

Operation and Maintenance of PVCu Windows and Doors

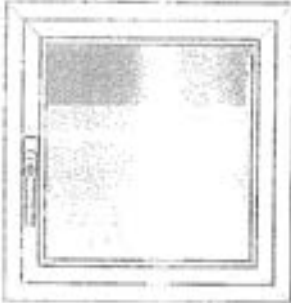


Norscot Joinery Ltd



“Tilt & Turn” Windows Operating Instructions

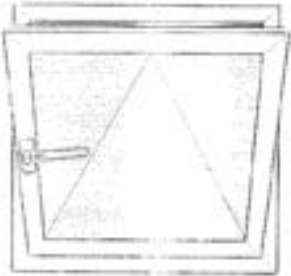
CLOSED POSITION



When closing the window from either the Tilt or Turn positions, ensure that the window is pushed fully home before turning the handle.

When the window is closed, the handle should be pointing vertically down. This ensures that the window mechanism is fully engaged and that the window is secure. Ensure that the key is removed when closed.

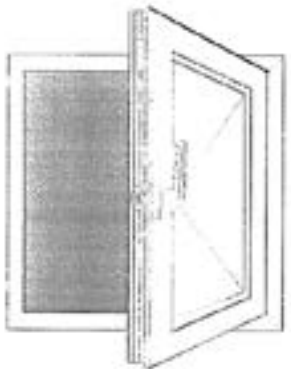
VENTILATION (TILT) POSITION



To put the window into the ventilation position, you do not need to use the key. Turn the handle towards the glass until the handle is horizontal. The handle will not move past this position without using the key.

When the handle is horizontal, pull firmly towards you and the window will lean inward. **Do not try to fully open the window from this position.**

CLEANING/ACCESS (TURN) POSITION



To put the window into the fully open position, insert and turn the key. If the window is closed, turn the handle towards the glass until it is in the vertical (up) position. Firmly pull the window towards you and the window will swing inward.

TROUBLESHOOTING

If force is used during operation, the window may go into Tilt and Turn modes at the same time.

To reset the window, push in the button on the window handle and at the same time pull the mishandling device (on the opening part of the window next to the handle) right back towards the handle and at the same time turn the handle to the upright (open) position, then push the window fully home and turn handle back to closed position.

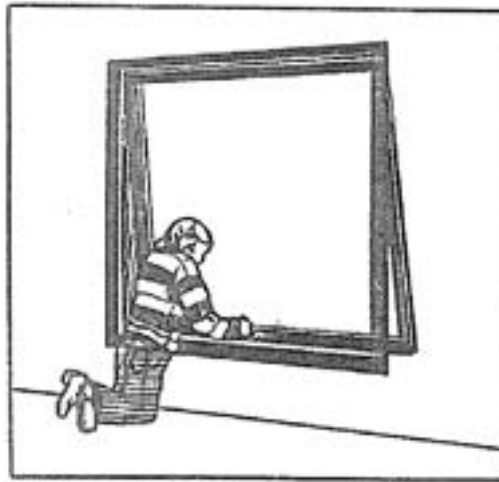


Mishandling device

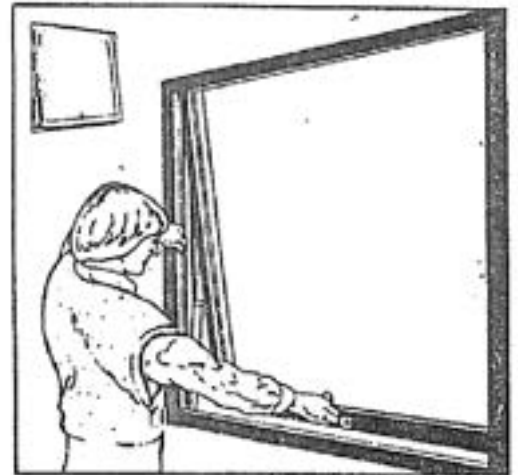


**'Top Swing',
Projecting
Fully
Reversible
Windows**

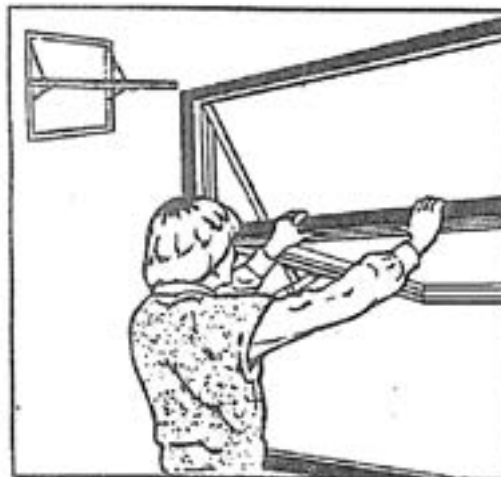
**Operating
Instructions**



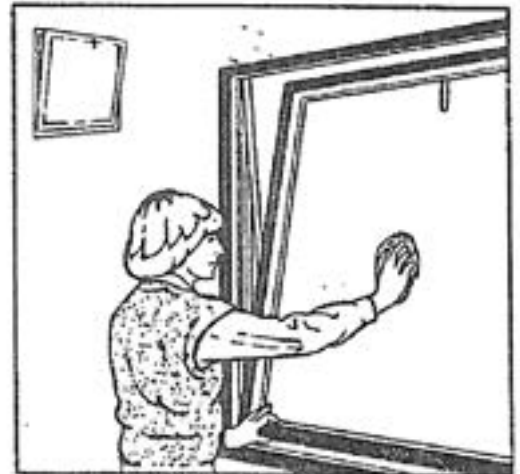
1) After operating the fastener, or espagnolette bolt, the sash is initially restricted to a child safety position.



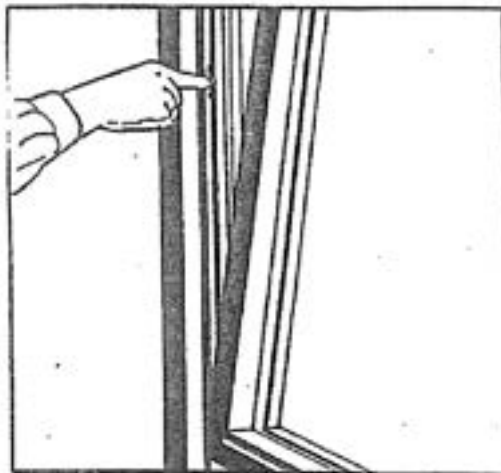
2) The restrictor safety device is located unobtrusively in the left hand side channel and is activated simply by pressing through both stop positions; this commences reversal of the sash.



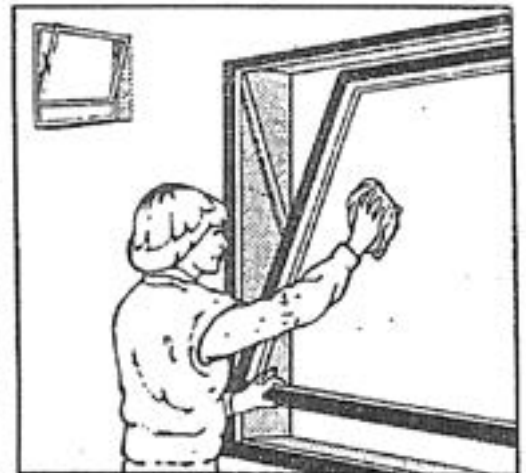
3) Reversal, fully outside the building is achieved by first pushing out the sash, gripping the top with both hands, and bearing downwards. Action is smooth and effortless and in-built friction of support arms holds the sash throughout the procedure.



4) As the fully reversed position is reached, the safety device automatically engages to firmly secure the sash, at one of two positions (depending upon soffit conditions) whilst the external glazed surface is cleaned, or the timber painted.



5) To return the sash to normal mode, the restrictor device is manually disengaged and the sash rotated. As the child safety position is passed, the device automatically re-engages.



6) Non-modular sizes of window, installed into external reveals where a soffit overhangs the head of the window, can still be safely reversed and secured for cleaning by engaging the restrictor device into the first of the two stop positions.

**See Page 6
for details on
Child Safety
Lock**

“Topswing Reversible” Windows

General Information

Your window is fitted with a **Handle** to secure the opening part (Sash) to the frame, and a **Safety Device** (located on the inside of the left frame upright), which allows you to control the extent to which the Sash may be turned. This **Safety Device** also prevents the Sash from being forced open or closed more than is required.

