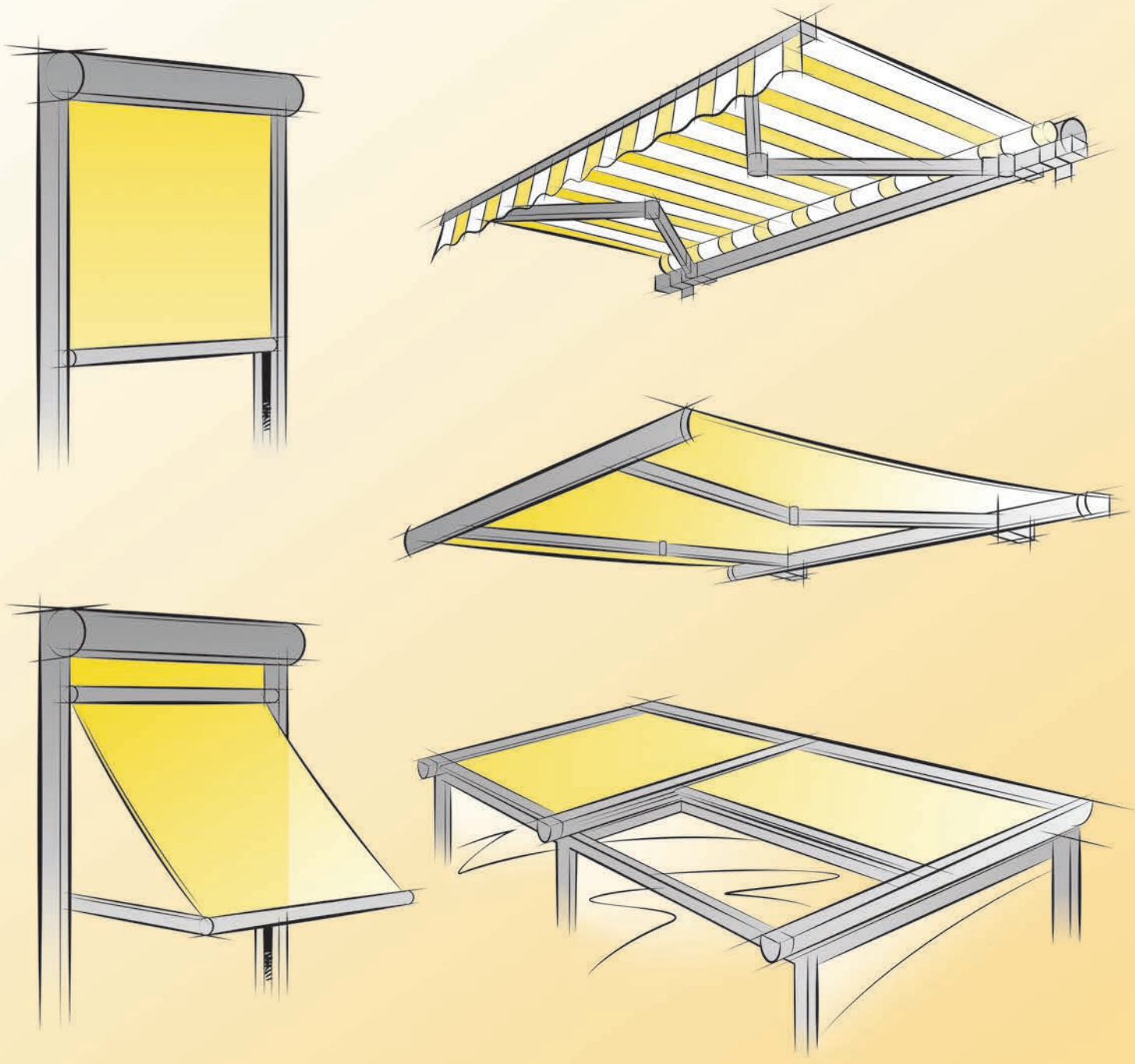
Guideline

for the Evaluation of Product Characteristics of Awnings



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1. Foreword

1.1 General information

Awnings are time-tested products. Despite careful production and proper installation, disagreements repeatedly occur between customers and contractors in relation to whether certain characteristics of awnings constitute grounds for complaints 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. It will assist experts in evaluating the feasibility limits for awnings. In addition, it should help prevent disputes and differences of opinion.
This guideline is therefore intended for dealers, installation companies and end users.

1.2 Scope of validity

This guideline is valid for the evaluation of product characteristics of awnings in accordance with DIN EN 13561. The evaluation is performed according to the principles described below. This guideline is subdivided into individual sections, into which the various product characteristics have been grouped. Each characteristic is described separately and in full. When instructions are given by any care, maintenance or operating instructions issued by manufacturers, these specifications must be observed and be performed accordingly.

2. Function

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. Safety-relevant instructions must be observed. The following list of points is not exhaustive. Additional negative consequences are possible, especially in the event of improper use.

2.3 Operation and use in windy conditions

Which maximum permissible wind speed was reached following installation largely depends on the type and number of fastening elements and the surface used for fastening. The awning may only be used up to the maximum wind speed specified by the installation company. This may differ from the maximum permissible wind speed specified by the manufacturer. When operated automatically (electronic controllers, with e.g. a wind sensor), damage to the awning cannot be conclusively ruled out. The system is not always able to react with sufficient speed to thunderstorms or gusts of wind that occur suddenly.

Side-seam guided systems may stop moving when the system is extending or retracting when an excessively high wind load (thunderstorm or gusts of wind) occur suddenly.

2.4 Operation and use in rainy conditions

The following conditions apply when using awnings in rainy conditions:

a. The fully extended, external fabric sun protection product must be able to withstand the force exerted by any water accumulating on the awning cloth at an angle of 14° (equivalent to a gradient of 25%) or any lesser angle specified by the manufacturer without breaking.

b. The rainwater is drained, thereby preventing formation of a water pocket.

c. The operating instructions provided by the manufacturer must include a notice advising that the extendable, external fabric sun protection product must be retracted in rainy conditions when its gradient is less than 25% or less than the awning angle recommended by the manufacturer.

d. The water is drained from the awning cloth over the full width of the front rail in rainy conditions. Front rails with a gutter are only able to drain limited amounts of rain. The rainwater may flow over the front rail in an uncontrolled manner in the event of heavy rain.

e. Dirty water will result in deposits forming on the front rail, on the valence and, in particular, on the gutter. Rainwater that accumulates near the front rail may flow off in an uncontrolled manner when the awning is extended.

f. When awnings are retracted, rainwater may be rolled into, and out of, the awning cloth and drip from the bottom of the cloth.
Even when awning systems are closed, water may enter the interior of the awning housing through small gaps or any openings required.
Condensation may also accumulate in the interior of the closed awning. To ensure this water can drain properly, openings may be required on the bottom of the awning.

