ADVANCED GLAZING SYSTEMS LTD

USER AND MAINTENANCE HANDBOOK

INTRODUCTION

Dear Client,

Thank you for choosing
ADVANCED GLAZING SYSTEMS
range of windows, doors and roofs.

Please refer to this manual as a guide to
general maintenance and operation of your products.

We do hope you enjoy the products
for many years to come.

CONTENTS

UPVC WINDOWS & DOORS MAINTENANCE INSTRUCTIONS

OUR TOP TIPS TO KEEP YOUR WINDOWS IN THE BEST CONDITION

We recommend...

- That you carry out routine maintenance on your windows, doors and conservatory at least twice a year. In areas of high exposure, you may want to do this more frequently.
- All parts of your new windows and doors that are exposed when closed, should be washed down with warm soapy water using a soft cloth, then dried thoroughly.
- Any parts that are exposed when the window and doors are open, should simply be wiped clean, removing any grime, dirt, insect remains or old lubricant.
- You avoid any cleaning agents that have ammonia in them or that are abrasive, particularly on handles and other metal fittings.
- Special attention is paid to keep drainage channels clear and free from any blockages.
- That any moving parts and fixings are treated as follows...
- The application of light oil, to keep the locking mechanism in good working order.
- A suitable acid and resin free grease should be used on sliding bars, gears and face plates.
- Maintenance of friction stays is important and we recommend that you follow the guidelines for lubrication and adjustment.

CLEANING PVC-U PROFILES

Dirty marks on PVC-U frames can easily be removed by using the cleaning materials shown in the table below.

Cleaning cloths should be unbleached cellulose/cotton material. Do not use cloths containing synthetic fibres.

	Cleaning Method		
Contamination	**Scrape off and polish using a dry cloth**	**Clean with water and mild detergent**	**Clean with non abrasive household detergent and water**
Pencil			✓
Emulsion paint	✓		
Felt pen			✓
Organic grease			✓
In-organic grease			✓
Plaster	✓	✓	
Woodstain		✓	
Ball-point pen			✓
Cellulose paint	✓		
Rust			✓
Soot			✓
Cement mortar		✓	
Wax pen		✓	

CASEMENT WINDOWS

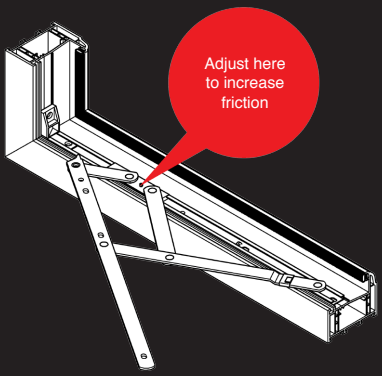
Checklist for the maintenance of your Casement Windows:

DO...

- Wash down the PVC-U at least twice a year, with warm soapy water and wipe it dry
- Regularly clean the glass with a clear liquid spray glass cleaner

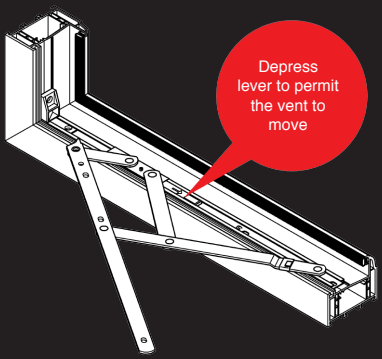
DON'T...

- Paint PVC-U window frames
- Use paste and cream cleaners which can be mildly abrasive
- Use any type of bleach, solvent or adhesive



Friction Hinges
Maintenance is important but straight forward. Keep the friction stay track free from dirt and grime and keep the hinge mechanism clean. Lubricate the metal parts regularly with light oil, concentrating on the pivot points.

Friction can be increased or decreased by adjustment of a screw. Turn in a clockwise direction to increase friction. Take care not to over tighten.



Egress Friction Hinges
In order to facilitate a maximum clear opening, egress hinges may be fitted. In most cases this will be an upstairs window and allows the window to be opened to 90°.

Some egress hinges combine the opening facility with an easy clean system, whereby the vent can be slid sideways to allow external cleaning to be carried out from inside.

To utilise the easy clean facility, open the window normally, then press and hold down the button on both hinges to release the restrictor hinge. Slide the vent across to allow egress.

Window Locking Mechanisms

Windows fitted with either an espagnolette or bi-directional locking system will allow the window to remain partly open at night to facilitate ventilation.

To engage the window in its night vent position, open the window to approximately 15mm and then return the handle to its locking position. You may feel slight resistance so do not try to force the handle, simply move the window slightly until you find a point where there is no resistance and close. Check the window is held securely in the night vent position by pushing gently on the vent - if held securely it should not move.

