

# Recommendations for Measuring and Installation



**Genuine High Performance**

# **Timber + Aluminium Clad**

**Windows and Doors**

 **NorDan®**

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# Introduction

NorDan products are made to a very high standard and it is essential that this is not compromised in the installation process. The suggestions and guidelines included in this leaflet are intended to help ensure that this does not happen. Remember: if in doubt, ask your nearest NorDan office for advice (details on the back of this leaflet).

Whether in the measurement, the sizing, the site handling and storage or the installation of NorDan windows, it is always preferable to employ good practices to ensure maximum satisfaction with the finished article.

We look upon our products, not as building components, but as high quality furniture to be carefully handled and installed at all times. This will ensure there are few maintenance problems during the product's lifetime which will consequently be a long one.

The following are some practical measures to help achieve this:

- Never install into an incomplete opening or a building without a fully installed, weather-tight roof.
- Store goods under cover in a dry and ventilated space until they are installed.
- Use soft packers to keep frames from rubbing or touching one another when in store.
- Store units vertically, NEVER horizontally.
- Handle the products like furniture. Wear clean gloves to protect the finishing.
- Encourage other trades to respect and not abuse installed windows and doors.
- Follow all the guidelines in this leaflet.
- Protect the products after installation.

**Note:** The installer should always check with a structural engineer to ensure the security of the fixings, and that the structure is capable of taking the transferred loadings.

# Good building practice

When installing and fixing NorDan windows, good site building practice should be employed at all times, including all Health & Safety observances. NorDan takes no responsibility for fitting carried out improperly by others.

NorDan working methods and installation recommendations are based on the requirements featured in BS 8213: Part 4: 1990, 'Code of practise for the installation of replacement windows and doors in dwellings' and Section 6 GGF data sheet 'Installation of windows and doors in domestic properties', 1996.

Copies of the publications are obtainable from:

## Bsi

389 Chiswick High Road, London, W4 4AL, UK  
Tel: 020 8996 9000  
Fax: 020 8996 7001

## Glass and Glazing Federation

44-48 Borough High Street, London, SE1 1XB, UK  
Tel: 0171 403 7177  
Fax: 0171 357 7458

Both publications serve the replacement market generally. The principles of good working practice described therein are the same for new build works including matters relating to Health and Safety.

NorDan recommend that all installers obtain copies of the publications and comply with them while following these manufacturers' recommendations.

# Calculating manufacturing sizes

Before adopting dimensions shown on architects' drawings to determine manufacturing sizes, consider the following:

- Tolerances within the openings to ensure windows / doors can be fitted plumb and square leaving sufficient gaps for sealing / pointing
- Have you allowed sufficient space at the bottom of the window to incorporate the NorDan extension cill (if required)?
- It is strongly recommended that sizes are taken from prepared openings prior to production.

## Tolerances

Normally, a nominal gap of 10mm at either side and at the head of the frame is sufficient to allow a plumb & square fit and achieve a suitable sealed joint between frame and wall. Always avoid gaps of less than 5mm as this encourages capillary action of water and leaves insufficient space for a proper polyurethane foam fill.

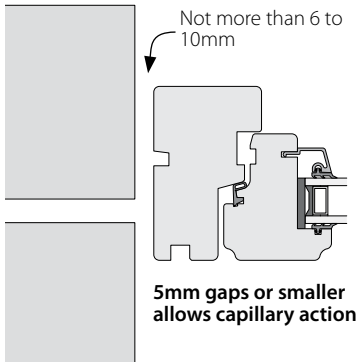


Fig. 1: Typical horizontal section

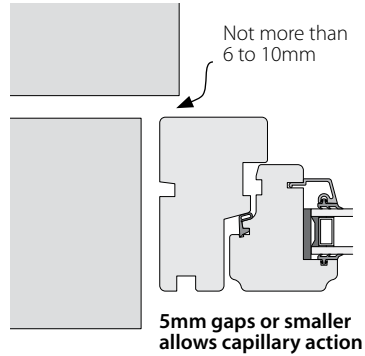


Fig. 2: Rebate / horizontal section

## Cill considerations

As there is a large variety of cill scenarios, it is advisable to consult your local NorDan office for advice on the appropriate tolerance and the most suitable aluminium extension cill (see page 18 for different cill types).

If the construction detail includes a cant brick then the chances are, a nominal tolerance of 6-7mm will ensure the cill detail works (see Fig. 3).

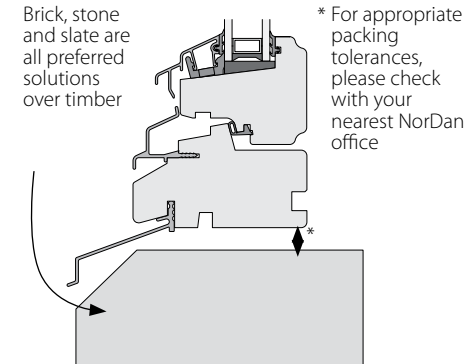
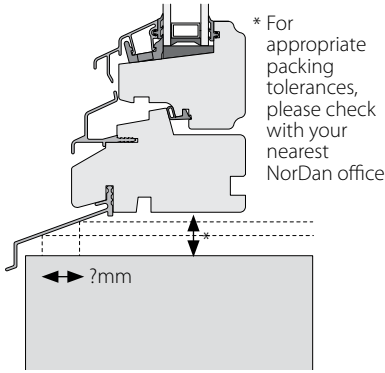


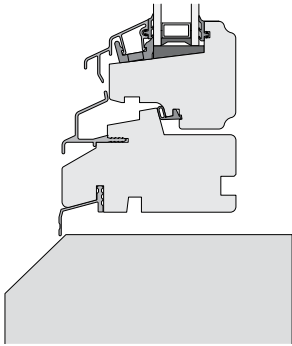
Fig. 3: Cill height

If the cill detail includes a flat surface then the threshold may need raising to allow for cill slope and reach perhaps by as much as 40mm or more (see Fig. 4).