The spring loaded **Safety Device** may be disengaged by pressing and holding in the release bar, thus allowing the Sash to be pushed outwards or pulled back in.

NEVER attempt to alter the position of the sash without first disengaging the Safety Device otherwise SEVERE DAMAGE will result.

NEVER disengage the Safety Device without having a hold on the Handle to prevent the Sash from closing rapidly, thereby trapping your fingers.

VENTILATION – Position 1

Unlock and lift the **Handle**, and push the Sash outwards from the bottom until the **Safety Device** engages in its first position. The Sash should now be open by approximately 90mm.

VENTILATION – Position 2

Disengage the **Safety Device** and push the Sash outwards from the bottom until it locks in its second position. The Sash should now be open by 230mm.

FULL REVERSAL – Position 3

Disengage the **Safety Device** and push the Sash outwards from the bottom until it is horizontal. Now pull the top of the Sash downwards until the **Safety Device** engages again. The Sash is now safely locked in a position, which allows cleaning and maintenance.

TO CLOSE THE SASH

Disengage the **Safety Device** and reverse the above instructions to return the Sash to its closed position.

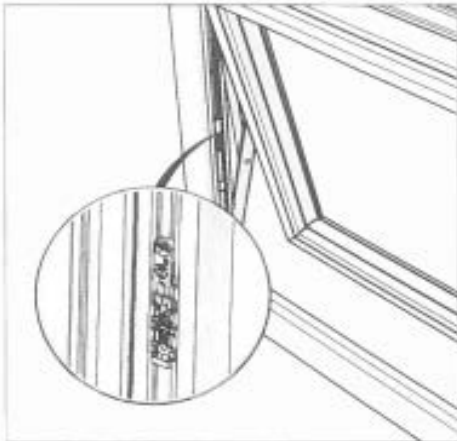
CAUTION! – Remember to disengage the Safety Device as the Sash passes through each position.

Topswing Reversible Windows

Operating Instructions for Windows Fitted with Yale Revolution Hinge

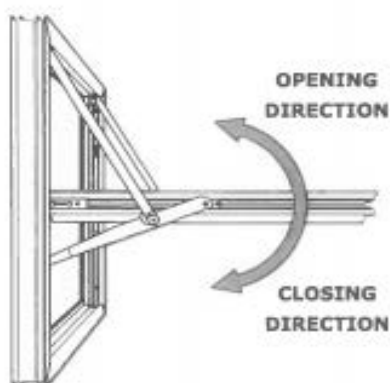
Yale Revolution Window Hinge

Product Operation: Easy Close Operation



RESTRICTOR LEVER

- The restrictor lever can be found on the left hand hinge, when viewed from the inside.
- The restrictor lever must be pressed to open the sash, when locked out.
- Please note: the restrictor lever is only present in module sizes M6.0 and above.



1

SAFETY POSITION

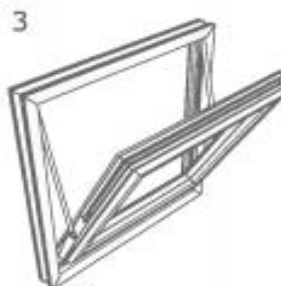
- Open the window until the hinge locks the sash out and restricts at the first position.
- The restrictor lever will then need to be pressed in order to open the window further (there is no need to press the button to close the window).



2

VENTILATION POSITION

- Continue to open the window further until it locks out and restricts at the second position.
- The restrictor lever will then need to be pressed in order to open the window further (there is no need to press the button to close the window).



3

WASH POSITION

- Fully reverse the sash until it engages into this third position.
- The restrictor lever will then need to be pressed in order to release the sash from this position (to close).

At each of the above positions the key operated lock out feature can be used to prevent the restrictor being released.

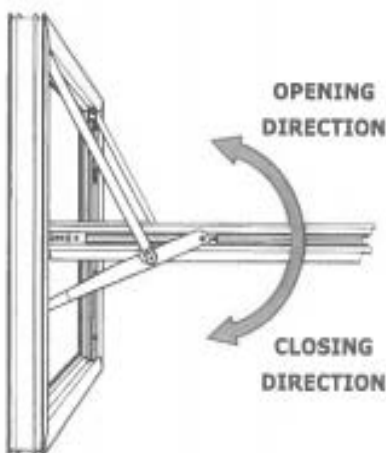
Yale Revolution Window Hinge

Product Operation: Anti-Blow Back



RESTRICTOR LEVER

- The restrictor lever can be found on the left hand hinge, when viewed from the inside.
- The restrictor lever must be pressed to open and close the sash, when locked out.
- Please note: the restrictor lever is only present in module sizes M6.0 and above.



1



SAFETY POSITION

- Open the window until the hinge locks the sash out and restricts at the first position.
- The restrictor lever will then need to be pressed in order to release the sash from this position (this could be to open or close).

2



VENTILATION POSITION

- Continue to open the window further until it locks out and restricts at the second position.
- The restrictor lever will then need to be pressed in order to release the sash from this position (this could be to open or close).

3



WASH POSITION

- Fully reverse the sash until it engages into this third position.
- The restrictor lever will then need to be pressed in order to release the sash from this position (to close).

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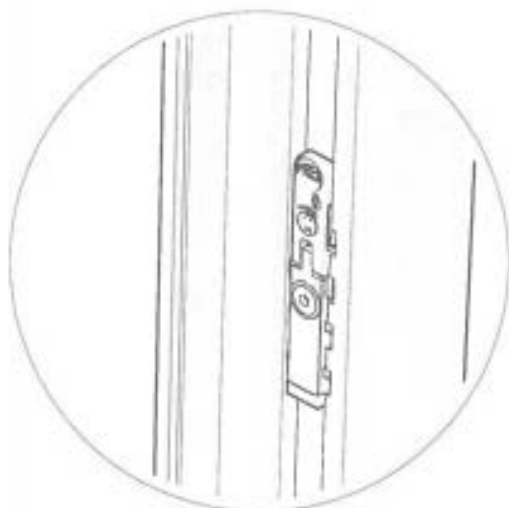
Yale Revolution Window Hinge

Product Operation: How To Change Configuration

RESTRICTION POSITION

The Yale Revolution Window Hinge can be configured to either of the following;

- Anti-Blow Back
- Easy Close



ANTI-BLOW BACK

Product as supplied will hold the sash in the set restricted positions when under moderate wind load.

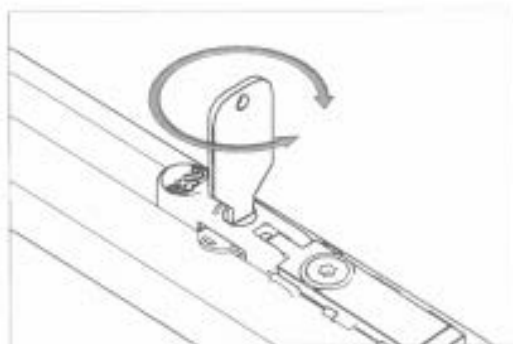
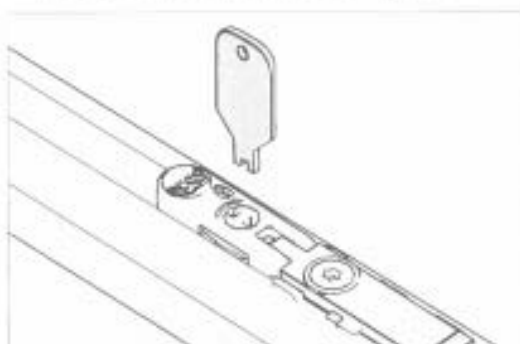
EASY CLOSE

Product function can be changed by re-configuration of the sash release lever; this allows the sash to be easily closed without any user interaction. This can be done by:

1. Using the key to engage the lock out feature
2. Removing the retaining screw (M4 x 6mm) (T20 Torx drive required)
3. Removing the insert
4. Disengaging the lockout feature

KEY OPERATED LOCK OUT FEATURE

- Insert the key into the restrictor lever lock and rotate 90° (clockwise) to ensure that the window cannot be accidentally derestricted.
- Reverse this procedure to take the hinge out of this mode.

