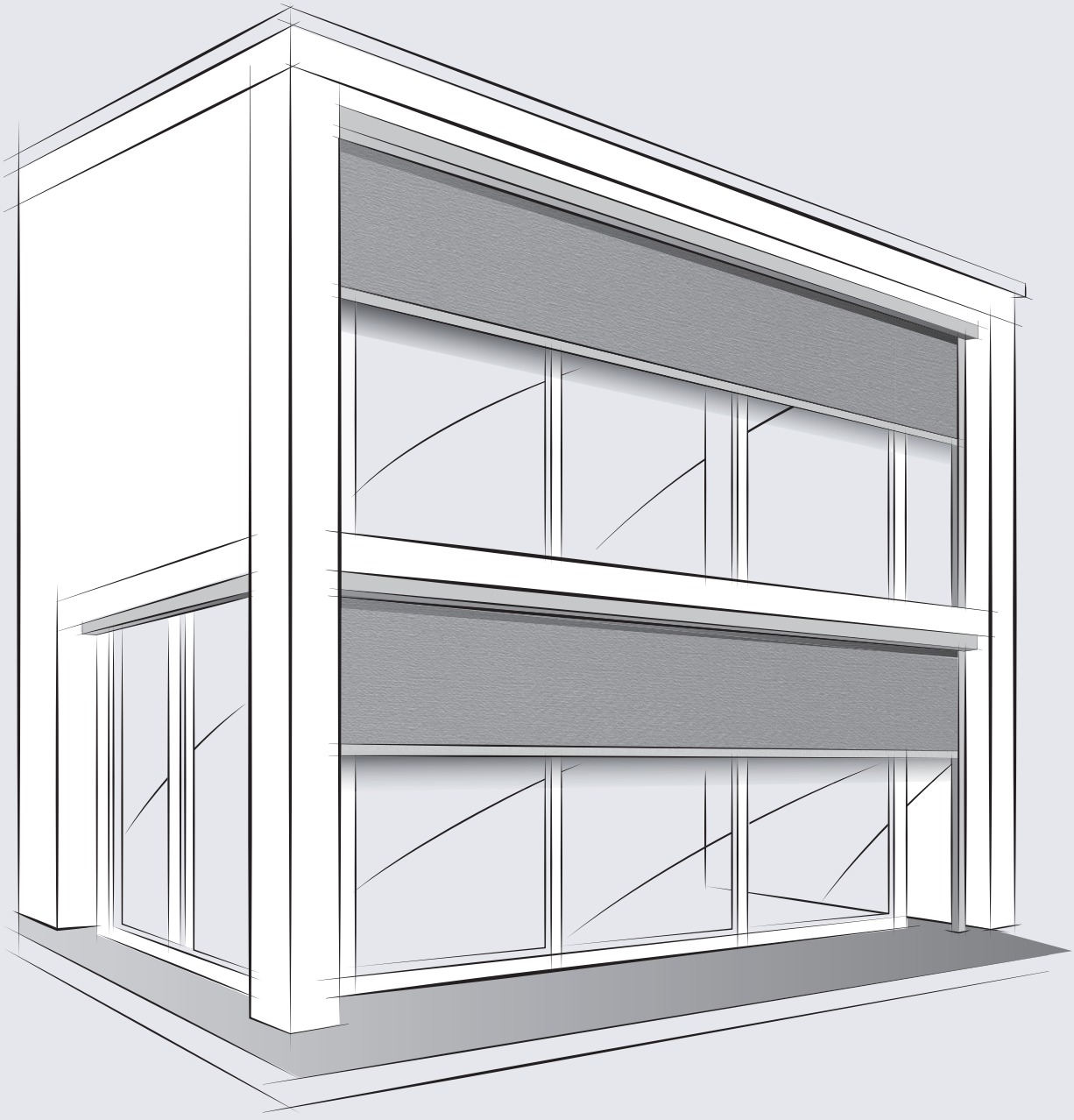
Guideline for assessment of vertical, side-seam guided awnings



Last updated July 2023
Publisher:

IVRSA
INDUSTRIEVEREINIGUNG
Rollladen-Sonnenschutz-Automation

Table of contents

1. Foreword

1.1 General information

Side-seam guided awnings (commonly known as ZIP awnings) are tried and tested products. Despite careful production and proper installation, customers and contractors may disagree on whether certain characteristics of the side-seam guided awnings are defects or not. This guideline will provide a basis for specialist dealers and fitters as they advise the user on product quality, technical limits and product-specific characteristics that enable users to assess the limits of what is feasible with side-seam guided awnings. In addition, it should help prevent disputes and differences of opinion. This guideline is therefore intended for dealers, installation companies, manufacturers, technical experts and end users.

1.2 Scope and structure of the guideline

This guideline applies to the evaluation of product characteristics of symmetrical, vertically installed side-seam guided awnings for the building trade.
The product is evaluated according to the principles described below. This guideline is subdivided into individual sections that describe the various product characteristics.

2. Operation

2.1 General information

This section describes the requirements for fault-free operation and operability under certain framework conditions and discusses the topic of "noise". The instructions and other information provided by the manufacturer must be observed in all cases.

2.2 Requirements for fault-free operation

This section lists the requirements that are deemed essential for fault-free operation. A basic requirement is adherence to the installation, operating, maintenance and cleaning instructions provided by the manufacturer. If these are not adhered to, fault-free operation cannot be ensured and permanent damage could occur.
It is especially important that the safety-relevant instructions are observed. The following list of points is not exhaustive. Additional negative consequences are possible, especially in the event of improper use.

2.2.1 Obstructions when lowering the product and possible resulting damage

The cloth must not be obstructed while it is being lowered. This particularly applies to the following situations:

- The cloth strikes an obstacle (operating error).
- Ice has formed on individual components such as the cloth covering (operating error, follow the manufacturer's instructions, see also Section 2.3).

2.2.2 Other installation and operating errors

Guide rails must be installed according to the manufacturer's installation instructions. It is particularly important to note the following:

- If the arrangement is too narrow or too wide, the cloth may jam, causing excessive wear and overloading of the drive system.

- A guide arrangement that is not vertical or is at different heights causes similar problems. The operation of systems that are iced over also generally results in damage (operating error, follow the manufacturer instructions, see also Section 2.3).

2.2.3 Special characteristics of coupled systems

Systems must be mechanically coupled locally, taking the positions of both systems into account. If two incorrect system positions are coupled, the coupled blind could make contact with the box before the drive blind does.
Possible consequences include:

- One-sided overloading of the drive system
- Overloading of the coupling elements
- Permanent deformation of the drive shaft due to overloading

2.3 Operation in icy conditions

In cold seasons, malfunctions and damage may occur due to the effects of frost. This situation is caused by moisture (such as melt water, rain or snow) on the cloth/blind that can freeze at low temperatures. This results in the following situations, among others:

- Frost, snow and ice formation on the inside and outside of the blind
- Snow and ice in the guide rails hinder extending and retracting of the awning
- Freezing while raised (the system was raised while wet or covered in frost)
- Noise development as components are pulled out of position
- Condensation in the box and freezing

This is a physical process that cannot be influenced by the manufacturer. Even electrical drive systems with obstacle detection do not guarantee absolute protection. The operating instructions of the blind/cloth indicate whether it may be operated in the event of frost and which measures should be taken to prevent damage (the instructions must be followed especially carefully for automatic operation).
Damage due to the effects of frost is generally the result of operating errors!

2.4 Characteristics of electrical drive systems

The electrical drive systems are generally based on AC asynchronous motors.
These have the following characteristics:

- The higher the load, the lower the rotational speed. This is due to their functional principle and, depending on the type of motor, may drop to as low as 5 rpm.
- The speed drops as the electrical drive system heats up during operation and at high ambient temperatures.
- Operating duration of at least 4 min (for short-term operation see Section 2.4.2).
- Temperature limiter that switches off the drive system at excessively high temperatures (see Section 2.4.2).