Whatever the final solution is, deduct the required allowance for the cill detail from the overall height then apply a suitable fitting tolerance.



**Fig. 4:** Cill distance and height



**Fig. 5:** Extension cill sizes

## Fully reversible (HG) window

If you are fitting a fully reversible window behind a check in the outside skin of a cavity wall then the window should have no more than a 10mm 'cover' at the jambs and head to ensure the sash operation is not obstructed.

# Measuring / surveying

When surveying, measure old or new openings to establish both vertical, horizontal and diagonal measurements.

## Outward opening windows

### Diagonal measurement

Compare and adjust to the nearest squared size available.

### Width

If the reveal is stepped by internal plaster and the new window is to butt up to the plaster then check the new window frame thickness. This ensures the sash will open outwards with no obstruction and determines the required width for manufacture.

### Height

Check the cill detail in accordance with the recommendations to establish the overall height tolerance required (see Fig. 4).

Check that the trickle vent (if required) will be clear of ceiling plaster and if the internal lintel (soffite) is or will be tiled. Adjust the manufacturing height accordingly to ensure the trickle vent will operate freely.

Don't forget to make allowances for window boards, existing or proposed.

## Inward opening windows

### Diagonal measurement

Compare and adjust to the nearest squared size available.

### Width

If the reveal is stepped by internal plaster and the new window is to butt up to the plaster then check the new window internal frame dimension to ensure the sash will open inwards without obstruction. Determine the required manufacturing width accordingly.

If the reveal is stepped by internal plaster and the new window is to be drawn in over the plaster then check the new window internal frame dimension to ensure the sash will open inwardly without obstruction. Determine the required manufacturing width accordingly.

Where a wall is tiled and if the window is to be drawn in over the tiles then determine the required manufacturing width accordingly.

**Height**

Check the cill detail in accordance with these recommendations to establish the overall height tolerance required.

Check the trickle vent (if required) will be clear of ceiling plaster and if the internal lintel (soffite) is or will be tiled. Adjust the manufacturing height accordingly to ensure the trickle vent will operate freely. Don't forget to make allowances for window boards, existing or proposed.

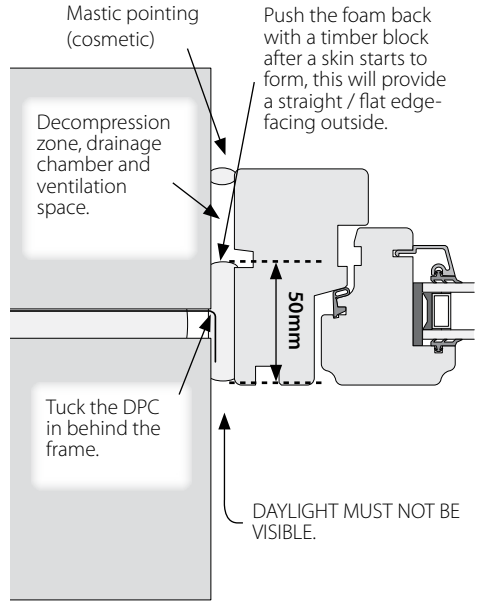
**Note:** Record all external and internal sizes so that all internal/external finishing materials can be procured in time to ensure installation is fully completed on the day of installation.

# Two step tightening

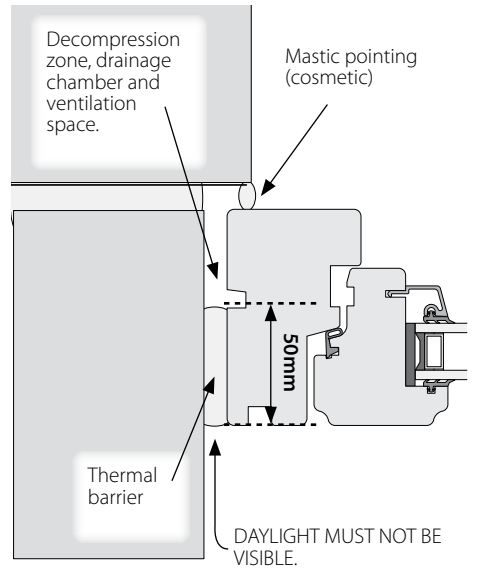
'Two step tightening' is a design principle which is employed extensively in the design of NorDan products to ensure a weather tight seal between the fixed frame and opening sash. We recommend that our products are installed using the same principle to ensure that the whole opening performs efficiently both as a weather barrier and as a prevention to the loss of heat from the building.

Simply put, it involves protecting the inner seal by ensuring there is a drainage gap between outer and inner seals. The accompanying diagrams illustrate how this works in practice.