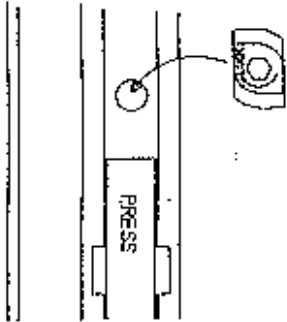




TOP SWING WINDOWS

Instructions For Use of Child Restrictor Blocking Device

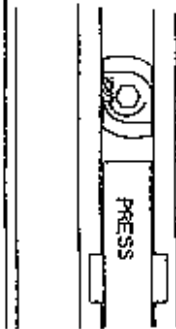
1




Blocking Device

Open window to a position where PRESS button is not covering the 6mm hole at the bottom of the aluminium track

2

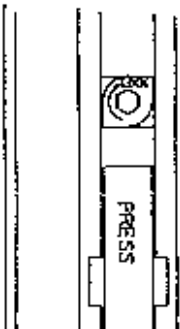


Place Blocking Device over the hole using Allen key as tool



Allen Key

3



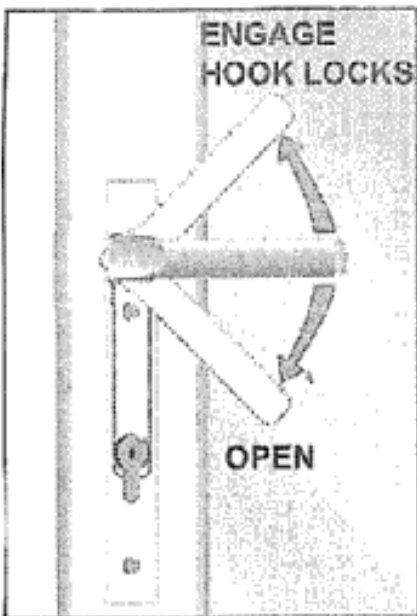
Twist Blocking Device clockwise using Allen key as tool



“Schlegel” Lockmaster Multipoint Locks for Doors

Operating Instructions (viewed externally)

LOCKING THE DOOR



- Step 1** - Close the door firmly, but do not slam it.
- Step 2** - Lift the door handle firmly upwards. This will engage the hook bolts into the doorframe keepers.

CAUTION! If you do not lift the door handle correctly, the lock system will not work!

- Step 3** - Turn the key or thumbturn anti-clockwise. The top, bottom and center locking points are now engaged totally into the doorframe and cannot be retracted.

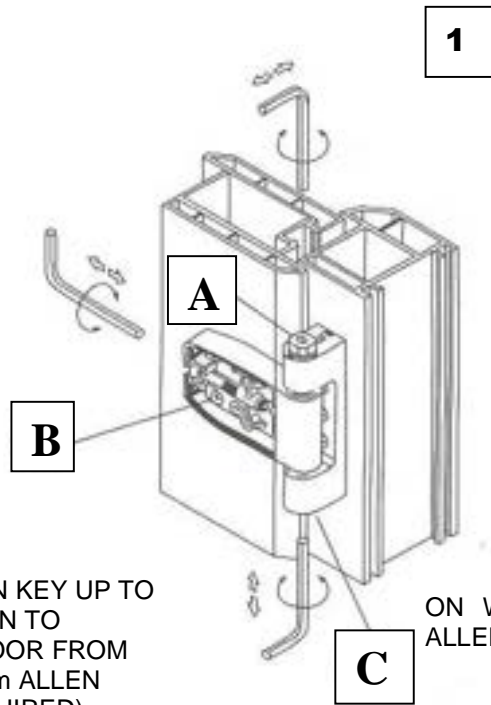
UNLOCKING THE DOOR

- Step 1** - Simply turn the key or thumbturn clockwise and move the door handle downwards. This will retract all locking points and enable the door to be opened.



ADJUSTMENTS FOR PVCu DOOR HINGES

ON WISHING TO ADJUST THE FRAME COVER PLEASE ENSURE THE FOUR FIXING SCREWS ARE BACKED OFF AT (B). SECURE AFTER ADJUSTMENT IS MADE

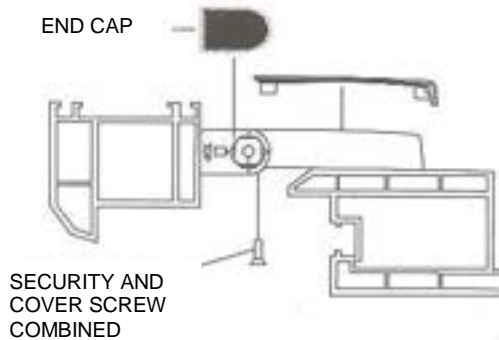


1 INSERT HINGE PIN AND ALIGN PIN DATUM MARK ON HINGE BODY SO ALL HINGES ARE SET THE SAME AT (A). ON WISHING TO ADJUST THE PIN AGAIN, PUSH THE ALLEN KEY THROUGH THE BOTTOM OF THE HEIGHT ADJUSTER CAM UNTIL THE PIN IS FLUSH WITH THE TOP OF THE FRAME CASTING. ADJUST AND TAP PIN BACK INTO PLACE.

PUSH ALLEN KEY UP TO RELEASE PIN TO REMOVE DOOR FROM FRAME (5mm ALLEN KEY IS REQUIRED)

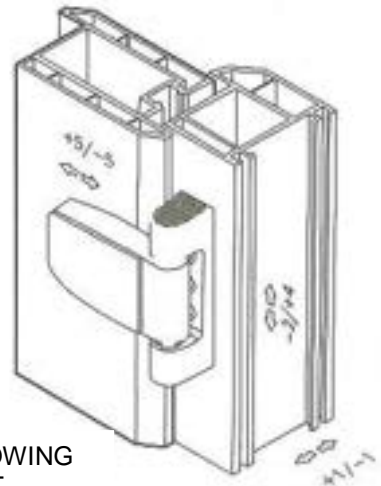
ON WISHING TO ADJUST HEIGHT, USE ALLEN KEY IN ADJUSTMENT CAM AT (C).

2 SCREW DOWN SECURITY GRUB SCREW, IF FITTED, COVER SCREW AND APPLY END CAPS



3

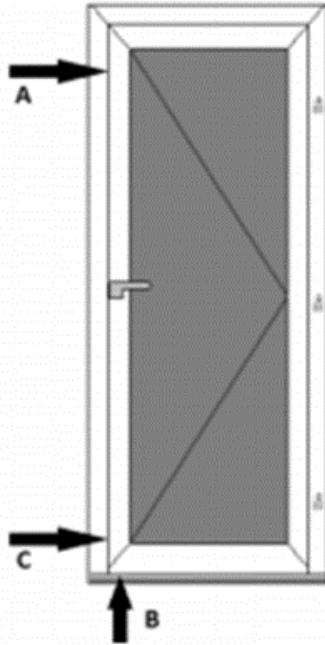
HINGE FITTED SHOWING FULL ADJUSTMENT





DOOR ADJUSTMENT

First establish where the door is catching.



To establish if the door is catching at point A, B or cam is hitting the keeper.

While closing the door slowly, look at the leading edge of the door as it passes the keeper, look to see if the door is striking at point A and that points A & C are equal/parallel with the frame, as the bottom of the door passes the frame look to see if it is striking at point B.

If the door is rubbing at point A only then adjust door as detailed below in point **1**.

If the door is rubbing at points A & B then adjust the door as detailed in point **1** first as this may adjust the door at point B as well.

If the door is rubbing at point B only, check the gap at points A & C are equal/parallel.

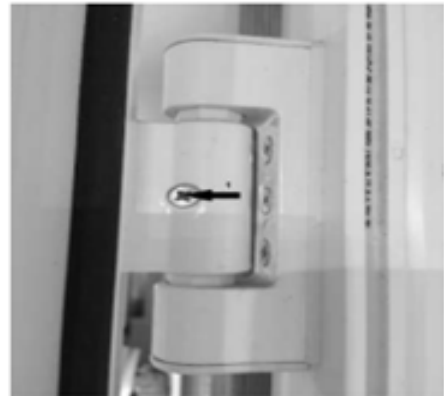
If the gap at point C is greater than point A, then adjust door as detailed below in point **3** only.

