

## 1. Loading the connecting joints

1. Driving rain
2. Wind loads
3. Operation
4. Sound
5. Element elongation
6. Unintentional closing (slammed shut by the wind)

## 2. Joint types and designs

### 2.1 Working joints

The joints must not pick up movement. The joint filler is for sealing purposes only.

### 2.2 Movement joints

These joints are subjected to all of the influences under 1.0. They must therefore be executed with particular care and with materials of adequate robustness if they are to withstand the greater loads. Only in this manner can damage to the building be prevented.

Because they can compensate building tolerances, are easy to process, and can withstand all the effects of wind, driving rain, and movements over the long term, joint fillers are ideal as sealants between window frames and the building substrate. Joint sealing strips and installation casements are just as suitable, but not for universal applications.

#### 2.2.1 Sources of defects in joint plans

1. joint too narrow/shallow
2. wrongly assumed directions of movement
3. inadequately prepared bonding surfaces (avoid bonding on three sides; joint flanks must be firm and dry).

#### 2.2.2 Sources of defects in execution

1. bonding on three sides
2. bonding sites wet
3. bonding surfaces not firm
4. no or inadequate depth limiter
5. closed-cell round cord
6. incorrect joint material
7. failure to observe the technical guidelines issued by the manufacturer of the joint filler

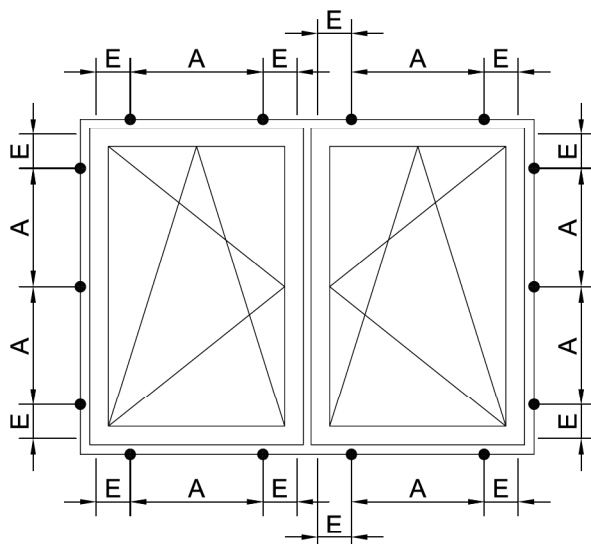
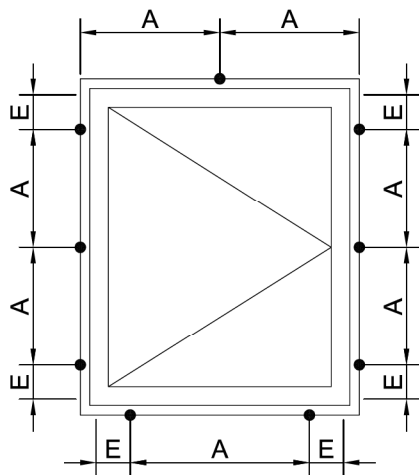
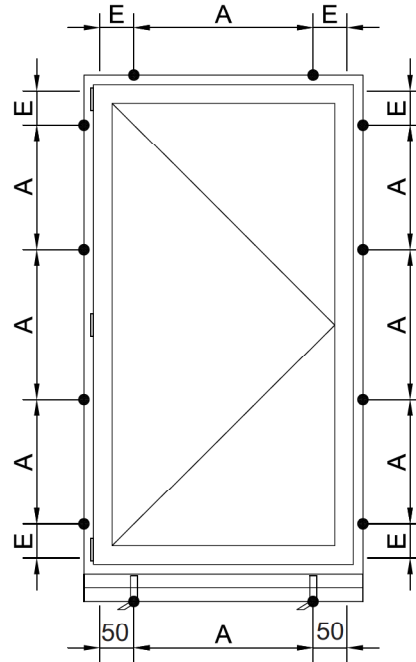
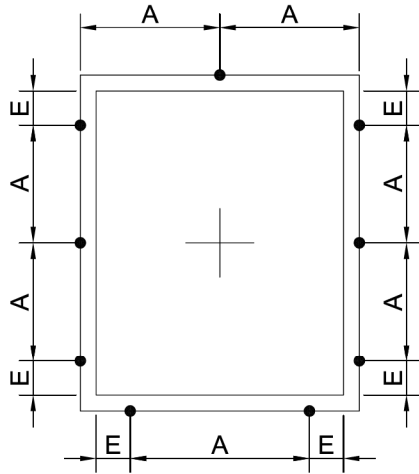
### 2.2.3 Special requirements

Particularly when sound insulation measures are implemented, the space between the outer and inner joint or between the frame's outside and its connection to the building must be carefully filled with mineral fibres (glass fibres / rock wool). This acts as a considerable barrier to the passage of sound. The backfilled mineral fibres must not be packed too tightly if there is to be no firm coupling between the PVC outer frame and the building. The joints must not be grouted, otherwise they will form a direct, firm connection between the window and the building. The grouting crumbles under the window's movements and drops out of the joint. Unintentional closing (e.g. the wind slamming the sashes shut) exerts particularly high loads on the joints. As a consequence a connection with plaster cannot remain tight over the long term. The plaster crumbles, water can enter the joint, and damage is caused to the building. Joint fillers are resilient and remain tight.

The advantage of plaster connection profiles of PVC-lined angle beads is that the bonding flanks of the joint filler **always come into contact with PVC**. This allows jointing even when the final coat of plaster is still moist. The joint has perfectly firm flanks and many sources of defects are prevented.

The joint dimensions must allow for lintel deflections (consult the structural analyst!).