**Don't rely on mastic pointing for weather-sealing. Observe the principles of two step tightening.**



**Fig. 6:** 'Two step tightening'



**Fig. 7:** 'Two step tightening' with rebate

Points to note:

- Always ensure that the window is plumb, level and square in the opening prior to making the final fixing to the structure (if cavity closers are used, ensure the fixings are taken back into the solid brick/blockwork).
- When injecting foam into the gap between frame and wall, always ensure that there is a gap of at least 15 to 20mm between the foam and the front face of the window/door frame (see also notes on application of the foam).
- Leave a suitable gap (6 to 10mm) for the external mastic seal to grip.

## Removing old windows

1. Make sure that each installation can start and finish as a single safe and efficient operation.
2. Never remove a window before checking the new window is of the right type and particularly THE RIGHT SIZE.
3. Always de-glaze before attempting to remove old window frames.
4. When levering against the building to prise window frames out, always use a timber block against the building to protect brick surfaces and avoid bricks breaking free.
5. Place all old glass immediately into a secure and safe container (bin box or dustbin with a lid only removed when needed).
6. Always remove windows while working in a protected area with a suitable floor covering to gather up loose or broken glass and other debris to reduce the risk of injury to you and others.
7. NEVER work without PPE.

## Preparing the opening

Building in windows or doors is NOT RECOMMENDED by NorDan and will result in the withdrawal of the guarantee.

**Never install into an opening where the cill section (bottom) is damaged or missing. Neither install into an opening which is in any way incomplete.**

Always first clean and, if necessary, arrange for or carry out the repair of opening thresholds before installing.

### Cill packers

When the opening is level and clean of debris, apply a mastic coating of sufficient thickness to lay the window or door-set on top to form a totally airtight and waterproof seal.

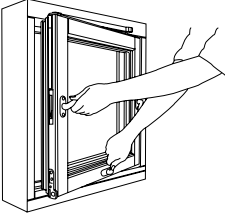
If the threshold surface is not level then apply a bed of mastic / foam sealant and lay packers as required to make level. If making level can be achieved by way of moderate use of packing then that will suffice and the installation may continue. When fixed, apply further mastic along the length to ensure a total seal as described above. Packers must be solid, rot proof, and of a size to maximise load transfer without any risk of the product dropping after installation.

If the installation requires a packer of whatever thickness then first ensure the threshold is clean of debris before applying a mastic or waterproof foam coating of sufficient thickness to lay the packer on to form a totally airtight and waterproof seal. Mastic the top and proceed accordingly. In such cases the packer must be continuous and suitably treated against rot and decay. If necessary, additional small packers may be added to on top of the first packer as previously described.

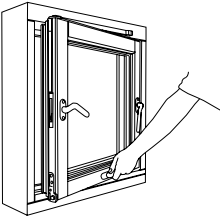
# Removing the sash

If the window you are installing is a Fully Reversible window (HG) or a Villa range of window then it is not recommended that you remove the sash. For three handled and one handled tilt and turn windows, follow the corresponding details below for safe sash removal:

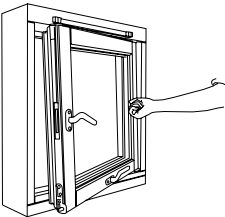
## Three handled tilt and turn



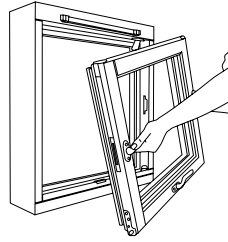
- 1 Start with the window open in the side hung (cleaning) position.



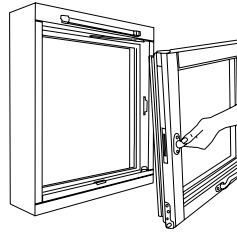
- 2 Close the bottom handle of the sash.



- 3 Open the side handle on the 'hinged' side.



- 4 Tilt the sash inwards by approximately 30° then lift it up and off the ball fitting (the fitting is situated underneath the 'hinged' side).



- 5 Uncouple the steel holding stay in the head of the sash. Put the sash in a safe place.

To replace the sash follow the procedure in reverse order.

## One handled tilt and turn

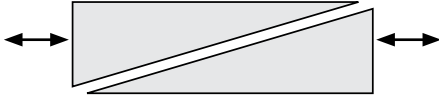
- 1 Open the window into the cleaning position. This is done by turning the handle 180° so that the handle points upwards.
- 2 Press in the button positioned on the edge of the sash near the handle.
- 3 While still holding in the button, turn the handle downwards into the horizontal position. Release the button.
- 4 Lift the sash so that it releases from the hinged side of the frame.
- 5 Release the steel restrictor stay positioned in the head of the sash. The sash is now free to remove safely.

To replace the sash follow the above procedure in reverse order.

# Wedges

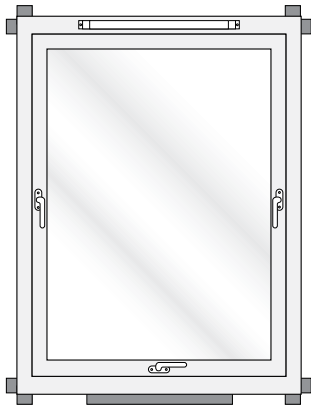
It is recommended that wedges are first used when setting the frame square and plumb prior to fixing. Ensure that the wedges are dry. Use two wedges (see Fig. 8) for each corner of the frame, this will apply an even pressure without twisting the frame.

Check the plane with other windows (before installing) and position the frame accordingly.