If the gap at point C is equal or less than point A and the cam is hitting the keeper, then adjust the door as detailed in point **2**.

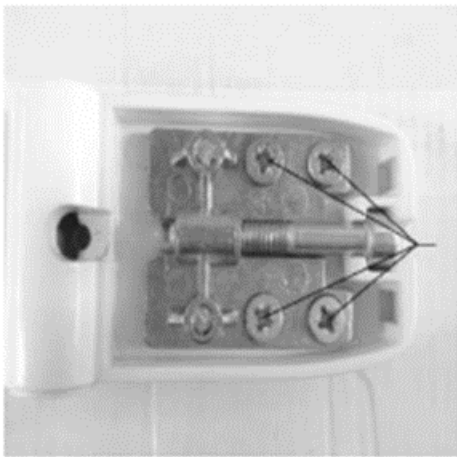
Cam hitting the keeper, then adjust the door as detailed in point **2**.



Point 1 - Open the door. At the back of the top hinge you will see a screw, slacken this screw to remove the face plate on the front of the hinge



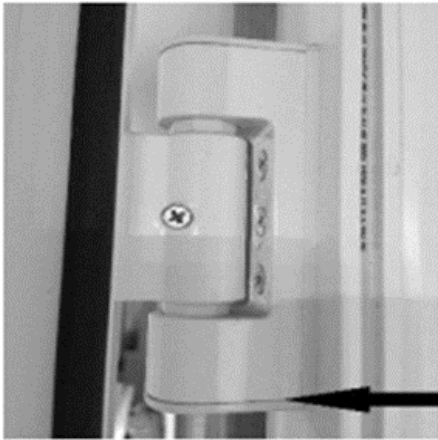
Slacken the 4 screws on the face of the door.



With a 5 mm Allen key adjust door to bring it away from the frame until it clears by 2-3 mm.



Point 2 - Remove plastic cover on bottom of all the hinges by inserting a scrapper or blunt knife between the metal and plastic cover until it stops and lever off.



Insert 5 mm Allen key into the adjustment nut and rotate 2-3 times in a direction that lifts the door, then repeat on the other hinges until door clears, ensure all bolts are applying pressure.

Point 3 - Open the door, at the back of the bottom hinge you will see a screw, slacken screw to remove the face plate on the front of the hinge.

Then slacken the 4 screws on the face of the door.

With a 5 mm Allen key adjust the door to move it towards the frame until the door is parallel to the frame or clears by 2-3 mm.

DRAUGHT

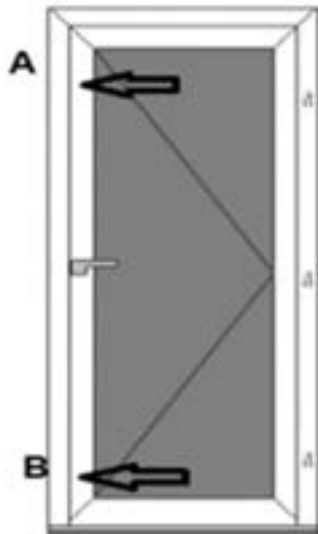
If the draught is coming through the closing side adjust the cams.

Cam adjustment.

On the edge of the door insert 4 mm Allen key into the cam and rotate the cam so the notch moves closer to the door gasket. This increases the pressure on the gasket.

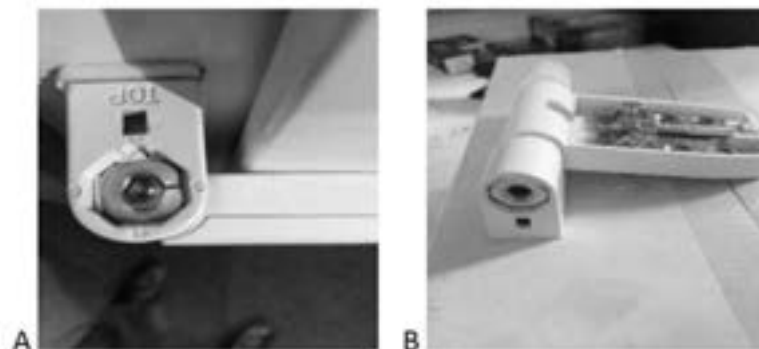


If the door is still draughty you will have to establish if the cams are engaging, from the outside close the door and lock it with the door in the locked position, at the top corner and bottom corner try to push the door in.



If the door moves in at point A or B then the cams are not engaging and the door sash will have to be moved over as in point 1 & 3 above.

If the draught is coming through the hinge side, you will have to adjust the hinge pins.



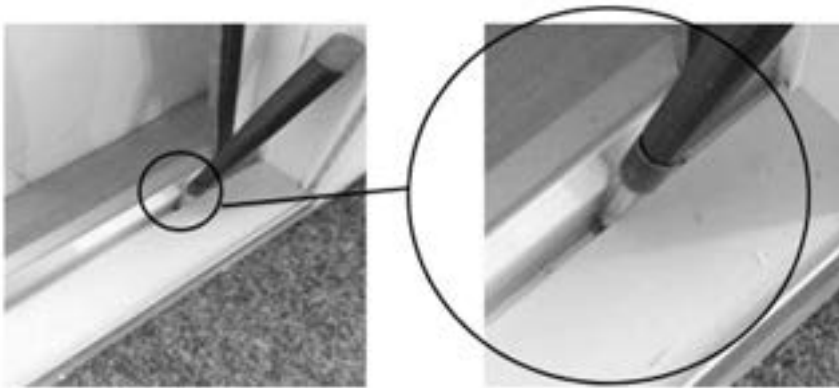
To rotate the pin - From below the hinge put the long leg of the Allen key through the bolt and tap the pin up, then rotate the pin with a 5 mm Allen key so the notch moves closer the door frame. When you do this adjustment you will have to check that the door opens, shuts and locks properly.

DOOR MAINTENANCE

The following should be completed annually and if sea facing twice annually.

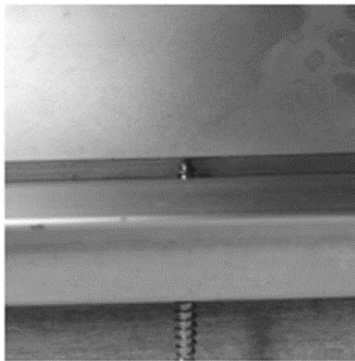
All gaskets should be wiped a brush or cloth to remove loose dirt, then wiped with a cloth pre-sprayed with oil or silicon spray.

Low threshold - remove dirt from channel. These photos (black and white ones) show the older style of threshold which has now been updated to the new one (colour) shown below.



Threshold drainage holes inspected for blockage by inserting a screw driver in the drainage hole.

(New Style Low Threshold)



Lock - Apply oil to the following points:

Top of door between lock face door



Cams



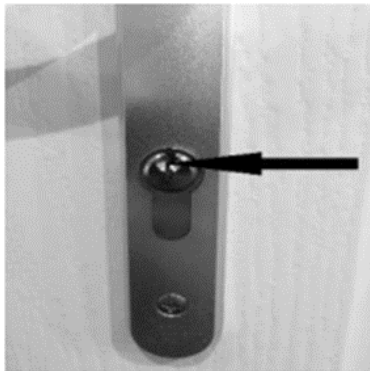
Hooks – lift handle prior to applying oil



Latch - push handle down, apply oil in gap
(If the key is tight or difficult to turn oil at this point).



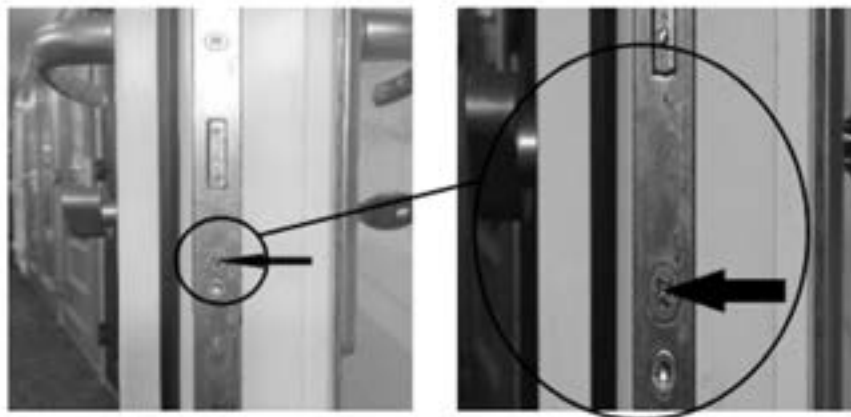
Lock Cylinder



After applying oil to the above points, the lock should be put through its full motion several times.