2.4.1 Electrical drive systems for side-seam guided systems

The manufacturer is responsible for choosing a suitable motor to ensure that the system retracts safely and securely in the wind speeds approved by the manufacturer.
There are a large number of manufacturer-dependent systems that switch off the side-seam guided systems at the top and bottom limit positions:

Mechanical limit switch-off devices:

- Lower limit position is fixed, optionally adjustable
- Adjustment of the upper limit position is optional
- An intermediate position can be set as an additional option
- Parallel connection only possible via cut-off relay (external component)

Electronic limit switch-off devices:

- As above, but electronically adjustable via a programming cable, or directly at the drive system as an additional option
- Optional torque overload protection (obstacle detection), freezing protection
- Drive systems without a continuous power supply have a start-up delay due to their functional principle
- In general, a parallel connection is possible using drive systems with the same design (note manufacturer's instructions)

Limit switch-off devices with a bus interface:

- As above, but using drive electronics with a continuous power supply.
- Interface between the motor electronics and building controller used to exchange information on the drive system's position (bus line).

A common feature of all limit switch-off methods is that the blind can be moved precisely to the lower limit position and, if applicable, to the upper limit position, via position measuring devices located in the drive system.
For limit switch-off devices with a bus interface, the building controller can forward positioning commands via the bus to the drive system. Using this method, intermediate positions can be achieved with relatively high precision.

2.4.2 Operating modes of electrical drive systems

The method by which an electrical drive system may be operated is defined by the so-called operating mode (EN 60034-1). The operating mode describes how, and for how long, the drive system may be loaded to ensure that it is not heated to impermissibly high levels. Examples of operating modes include continuous mode, short-term mode and periodic mode. Electrical drive systems for side-seam guided awnings (usually AC asynchronous motors) are designed for short-term operation. The standard designation for short-term operation is S2. Short-term operation was formerly referred to as KB.

The product standard for sunblind drive systems (EN 60335-2-97) specifies a rated operating time of at least 4 minutes without a pause. Drive systems with a declaration of "S2 4 min" on the type plate must be operable for at least 4 minutes with the applicable rated torque, at a room temperature of 25 degrees Celsius.

The drive systems must then cool back down to room temperature.
Adherence to this requirement is tested by means of a temperature increase measurement as per EN 60335-1. At higher ambient temperatures and in unfavourable installation situations, the operating time may be reduced accordingly.

Electrical drive systems that need to be protected against excessive temperature increases in case of improper or unfavourable operation are equipped with a temperature limiter (thermal protection switch). This allows the drive system to be stopped at any position, for the purposes of self-protection. After a cooling phase, the system can be operated again normally. It may be necessary to issue a new travel command (depending on the specific control system).

2.5 Scraping/striking the facade

In gusty wind, even if this is within the assured limits, the cloth and the bottom bar may partially come into contact with the glass, mullion, window post and facade, with the likelihood increasing as the system width increases, and when windows or doors are open. This does not affect the service life of the cloth.

2.6 Noise development

2.6.1 General information

Noise development caused by power-operated shutters/awnings is not classed as a significant hazard according to the health and safety requirements for machines. For this reason, DIN EN 13561 does not include specific requirements for health and safety related noise targets.

However, there are national requirements in place, such as DIN 4109: Sound insulation in buildings – Part 1: Minimum requirements, from 2016. DIN 4109-1 is a national building legislation standard that was most recently amended in 2018. DIN 4109-1 specifies minimum requirements for noise protection between distinct building units (e.g. adjacent apartments) with the aim of "protecting persons in rooms from unacceptable disturbances caused by noise transmission".

The practical application of DIN 4109-1 does not depend on the building type (non-residential, residential) but rather applies in every case to rooms that require sound insulation. In the case of apartments, DIN 4109-1 does not apply to one's own residential space, rather to rooms in other apartments that require sound insulation.

What constitutes a room requiring sound insulation?
Rooms requiring sound insulation in accordance with DIN 4109-1 include:

- Living rooms and bedrooms
- Children's rooms
- Offices/workspaces
- Classrooms/seminar rooms

Motor driven exterior shutters/awnings are parts of building-technology systems. Therefore, corresponding requirements relating to switching technology apply (including for lifts, sanitation systems and ventilation devices). While it is true that manually operated shutters/awnings lead to similar noise levels, noise development is in this case influenced primarily by the user, which is why shutters/awnings are not subject to the standardised switching-technology requirements of DIN 4109-1. In accordance with DIN 4109-1, the designated sound pressure level in living rooms and bedrooms must not exceed a value of L AFmax 30 dB(A) for the operation of building-technology systems, whereas a value of L AFmax 35 dB(A) applies to offices and workspaces. This represents the minimum standard as stipulated by national building legislation, i.e. these values must not be exceeded. For Germany, the maximum noise level stipulated in DIN 4109-1 is the standard, while elsewhere in Europe the values vary on a country-to-country basis (Switzerland uses mean values).

Note: There is no recognised testing method for determining emissions of power-operated shutters/awnings. As a result, it is not possible to provide planners with concrete values that they could use to evaluate, by means of a transfer function, the emissions likely to occur in rooms requiring noise insulation in advance.

2.6.2 Noise development during operation

When side-seam guided awnings are operated, running, switch-off and frictional noises are unavoidable despite high-quality manufacturing and installation. These noises are caused by the following situations and components:

- Raising and lowering of the blind
- Motor, gear and guide
- Braking of the motor (clicking)
- Vibration/quivering during raising and lowering.

Simultaneous operation of multiple systems enhances these noises (group or central command).

2.6.3 Noise transmission

The transmission of noise and vibrations into the building structure by the side-seam guided awning, which is also influenced by the design of the building structure, cannot be avoided, even when the system is properly installed with the necessary diligence. This represents the current state of the art. Additional noise-reducing measures require individual design planning. This results in additional costs.

2.6.4 Noise development in windy conditions

If wind values exceed the usage recommendations of the manufacturer in question, the cloth and/or bottom bar may strike the window/facade.
Due to the play that must be present in the guide rails to ensure proper operation, noise cannot be avoided – even when you comply with recommended use.
Noises due to wind load are technically unavoidable.

Note: For more information, consult the guideline for the use of wind monitors.

2.7 Electrostatic discharge

Electrostatic discharge is a spark produced by a large difference in electrical potential or by electrical breakdown, which produces a high electrical voltage pulse. The cause of the difference in electric potential is usually electrostatic charges cause by friction (triboelectric effect) or electrostatic induction. Static electricity is produced e.g. when walking on carpet as well.
The effect described may also occur on an awning when winding up or unwinding the cloth covering (this is more pronounced on new cloths and at low humidity). This effect is not considered a production defect.

3. Visual characteristics

3.1 General information

When checking for certain visual characteristics, the correct viewing distance must be maintained. This distance is 3 m for exterior parts and 2 m for interior parts. The following lighting conditions must be adhered to: diffuse daylight outdoors, lighting suitable for normal room use indoors; grazing light or targeted illumination are not permissible; the viewing angle is perpendicular to the surface.
The surface characteristics can best be evaluated on new components in their installed condition (immediately after they are mounted). Influences relating to the construction site, weather and chemical exposure, e.g. salty air, may result in major deviations. Additional information can be found in the publication "Hinzunehmende Unregelmäßigkeiten bei Gebäuden" [1] (Permissible Irregularities in Buildings).

3.2 Characteristics of organically coated surfaces

Visible flaws may arise during manufacturing, surface coating, surface treatment, or the transport and installation of boxes, cover panels, guide rails, bottom rails, cover panel caps, etc. The individual flaws are described and evaluated below. Surfaces are categorised into areas with high (•••), average (••) and low or no (•) requirements. Figure 1 illustrates these surfaces. The illustrations serve as examples and apply in kind to all types of side-seam guided systems.
The general evaluation does not apply to manually applied coatings or touch-up work performed after installation. It only applies to coil-coated surfaces to a limited degree since certain characteristics cannot occur here. The information provided here is based on the VFF Merkblatt (Information Sheet) AL.02 from October 2016 [2].