Side-seam guided systems may stop moving when the system is extending or retracting when large amounts of water accumulate suddenly (thunderstorms, downpours).

g. Awning cloths that have become wet must be extended for drying as soon as possible to ensure no damage is sustained. The standard awning cloths in use are impregnated to make them weatherproof and dirt repellent, however are not absolutely waterproof. The protective effect of the impregnation may decrease over time.

h. If a water pocket forms on an awning, then the water must be removed completely before retracting the awning. The water pocket may cause damage to the awning cloth, the awning components and the fastening to occur.

i. When operated automatically (electronic controllers, e.g. with a wind sensor), damage to the awning cannot be conclusively ruled out.
The system is not always able to react with sufficient speed to thunderstorms or heavy rain that occur suddenly.

2.5 Operation and use in icy and snowy conditions

An awning may not be used and operated in icy and snowy conditions. In the event of a snow-covered awning, the snow must be removed completely before retracting the awning, and a check of whether parts of the awning have frozen in place must be made.

Examples of improper operation and typical faults that occur:

a. An awning cloth may freeze solid, and might not be able to be rolled up or rolled out. Result: The awning cloth may be damaged.

b. Rails or other components may freeze in place. Result: Potential personal injury or property damage due to sudden release of rails during extension.

c. Potential destruction of the awning and/or its fastenings due to snow load, or due to snow in the part of the awning that moves. Roof avalanches may damage extended, or partly extended, awnings.

d. Potential increase in the diameter when rolled up due to coatings of ice or snow:
- Potential damage to the awning cloth due to scraping on components/brackets
- Potential damage to the inside of the casing, as the diameter when rolled up becomes too large
- Potential damage to the tensioning system of counterweight tensioning systems
- Potential damage to the drive motor

e. Snow and ice in guide rails may obstruct the run, and result in damage.

f. When operated automatically (electronic controller, e.g. without a frost detection monitor), damage to the awning cannot be conclusively ruled out, as components that freeze into place may cause damage due to automatic movements. Damage due to frost generally occurs as operating errors.

2.6 Moisture due to indoor operation (e.g. when using a crank rod)
A detailed description of moisture on the crank rods and corrosion on the internal components is provided in the following.

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. Moisture on the indoor crank mechanism may have physical reasons even when the awning has been correctly installed, and is technically unavoidable.

Corrosion on interior components:
Pivot bearings, collapsible cranks and other internal fittings that are galvanised or nickel-plated must be designed to be sufficiently corrosion-resistant in normal interior atmospheres (Class 1 in accordance with DIN EN 13659).
A normal interior atmosphere as defined in this regulation corresponds to room types 1 and 2 in accordance with Appendix A of DIN EN 13120.
Should higher humidity levels occur, e.g. due to poor ventilation or aggressive atmospheres, a higher level of corrosion resistance must be provided. This must be arranged separately with the contractor.
During construction work, e.g. when plastering the interior, the fact that a normal interior atmosphere usually does not exist must be observed. In particular, this must be observed when the operating elements are to be mounted before plastering and tiling.

2.7 Operation
The operating side and position of grommets (position of the gearbox feeder) for crank-operated awnings is decided during on-site consultation. The manufacturer's specifications on the position of the operating side and the type of drive must be observed. The position of the grommets should allow problem-free operation of awnings. If awnings operated mechanically are delivered without an end stop, then the manufacturer's operating instructions must be observed to prevent awning cloths from being damaged by incorrect operation (incorrect winding).

Permissible values for operating forces on different manually operated products are defined in DIN EN 13561.

2.8 Scraping/striking parts of awnings
The cloth used for awnings may strike against parts of buildings or any existing substructures in the event of a heavier wind load. Damage to buildings, the substructure or the sun protection product, in addition to increased noise levels, may occur as a result.

a. In the case of cable-guided systems, the awning cloth and front rail may strike against the substructure, in particular when in intermediate positions.

b. In the case of systems without cable guides or rail guides, awning cloths and front rails may strike against the substructure.

c. Supporting systems (guide tubes, cloth support tubes, tensioners etc.) reduce scraping/striking against the substructure, however cannot prevent them altogether.

2.9 Noise development und noise transmission

2.9.1 General information

Noise development caused by power-operated awnings is not classed as a significant hazard according to the health and safety requirements for machines. For this reason, DIN EN 13659 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. 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 awnings are components 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.

2.9.2 Noise development during operation

When awnings are operated, running, switch-off and frictional noises are unavoidable despite high-quality manufacturing and installation. These noises are caused by e.g.:

a. Running noises produced by motors and manual gears when extending and retracting the awning

b. Opening and closing noises

c. Settling and overloading noises due to varying loads on the frame

d. Running noises, e.g. due to glides and rollers in guide rails, in bearing points and spring tensioning noises

e. Friction and flexing noises produced by the awning cloth

2.9.3 Noise development in windy conditions

Windy conditions may cause the extended awning cloth to move.
These movements may be transmitted to the awning frame, and result in noise emissions. Due to the play required in the guide rails of vertical and sunroom awnings for flawless function, rattling of rollers etc. cannot be avoided. Noise development in windy conditions in technically unavoidable.

2.9.4 Noise development in changing temperatures

When the temperature decreases or increases, considerable decreases or increases in awning length occur. This may cause temporary, unavoidable tensioning or tension release noises.

2.9.5 Noise transmission

The transmission of noise and vibrations into the building structure by the 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 is the current state of the art. Additional noise-reducing measures require individual design planning. This may incur additional costs.

2.10 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 fabric covering. New fabrics, structural-related designs and low ambient humidity in particular intensify this. 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 selective illumination, for example, from a torch, 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). When checking for certain visual characteristics, the correct viewing distance and light conditions must be observed.