REPLACING DOOR CYLINDER

Remove 1st screw below the key on edge of door, rotate thumb turn or key slowly while pulling cylinder towards you, you will feel the cylinder begin to move, stop rotating the thumb turn or key and pull the cylinder out.



When replacing the cylinder rotate the thumb turn so the lever is flush in the cylinder.



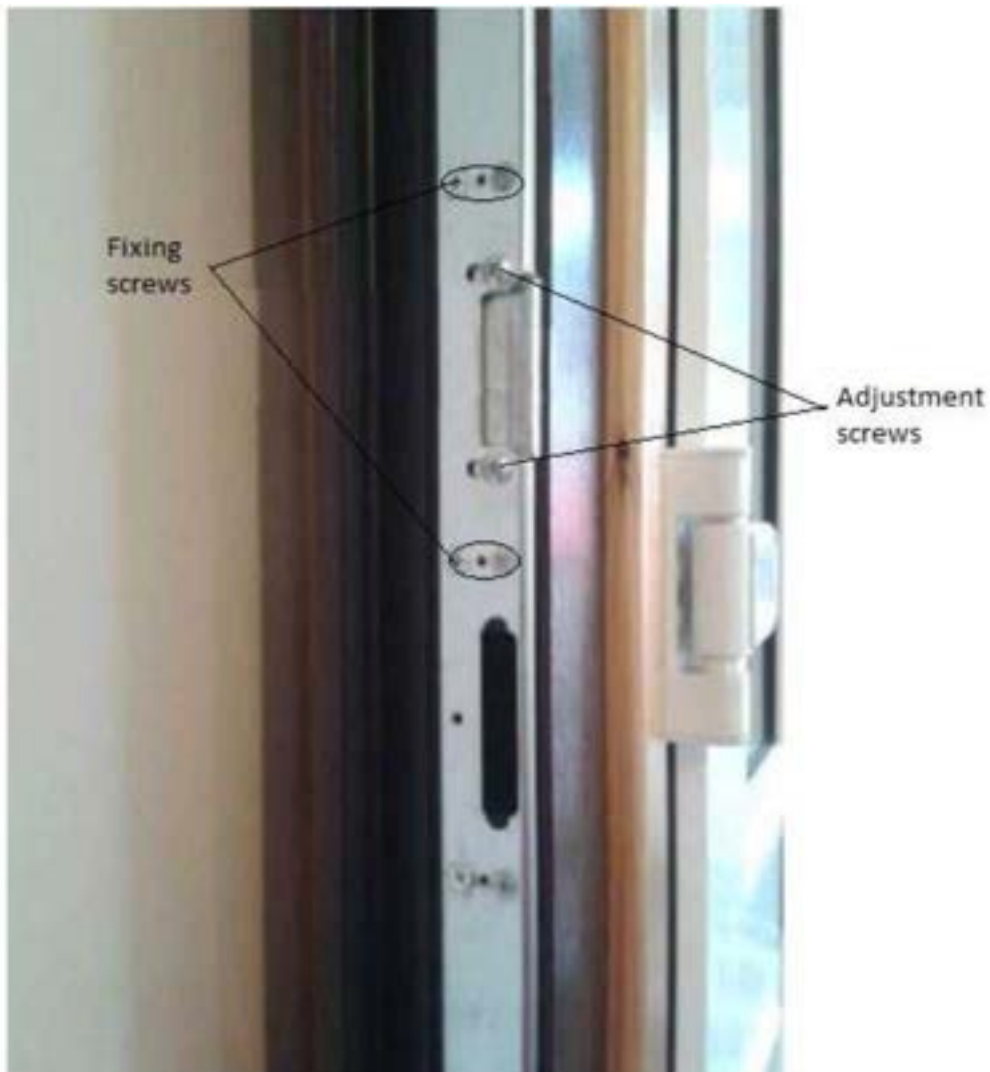
45-55 Thumb Turn



55-45 Thumb Turn

If the cylinder is key only then the order of the dimensions does not matter as the cylinder can be turned around.

DOOR KEEPER ADJUSTMENT



Slacken fixing and adjustment screws, then tap or slide keeper in or out as required. Care must be taken to not over tighten and strip the threads of the machine screws.

OPERATION OF TILT AND SLIDE PATIO DOORS

This versatile inward opening door can be 'Closed', placed in the 'Tilt' position for ventilation or in the 'Slide' position to clear the doorway for access.



Handle in horizontal position (Tilt)

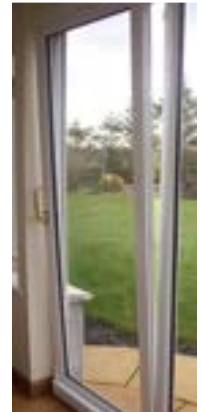
Tilt Position

To put the door into the 'Tilt' position move handle from the closed position upwards into the horizontal position and the top of the door should tilt inwards.



Handle in Closed position

To close the door from the 'Tilt' position, push the door shut and pull handle downwards through 180° to the closed position.



Door in Tilt position

If you have an outside handle it operates the same as the internal one, however please note the clearance for your hand is limited and you should not grab it i.e. keep your hand to the glass side only.



Slide position

Slide Position

To slide the door open put the handle into the upright position and pull on handle to eject door from doorway and slide door over to clear access.

To close the door is the reverse operation, except that the bottom of the door automatically re-engages itself at the bottom. Pull the door leaf back over and push shut and turn the handle downward back into the closed position.



Handle in slide position

NOTE: The patio door must always be fully shut before changing the handle position. Only one mode can be selected at one time. Do not try to open the door when the handle is between these positions.

Maintaining Your PVCu Windows & Doors

Cleaning

To maintain the looks and ease of use of your products, PVCu surfaces and handles will need occasional cleaning.

- Clean your PVCu windows, doors and conservatory with a soft cloth, warm water and a mild detergent such as washing up liquid. For stubborn marks apply liquid Cif or a similar product to a clean cloth and rub off. It is advised that non-abrasive cleaners and non-solvent materials be used as surfaces could be damaged.
- Where fitted, drainage holes and slots should be inspected and kept clear and free from blockage to ensure optimum performance, especially in bad weather. Dirt and grit should be removed from door thresholds and cills of opening windows.
- Keep weatherstrips and glazing gaskets free from dirt and grime. It is advisable to periodically check gaskets and weatherseals to ensure that they have not become dislodged or damaged.
- Window and door handles can be cleaned with a soft, dry cloth. If further cleaning is required, use a mild solution of warm, soapy water on a soft cloth and dry thoroughly afterwards.
- Ventilators should be regularly washed with a mild detergent.

Hardware Maintenance

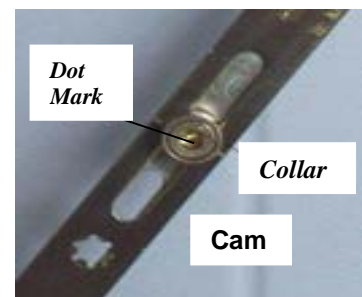
Regular maintenance of mechanical components will reduce wear and tear and prolong serviceable life. We would recommend that this be carried out at least twice a year.

Lubrication

Firstly de-grease all parts using a mild solution of warm soapy water. This will help reduce the build up of greasy deposits.

For smooth operation all locks, hinges, friction stays and door cylinders should be kept clean and occasionally lubricated to

- The collar around the cams on doors and windows should be lubricated to keep them free moving.



Locking Mechanisms

- Shootbolt locking mechanisms and strikers should be wiped down with a soft cloth, and a smear of petroleum jelly should be applied to mushroom cams and strikers. Silicone spray should be applied to the shootbolt extensions and the faceplate of the drive gear.

Friction Stays/Hinges

- All friction stays with sliding shoes, which travel along a track, must be kept clear of dirt, debris and obstructions at all times. Firstly de-grease all parts using a mild solution of warm soapy water, then dry thoroughly afterwards. This will help reduce the build up of greasy deposits. For optimum performance lubricate all pivot points with light engineering oil. It is best applied with an oil gun or from a can with a small nozzle. Don't apply too much oil and wipe away any surplus. Be careful not to allow oil to come into contact with window surfaces, blinds and curtains.