Securing points in masonry



- = securing points
- A = anchor spacing max 700 mm
- E = – distance from the inside corner approx 150 mm
  - for mullions and locks, distance from the profile's inside edge approx 150 mm
  - on non white profiles approx 250 mm

**2.3 Protective film**

In the case of profiles provided with a protective film before leaving the works, we recommend removing this directly, but no later than three months, following the installation of these windows.

**2.4 Storage and transport**

Supports, beds, etc., should be secured against slipping and tipping (wooden boards, pallets, frames). All window and door elements must be transported vertically. Avoid pressure points and deflections.

*Packaging must not have any damaging effects.*

*It is imperative that no heat or water can accumulate in the packaging.*

**3. Installation**

**3.1 Installation basics**

**3.1.1 Overground building tolerances DIN 18202**

Check building apertures against the following table:

Component surface	max deviations for nominal dimension range		
	up to 2.5 m	over 2.5 m up to 5 m	over 5 m
unfinished (e.g. masonry not plastered yet)	<b>±10 mm</b>	<b>±15 mm</b>	<b>±20 mm</b>
finished (e.g. plastered masonry, masonry of facing bricks, facing concrete)	<b>±5 mm</b>	<b>±10 mm</b>	<b>±15 mm</b>

**3.1.2 Datum levels**

The customer must provide the corresponding heights above datum level (elevation in metres). There must be at least one datum level for each storey. The datum levels must be spaced no greater than 10 m, and the heights above these examined before installation work commences. The customer must be notified immediately of any discrepancies.

**3.1.3 Position in the building**

If not specified otherwise, all elements must be installed vertically or horizontally and flush.

Horizontal elements may not exceed 1.5 mm/m (spirit level precision), or 3 mm/m in total. There must be no impediment to the function nor any detriment to the appearance.

This max deviation from the vertical must also be observed if there is to be no detrimental effect on the  $U_w$  value.

The exact positions of the window and door elements in the building must be agreed in writing with the customer/planner.

**3.1.4 General specifications**

Installing must observe the RAL quality and GKF guidelines.

The installations depicted in the following (Register 2.7.2) are examples!

#### **4. Connection to the building**

##### **4.1 Fasteners**

Dowel pins, anchors, wall anchors, drive-in anchors, mounting rails, installation casements, etc.

- The selected fasteners (wall anchors, dowel pins, etc.) must not obstruct elongation of the elements at the connections to the buildings (special dowel pins are recommended).

##### **4.2 Fastening**

Securing and aligning the installation with wedges. We recommend diagonal wedging (but not directly at the corners).

Leaving a gap of at least 10 mm facilitates the subsequent application of sealing compound.

**Installation points must be selected as follows:**

- 100–150 mm from the inside corners
- spaced at max 700 mm

Note the installation instructions on page 3.

**IMPORTANT**

On burglar-resistant doors and windows, pressure-resistant shims must be inserted between the wall and outer frame at all locking points.

**5. Joints between frames and buildings**

**5.1 Width**

Whenever possible you must leave gaps of the same width at the jamb connectors and lintel. You must consult the following table when applying silicone sealants to the joins.

Surfaces of window profiles	Joint design (minimum joint width b in mm)						
	with straight-edged stop				with inner stop		
	for element lengths up to				for element lengths up to		
	1.5 m	2.5 m	3.5 m	4.5 m	2.5 m	3.5 m	4.5 m
white	10	15	20	25	10	10	15
non-white	15	20	25	30	10	15	20

The gap between the window plane and the stop must be no less than 10 mm on a jamb with stop.

**5.2 Sealing**

Depending on the respective requirements, the connection gap to the building must be filled with thermal or sound insulation materials like mineral or glass wool or other compressible insulating material.

Make sure when applying insulating material that the gap width and depth needed for sealing remain unobstructed.

*Use filling foams only when they do not subsequently react and are compatible with PVC frames and sealant.*

Insulating the connecting joint with PU foam should be agreed in writing in both the tender and the job confirmation.

Bituminous substances can be used only with restrictions because their contact causes stubborn staining on the PVC surface that can no longer be removed.

When sealing gaps, you should proceed according to the principle “inside tighter than outside”.

If not specified otherwise the following basic rule applies to silicone and other sealants: the thickness of the sealant corresponds to half the gap width.

Observe the manufacturer’s manufacturing instructions when applying pre-compressed sealing tapes and flexible waterproofing sheets.

## 6. General instructions

- In order to obtain the correct building gap on particularly wide elements, clarify with the customer the max possible lintel deflection.
- Forces exerted by the building's movements must not be transferred to the installed element.
- Immediately after installing the elements conduct an approval procedure (in accordance with VOB [German contract procedure for building works]) with the supplier.
- Outdoor sills of natural or artificial stone provided by the customer should be fitted with a spacing bead or a corresponding profile (between the bottom frame and window breast).  
This prevents thermal bridges from forming between the outside and inside sills.

### IMPORTANT

Metals like lead, copper, or alloys containing copper (e.g. brass) must not be fitted together with aluminium (also not in the liquid section). Galvanised steel parts and components of stainless steel or zinc can be processed with aluminium without problems.

Aluminium components must not be subjected to scratching or impacts. When there is masonry or plastering work after installation this is best protected with suitable self-adhesive and smooth UV-resistant PVC-U films.

Aluminium has differing elongation properties and should therefore not form a fixed connection with plaster or the body shell.

The fastening between aluminium and the body shell should always be a sliding design.

Aluminium undergoes a change in length of about 1.2 mm/m under a temperature difference of 50 °C. Lengths exceeding 3 m should not be fitted without a butt (expansion) joint.