**Fig. 8:** Wedges

Wedges should never be used for the fixing of the window. Mechanical fixings should be used at all times. After packing and fixing, wedges should be removed.



Two wedges should be used on each corner.

Place the wedges only on the end grain.

Pressure on the wedges should not be so great that the frame is forced to bow, twist or bend.

Use a continuous packer under the frame. The depth will vary depending on the sub-cill detail (see pages 3 & 4).

**Fig. 9:** Position of wedges

# Packers

Packing alongside fixings must be of a size and shape to effectively transfer the fixing load into the main structure without twist or bow. Vary the thickness of packers to ensure the sides are plumb and square without causing twist or bow.

Before finally fixing the window frame into the opening, position the packers to create a secure fit. Use only rot-proof packers. Do not force packers into the opening as this may cause distortion of the frame.

Where U shaped packers are required these may hang over the fixings but should provide a sufficient surface area to enable transfer of load.

# Fixings

As there are a variety of recommended installation procedures, NorDan offer the following recommendations:

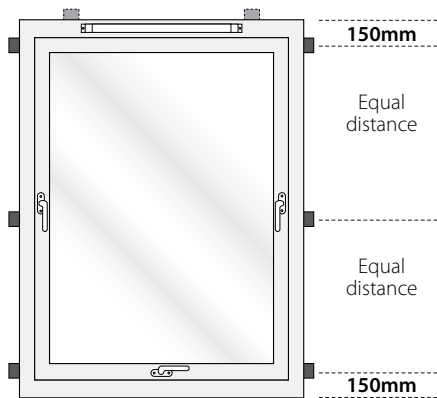
- Fixings must be capable of transferring loads directly to the main structure.
- Frames should be fixed square and without twist (to avoid 'springing and bowing').
- Never 'persuade' joinery into an opening. It either fits or it doesn't!
- Talk to us. We are here to help you.
- NEVER, but never, build in.

## Position of fixings

Fix sides 150mm from the top and bottom and no more than 600mm apart. This will depend on the overall width of the window and degree of exposure. Head fixings may also be required. Please check with NorDan if you are uncertain. All fixing points must be packed.

## Frame positioning

For flush jambs, there should be a minimum distance of 25 to 35mm from the front of the frame to the brickwork face. In all cases, set the window as far back as possible for better weather performance.



**Fig. 10:** Fixing positions

In general windows fixings are required a minimum 25mm deep into sound material with door fixings comprising expanding bolts or other high grip devices 50mm deep. NorDan recommends all fixings are at least 50mm deep into the main structure excluding plaster.

### Factory pre-drilled fixing positions

Where a product has pre-drilled fixing positions, these must be employed in addition to the fixing positions as outlined. Such pre-drilled fixing positions are determined by the hinge manufacturer.

### Fixing the window (direct fixing)

Avoid drilling fixings in straight lines. Always stagger them across the depth of the frame to avoid the frame twisting.

- 1) Use packers at the screw points to fill the tolerances between frame and wall.
- 2) Drill through frame and packers to spread the load of the fixing screw, avoiding twist / bow of the frame with a depth of at least 50mm into solid brickwork or the main structure.
- 3) Plug the drilled hole and screw. Fix and tighten.
- 4) Check for twisting or bowing and adjust accordingly.

## When is a head and cill fixing necessary?

Apply a fixing in the head and cill if necessary, if the window exceeds 1200mm in width. Do not puncture water trays or DPCs! Also:

- If the opening is not sound.
- Where window frames are coupled.
- If the contractor's structural engineer recommends them.
- When common sense and good building practise demand.

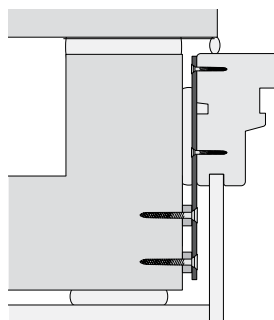
If a head fixing is used, be careful that it does not interfere with the vent at the head of the window.

## Straps (indirect fixing)

If using straps, then only use a rust-proofed metal of a size and dimension to ensure that weight / load distribution goes directly into the main structure (see Fig. 11).

Always move fixing straps as necessary to avoid fixing in mortar joints or edges. The product loading **MUST** be transferred to the main structure with positive fixing.

Straps should be rust-proof, 3-5mm thick, 30-50mm wide and long enough to ensure a secure fixing directly to the main structure.



**Fig. 11:** Using straps

It is highly recommended that straps are not bent to shape but packed to create a secure fixing (see Fig. 11). In extreme circumstances, straps can be bent prior to fixing to the window. In all other cases, straps must be bent to ensure a correct fixing. If you are unsure of this, please contact your nearest NorDan office.

Fixing straps should always be screwed with at least two screws in the window and two in the wall (see Fig. 13). One fixing (frame and wall) may cause the frame to drop!

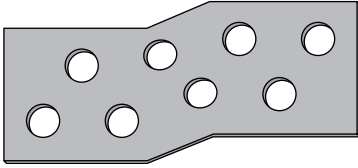


Fig. 12: Bending straps

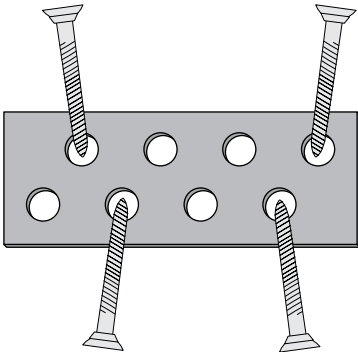


Fig. 13: Fixing straps

## In all cases of fixing

Apply fixings only to the main structure and always into solid grounds (avoid mortar joints, brick or block edges). Employ direct fixing into the main structure in preference to back strapping if possible. Use appropriate fixings.