Appropriate lubricants could include:

Window locks, window and door handles,

- Light oil such as 3 in One

Friction hinge, friction stay channels
And other sliding sections

- a thin film of light grease such as Vaseline

Door locks, cylinder locks

- Light oil such as 3 in One

Lubrication points on a Topswing Reversible Window



Lubrication points on a Topswing Reversible Window





Casement Hinge Adjustment

To adjust hinge first remove block (item1) and then remove the screw in the round hole (item 2). Then just slacken both the screws that are in the elongated holes (items 3 & 4). This will now allow you to move the hinge up or down this should give you an adjustment of about 5mm.

Once you have your hinge in the desired position you will need to take an existing self-tapping screw and use it to make new holes in the reinforcing. Tighten all screws and then replace block (item 1) to bottom of the hinge.



For extra adjustment you can adjust the hinge on the opening sash by firstly removing the block (item5) and then remove the screw in the round hole (item 6). Slacken the screws in the elongated holes (items 7 & 8) and this will now allow you to move the hinge up and down. You will then need to take a self-tapping screw and use it to make new holes in the reinforcing. Once in the desired position tighten all screws and place the block (item 5) at the bottom of the hinge and tighten.

Depending on the external ingoe detail and the clearance available to work at the hinge part on the sash it may require you to remove the sash

WINDOW MAINTENANCE

The following should be completed annually and if sea facing twice annually.

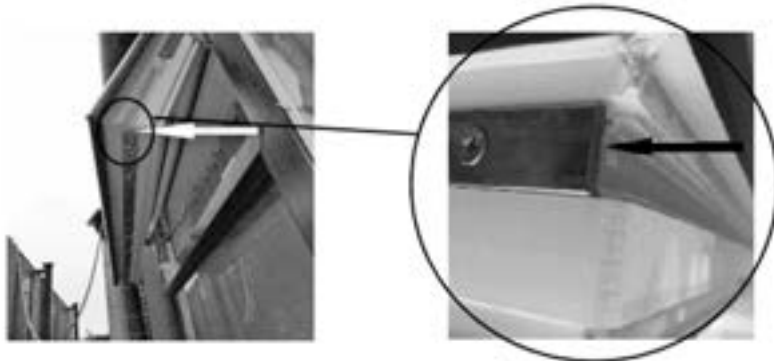
All gaskets should be wiped with a brush or cloth to remove loose dirt, then wiped with a cloth pre-sprayed with oil or silicon.

Handle - apply a small amount of oil at point 1.



Hinges - all moving parts oiled annually, every 6 months if sea facing.

Locks - with the window open oil all moving parts and keepers, at the end of the lock mechanism put oil in the gap between the metal face plate and window frame.



On top swing windows it's important to oil the top slide guide pictured below.



Operate the window through its full movement several times to disperse the oil.

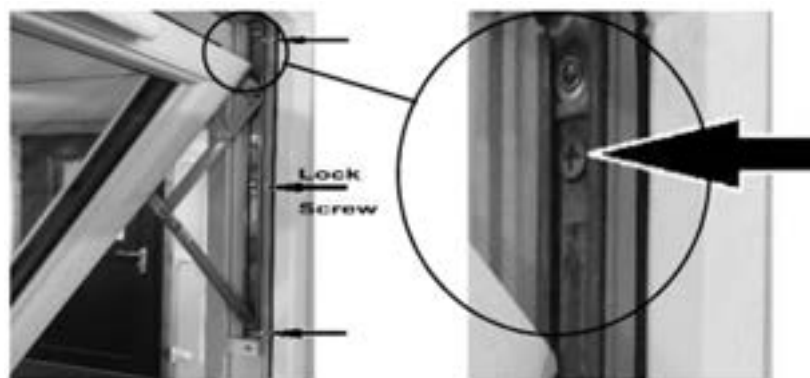
CASEMENT ADJUSTMENT

To determine what is wrong, with the window closed ensure the sash is parallel to the frame on the sides and if it is see information below. If the sash is parallel at the top but not at the sides, then the sash may require de glazing.

While closing the window look to see if:

- (1) Sash is hitting the keeper then adjust as shown at **1** below.
- (2) The cams are hitting the frame then adjust as item **1** below.
- (3) The cams are hitting the side of the keeper, check that the sash is central in the frame if so adjust as item **3** below. If sash is not central adjust one hinge as item **1** below.

1. Top hung – Slacken all screws on the hinge and remove the locking screw which will be in the non-slotted hole **DO NOT REMOVE** the screws that are in the slotted holes. While lifting the sash tighten the screws and ensuring the sash has not dropped refit the locking screw, this screw should be angled upwards so as to cut a new hole.



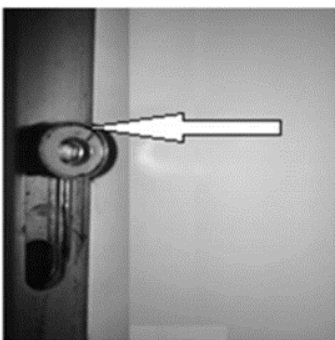
NOTE – If handle is difficult to close then the sash has been raised too far.

2. Side Hung – Slacken the screws on the hinge and remove the locking screw which will be in the non-slotted hole, **DO NOT REMOVE** the screws that are in the slotted holes, move sash to required position and tighten screws, refit locking screw so it cuts a new hole.

3. Move keepers so they are central to the cams.

CASEMENT - DRAUGHTS

Closing side - Cam adjustment, on the edge of the window insert 4 mm Allen key in to cam and rotate so the notch moves towards the outer face, this increases compression.



Hinge side – New hinges required and/or pull in blocks fitted.

TOP SWING (Fully Reversible) WINDOW - DRAUGHTS

Cam adjustment, on the edge of the window insert 4 mm Allen key in to cam and rotate so the notch moves towards the outer face, this increases compression.



TILT & TURN WINDOW ADJUSTMENT

If window appears to be falling into the room, confused hinge.

Place one hand on the top hinge corner while pushing turn the handle through 180 degrees until it closes. If the handle will not turn you will have to operate the mishandling device by pulling it to the vertical and rotate the handle to the tilt position, then repeat the above.

Mishandling device



TILT AND TURN – DRAUGHTS

With sash closed check sash is parallel and central within frame, if sash is not parallel then the cams maybe missing the keepers.

Cam adjustment, on the edge of the window insert 4 mm Allen key in to cam and rotate so the notch moves towards the inner face or use a spanner to rotate oblong cam towards the horizontal, if there is no increase in compression then the cams maybe missing the keeper or new gasket is required.



WINDOW HANDLES

If a window handle turns and the window does not open then the gearing lock is broken, seek professional help.

BROKEN THUMB PRESS

Ensure handle is unlocked, insert thin bladed scrapper or knife between the handle and its body and open handle as normal, if a piece of black plastic falls out, you will be able to use the handle.



NOTE:. If the knife has been placed in the correct place and the handle does not turn then the gearing/lock is seized.

If the above method does not work, the handle can be forced open, this will break the handle casing and in most cases the handle will still work.

REPLACING WINDOW HANDLE

Place the handle in the open position and unscrew exposed screw (remove screw cover cap if fitted), close the handle and remove the screw cover cap and screw, the handle will now pull off and the window will be shut and secure.



Fit new handle in reverse order of above.

Lubrication points on a Door Lock



Lead

Lead on windows and doors should be washed down regularly with hot soapy water, dried off with a non abrasive towel and sheened with regular household furniture polish.

Silicone Sealant to Window/Door Frames and Brickwork

The joint between windows, doors and conservatories and the surrounding building is sealed using high performance silicone to prevent ingress of weather and draughts.

At sometime during the lifetime of the replacement door and window frame, the silicone cloaking this gap will need some attention. The elapsed time will vary depending on many factors, but it will be

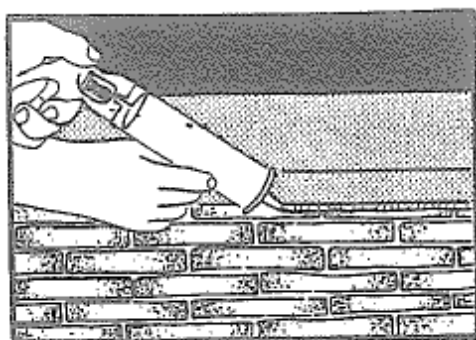
self-evident when the silicone flakes off and no longer makes contact with the frame and brickwork.