3.2 Surface properties of organically coated surfaces

3.2.1 General information

Visible flaws may arise during manufacturing, surface coating, surface treatment, or the transport and installation of non-fabric awning components. The individual flaws are described and evaluated below. Surfaces are categorised into areas with high (•••), average (••) and low or no (•) requirements. The views shown in Figure 1 to Figure 5 are intended to illustrate these surfaces. The illustrations are provided as examples and apply accordingly to all types of awnings. 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, as they cannot exhibit certain characteristics. The information provided here is based on the VFF Merkblatt (Information Sheet) AL.02 [2] from October 2007.

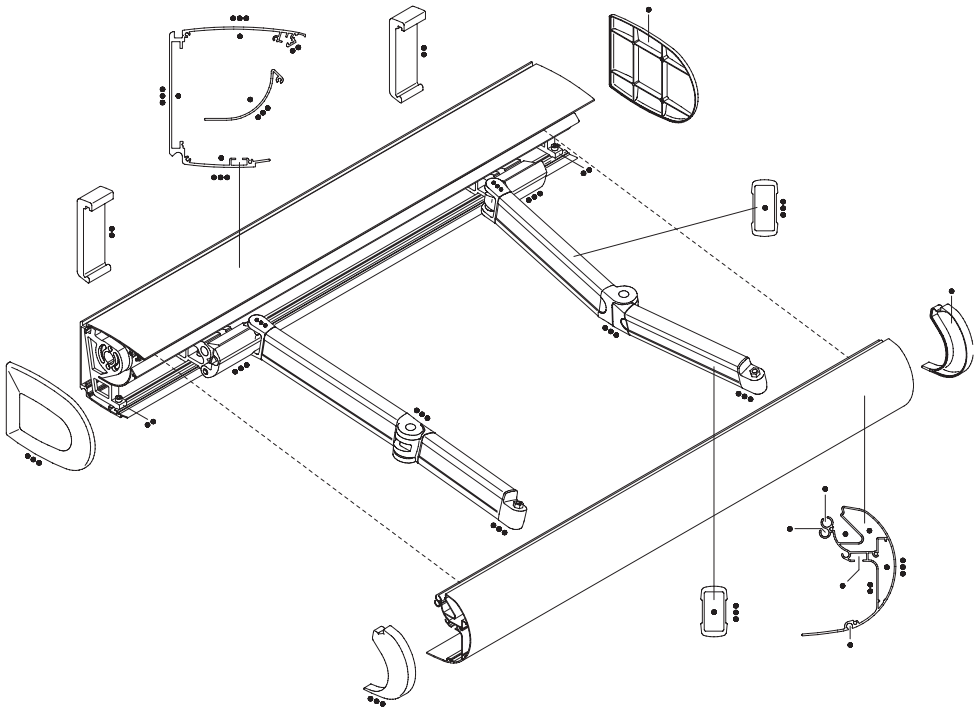

Fig. 1: Definition of visible surfaces – closed extending-arm awnings

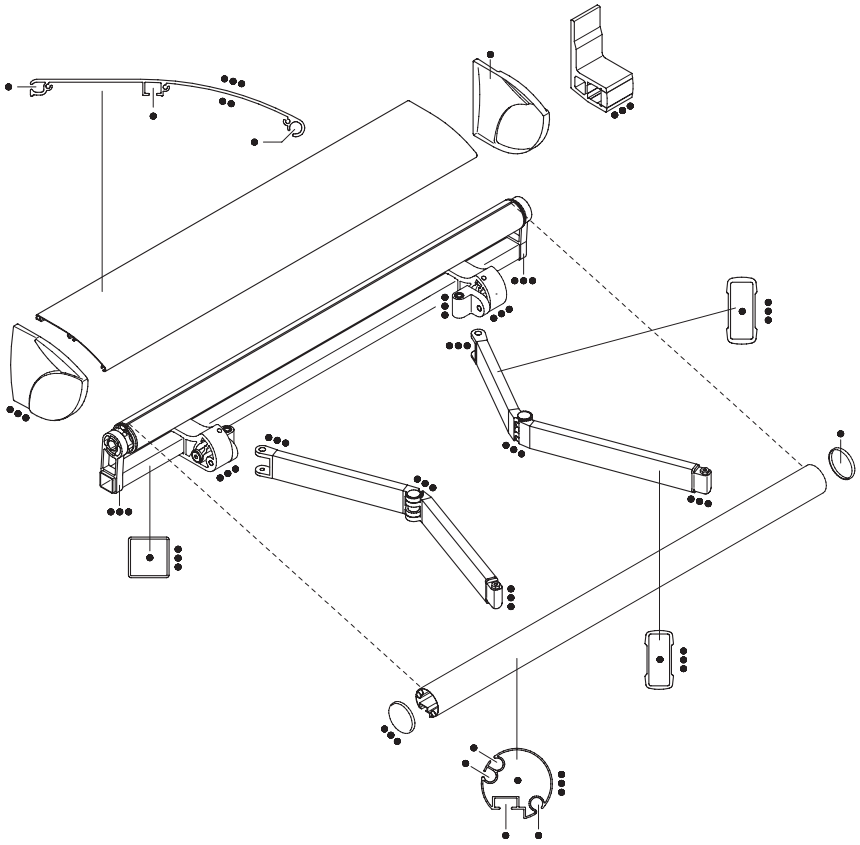

Fig. 2: Definition of visible surfaces – open extending-arm awnings

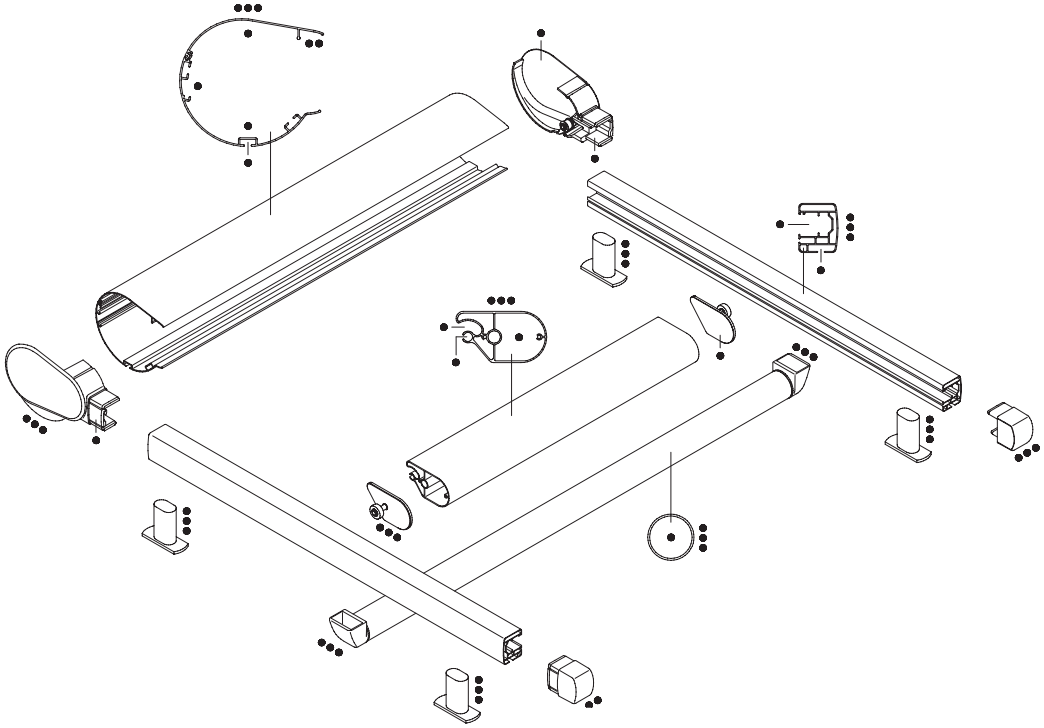

Fig. 3: Definition of visible surfaces – sunroom awnings, over glass and underglass awnings and freestanding installation