Pay particular attention to large windows and doors, where the weight of the opening sash or door leaf requires strong direct fixing to the main structure (the lack of which can be the cause of sash / door leaf

dropping and subsequent misalignment [and failures] of multi-point locking). NEVER use flexible fixing straps (the most common cause of plaster cracking around installations and doors dropping!). Make sure the gap between the inside of the frame and opening light is equal all the way round after fitting. Check the opening light opens and closes easily during installation. Check again after installation.

## Recommended fixings

(subject to any requirements of structural engineer)

### Direct fixing windows

#### Outward opening

**Type:** No. 8 with suitable size plug and type according to main structure.

**Length:** 75mm to 100mm unless otherwise required to reach 50mm depth into solid main structure (no near edge or mortar joints).

#### Inward opening

**Type:** No. 8 with suitable size plug and type according to main structure.

**Length:** 125mm to 150mm unless otherwise required to meet 50mm depth into solid main structure (no near edge or mortar joints).

### Direct fixing door sets

#### Outward or inward opening

**Type:** Expanding bolts or other high grip devices with or without suitable size plug and type according to main structure.

**Length:** As required to meet 50mm depth into solid main structure (no near edge or mortar joints). Always ensure that if a fixing is not immediately adjacent to the uppermost door hinge (within 50mm) then add an extra one (this is the most critical load point of any side hung door).

### Fixing straps to windows

#### Fixings for straps to window frame

**Type:** No. 8

**Length:** 30mm (or as required)

#### Wall fixing

**Type:** 'Rawl' No. 8 or similar

**Length:** 80mm unless otherwise required to meet 50mm depth into solid main structure (no near edge or mortar joints).

## Fixing straps to doors

**Type:** Not recommended unless a Structural Engineer confirms suitability and specifies the fixings.

## Composite assemblies (screens)

**Type:** Refer to a Structural Engineer.

# Foam filling application

Fine spray all surfaces with water before using expanding foam (provides a better seal and helps the foam to go further). Use only polyurethane foam which must be applied in accordance with the manufacturer's recommendations. The foam provides the main thermal barrier and is therefore critical (see page 5). Apply expanding filling foam to build up a barrier. Aim for a minimum 50mm thickness. Inject preferably from the inside (see Fig. 6 and 7). Check the foam around the packers for gaps after curing and fill them. Be prepared to brace goods to stop expansion. Remember; foam applied in the winter can re-activate in the spring! Take careful note of manufacturers recommendations.

# Mastic application

Please note that these recommendations do not rely on mastic to form the main weather seal, which is provided by fire resistant polyurethane foam. Mastic application does provide a degree of protection such as described in the principles of 'Two Step Tightening' (see page 5). Providing mastic application stops short approx. 12mm from the bottom of jambs, the partially enclosed timber surfaces are allowed to 'breathe' and the air flow behind the mastic will create a self-draining, self-ventilated atmosphere (otherwise known as the 'Decompression Zone').

# Installation procedures

## Windows

### 1 Inspect and prepare opening

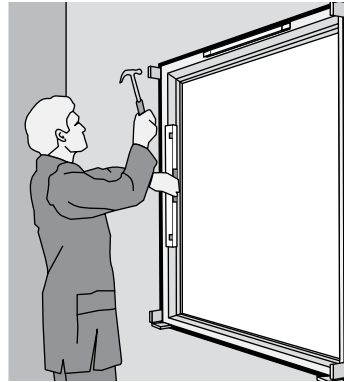
Check that the opening is clear of debris and is structurally sound (see page 6). Check that the measurements of the opening match the window for installation allowing for tolerances (see page 3).

### 2 Remove sash

If the window you are installing is a Fully Reversible window (HG) or a Villa range of window then it is not recommended that you remove the sash. For any other window type; Three handled tilt and turn, one handled tilt and turn, follow the corresponding details on page 7.

### 3 Fit RAS Cills (if applicable)

Ras Cills 120, 125 and 199 should be fitted to the underside of the frame. If the cill is slack in the groove, pin in place using a galvanised nail (see page 18 for more information).



**Fig. 14:** Use wedges for levelling

### 4 Insert frame into opening (Fig 14)

Insert the window frame into the prepared opening using wedges for levelling purposes on the end grain (see page 8). Do not force wedges into the gap in any other location as this may distort the frame.

## 5 Fix frame into opening

The type of fixings (direct fixing or indirect fixing using straps) used to secure the frame is dependant on the structure of the building, please check which details are appropriate on pages 8 and 9. For indirect fixing, see pages 9 and 10.

Direct fixing

- a Insert packers in the bottom of the frame first and fix with screws about 150mm up from the bottom of the opening.
- b Insert packers at the top of the frame, fix with screws about 150mm down from the top of the opening.
- c Depending on the size and weight of the window, fix at further points around the frame.

Remove wedges after fixing.



Fig. 15: Insert sash

## 6 Insert sash into frame

Insert the sash into the frame and swing on it (for three handled and one handled tilt and turn windows depending on size). This will remove any slackness in the glass packing and fittings which effectively reduces future wear and tear.

