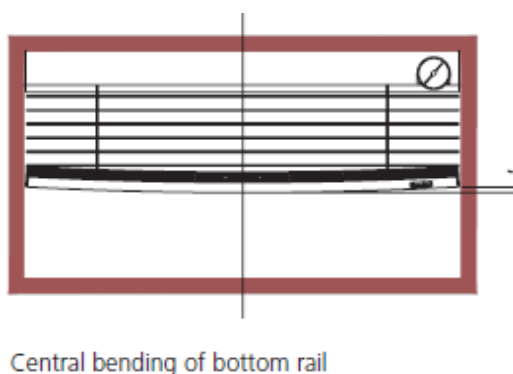


Fig. 2 Central deflection of the lower rail

Closed slat tilt angle

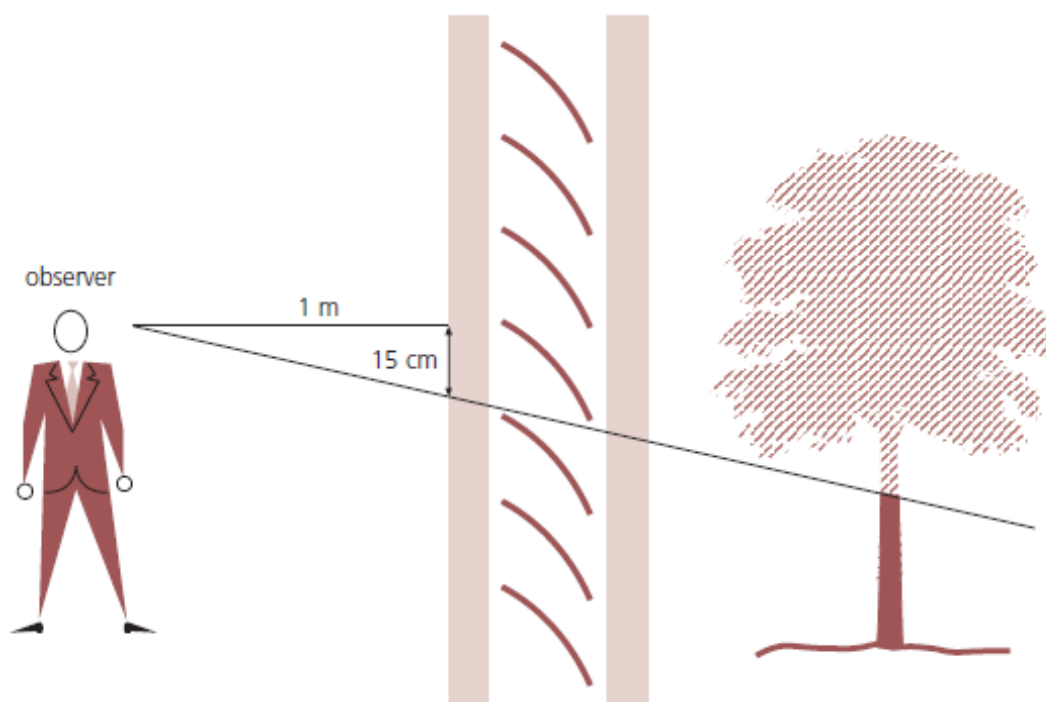
The tilt of the slats controls the amount of light admitted indoors. The tilt of the slats is controlled by the movement of the strap ladders.

The closed slat tilt angle shall be at least 60° around the axis parallel to the inner pane. The closed slat tilt angle tolerances depend on the blind height:

Blind height	Tolerance	Closed slat tilt min. angle
≤ 1 m	5°	55°
> 1 m	10°	50°



Below are the instructions of verifying the correct closed slat tilt angle:



- Close the slats completely with the concave side facing inward.
- Define a line on the blind surface which is level with the line of sight of your eyes and stand 1 m away from the inner pane.
- Look at the area obscured by the slats.
- All objects behind the area at least 150 mm below the line of sight should be obscured to the observer (this corresponds to an approximate closed slit tilt angle of 60°).

Notice: A potential result of the specified tolerance is differences in the degree of closure between the adjacent slats.

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Slat tilting angle

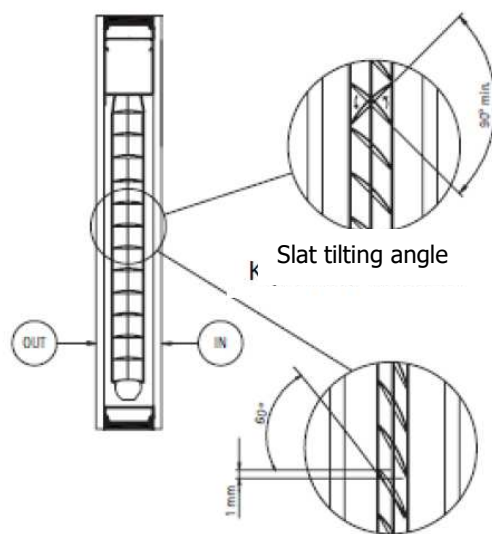
The slats shall tilt by at least 90° around the slat centreline.