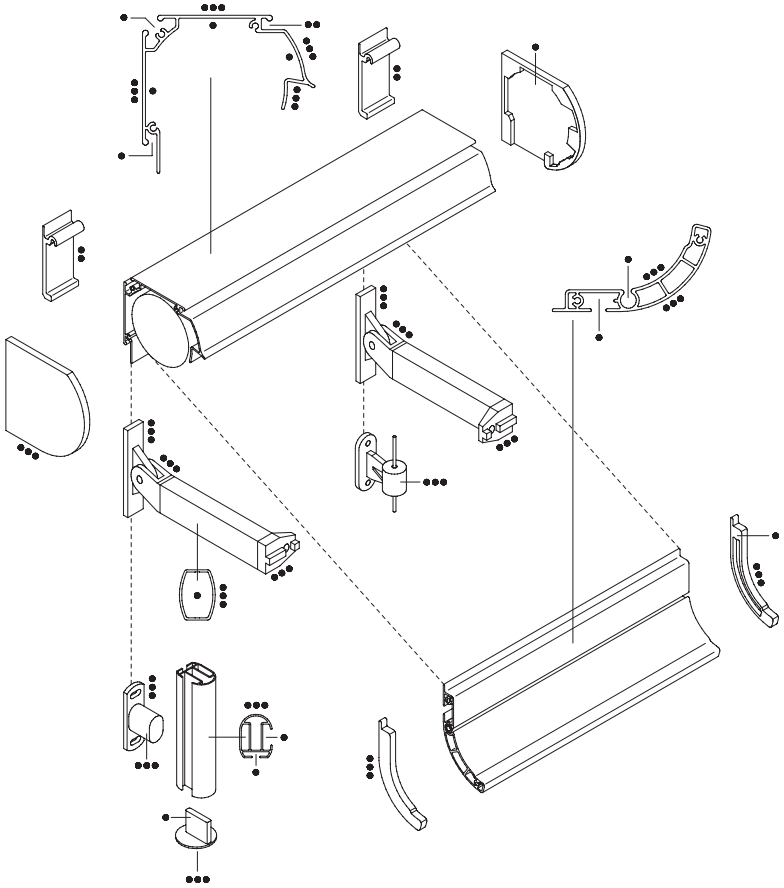

Fig. 4: Definition of visible surfaces – façade awnings

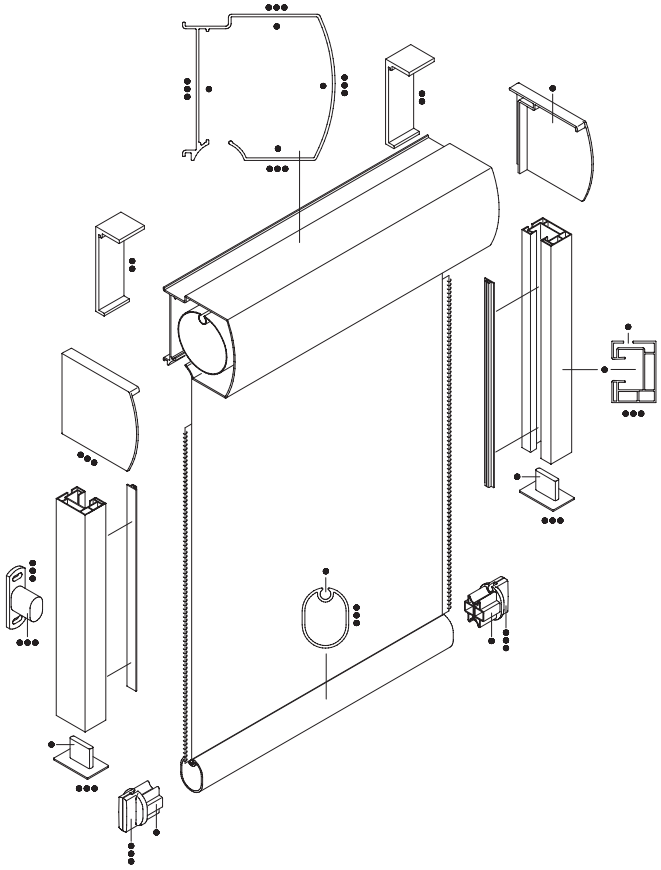

Fig. 5: Definition of visible surfaces – ZIP awning

3.2.2 Craters, blisters

These flaws are permissible within the following limits:
••• Diameter less than 0.5 mm, up to 10 occurrences per m or m²
•• Diameter less than 1 mm, up to 10 occurrences per m or m²
• Permissible

3.2.3 Inclusions e.g. fibres

These flaws are permissible within the following limits:
••• Diameter less than 0.5 mm, up to 5 occurrences per m or m²
•• Diameter less than 1 mm, up to 10 occurrences per m or m²
• Permissible

3.2.4 Chipping

Only permissible in the • category

3.2.5 Paint run

Only permissible under certain conditions in the • category

3.2.6 Orange peel effect

••• Permissible if finely structured; coarsely structured effect only permissible with a layer thicknesses of over 120 µm
••, • Permissible
Note: Orange peel effect occurs due to design-related or paint application-related reasons, as well as due to paint-specific causes in the case of high-pigment paints such as yellow, orange or red.