## 7 Adjust fixings

Adjust the fixings until the sash operates smoothly. Check that there is an even clearance between the sash and frame.

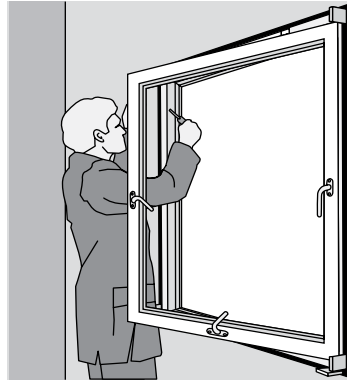


Fig. 16: Adjust fixings

## 8 Apply foam around the frame

Spray all surfaces with water before using expanding foam. See page 5 and 11 for further information.

## 9 Apply mastic (if necessary)

Apply an even bead of mastic around the window / wall junction (see page 5 and 11) or fit a cover facing if required.

# Installation procedures

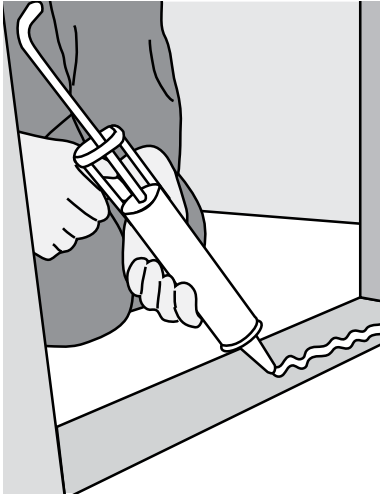
## Single and double door sets

### 1 Inspect and prepare opening

Check that the opening is clear of debris and is structurally sound. Never install a door into an incomplete opening. Check that the measurements of the opening match the door for installation, allowing for fitting tolerances.

**Note:** Where the main structure is incapable of taking the load or providing a secure permanent fixing, refer to the contractor or client. If the main structure is timber frame, check that it is fully treated and protected from swelling.

The floor should be flat and level with the door width. Use mastic between the door cill and underside of the door threshold to ensure a good seal.



**Fig. 17:** Prepare opening

## 2 Remove door leaf (leaves) from door set

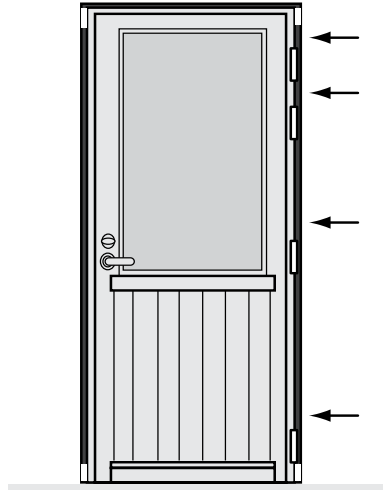
First remove any transportation packers from the bottom of the door leaves. Open the door by 90° and lift the door leaf off the hinges. Do not attempt this on your own. Observe health and safety guidelines at all times. Put the door leaf (leaves) in a safe place.

## 3 Fix frame in opening

Place the frame in the opening, securing firstly with rot-proof dense wedges making sure the frame is level and plumb without twist. The hinged side must be level both ways before it is fastened with screws. Do the same with the lockable side (or the other hinged side on double doors).

If there is no option but to fix the door using straps (not recommended), ensure that the straps are of a suitable thickness and are securely fastened to the door frame prior to offering the door to the opening (see pages 8 to 10).

**Note:** For timber frame, fix 38 x 50mm fire-stops to top and both sides. Screw through the fire-stops onto the timber frame.



**Fig. 18:** Fixing locations



**Fig. 19:** Check levels and fixings

## 4 Check levels and fixings

Refit the door leaf (leaves) then hang onto them. This will remove any slackness in the door and fittings which effectively reduces future wear and tear. Re-fasten all the screws checking that fixings are the correct distance apart.

Check that the gap on the lockable side is a little less

than on the hinged side.

**Note:** For double door sets, use an Allen Key to adjust the slip bolt keepers (positioned at top and bottom of frame) until the fixed leaf is tight against the seal on the frame.

### 5 Apply foam around the frame

Spray all surfaces with water before using expanding foam. See page 5 and 11 for further information.

### 6 Apply mastic (if necessary)

Apply an even bead of mastic around the door / wall junction (see page 5 and 11) or fit a cover facing if required.

## Installation procedures

### Patio doors

#### 1 Prepare the patio door set

- a Remove aluminium ribbon fixed under the wheel with red tape. Remove the wooden wedge, used for holding the sliding leaf in place during transit.
- b Remove the wedge placed near the middle post.
- c Open the security lock situated in the middle post.

#### 2 Inspect opening

Check that the opening is clear of debris and is structurally sound. Never install a door into an incomplete opening. Check that the measurements of the opening match the door for installation, allowing for fitting tolerances.

The floor should be flat and level with the door width. Use mastic between the door cill and underside of the door threshold to ensure a good seal.