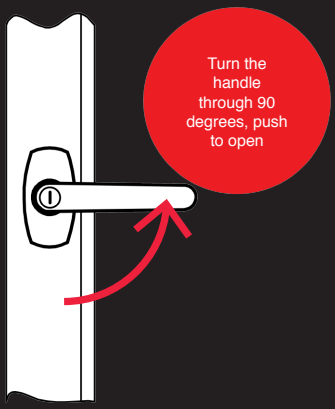
Maintenance of locking systems is simple: apply light oil to the moving parts, once a year. Similarly, a little grease should be applied to the locking slots to facilitate smooth running.

Ventilation Control

Windows can be fitted with a trickle ventilation unit, located at the top of the frame. This is designed so that you can control ventilation and minimise any build up of condensation. Simply open or close the ventilator. No maintenance is required.

Handles

Windows are fitted with key locking, push to open handles. An easy to use system, yet secure and long lasting. To operate, simply press the thumb button, turn through 90° and push the window to the desired angle. To close, reverse the procedure by pulling the window closed and turning the handle back to its original position, thus engaging it automatically. Handles can be deadlocked by using the key provided.



VERTICAL SLIDER

Vertical Slider Mechanism

The hardware requires simple lubrication. An application of light oil will keep the locking mechanisms in good working order.

Window Operation

The window is opened for ventilation by unlocking the snail cam(s) located on the top face of the bottom sash using the key provided (if key locking versions are fitted). Turn the cam(s) until released from the keep(s).

The bottom sash may now be slid upwards and/or the top sash may be slid downwards.

To close the window slide both sashes fully closed and re-engage the snail cam(s).

The window is opened into the cleaning position by opening the bottom sash to approximately 100mm (as previously described). Both tilt catches are then slid inwards releasing the top of the sash. This can then be pulled inwards and rested on it's restrictor to allow safe cleaning of the glass from inside the building.

The top sash can now be slid down. Both of it's tilt catches are then slid inwards releasing the top of this sash. This can then be pulled inwards and rested on it's restrictor to allow safe cleaning of the glass from inside the building.

Ventilation Control

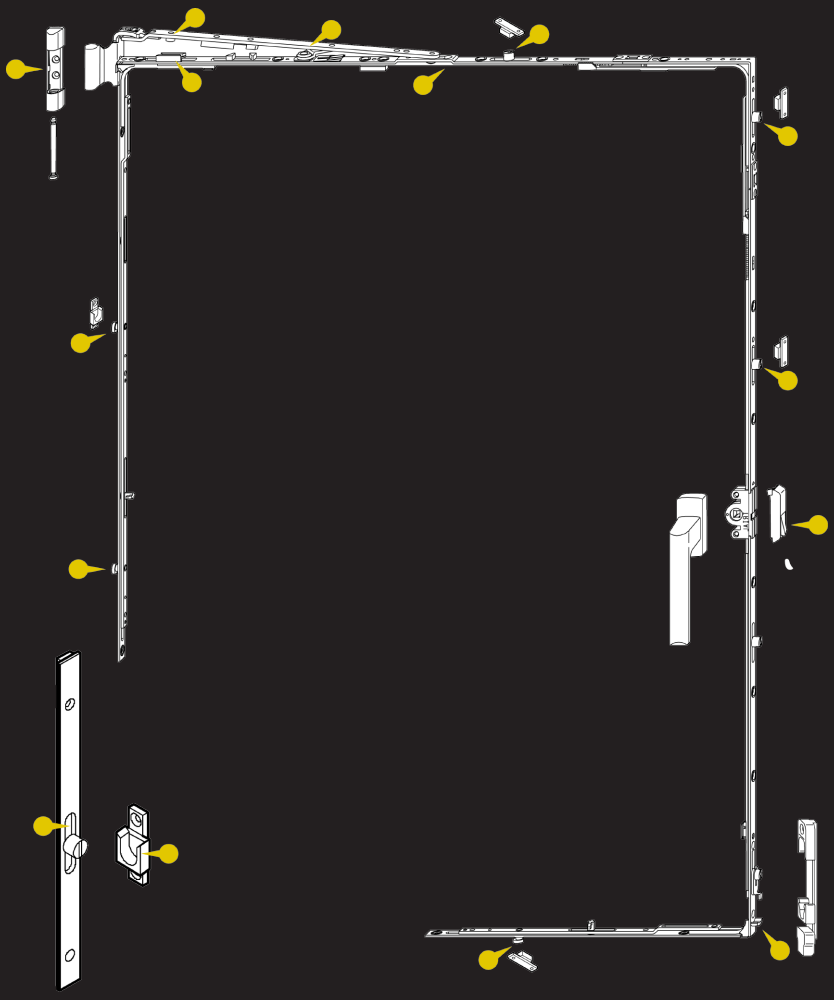
Windows can be fitted with a trickle ventilation unit. This is designed so that you can control ventilation and minimise any build up of condensation. Simply open or close the ventilator. No maintenance is required.