3.2.7 Colour deviations und gloss variations

Different paint batches and different primary materials (extruded, cast aluminium) may result in deviations in colour and variations in gloss, and are unavoidable. The conditions specified in the VFF Merkblatt (Information Sheet) AL.02 apply for the evaluation in relation to the individual visible surfaces.

Potential causes of differences in colour and gloss:
a. Coil coating does not offer RAL colours and merely approximates these in the case of sheet metal, roll-formed parts or cover panels.

b. In the case of larger orders, the coating materials may originate from different batches.

c. Subsequent deliveries may exhibit deviations in colour.

d. Metal components from different manufacturing/processing methods (even if they are all coated using the same method) and plastic.

e. 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. The evaluation of metallic paints is considered to be particularly problematic. Therefore, they should only be evaluated visually.

f. 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. This must be tolerated as a generally recognised state of the art.

g. The component shape (e.g. arched) results in different colour impressions.

3.3 Surface properties of anodized surfaces

3.3.1 General information

Anodization is a corrosion-protection, electrochemical surface treatment for aluminium that does not apply additional material to the surface, but instead creates an oxide layer. 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; in the case of E6 chemical pickling produces a rough, matte surface.
In the case of the other methods, the surface is processed mechanically by means of brushing, grinding or polishing. However, these methods are costly and is not always possible on curved surfaces. The following criteria are based on the VFF Merkblatt (Information Sheet) AL.03 [3] from October 2007.

3.3.2 Silicon precipitation

Silicon precipitation occurs on account of adverse 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 is only permissible in the • category.

3.3.3 Web marks, coarse grain

The production of profiles by means of extrusion results in different material structures.
•••, •• Permissible, if pickling treatment E0 or E6 (pickled) in accordance with 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, which can be determined using measurement technology; see VFF Merkblatt (Information Sheet) AL.03 from October 2007.

3.3.6 Colour deviations

Colour deviations occur due to different material structures, particularly due to welding, and are permissible.

For manufacturing reasons, there may be variations in the surface characteristics that cannot be avoided. This does not include transport damage. Specifications regarding signs of wear are contained in Section 3.6.2 and 3.6.3.

3.3.7 Grinding marks and dents on weld seams

Grinding marks and dents on weld seams 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
(e.g. polishing or grinding)
••, • Permissible

3.3.8 Surface irregularities due to semi-finished products

(e.g. dents, drawing marks, longitudinal weld seams, imprints, structures)

Surface irregularities due to semi-finished products occur during "forming" processes, this being e.g. casting, rolling, extrusion. They are sometime only visible after coating.
Surface irregularities due to semi-finished products include the following:

- Dents
- Drawing marks
- Longitudinal weld seams
- Imprints (e.g. web marks)
- 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.

3.3.9 Production-related mechanical damage

(e.g. dents, bumps, scratches)
••• Impermissible (except in the articulated arm shaft area)
•• Permissible if not conspicuous (adhere to the viewing distances)
• Permissible.

3.4 Awning cloth appearance

Information on the appearance of awning cloths is provided in the "ITRS Guideline for the Evaluation of Manufactured Awning Cloths". Signs of wear may occur even after operating the awning for the first time. They are usually intensified by adverse environmental conditions (e.g. dirt, sand, soot etc.). Signs of wear are unavoidable and are therefore not considered to be a product flaw.

3.5 Signs of wear

3.5.1 Signs of wear due to arm movements

Friction may cause signs of wear near the deflection mechanism (e.g. joints, chain, belt strap, steel rope). Sagging of the awning cloth under its own weight and/or due to the wind load may also result in signs of wear appearing on the articulated arm and the cloth.

3.5.2 Signs of wear affecting moving parts

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

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

3.5.3 Soiling due to weather and environmental conditions

Fabric sun protection 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, bird droppings, petals, leaves and other organic or inorganic substances. 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 maintenance 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.

3.6 Simultaneous awning movement

The bottom rails 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.

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 and guide ropes.

c. The individual electric drives exhibit different rotational speeds.

d. Potential clutch play 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.

3.7 Final awning positions

Bottom and front rails of awnings installed next to each other may exhibit final positions that differ from each other.

The following items may constitute other potential causes:

a. Permissible tolerance of the limit switches of the drives

b. 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 (sewing or bonding)

c. Different awning sizes

d. Different fabric ageing properties

e. Potential clutch play in the case of mechanically coupled systems, maximum tolerance per coupling point +/- 20 mm

3.8 Settling properties of extending-arm awnings

The use of extending-arm awnings may result in settling of the awning frame due to the action of temporary high forces. Use in windy and rainy conditions intensifies this effect. A potential change in the gradient of the front rail cannot be avoided, and can usually be readjusted.

3.9 Asymmetrical running in extending-arm awning movement

The front profile may deviate from the horizontal by up to +/- 40 mm during extension and retraction due to design and installation-related reasons. This visual phenomenon is particularly pronounced in the case of large awning projections and widths, and may be visible during movement and in intermediate positions. The function of the awning is not impaired by this phenomenon.

3.10 Running properties of systems with a lateral guide

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

4. Shape and dimensional deviations

4.1 General information

The shape and dimensional deviations specified in this section only apply for the manufacture of fabric sun protection products. When in use, weather conditions, the type of use and operation may cause larger deviations. The specifications issued by the respective manufacturer must be observed for dimensional deviations from order-based dimensions.

4.2 Dimensions

Dimensional definitions for width and projection are specified in accordance with DIN EN 12216 (figures are based on DIN EN 12216).