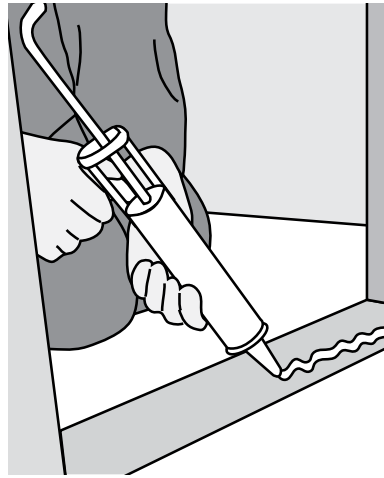


Fig. 20: Prepare opening

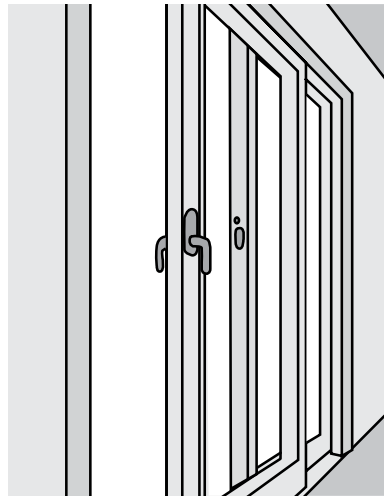


Fig. 21: Remove sliding door

#### 3 Remove the sliding door

- a Slide the opening part so that it is half open.
- b Remove the anti-lift device on top of the running gear.
- c Lift the sliding door up and out of the frame and leave in a safe place.

**Note:** Do not attempt to do this on your own as the weight of the door requires at least two people to carry out this operation. Always observe Health and Safety guidelines on lifting weights.



**Fig. 22:** Fix frame in opening

#### 4 Fix frame in opening

If fixing the door with straps, ensure that the straps are of a suitable thickness and are securely fastened to the door frame prior to offering the door to the opening.

Position the patio door frame and fixed side into the opening, securing firstly with rot-proof dense wedges making sure the frame is level and plumb without twist. Fasten the frame first at the fixed side at the top and bottom after checking that it is level. Do the same with the opening side of the frame.

#### 5 Re-fit the sliding door

Fit the sliding door into the frame:

- a Lift the sliding door up and into the frame.

**Note:** Do not attempt to do this on your own as the weight of the door requires at least two people to carry out this operation. Always observe Health and Safety guidelines on lifting weights

- b Attach the anti-lift device on top of the running gear.
- c Test the operation of the door.

The sliding part must be parallel with the frame and jamb. Insert screws in the middle of each side of the frame.



**Fig. 23:** Re-fit sliding door

**Note:** Patio doors wider than 2488mm require an extra fixing in the top frame and at the door cill.

Closely check the fitting instructions on how to fit the handle and lock.

#### 6 Apply foam around the frame

Spray all surfaces with water before using expanding foam. See page 5 and 11 for further information.

#### 7 Apply mastic (if necessary)

Apply an even bead of mastic around the door / wall junction (see page 5 and 11) or fit a cover facing if required.

## Composite assemblies

Before site assembling composites (screens) please refer to the NorDan technical manual for coupling details as well as page references for inserting steel enforcement.

If you need any assistance or further information please call NorDan UK Ltd.

In brief, the procedure for installing steel is as follows:

- 1) Select the appropriate steel section (check with structural engineer).
- 2) Apply mastic along the coupling rebate of the bottom section to be coupled.
- 3) Lay the steel into position.
- 4) Check it's position then screw through the smaller of the three holes at each fixing point to stabilise the steel.
- 5) Then drill down through the centre of the larger fixing hole to produce a pilot hole through the timber frame.
- 6) Apply mastic along the upper section to be coupled to ensure that when coupled the joint is positively air and waterproof.
- 7) Lay the upper section over the section below and align the coupling accordingly.
- 8) Insert the main coupling (fixing) screws into the pilot holes underneath and screw tight from the centre moving out.
- 9) Wipe any mastic spillage away.

The above procedure can be followed as a multiple assembly is formed in-situ, providing there is adequate room to manoeuvre whilst ensuring the ability to fix directly into the main structure.

**Note:** Remove the glass and apply fixings in the glazing rebate whenever possible.

### H&S

Once coupled, the units must be lifted vertically.

## Couplings

Always consult the NorDan technical manual for more detailed information regarding various coupling configurations.

Note: Create pilot holes before using coupling screws to prevent splitting the wood

### Horizontal fixings

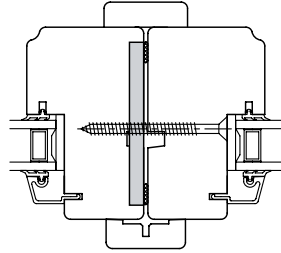


Fig. 24: Horizontal cross section

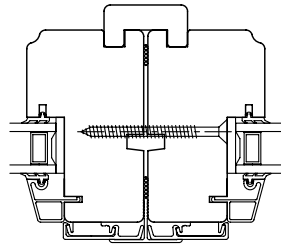


Fig. 25: Horizontal cross section, aluminium clad

### Vertical fixings

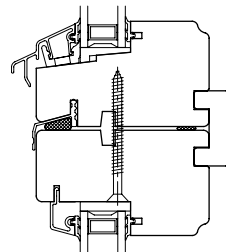
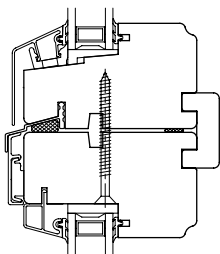


Fig. 26: Vertical cross section (RAS 116)



**Fig. 27:** Vertical cross section (RAS 305)

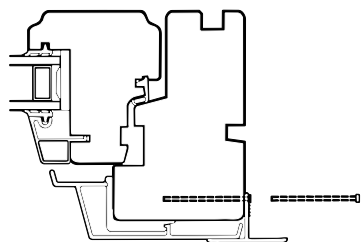
## Vertical couplings using RAS 255

### Fitting RAS 255

The RAS 255 should be fitted before the units have been coupled (see Fig. 28). Check with your nearest NorDan office for advice on specific applications.