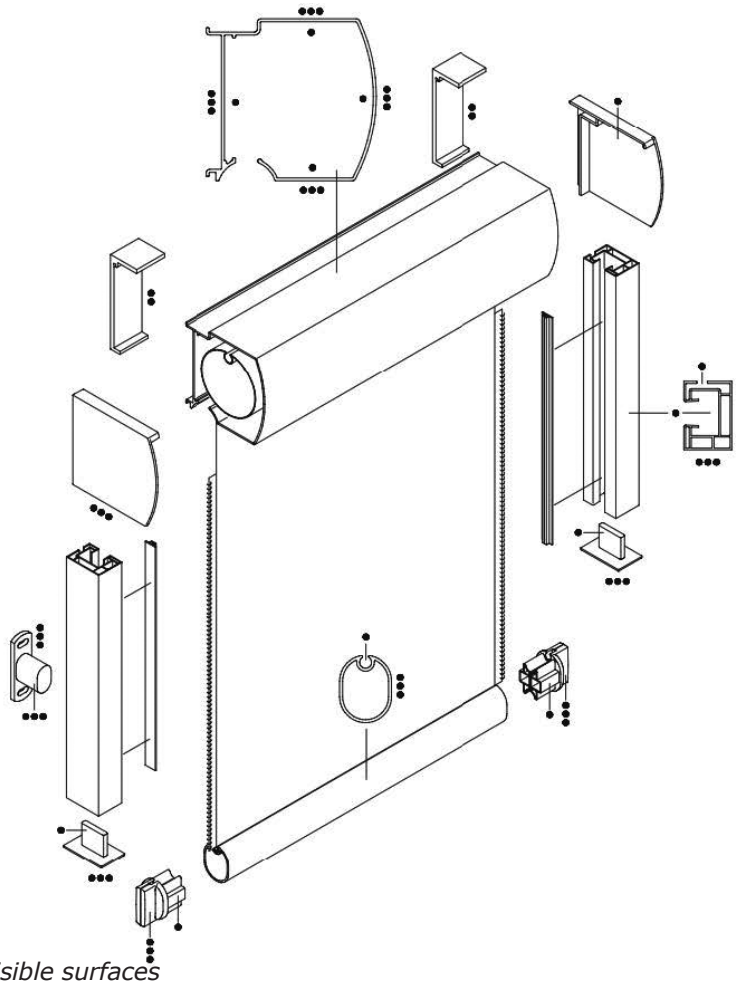


Figure 1: Definition of visible surfaces

3.2.1 Craters, blisters
Permissible in the following limits: ••• diameter less than 0.5 mm, up to 10 occurrences per m or m² •• up to 10 occurrences of 1 mm per m or m² • permissible

3.2.2 Inclusions (e.g. fibres)
Permissible in the following limits: ••• diameter less than 0.5 mm, up to 5 occurrences per m or m² •• up to 10 occurrences of 1 mm per m or m² • permissible

3.2.3 Chipping
Only permissible in the • category

3.2.4 Paint run
Only permissible under certain conditions in the • category

3.2.5 Orange peel effect
Permissible if finely structured; coarsely structured effect only permissible with a layer thicknesses of over 120 µm (for design- or order-related reasons) and for paint-specific reasons (highly pigmented paint, e.g. yellow/orange/red) ••, • permissible

3.2.6 Gloss variations
The causes here are often related to the manufacturing process or material and are not grounds for complaint in this case. Comparisons can only be made if the same production method has been used. The following applies to the individual surfaces:
•••, •• permissible if within certain tolerances • permissible

The tolerances can only be measured using reflection measurement as per DIN 67530 (60° measurement geometry) in gloss units: glossy surfaces ±10 units, satin finish ±7 units, matte surfaces ±5 units (VFF Merkblatt (Information Sheet) Al.02 [3]). Note that the matte effect may be reinforced in matte colours due to design-related edge conditions and edge piling.

3.2.7 Colour deviations
The causes here are often related to the manufacturing process or material and therefore cannot be avoided. Examples:

- Coil coating does not offer RAL colours and merely approximates these (sheet metal, roll-formed parts such as slats or cover panels).
- In larger orders, the coating materials may originate from different batches or different manufacturers.
  This also applies to subsequent deliveries.
- Metal components from different manufacturing/processing methods and plastic, even if they are all coated using the same method.

- In the case of metallic coatings, a different alignment of the metal pigments, for example due to the coating direction, can result in different colour impressions. In the case of metallic paints, colour and metallic effect differences as well as clouding cannot be ruled out entirely because of the composition of the coating material. This primarily affects parts that are manually coated because of their geometry or that have different material thicknesses, for example.

These points represent the current state of the art for the reasons specified in this section.

3.3 Properties of anodized surfaces

3.3.1 General information

Anodization is a corrosion-protection surface treatment for aluminium that does not apply material to the surface but instead creates an oxide layer by means of an electrochemical treatment. This oxide layer has the same colour as the natural colour of aluminium (colour designation EV 1). The colour can be changed using suitable metal salt-solutions (C 11-14, bronze to black) or colour pigment deposits. The original surface structure remains more or less intact, depending on the selected surface pre-treatment. The pre-treatments are identified with the upper case letter E and classified from E0 to E6: E0 means no pre-treatment, while E6 indicates a rough, matte surface due chemical pickling. In the other methods, the surface is processed mechanically by means of brushing, grinding or polishing. However, these methods are costly and cannot always be used on curved surfaces. The following criteria are based on the VFF Merkblatt (Information Sheet) AL.03 from October 2016 [3].

3.3.2 Silicon precipitation

This occurs on account of unfavourable heat treatment of hardening alloys or when using material that is not of anodization quality. This causes zones of differing electrical conductivity, which has an impact on the thickness of the anodized layer. This effect is only permissible in the • category.

3.3.3 Web marks, coarse grain

The production of profiles by means of extrusion results in varying material structures. •••, •• permissible, if pickling treatment E0 or E6 (pickled) as per DIN 17611 is used or in the case of other pre-treatment methods if they are not conspicuous (adhere to the viewing distances).
Not permissible for surfaces E1 to E5. • permissible

3.3.4 Pre-corrosion

The possibility of pre-corrosion occurring during transport from the manufacturing location of the semi-finished products to the surface treatment location cannot be ruled out and depends on the aluminium alloys in question. These oxide layers are partially accentuated by pickling treatment (E6) and can only be removed by machining (e.g. grinding, E1). The following evaluation must be made:
•••, •• permissible under certain circumstances, i.e. if E0 or E6 (pickling treatment) in accordance with DIN 17611 • permissible

3.3.5 Gloss variations

Depending on surface characteristics and material differences, there may be variations in gloss levels. Profiles and cover panels may only be compared if they are their natural colour or have been anodized using the one-stage or two-stage method. In general, these differences are permissible. Tolerances only exist in the ••• category, and these can only be determined using measurement technology (max. 20 units).

3.3.6 Colour deviations

Colour deviations arise due to different material structures, particularly due to welding. On account of the material characteristics, they cannot be avoided.

3.4 Surface properties

3.4.1 General information

For manufacturing reasons, there may be variations in the surface characteristics that cannot be avoided. This does not include transport damage, however. Specifications regarding signs of wear are contained in Section 3.7.

3.4.2 Grinding marks and dents on weld seams

These characteristics occur during processing prior to coating and are not fully covered by the coating. ••• permissible, if the highest surface quality has not been agreed on, such as polishing and grinding ••, • permissible.

3.4.3 Surface irregularities due to semi-finished products

These irregularities occur during "forming", e.g. during casting, rolling and extruding, and are sometimes only visible after coating. They include the following:
• dents, • drawing marks, • longitudinal weld seams, • imprints, • structures, • uneven surfaces of cast parts, • dents and rolling marks on rolled sheet, • ejector marks.

These are permissible at all positions and are not considered product flaws. Surface damage due to outgassing is impermissible on surfaces of category •••.

3.4.4 Production-related mechanical damage

(e.g. dents, bumps, scratches) •••, •• permissible if not conspicuous (adhere to the viewing distances) • permissible.

3.5 Light transmission

Light transmission depends largely on which fabric is used and it can generally be found in the technical data sheets for the fabric.
Unavoidably, some light will come through even when opaque fabrics are used.
Light enters and reflects through the zip fastener, the bottom bar and the box.
Depending on the structural situation, e.g. blind frame etc., less light may enter.