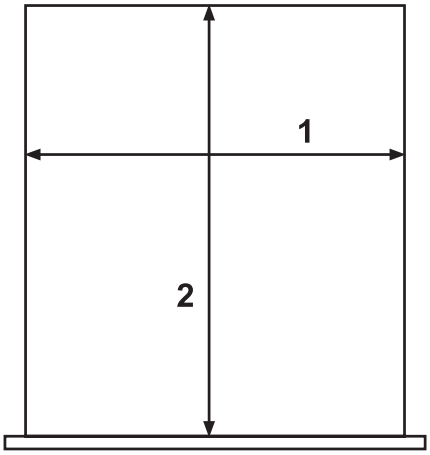

Fig. 6

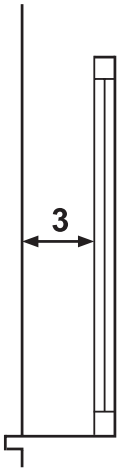

Fig. 7

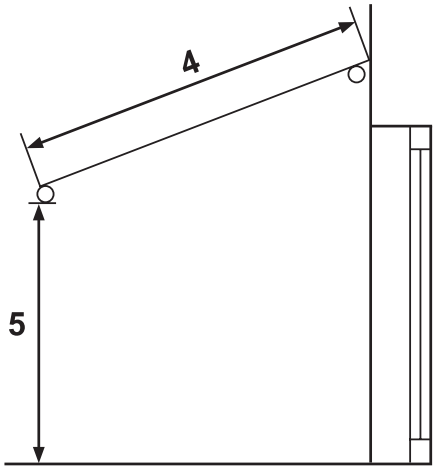

Fig. 8

1 = Width L
2 = Height
3 = Depth
4 = Projection
5 = Headroom

In accordance with DIN V 18073, the manufacturer's product-related, order-based dimensions are considered the dimensions for price calculation, or when VOB (German Construction Contract Procedures) apply, DIN 18358 VOB Part C.

When the manufacturer has not specified anything to the contrary, the following dimensional deviations are permitted in accordance with DIN EN 13561:

Vertical and sunroom awnings – permissible dimensional deviations

Width L m	Permissible deviations mm
L ≤ 2	+0 –3
2 < L ≤ 4	+0 –4
L > 4	+0 –5

Projection H m	Permissible deviations mm
H ≤ 1.5	+2 –2
1.5 < H ≤ 2.5	+3 –3
H > 2.5	+4 –4

Extended awnings – permissible dimensional deviations

Width L m	Permissible deviations mm
L ≤ 6	+0 –10
6 < L ≤ 12	+0 –20
12 < L ≤ 18	+0 –30

Diagonal projection H m	Permissible deviations mm
H ≤ 6	±40
6 < H ≤ 12	±40
12 < H ≤ 18	±40

4.3 Component sagging

Sagging is determined by the following factors:

a. Design-related factors (e.g. number and configuration of brackets)

b. Production-related factors (e.g. straightness deviation of rails)

c. Dead weight of components (case rail, front rail, cloth roller, etc.)

d. Spring or compressive forces of tensioning systems

e. External loads (e.g. wind load on rails and awning cloth)

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.

4.4 Closing properties

4.4.1 Cassette awnings

In the case of sagging of the various components described in 4.3, the loads are unequally distributed onto the seams in the awning cloth. The seams in the outer hems are usually subject to higher loads than the seams on the inside. When the awning is retracted, this causes the outer seams to be wound more tightly that the seams on the inside of the cloth. The difference is diameter this results in may, depending on the design, cause a difference in the gap size in the middle area between the cassette and front rail in relation to the respective outer edges. In addition, twisting moments in the cloth roller may cause the awning to be closed on the drive side while still open on the bearing side. Furthermore, a gap opens when using drives with reversion (small return motion to relieve cloth strain after full closure of the awning) for system-related reasons.

The effects described produce different gaps, which are identified by a Z in the following figures.

Dimensional deviations in the case of dimension Z (fig. 9, 10, 11, 12 and 13) can be found in the manufacturer's specifications. If no specifications are provided, the following tolerances apply for individual systems:

a. Gap Z = max. 1.5 mm per meter L (fig. 9/10)

b. In the centre of a gap that decreases towards the outside Z = max. 1.5 mm per meter L (fig. 11)

c. At the end of a gap that decreases towards the other end, Z = max. 1.5 mm per meter L (fig. 12)

d. When closed in the middle and a gap at the ends Z = max. 1.5 mm per meter L (fig. 13)