The worn silicone should be raked off with a chisel or screwdriver. Remove any stubborn bits remaining with a wire brush to the brickwork only and use turps or white spirit to remove from frame.

Tubes of silicone and a gun, called a preening gun, can be purchased from any good DIY shop.

The tube of silicone should be fitted into the preening gun. Cut the nozzle off the tube of silicone - about 5mm from the tip of the nozzle. Don't cut too much off otherwise the amount forced out will be too thick. A bead about 6mm wide is ideal. The gun is now loaded and ready for use.

It is not difficult to apply the silicone in a neat, straight line, but care is required as it could finish up all over the brickwork. In this wet state, it is messy to remove.



To get the best results, use the reveal wall as a straight edge rest, and move the gun downwards, or across, as the case may be, pulling away from the starting point all the time, whilst at the same time forcing the nozzle end into the gap, or alongside it. Keep the nozzle at a downward angle.

Professionals even out any ripples in the silicone by wetting one finger and running it lightly over the imperfections in one full stroke. Too much pressure and not enough water on the finger could well result in dragging off strips of the silicone.



Condensation

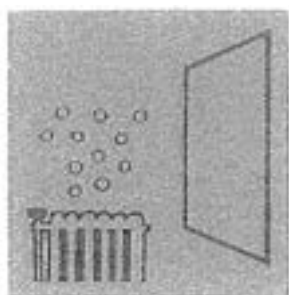
What is condensation?

Condensation is the water, which results from the conversion of water vapour in the atmosphere.

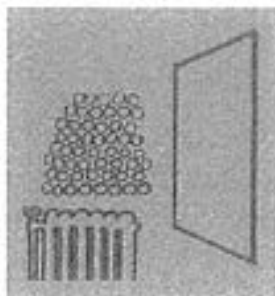


The air, which surrounds us in our homes, always contains water vapour, which is usually invisible. A typical example is the steam Cloud from a kettle, which rapidly becomes invisible – it has in fact been absorbed into the atmosphere.

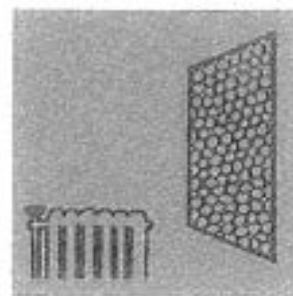
The warmer the air, the more water vapour it can hold – but there is a limit to the amount it can hold for a given temperature. When that limit is reached, the air is said to be “saturated”. When saturated air comes into contact with a surface which is at a lower temperature than itself, the air is chilled at the point of contact and sheds its surplus water vapour on that surface – initially in the form of a mist and, if excessive, eventually in the form of droplets of moisture. An example of this is when a person breathes onto a mirror: condensation occurs because the exhaled air is saturated and its temperature is higher than that of the mirror (which is at room temperature).



1
NORMAL ROOM
CONDITIONS
Air content about
40% to 60% moisture.



2
MOISTURE
CONTENT
INCREASES



3
OUTSIDE
TEMPERATURE
FALLS
Moisture condenses
on cold surface.

The factors governing condensation

The three main factors governing condensation are:

- 1. Water vapour content of the air.**
- 2. Inside room temperature.**
- 3. Outside temperature.**
- 4. Variation between inside room temperature, outside temperature and the glazing.**

The first two factors are normally controllable.

1. Water vapour content of the air.

This is produced by normal living activities such as washing, cooking, bathing, etc., and can be controlled by the use of extractor fans, cowlings, and ventilation at appropriate places.

2. Inside room temperature.

This can be controlled by replacing single glazing with double-glazing or triple glazing, thereby maintaining a higher surface temperature of the glass on the room side, and by increasing the air temperature to enable it to hold more water vapour without condensing.

3. Outside temperature

This cannot be controlled, but its effect on the inside room temperature can be countered by the installation of double or triple glazing.

4. Internal and external temperature variation

This cannot be controlled as the main variant is the outside temperature. However, this variation may also be affected by building orientation, localized atmospheric conditions, shelter from nearby trees or buildings, air currents, wind speeds and nearby vegetation.

NOTE: It is often the case that external condensation will appear on some windows but not on others due to variable micro-climates in differing locations.

How double glazing helps

Double-glazing is an insulator, designed to reduce the loss of heat by conduction from the inside to the outside of a building.

Under average exposure conditions, and provided the room is heated, the room side surface temperature of the inner glass will be higher than would be the case with single glazing. The likelihood of condensation occurring when warm moist air in the room comes into contact with the surface of the glass is thereby reduced.

It must be remembered, however, that double-glazing is an insulator and not a source of heat: nor does it control the amount of water vapour in the air. When rooms are inadequately heated and there is little heat to retain, double-glazing cannot fulfill the purpose for which it was installed.

One reason why condensation forms in a room not normally occupied is that many householders, for reasons of economy, do not heat such rooms. Consequently the surface temperature of the inner glass gets very close to the outside temperature. In addition, the windows in such rooms are generally kept closed, but water vapour, generated elsewhere in the house, will find its way in and then cannot escape. Thus the two conditions necessary to produce condensation – a low glass surface temperature, and high water vapour content in the atmosphere – are present.

The location of condensation on the glass

When attempting to reduce the degree of condensation it is important to note on which surface of the glass it forms; its location indicates the cause, and so points to the solution.

Condensation on the room side surface of the inner glass means that the temperature of the glass surface is too low given



the water vapour content of the atmosphere in the room. This is most likely to occur on the surface of single glazed windows but can happen on double or triple glazed windows if the room isn't heated.

Condensation within the cavity (between the two pieces of glass) of a hermetically sealed unit denotes a failure of the seal and the unit should be replaced.

Condensation on the outside surface of glass forms when its temperature drops below the outdoor dew point temperature.

Windows manufactured with a double or triple glazed unit containing energy efficient low-emissivity glass have enhanced thermal insulation properties thanks to a high performance transparent coating that reflects heat from radiators or fires back into the room.

As a result the outer pane of glass does not get warmed by heat escaping from inside the building through the glass and remains cooler in comparison to less thermally efficient windows.

External condensation only occurs in certain climatic conditions – a variable combination of high relative humidity and clear cold conditions normally experienced in spring and autumn.

How to reduce the condensation

When formed on the room side surface of the inner glass

- 1) Provide natural ventilation through an opening section of the window, or through a proprietary ventilating unit, or through an airbrick.
- 2) Where there is no open fire, or where existing flues have been blocked off (and cannot be unblocked), ensure that wall vents are fitted and kept clear.
- 3) Open at least one window in each room for some part of the day to permit a change of air.
- 4) Ensure ventilation of all rooms where gas or oil heaters are used.
- 5) Fix hoods over cookers and other equipment producing steam, and ventilate them to the outside air.
- 6) Ensure that bathrooms and kitchens are ventilated in accordance with National Standards.
- 7) Draught proof internal doors and keep them closed, to prevent transfer of air with a high water vapour content from the main moisture producing rooms – kitchens, bathrooms, and drying rooms. It should be borne in mind that water vapour does not remain in the room where it is first generated, but tends to migrate all over the house because:
 - a) The water vapour pressure in the original room may be higher than elsewhere, and so the moist air will be forced out into rooms with a lower pressure, and
 - b) Air movement will carry it through the house.
- 8) Increase slightly the air temperature within the house.
- 9) In cold weather, keep some form of heating on permanently in the house.
- 10) Wherever practicable, fix radiators under windows to maintain the temperature of the inner glass at a reasonable level.
- 11) Isolating the inner glass from the warm room air with heavy curtains when drawn can cause condensation. To allow free passage of warm air to the glass, position curtains 15cm to 20cm away from the window, and ensure there are sufficient gaps at the top and bottom to permit continuous circulation. (Holes should be drilled along the top of any box pelmet used).

SUMMARY

Internal Condensation

This is usually a ventilation problem and cannot be caused purely by the installation of double or triple glazing. By acting as a heat barrier and providing an inner pane which is considerably warmer than the outer pane, condensation may be reduced.