3.6 Closing properties

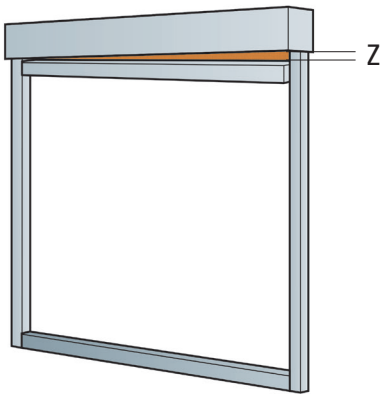


Figure 2: Gap between bottom bar and awning box at one outer edge

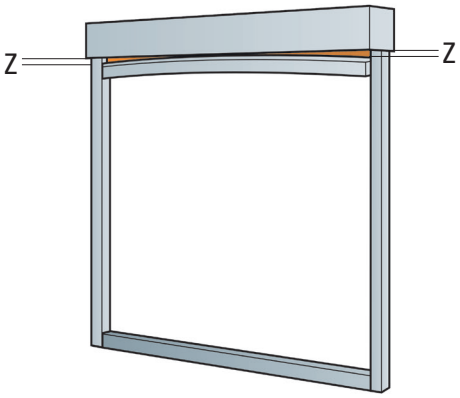


Figure 3: Gap between bottom bar and awning box at both outer edges

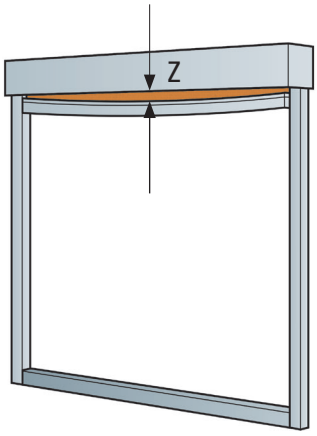


Figure 4: Gap between bottom bar and awning box in the middle area

When retracted, the case rail and the bottom bar should be as parallel as possible (maximum gap size Z 5 mm per metre, the total should not exceed 15 mm). Component sagging is permissible to the extent that the function of the awning system (also see the manufacturer's specifications, if applicable) is not impaired.

3.7 Design-related signs of use

Signs of wear affecting moving parts: Signs of wear may occur in the contact area of moving parts, e.g. in the case of:

- Front bars/bottom bars and casing rails
- Awning cloths and guide tubes
- Crank holes
- Sliding inserts or rollers
- Friction bearings (e.g. cloth support bearings)

3.7.1 Soiling due to weather and environmental conditions

Fabric sunblind systems are predominantly used in outdoor areas, and are therefore constantly exposed to the effects of the weather and environmental conditions prevailing at the site of use. These are e.g. rain, snow, salty sea air, air pollutants, odours, bird droppings, petals, leaves and other
organic or inorganic soiling. These effects may result in visual changes (dirt, weathering) to the surfaces of the frame and the awning cloths over time. Ageing cannot be prevented by the current state of the art, and is therefore not considered grounds for a customer complaint. If the systems are not regularly and properly maintained and cleaned, then this can result in irreparable surface damage including a loss of the decorative aesthetics. In this case, the operating and care instructions issued by the manufacturer must be observed. Surfaces of frames should, if nothing to the contrary has been specified, be cleaned at least once a year. When cleaning, acidic, alkaline and abrasive cleaning materials and processes, as well as increased temperatures or direct exposure of moving parts to high-pressure cleaners, must be avoided. When cleaning awning cloths, the provisions and warnings specified in the "ITRS Guideline on Cleaning and Care of Awning Cloth" must be observed.

3.7.2 Corrosion caused by structural-physical factors
Soiling due to weather and environmental conditions

This section describes the role played by room climate. Particular attention is paid to the moisture on the crank mechanism and corrosion on the internal components:

- Moisture on the crank rods Because the crank mechanism is connected through to the outside, the indoor crank rods are colder than the component surfaces that surround them. As a result, ambient humidity may condense on these parts. Condensation may also form in the area of the wall bushing.
  This physical process cannot be avoided and does not lead to any further impairments in normal interior climatic conditions. In extreme cases, it may be advisable to wipe the moisture off.
  Humidity on the crank mechanism is physically unavoidable even when the system is installed properly.

- Corrosion on interior components: Pivot bearings, collapsible cranks and other internal fittings that are galvanised or nickel-plated are sufficiently corrosion-resistant in normal interior atmospheres (Class 1 as per EN 13659:2004-11 Section 17.3).

A normal interior atmosphere as defined in this regulation corresponds to room types I1 and I2 in accordance with Appendix A of EN 13120.

If higher humidity levels arise, e.g. I3 (poorly ventilated), or an aggressive I5 atmosphere exists, corrosion resistance must be improved. This must be arranged separately with the contractor.

Note that during construction work, e.g. when plastering the interior, a normal interior atmosphere usually does not exist. In particular, this must be observed when the operating elements are to be mounted before plastering and tiling.

3.7.3 Factors influencing running behaviour and positional accuracy of side-seam guided systems

Running properties of side-seam guided systems: During extension, irregular movements may occur. Potential causes of this may include:

a. Different friction values (stick-slip effect)

b. Different friction characteristics (e.g. environmental conditions, temperature conditions)

c. Fluctuating forces due to e.g. tensioning system during movement

3.7.4 Simultaneous awning movement

The bottom bars of several awnings installed next to each other do not generally exhibit simultaneous movement when extending and retracting, as they may move at different speeds. When the sizes of the awnings differ considerably, then simultaneous movement will be severely affected due to the different roller diameters used. The following items constitute other potential causes:

a. Different winding properties of the awning cloths on the cloth roller, due to permissible dimensional tolerances of the cloth roller and/or due to the positions of the seams of the awning cloths, depending on the connection technology used (see the Guideline for the Evaluation of Fitted Awning Cloths).

b. Differences in friction of the bottom bar bearings in/on the guide mechanisms, such as guide rails.

c. The individual electric drives exhibit different rotational speeds.

d. Potential coupling slack in the case of mechanically coupled systems.

e. Potential delay times in the case of electronically coupled systems.
Due to these influences, the offset between adjacent blinds when they are being raised and lowered may be up to 500 mm depending on the drop.
DC motors are not covered.

f. Incorrectly installed system position (see Section 2.2.3)

3.8 Protective and wrapping film, stickers

Protective and wrapping films must be removed after installation according to manufacturer's instructions or as soon as possible, unless otherwise agreed. This also applies to labels on visible surfaces that are no longer needed after installation.

4. Shape and dimensional deviations

4.1 General information

This section only applies to the manufacturing process. During use, greater shape-based and dimensional deviations may occur due to weather-related influences, type of usage and handling. Where no special agreements have been reached, no material-specific standards are in place and no further relevant stipulations are detailed below, then DIN 18202 should be considered the basis for the evaluation of tolerances. For contracts based on the German Construction Contract Procedures (VOB), the tolerances as per DIN 18358 apply unless otherwise agreed. For the dimensional tolerance limits of order-based dimensions, the manufacturer's specifications must be consulted.

4.2 Shape deviations

4.2.1 Boxes for new buildings (ready-made boxes)

The following dimensional limits apply:
5 mm/m, but a maximum of 10 mm, both for sagging and for deviations from the horizontal.

4.2.2 Sagging of metal cover panels and boxes

Regardless of the manufacturing process, the following deviations are permissible:
3 mm/m, max. 10 mm.
These tolerances apply only to sagging. Height differences between the left and right are evaluated as per DIN 18202.