Slat overlap

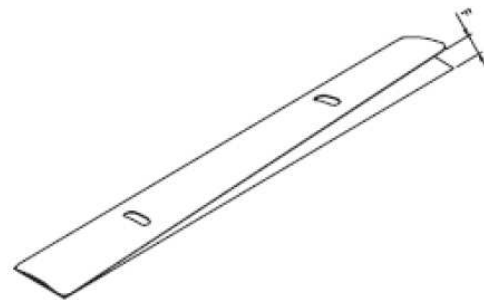
With the slats fully closed at 60° of tilt, the slats shall overlap one another by more than 1 mm.

Parallelism of the slats

The maximum differences in the horizontal position of individual slats must not be greater than 2 mm per linear metre. Measure this at several points on the blind with the slats tilted to the horizontal position (see: EN 13120).



Minimum slat overlap



Parallelism of the slats

External control tolerances

Unless specified in a custom order, the external control cable shall end 65 mm away from the line of sight, with a tolerance of +10 mm/-20 mm. The length tolerance of the external rotary rod with the catalogue-specified length is +5 mm/-5 mm.

Non-conformity

A non-conformity assessment of ScreenLine® products must be based on visual inspection of the blind installed within the IGU (between the glass panes). This assessment applies only to the visible parts of the blind (main rail, slats, and glazing spacers, if included in a ScreenLine® kit). The quality of the glass panes is not under this assessment. (Note: Delete the last sentence from the customer warranty text)

Assessment procedure

The quality assessment of the blind must follow this procedure:

- The IBIGUs (integral blind insulated glass units) shall be upright and true to plumb, according to their operating specifications
- Leave the blind lowered and the slats tilted by approx. 45° from the horizontal
- When visually inspecting the IBIGU from both sides, the observer shall be 2 m away from the IBIGU plane being faced, keeping the line of sight perpendicular to the glass pane, as illustrated below
- Prior to making the assessment, do not apply any markings to any points where potential non-conformities could be
- Do not attempt this assessment if sunlight falls directly on the slats.

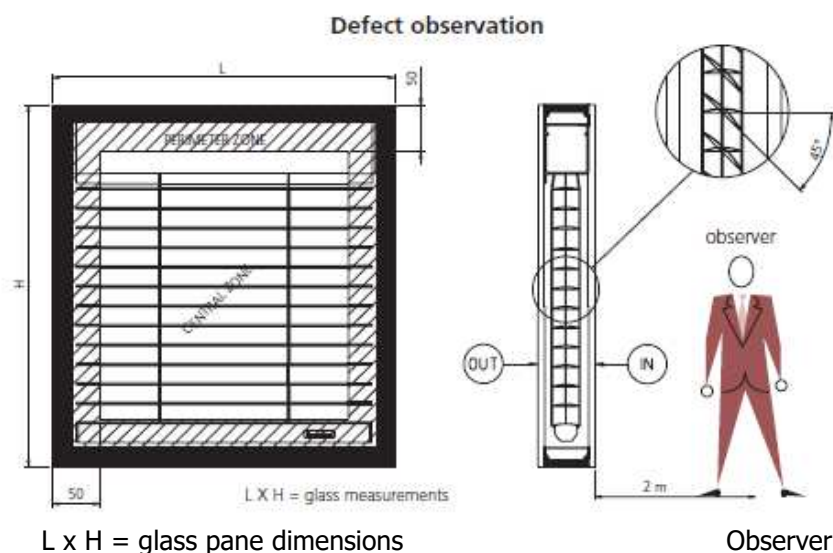


Fig. 3: Visual inspection of defects

Acceptance criteria

Divide the area of the IBIGU into two zones: the peripheral zone and the central zone (as illustrated below).

Peripheral zone: a 5 cm wide strip around the IBIGU. This zone includes the main rail and the lower rail of the blind, the extreme ends of the slats and the fabric, as well as the glazing spacer.

Central zone: it includes the remaining area (except the peripheral zone). The central zone contains the central part of the blind that should have the lowest number of defects. For the blind components (main rail, slats, fabric, and lower rail), the acceptable defects are listed below. Note that the total area of the IBIGU should be rounded to the next whole number.

Peripheral zone

Inclusions, stains, coating defects:

A maximum of 1 defect measuring no more 3 mm across on each 1 square metre of the IBIGU is acceptable.

Sediment on the slats/stains on the fabric: A maximum of 1 defect measuring no more 3 mm across on each 1 square metre of the IBIGU is acceptable. If there is dirt found on the ends of slats, apply the acceptance criteria specified in "Rub marks resulting from upright glazing spacers" below.

Scratches/marks on the fabric: Light and not overly evident scratches are acceptable if the total length of these defects is no more than 30 mm. The maximum length of a single scratch shall be no more than 15 mm.