Modern buildings are designed to eliminate draughts and do not have the natural ventilation that some older houses have with their chimneys and ill-fitting doors and windows. Houses

which have been completely sealed by the installation of cavity wall insulation, loft insulation, double or triple glazing, and draught proofing throughout are likely to become moisture traps. In such cases, condensation is a ventilation problem. Provided the rooms are heated normally, the solution will probably be found by providing controlled ventilation.

When lack of ventilation is suspected, you should consult a heating and ventilation engineer.

In the case of the older, “unsealed” buildings, the dominant factor is likely to be the indoor temperature, and additional heat, or the introduction of localized heat near the windows, will probably provide the answer.

External Condensation

The appearance of external condensation is not a fault in the glass or the window. The phenomenon is a natural and predictable event caused by the outer pane of the glazing being colder than the glass that it replaced. With single glazing and older style double glazing a larger proportion of heat was lost to the outside through the glass. With modern low e glass products more of the heat is kept inside and the outer pane is not heated as much. Moisture condenses out of the air onto a cold surface that is said to be below the dew point. The dew point varies with the air temperature and the amount of moisture it contains. In spring and autumn in particular the glass temperature can fall to a low level during the night and the dew point can be comparatively high in these seasons. The glass is more often likely to be below the dew point in these conditions and the moisture condenses onto the surface.

To comply with the building regulations we are obliged to fit more thermally efficient windows in our homes. There are only a few exceptions to the regulations and they tend to apply to unheated spaces that would suffer external condensation to the same extent anyway. The trend is to use glass that has lower U values over time and the lower the U value the lower the outer pane temperature is likely to be and the bigger the risk of condensation on the external surface.

There is not much that can be done to avoid the risk of condensation to the outside. Heating the room more would have an effect but this understandably is not a good option. In many cases the condensation does not last long. A little heat from the sun warms the outer glass enough to evaporate the moisture and a gentle breeze or wind will do the same job.



Norscot Joinery Ltd

Visual Quality Standard for Installed Double Glazed Units

- Both panes of the sealed unit shall be viewed at right angles to the glass from the room side standing at a

- distance of not less than 2 metres; but for toughened, laminated or coated glasses, not less than 3 metres in natural daylight and not in direct sunlight. The area to be viewed is the normal vision area with the exception of a 50mm wide band around the perimeter of the unit.
- Flat transparent glass, including laminated or toughened glass, shall be deemed acceptable if the following phenomena are neither obtrusive nor bunched; totally enclosed seeds, bubbles or blisters; hairline scratches not more than 25mm long; minute embedded particles. Obtrusiveness of blemishes shall be judged by looking through the glass, not at it, under lighting conditions as described above.
- When thermally toughened glass is viewed by reflection, the effect of the toughening process may be seen under certain lighting conditions. The visibility of surface colouration or patterns does not indicate deterioration in the physical performance of the toughened glass. Because of the nature of the toughening process, distortion can be introduced. Such distortion will be accentuated when the glass is viewed in reflection or incorporated in insulating glass units.
- Visual double reflection can occur under certain lighting aspect conditions, especially when viewed from an angle. This is an optical phenomenon arising from multiple surface reflections in sealed units.
- The manufacture of flat laminated glass does not usually affect the visual quality of the glass incorporated in insulating glass units. However the faults generally accepted in the second paragraph above may be increased in number by the fact that several glasses and interlayers are used in the production of laminated glass. When viewed under certain light conditions, insulating glass units incorporating clear or tinted flat laminated glass may show a distortion effect caused by reflection on the multiple surfaces of the components of the laminated glass.
- **BREWSTER'S FRINGES**
The appearance of the optical phenomenon known as Brewster's Fringes is not a defect of the glass and can occur with any glass of high optical and surface quality. This phenomenon is a result of the high quality now being achieved worldwide by modern methods of glass manufacture.

Brewster's Fringes occur if wavelengths of light meet up with each other when they are exactly 180° out of phase – an example of the phenomenon known to physicists as the interference of light. The effect is similar to, although usually much smaller than, the interference fringes which can sometimes be seen on toughened glass windscreens.

In the case of insulating glass installations, Brewster's Fringes only occur when the surfaces of the glass are flat and the two panes of glass are parallel to each other, i.e. when the light transmission properties of the installation are of a very high order. What happens is that some of the incident light from the sun meets light reflected from one of the surfaces of the insulating glass in such a way that they are 180° out of phase and cancel each other out, thereby giving rise to a fringe effect, small in area on the glass when viewed from a particular angle. Alternatively, different parts of the incident solar radiation may be refracted through the glass by different amounts and end up by being 180° out of phase. This phenomenon is not a defect of the product, being dependent on the laws of physics and not on the quality of the insulating glass. In fact it arises because modern glass made by the float process is flat and, therefore, free of the distortion inherent in sheet glass.

The occurrence of Brewster's Fringes is in its nature rather like (though very much more rare than) the fact that under certain conditions, the observer will see a reflection of himself in any window or door - and no one could claim that this was a defect of glass.

Note Patterned Glass: the above criteria do not apply to patterned glass as due to the method of manufacture, imperfections such as seeds and bubbles are deemed to be acceptable.

Troubleshooting

Water Ingress – Windows/Doors

- Check drainage slots to ensure that they are clean.

- Check external silicone seal joint between the window/door and the surrounding building is still in place to ensure full adhesion. If it is not in place follow the instructions on page 9, which gives information on how to replace the seal.

Whistling Noise – Windows/Doors

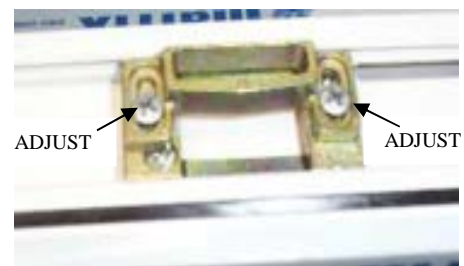
- Check external silicon seal joint between the window/door and the surrounding building is still in place. If it is not in place follow the instructions on page 9, which gives information on how to replace the seal.
- For PVCu doors ensure that the handle is pushed up to the engage hook lock position to ensure maximum sealing of the door. (See page 5)
- Try making adjustments on the compression to make a tighter seal. Insert Allen Key into the cam on the window/door and turn the dot mark on the cam towards the seal/gasket nearest the cam to tighten the compression on the window/door (adjustment +/- 2mm).



Picture 1

Window Draughty

- Check that the gap where the internal finishing's (ingoes) meets the frame of the window has been sealed.
- For Casement windows/Tilt & Turn windows an adjustment can be made to the cams on the window to increase the compression on the weather seals. Place Allen key in the cam, turn the dot mark on the cam towards the gasket to tighten the compression on the window (adjustment +/- 2 mm). (See Picture 1 above)
- For Fully Reversible Windows/Casements adjustment can be made to the catches to make the window close tighter. Slacken the two screws on each catch and move the keeper to the desired position. After adjustment tighten screws. Only fine adjustment is required.



Picture 2

Window Will Not Stay Open (Casement Window)

- Make a slight adjustment to the screw on the sliding bar that the hinge slides on.
Note: Only a very slight turn is required. Do not over tighten as this may cause destruction of the hinge.



Window Hinge Appears To Be Too Tight

- Make a slight adjustment as above to slacken the hinges on the window.

Note: When adjusting the cams any over adjustment may cause excessive wear and tear on the handles.

Door Will Not Lock/Difficult To Lock

- Ensure that the handle is pushed fully up to the engage hook lock position before turning key or cylinder (See operating instructions on page 5).
- Try lubricating the lock.

- Try opening the door and locking it. If the door will not lock in the open position this means that the lock may be faulty. Please contact us for further advice. If it locks okay in the open position, then try locking it when the door is closed. If it will not lock in the closed position adjustments may need to be made to the door sash and hinges (see door lock and hinge adjustments pages). Please contact us for further advice.

Door Making a Whistling Noise/Draughty

- Ensure that the handle is pushed fully up to the engaged lock position to ensure full compression on door seal. (See page 5)
- To make the door seal tighter try adjusting the gasket compression on the door. Insert Allen key and turn the dot mark on the cam, towards the gasket to tighten compression on door.