4.2.3 Boxes for plastering

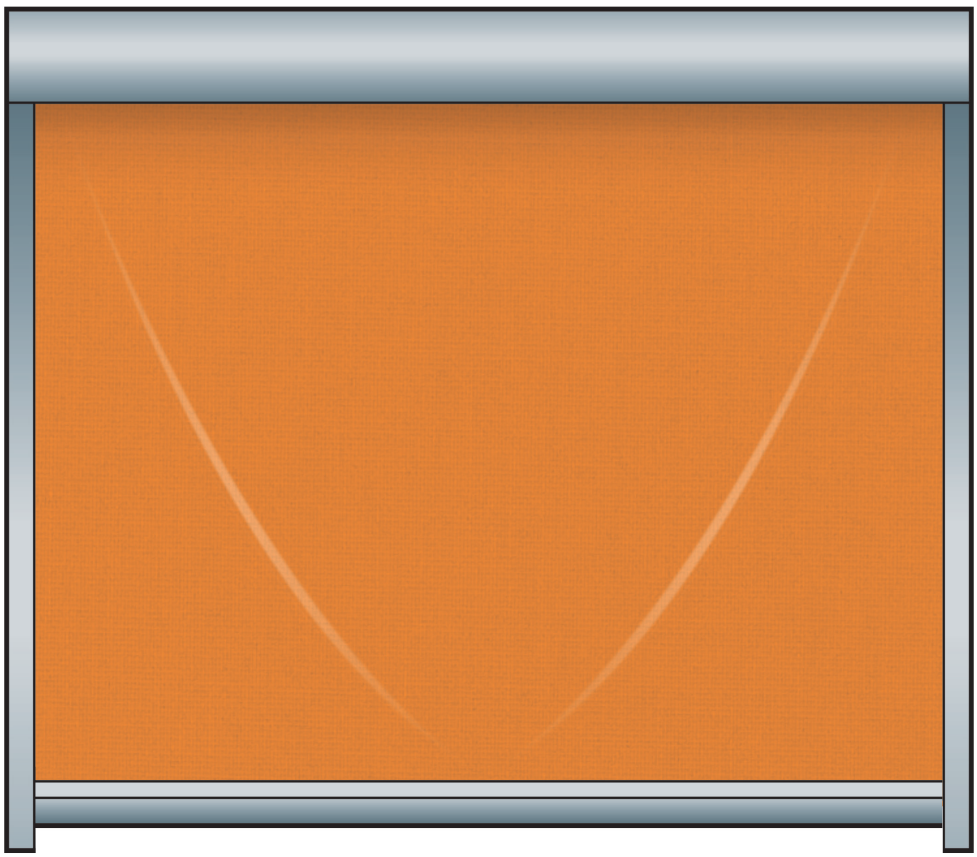
Plastering of the box must not cause any changes in the box shape that may lead to malfunctions. Boxes that are not yet embedded in plaster must meet the stipulations of Sections 4.2.1 and 4.2.2.
In addition, the manufacturer's dimensional specifications must be met.

5. Cloth

Awning cloth made from technical fabric has both a functional and a decorative role.
The core function of awning cloth used for sun protection is self-explanatory: to provide protection from excessive heat and sunlight.
Sun protection fabric must meet strict technical requirements and is subjected to extensive laboratory testing in the production process. Parameters such as the surface weight, maximum tensile strength, maximum tensile elongation, tear propagation force, water pressure resistance, hydrophobicity, fastness to weathering, solar energy behaviour and other characteristics are measured and evaluated according to internationally recognised standards. These values are documented and guaranteed in the technical data sheets of the respective fabric manufacturers. Even though only high-quality technical fabric is used for the manufacture of awning cloth, and this fabric is subjected to ongoing quality controls in all phases of the production process, it is nevertheless impossible to rule out slight irregularities in a piece of cloth in the form of so-called “blemishes”. These blemishes, however, have no influence on the usage characteristics.
All fabric blinds have a natural tendency to shrink and expand. This behaviour is interrupted by seams and zipper connections. This results in rippling/distortion of the cloth; see the following sub-sections.

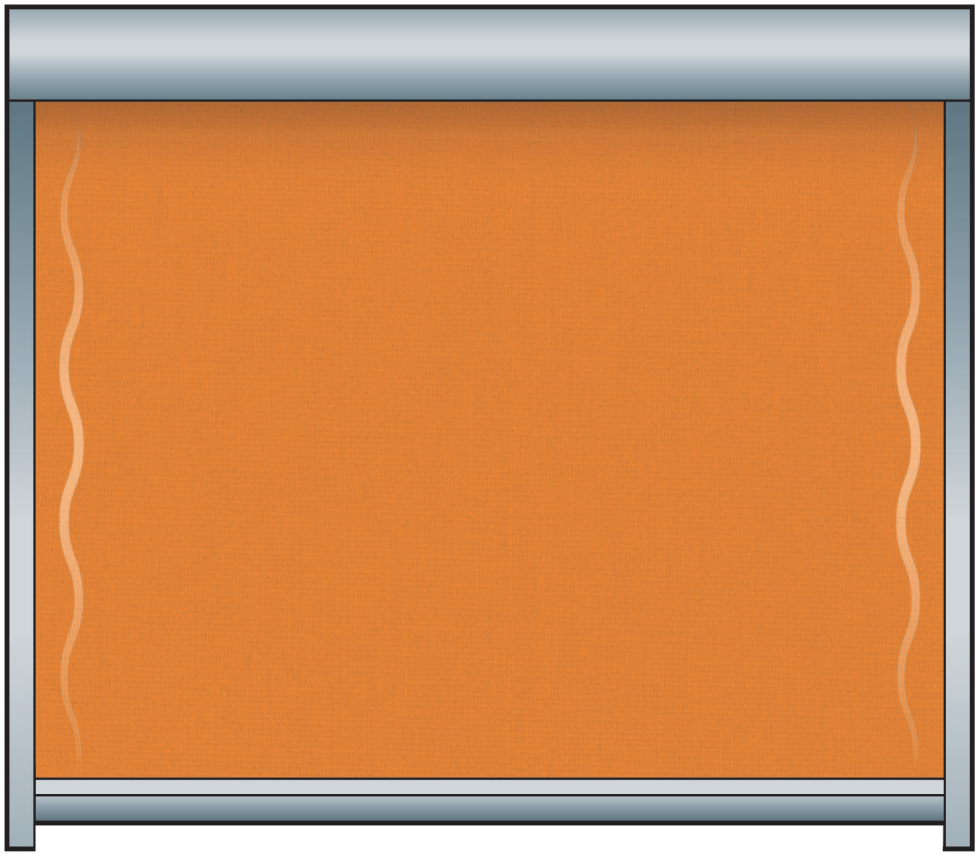
Note: The following phenomena can occur individually or in combination.

5.1 V-shaped ripples



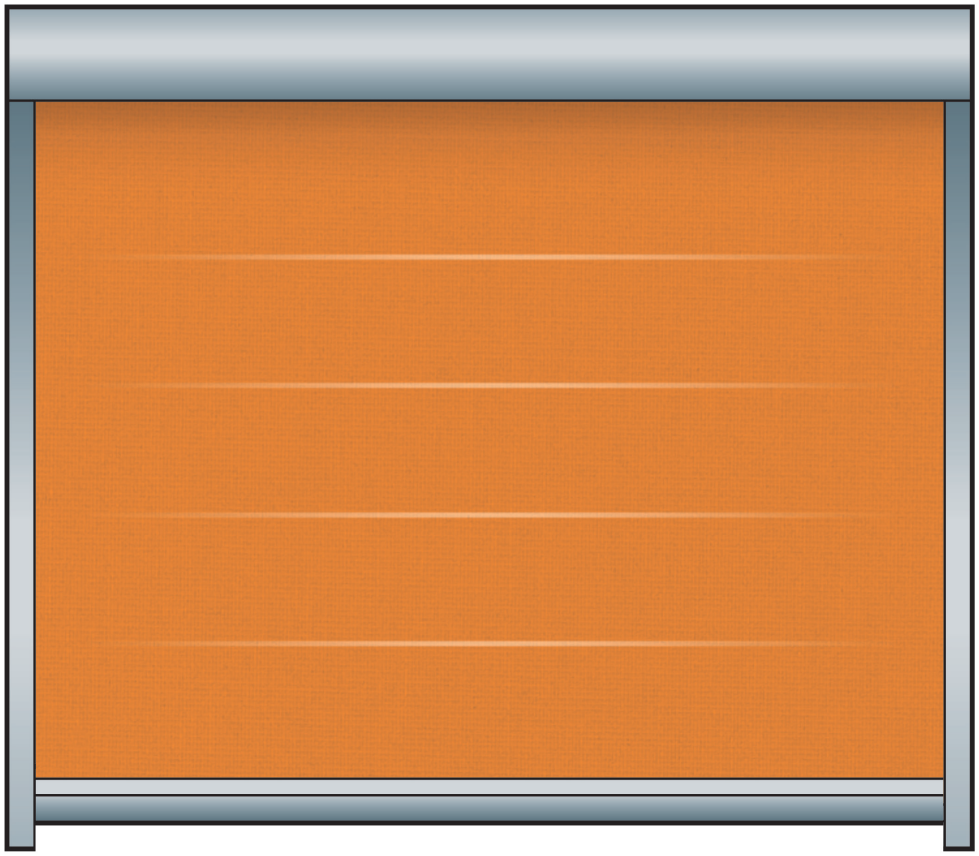
The V-shaped appearance is caused by sagging of the roller and the bottom bar. It is also affected by the width and the weather (cold and warm temperatures). The wider the system, the greater the probability of the roller and bottom bar sagging under their own weight, increasing this phenomenon.
If the V-shape is not symmetrical, check that the cloth is centred on the roller (see Section 5.4). For design-related reasons, V-shaped ripples are more common on wide systems and they should not really appear on narrow systems (approximately <1.5 m). Overlapped winding creases should not occur.