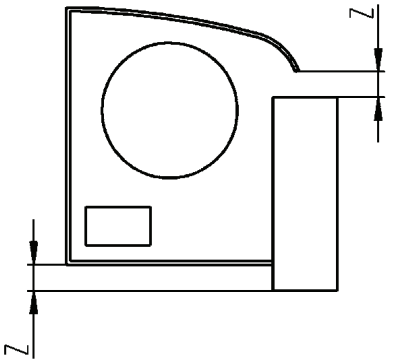

Fig. 9

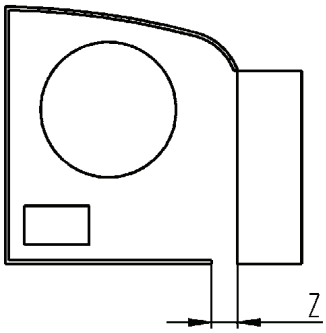

Fig. 10

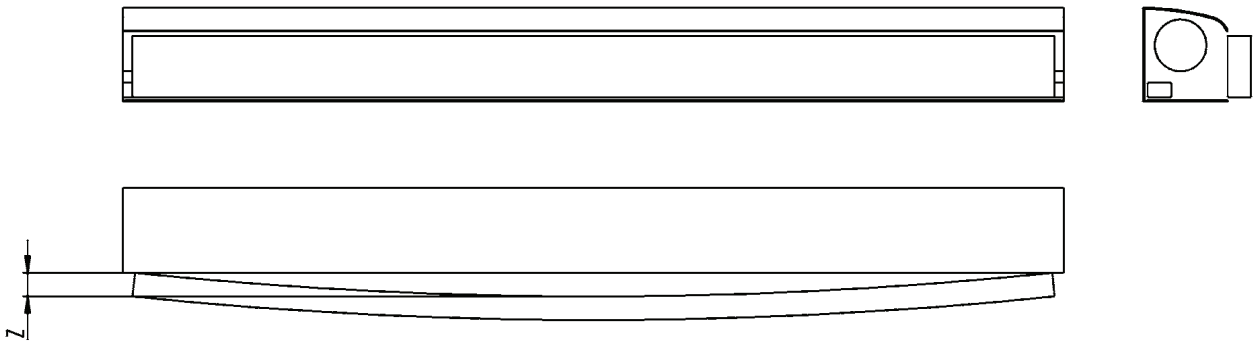

Fig. 11

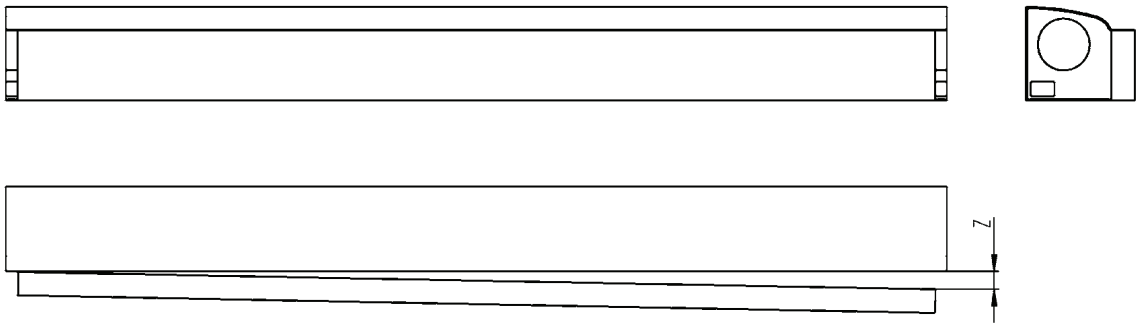

Fig. 12

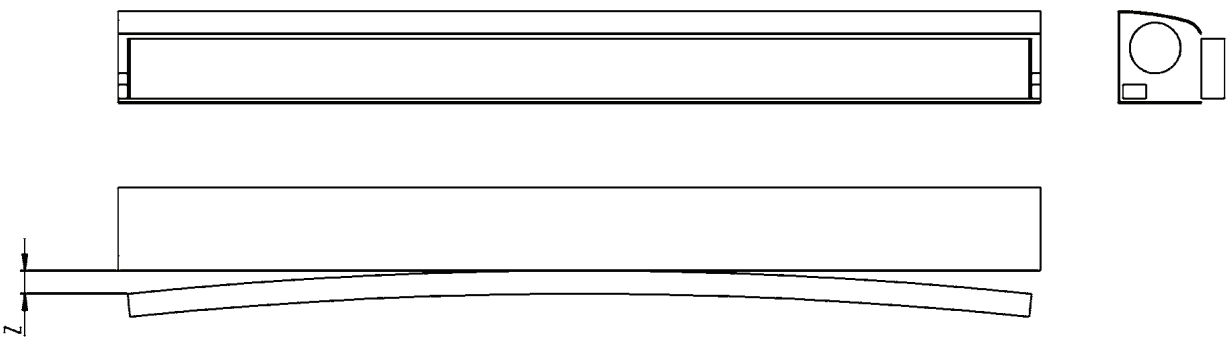

Fig. 13

4.4.2 Extending-arm awnings

In the case of extending-arm awnings without a mechanical end stop, the upper end stop should exhibit a setting that ensures that the cloth is not subject to tension and over-elongation of the cloth seams.

Front rail, cloth roller and protective cover should be as parallel as possible in relation to each other when retracted. The deviations should not exceed 20 mm. When a protective cover is used, the awning cloth should be completely covered by the protective cover.

Due to design, significant differences in distances between the protective cover and front railing may occur on open extending-arm awnings depending on the manufacturer and awning frame, or the awning angle that was set. The gap dimensions this produces are design-related, and are not considered a product flaw. Distances shown in illustrations in brochures may therefore differ considerably due to the awning angle configured at the actual site of use.

4.4.3 Position of the articulated arms

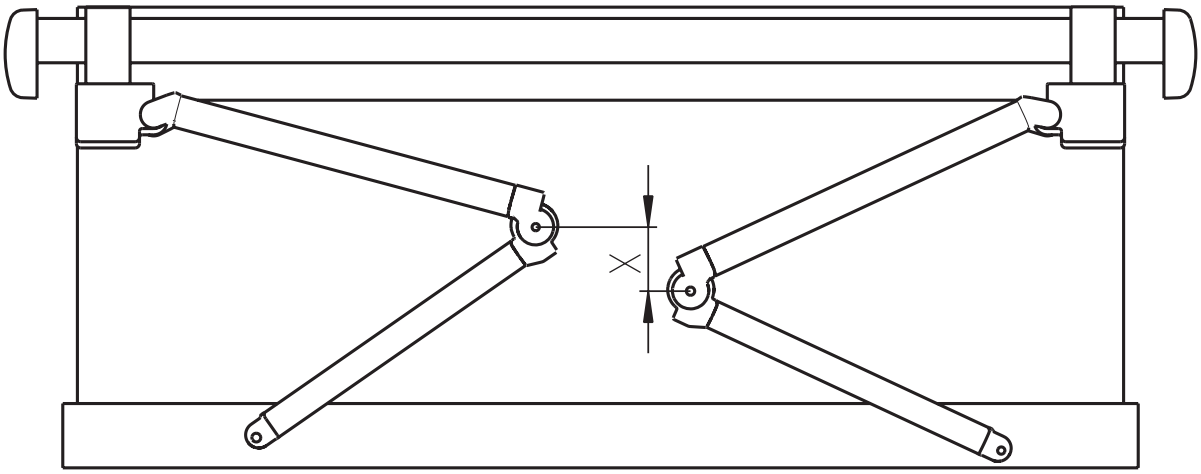

Fig. 14: Offset (X) of the articulated arms between the cloth roller and the front rail

An offset is permissible when it does not impair the function of the awning. Potential causes may include:

a. Cloth is not aligned on the front rail

b. Cloth is not fixed on the front rail

c. Horizontal and/or vertical bracket offset

d. Articulated arm holder not aligned at the front rail

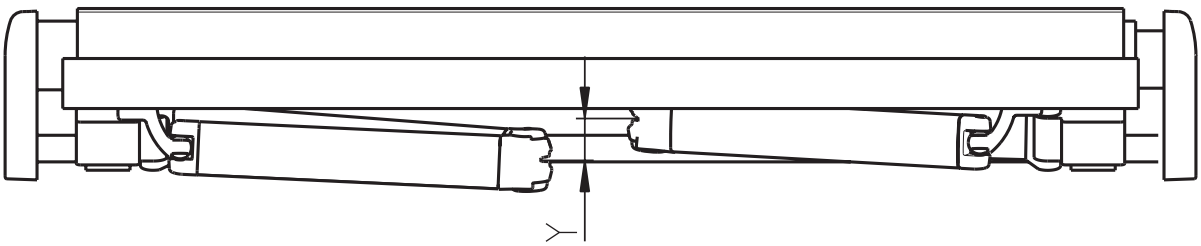

Fig. 15: Height offset (Y) of the articulated arms

The articulated arms should be as symmetrical as possible in relation to each other when retracted. The deviations (Y) should not exceed 20 mm.