Central zone

Inclusions, stains, coating defects:

A maximum of 1 defect measuring no more 2 mm across on each 1 square metre of the IBIGU is acceptable.

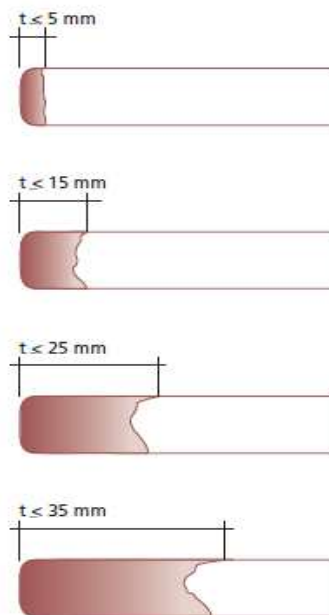
Sediment on the slats/stains on the material: A maximum of 1 defect measuring no more 2 mm across on each 1 square metre of the IBIGU is acceptable.

Scratches/marks on the fabric: A maximum of 2 light and not overly evident scratches are acceptable if the length of each scratch is no more than 10 mm.

Rub marks resulting from upright glazing spacers: Repeated rubbing of the slats against the upright spacers during movement of the blind will result in a dark deposit on the slats after some time. It is aluminium dust that sheds from the upright spacers. The side spacers in the ScreenLine® kits are specifically finished for protection in a proprietary process patented by Pellini. The process is designed reduce – and hence delay – the formation of deposits and to preserve the colour of the slats at the upright spacers touching the blind slats. This protection is resistant to solar radiation and does not induce tarnishing.

For the rubbing and the resulting black deposit on the slats, the following is a directive from IFT Rosenheim that facilitates determination of the acceptance limits for the black deposit and the related discolouration of the slats in integral blind systems.

1. Verify if 10% of all slats are discoloured at the tips. Focus on the dirtiest slat.
2. Determine the discolouration severity with reference to **Table 3**.
3. Determine the slat colour with reference to **Table 4**.
4. Determine the dirt deposit colour with reference to **Table 4**.
5. Determine the difference between the slat colour and the colour of the dirt with reference to the values read from the Tables.
6. Refer to **Table 5** to see if the discolouration acceptance limits are violated or not.

Table 3 Slat tip discolouration severity (t)

Table 4 Slat colour and colour difference






Slat colour/Dirt colour	Difference
	0 - 20%
	20 - 40%
	40 - 60%
	60 - 80%
	80 - 100%

Table 5 Slat discolouration acceptance limits

Discolouration severity	Colour difference				
	0-20%	20-40%	40-60%	60-80%	100%
t ≤ 5 mm	Pass	Pass	Pass	Pass	Pass
t ≤ 15 mm	Pass	Pass	Pass	Pass	Fail
t ≤ 20 mm	Pass	Pass	Pass	Fail	Fail
t ≤ 35 mm	Pass	Pass	Fail	Fail	Fail
t > 35 mm	Fail	Fail	Fail	Fail	Fail

If you cannot definitely decide between two colours in the Table, choose the lighter one.

Example

Assume a slat's colour is approximate to the first colour in **Table 4**. In this case, the colour contrast severity is 0–20%.

If the colour of the dirt on the slat is similar to the colour in the last image in Table 4, the colour contrast severity is between 80% and 100%.

The difference is 80%; with reference to Table 5, the darkest dirt can cause the slat colour change up to 15 mm of length.

Fabric corrugation

Both the powered version of the SL27 Rullo (M System) and the cable-operated version (C System) may cause corrugation of the fabric near the upright spacers between which the blind moves.

Fabric corrugation is only visible from a close distance of viewing (less than 2 m), with an observation line of sight less than 90° to the glass pane. A fabric corrugation is not a defect if it does not adversely affect the correct operation of the blind system (which means that the blind still can be lifted and lowered properly).

Special applications

The ScreenLine® kits are intended for integration with rectangular, upright-installed IGUs.

Special applications are also possible:

- Inclined and horizontal IGUs
- Different geometries of IGUs
- Structural IGUs

For inclined IGUs, it is not recommended to install integral blinds that can be lifted.

The friction of the slats against the glass pane will prevent the blind from working properly and may lead to failure of the strap ladder. Therefore, in inclined IGUs, it is recommended to use kits with pleated fabric or blinds limited to slat tilting only (if a suitable support for the slats is provided).

For IGUs units installed in tilt windows, do not operate the blind with the window tilt-open; always install a lockout which will prevent the IGU rotation 'upside down' (in 180° tilt systems). The blinds shall be lifted (fully raised) before the window is tilted. For tilt-only blind systems (with the retained lower rail), never attempt to tilt open the window before fully tilting the slats to close. For these applications, a dedicated model with pleated fabric or tilt-only Venetian blind shell is recommended.

For door-installed IBIGUs, repeated striking of the slats against either glass pane may result in strap ladder failure. It is recommended to attach shock absorbers on the doors for opening motion restriction.

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