5.2 Ripples along the sides next to the guide



Side-seam guided cloth features slight creases, particularly at the edges.
This can occur because the cloth and side-seam guide are on top of one another and travel along different paths when wound. This causes the cloth, when rolled, to fold up several times around the entire circumference. This is visible as a ripple. This phenomenon is compounded by adverse weather conditions (the lower the temperature, the more pronounced the phenomenon). The type of fabric, the production of the cloth and the seam parameters also affect the appearance. These are product-specific properties.

5.3 Transverse impressions on the cloth

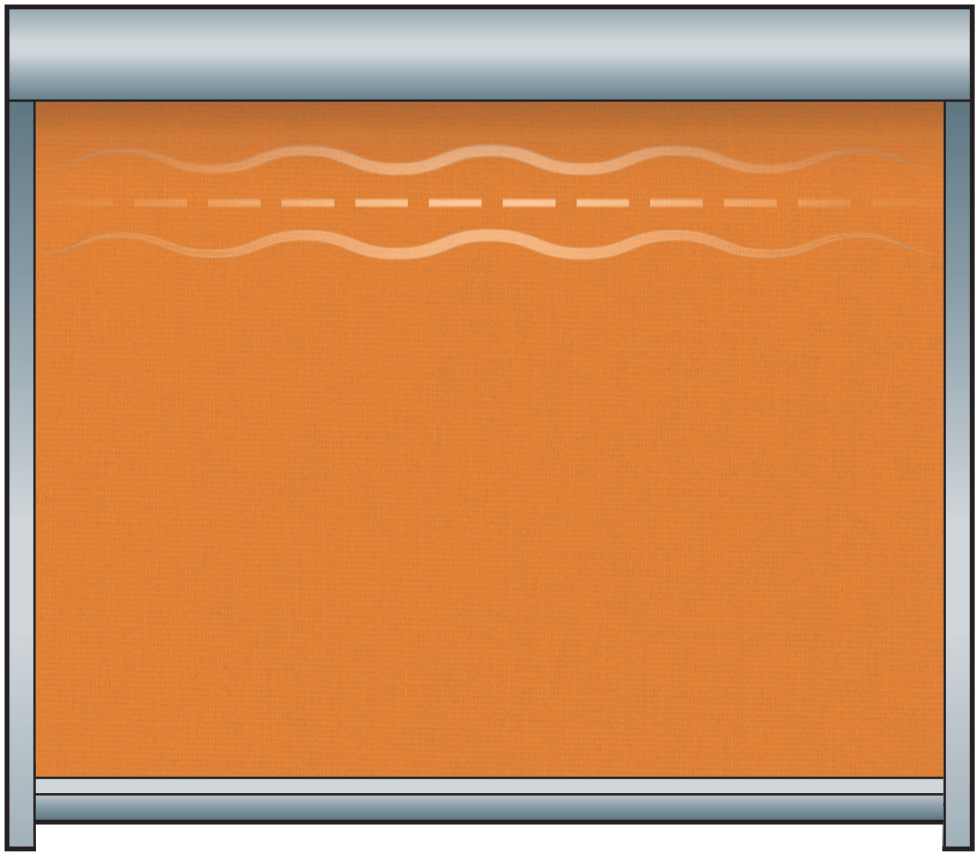


This phenomenon occurs due to the way the cloth is attached to the roller and in the case of lateral connections. The type of fabric roller bearing can also cause the phenomenon shown here.
Leaving the system out of use for longer periods has an adverse effect. At higher temperatures, depending on the type of fabric, this phenomenon can be minimised when the awning is extended.

5.4 Impermissible undulation diagonally across the cloth

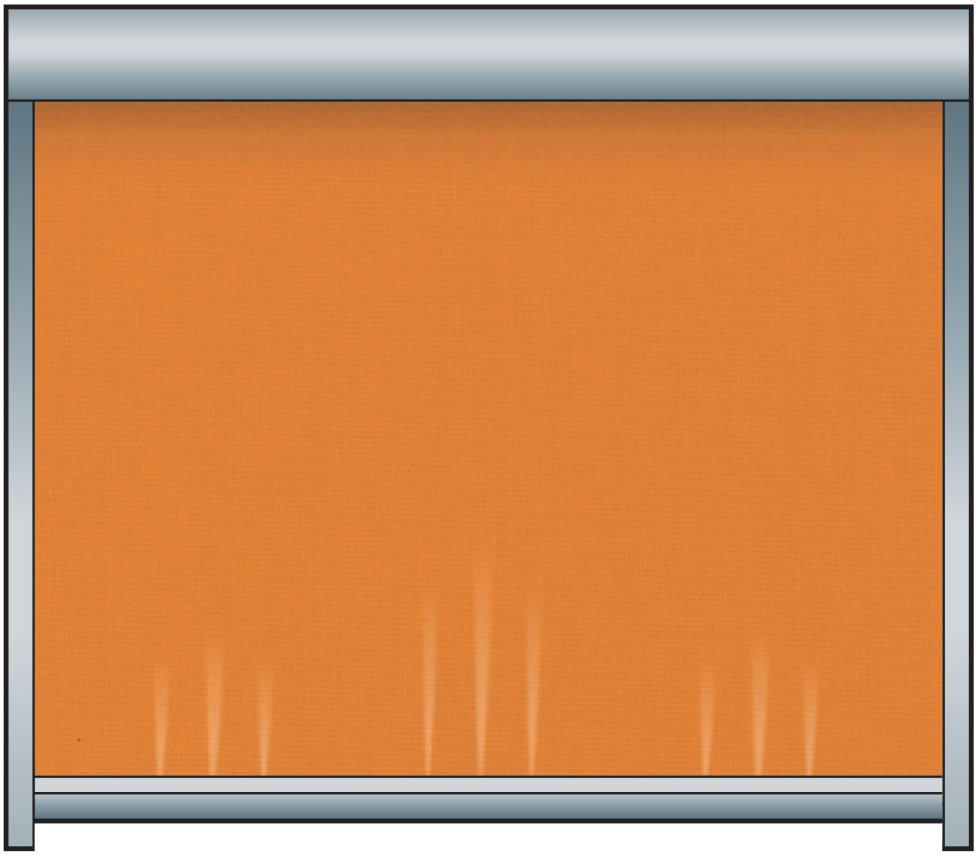
If there are diagonal ripples on one side, this is probably due to faulty centring of the cloth on the roller. This must be checked accordingly on site.
The phenomenon can also occur due to insufficient alignment of the cloth width to the overall design. If the system is not installed horizontally, this can also cause this phenomenon, as can guide rails that are not perpendicular.