Potential causes for deviations (Y) may include:

a. Arm bearings are not aligned at the support tube

b. Overloading due to e.g. wind load or water pocket

c. Horizontal and/or vertical bracket offset

d. Articulated arm holder not aligned at the front rail

4.4.4 Awnings with lateral guides and pull systems

When cases, roof coverings, the cloth roller and front rail feature are only mounted at the side, higher levels of sagging may occur on these types of awnings than described in 4.4.1.

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.

4.4.5 Awnings with lateral guides without pull systems

When cases, roof coverings, the cloth roller and front rail feature are only mounted at the side, higher levels of sagging may occur on these types of awnings than described in 4.4.1.

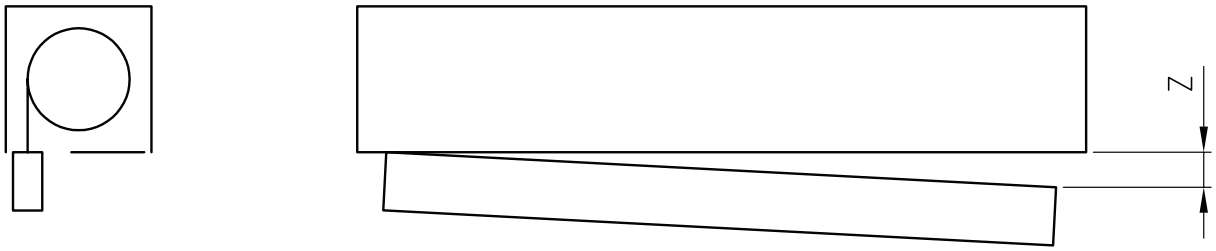

Fig. 16

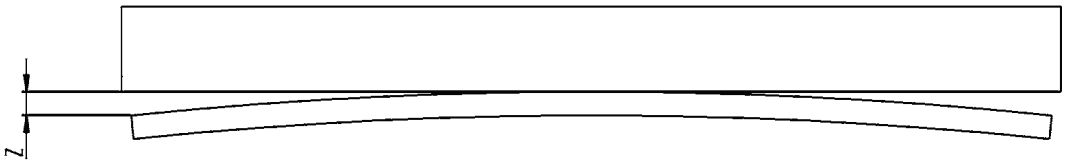

Fig. 17

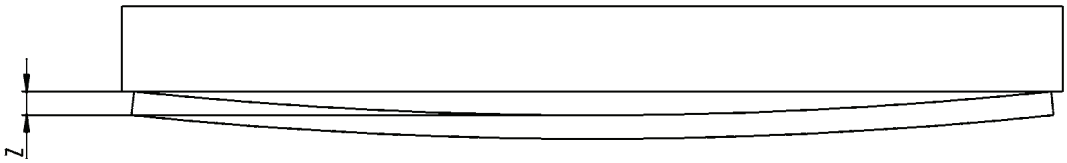

Fig. 18

The case rail and bottom rail should be as parallel as possible when retracted. The deviation (Z) 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.

5. Bibliography

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[2] VFF Merkblatt (Information Sheet) AL.02, October 2007

[3] VFF Merkblatt (Information Sheet) AL.03, October 2007

[4] DIN 4109-1:2018-01 Sound insulation in buildings – Part 1: Minimum requirements

[5] DIN EN 12216, Shutters, external blinds, internal blinds – Terminology, glossary and definitions; Trilingual version EN12216:2002

[6] DIN EN 13120 Internal blinds – Performance requirements including safety; German version EN 13120:2009

[7] DIN EN 13561 External blinds and awnings – Performance requirements including safety; German version EN 13561:2015

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[9] DIN 17611, Anodized products of wrought aluminium and wrought aluminium alloys – Technical conditions of delivery

[10] DIN V 18073, Roller shutters, awnings, rolling doors and other blinds and shutters in buildings – Terms and requirements

[11] DIN 18358 VOB Part C – Rolling shutters works

[12] ITRS Richtlinie zur Reinigung und Pflege von Markisentüchern (ITRS Guideline on Cleaning and Care of Awning Cloth), "The guideline describes cleaning of fabric blinds"

[13] ITRS Richtlinie zur Beurteilung von konfektionierten Markisentüchern (ITRS Guideline for the Evaluation of Manufactured Awning Cloth), "The guideline describes the relevant properties of the fabric blinds"

6. Legal notice

Text and design: IVRSA, Industrievereinigung Rolladen – Sonnenschutz – Automation, a working group of Industrieverband Technische Textilien - Rollladen - Sonnenschutz e.V.

The following guidelines and recommendations are available from **ITRS e.V.**:

- Guideline on Safety Instructions in Installation and Operating Instructions for Awnings
- Guideline on Technical Consultation, Sales and Installation of Extending-Arm Awnings
- Guideline on Cleaning and Care of Awning Cloth
- Association Recommendation for Use of Radio Technology in Building Automation
- Guideline for the Evaluation of Product Characteristics of External Venetian Blinds
- Guideline for the Evaluation of Product Characteristics of Awnings
- Guideline: Instructional Content, Certificate, Order and Verification for Electrical Specialists for Specified Duties in the Field of Skilled Shutter and Sun Protection Work
- Association Recommendation for Load Assumptions Pertaining to Wind / Suction Forces that Must be Taken into Consideration for Manufacturing
- Sun protection along emergency evacuation routes
- Association Recommendation for Measuring Windows with Attached Shutter Boxes

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