### Before coupling

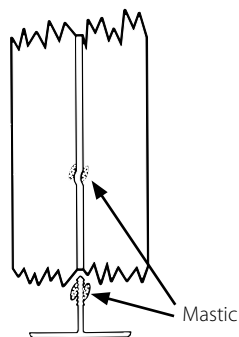
The RAS 255 should be fixed to the side of the frame with rust-proof nails (Senco type). Fixing should be ca. 50mm from each end and at approximately 500mm centres.



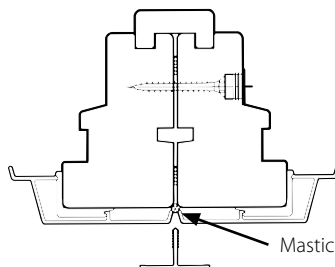
**Fig. 28:** RAS 255

### After coupling

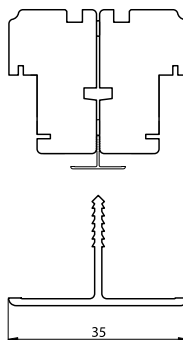
Kink the serrated leg of the RAS 255 manually using a hand tool such as pliers and apply adhesive between or on the kinked section (see Fig. 29). Kinks should be ca. 50mm from each end and at approximately 500mm centres.



**Fig. 29**



**Fig. 30**

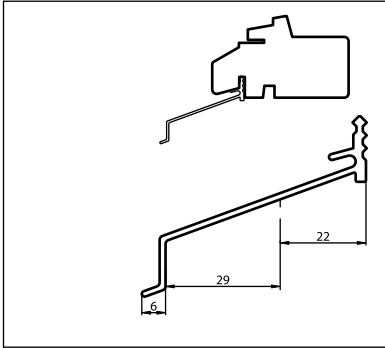


**RAS 255**

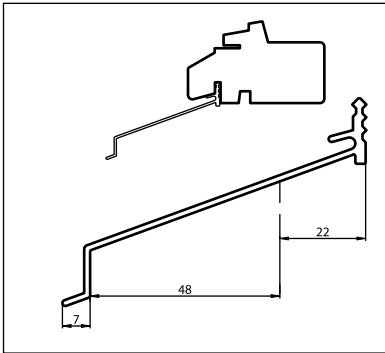
# RAS sections

Below are some RAS detail sections for reference:

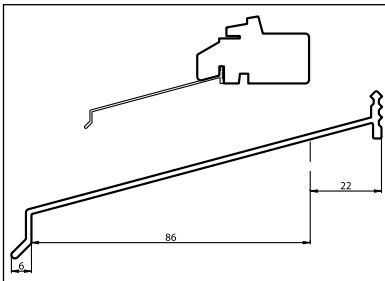
## RAS Cill details



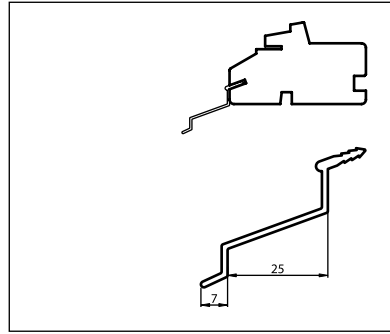
**RAS 120**



**RAS 125**

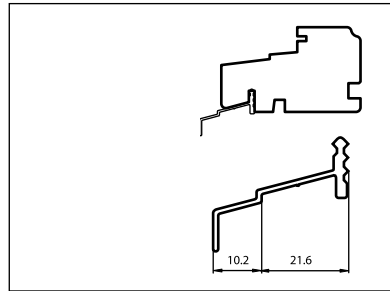


**RAS 199**

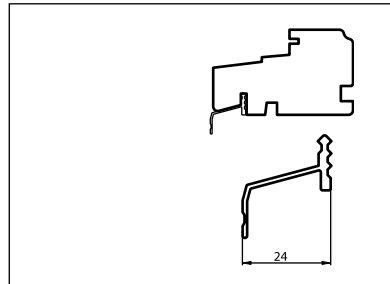


**RAS 278**

## RAS Coupling details



**RAS 305**



**RAS 116**

# Final notes

## Building sites

- Windows and doors must not be left open to swing in the wind or be exposed to the rain.
- Installed windows and doors must not be used as access to or from scaffolding for plant, materials or personnel.
- All trades must ensure care is taken not to cause damage to units already installed and protected.
- NorDan products must be kept shut and locked at all times until the project is complete to ensure that they acclimatise naturally to their new surroundings.

## Remember:

- Never install into an incomplete opening or into a building without a fully installed, weather-tight roof.
- Windows should be protected and maintained after installation to avoid damage and abuse.
- NEVER BUILD IN!

If you are in doubt about any information provided in this leaflet, please contact your nearest NorDan office. We are always happy to help.

## Notes

## Notes

## Notes



For further information, please contact your nearest NorDan supplier:

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Eastfield Business Park  
Newark Road South  
Glenrothes  
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WISHAW  
NorDan UK Ltd  
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Wishaw  
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ML2 7NS

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