5.5 Slight horizontal ripples above and below the seam with transverse machining



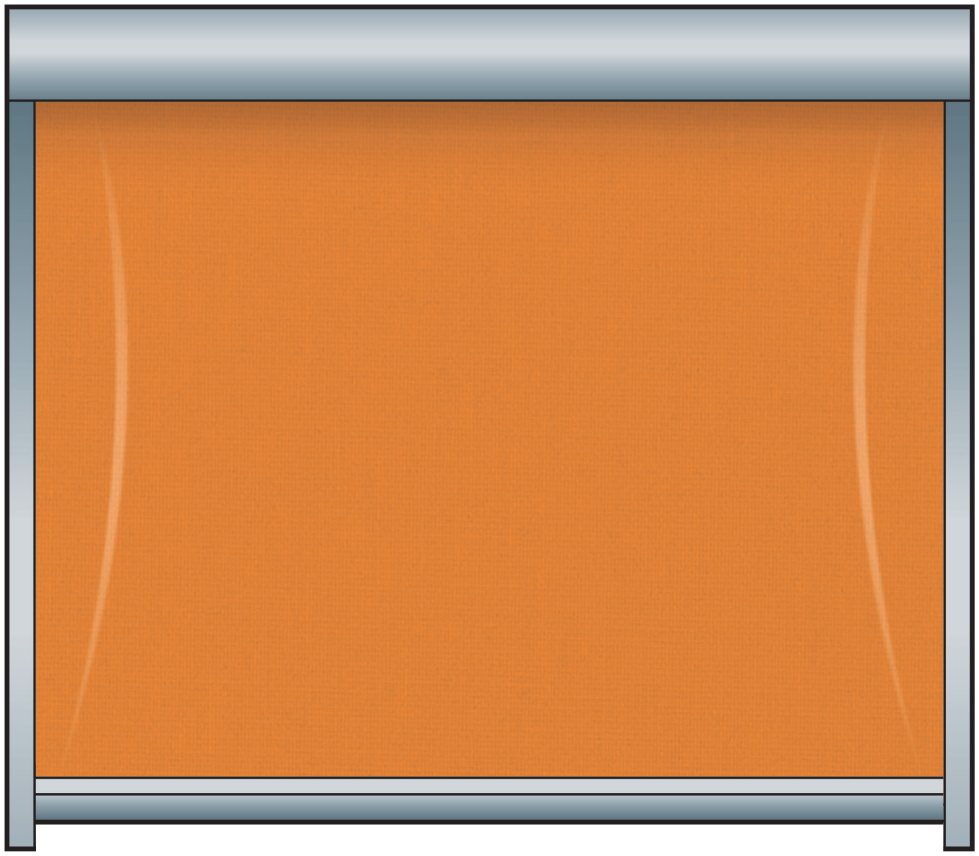
The join between two sections of cloth is the reason for this phenomenon. The weight of the bottom bar aggravates this phenomenon because the weight strains the seam differently across the width.
This is a product-specific property that can vary depending on the design and the joining method.

5.6 Ripples above the bottom bar



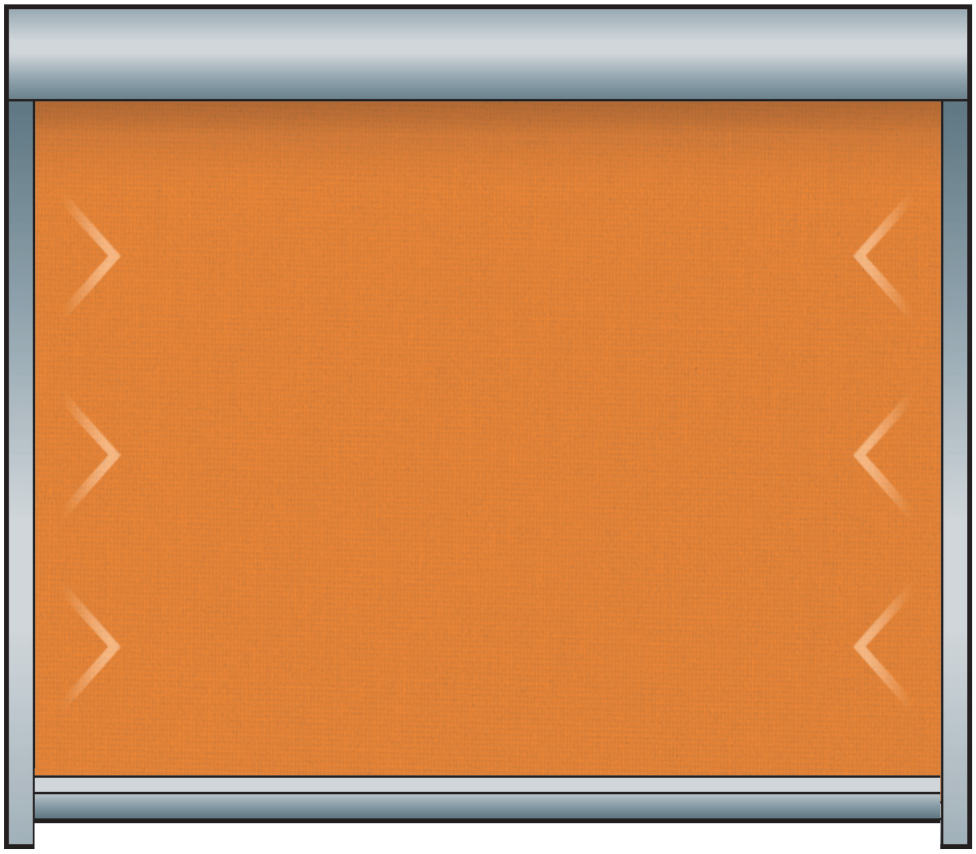
This is a product-specific property that can vary depending on the fabric type, the design and the joining method.

5.7 Impermissible vertical ripples in and around the guide



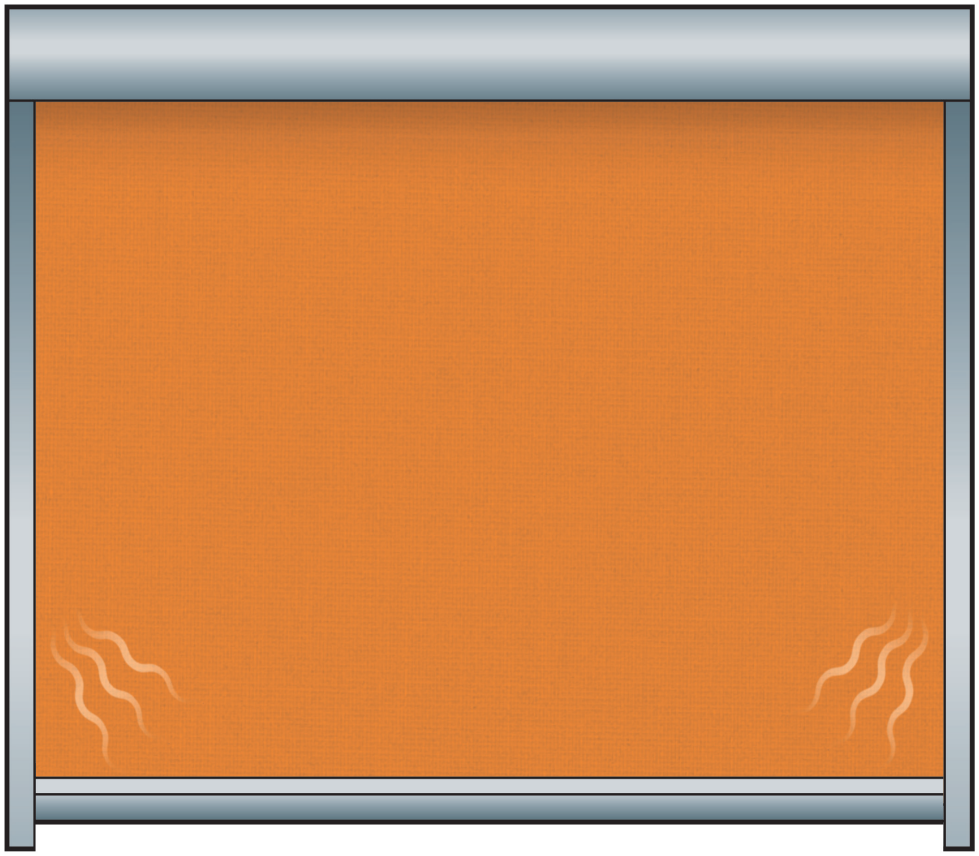
The phenomenon is affected by the installation situation or the alignment of the guide rails. It can also occur if the cloth is not tensioned sufficiently or evenly by the bottom bar weight.
It must be ensured that elongation of the cloth and shifting of the end positions do not cause cloth buckling.

5.8 Impermissible petal-shaped marks across the entire length



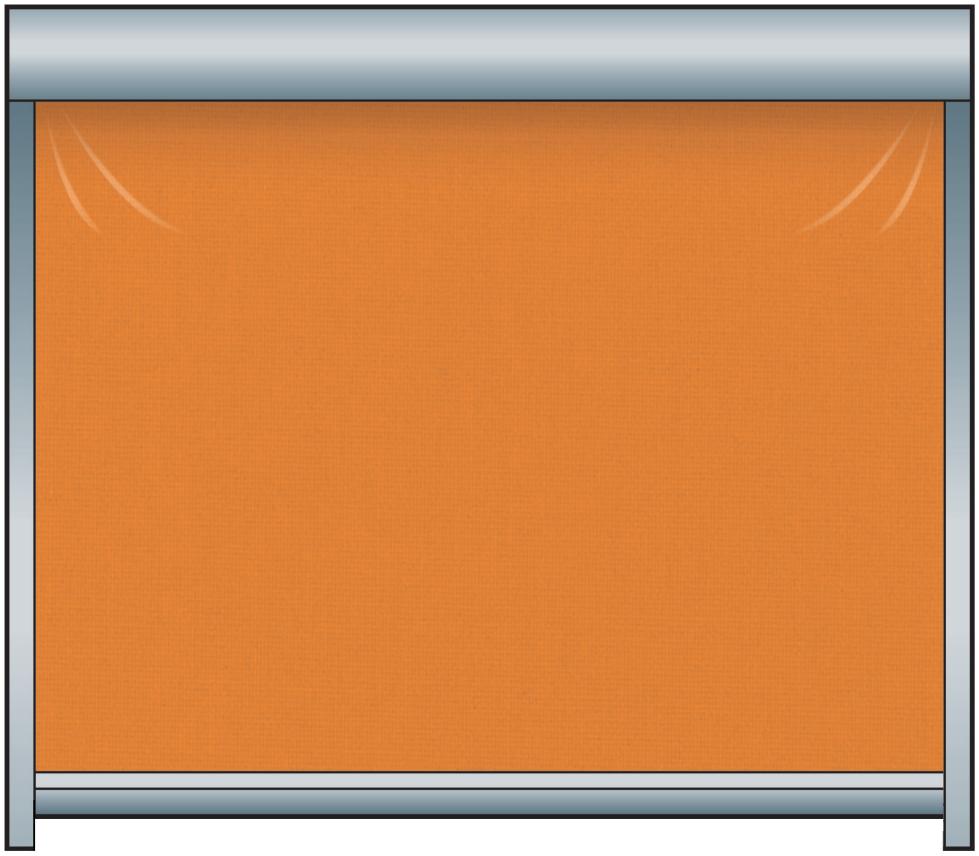
Petal-shaped marks are a more pronounced form of the "ripples along the sides next to the guide" phenomenon. This phenomenon only really occurs with inelastic fabrics. Choosing a suitable fabric width for the overall design has a decisive influence on this.

5.9 Ripples due to strain in the corners



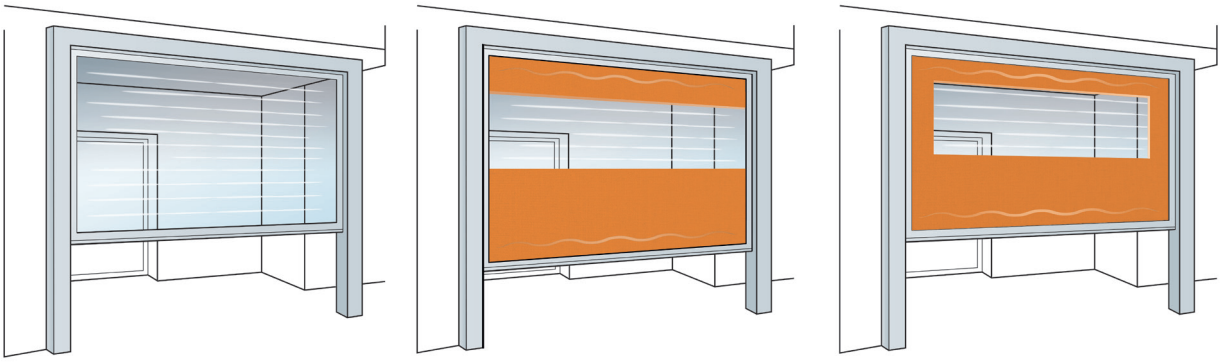
During upwards movement, ripples form and become many small diagonal ripples at the end. The cloth buckles during the winding process because the side seam guide is not precisely aligned. In the case of taller systems or where there is a greater number of winding revolutions on the roller, this phenomenon is more likely to occur.
This is a typical product property.

5.10 Rippling in the top corners



For design reasons, the phenomenon of ripples in the top corners is unavoidable. Overlapped winding creases should not occur.

5.11 Characteristics of cloths made of clear PVC film



Cloths made of clear PVC film can exhibit visible anomalies due to environmental influences or use of the systems (signs of use) and that therefore do not represent grounds for complaint:

1. Cloths made of clear PVC film can exhibit "milky patches" due to the absorption of water if they are wound up when wet. Unwinding them and warming them up (e.g. in sunlight), thus drying the cloth, should restore the original condition.

2. Cloths made of clear PVC film may develop score marks and scratches along with transverse streaks. Electrostatic charges can occur with greater frequency and attract greater amounts of dirt particles in the process.

3. Cloths made of clear PVC film shrink, especially at low temperatures (starting from around 5–10 degrees Celsius) and can cause creases and ripples (not grounds for complaint). At higher temperatures, the creasing can improve significantly.

4. Cloths made of clear PVC film are rigid at low temperatures and do not wind up as easily. If necessary, manual intervention (pulling slightly on the bottom bar) can help. If in doubt, do not operate the system.

5. Cloths made of clear PVC tend to become sticky at high temperatures (starting from around 35–40 degrees Celsius) and do not wind up easily. If necessary, manual intervention (pulling slightly on the bottom bar) can help. If in doubt, do not operate the system.

6. Cloths made of PVC tend to ripple near the welded joints.
   This effect is particularly pronounced in the transitional area between the PVC fabric and clear PVC film.

The following guidelines are available from **IVRSA**:

- Richtlinie zur technischen Beratung, zum Verkauf und zur Montage von Gelenkarmmarkisen (Guideline on Technical Consultation, Sales and Installation of Extending-Arm Awnings)
- Richtlinie zur Reinigung und Pflege von Markisentüchern (Guideline on Cleaning and Care of Awning Cloth)
- Verbandsempfehlung zu Funk in der Gebäudeautomation (Association Recommendation for Use of Radio Technology in Building Automation)
- Richtlinie zur Beurteilung der Produkteigenschaften von Markisen (Guideline for the Evaluation of Product Characteristics of External Venetian Blinds/Awnings)
- Richtlinie zur Beurteilung der Produkteigenschaften von Markisen (Guideline for the Evaluation of Product Characteristics of Awnings)
- Guideline: Lehrinhalte, Zertifikat, Bestellung und Bescheinigung zur Elektrofachkraft für festgelegte Tätigkeiten im Rollladen- und Sonnenschutztechniker-Handwerk (Instructional Content, Certificate, Order and Verification for Electrical Specialists for Specified Duties in the Field of Skilled Shutter and Sun Protection Work)
- Sonnenschutz in Rettungswegen (Sun Protection along Emergency Evacuation Routes)
- Verbandsempfehlung zur Bemessung von Fenstern mit Aufsatzrollladenkästen (Association Recommendation for Measuring Windows with Attached Shutter Boxes)
- Anschlüsse an Sonnenschutzprodukten (Connections to Sunblind Products) Schnittstellen Sonnenschutz, Führungsschiene, Fenster und Fensterbank (Interfaces for Sunblinds, Guide Rails, Windows and Windowsills)

RS DER FACHVERBAND

Bundesverband
Rollladen + Sonnenschutz e.V.
Hopmannstraße 2, 53177 Bonn,
Germany

bundesverband sonnenschutz technik

Bundesverband
Sonnenschutztechnik Österreich e.V.
Canisiusweg 121, A-6020 Innsbruck,
Austria

IVRSA
INDUSTRIEVEREINIGUNG
Rollladen-Sonnenschutz-Automation

Postal address:
Heinrichstr. 79 • 36037 Fulda, Germany
Phone: +49 (0)661 90 19 60 11
Fax: +49 (0)661 90 19 63 20
Email: info@ivrsa.de
Homepage: www.ivrsa.de