TILT & TURN WINDOWS

Tilt & Turn Mechanism

Maintenance is important but straightforward. Keep the locking mechanism clean and free from dirt and grime. Lubricate all locking points and strikers regularly, with light oil to facilitate smooth running.

For lubricating the fittings follow the arrows



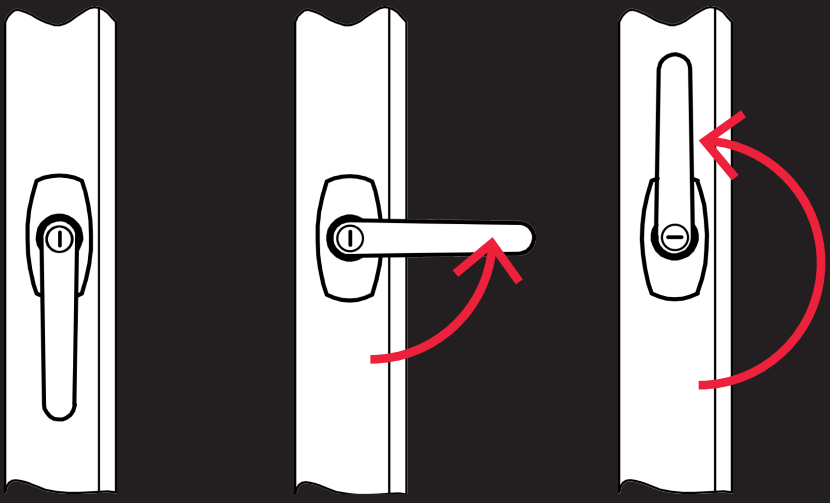
Window Operation

The window is taken into the tilt position for ventilation by unlocking the handle (if required) and moving it through 90º, to the first position. The window is then pulled gently inwards tilting on its lower edge.

Any slight resistance felt at this stage is caused by the anti-slam device that prevents the window being blown shut when subjected to higher wind pressures.

To close the window it is pushed shut and then secured by turning the handle back to the closed position. The window is taken into the turn position for cleaning. This is done as above but the handle continues to turn through 180º to the upright position. The window can then be hinged in to allow cleaning of the window from inside.

To close the window reverse the above procedure. It must be stressed that this position is for cleaning only and should not be used for ventilation.



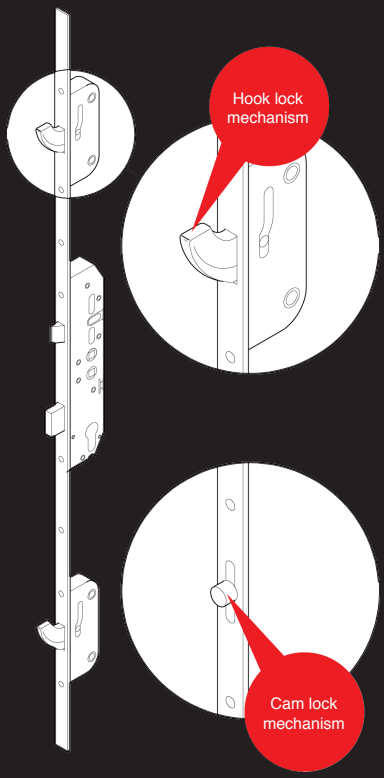
Closed position **Tilt position** **Turn position**

Please note: The above operation is for “Tilt before Turn” or “Tilt First” gear. “Turn before Tilt” or “Turn First” gear is also available although less common. If this is fitted the handle position shown above for the Tilt Position & Turn Position would be reversed.

Ventilation Control

Windows can be fitted with a trickle ventilation unit, located at the top of the frame. This is designed so that you can control ventilation and minimise any build up of condensation. Simply open or close the ventilator. No maintenance is required.

RESIDENTIAL AND FRENCH DOORS



Door Locking Mechanisms

Doors can be equipped with a hook or cam lock mechanism. In some cases there may be a split spindle lock - this means you cannot enter the house without using a key to open the door.

Locking

To operate the lock, insert the key into the cylinder. Rotate the handle upwards and turn the key for one complete revolution to activate the deadbolt, which locks the whole mechanism. Release the handle.

Unlocking

Insert the key into the cylinder and disengage the deadbolt by turning one complete revolution. Depress the handle and open the door. Where a split spindle is fitted in addition, after you have depressed the handle, turn the key a further quarter revolution to release the latch.

Handle Options

Traditional front doors can be fitted with an external pad operated handle with a lever operated internal handle. Back doors are usually fitted with a lever operated handle both internally and externally.

Maintenance of the locking systems is simple: apply light oil to the moving parts, once a year. Similarly, a little grease should be applied to the locking slots to facilitate smooth running.

INLINE SLIDING PATIOS

To lock:

- Slide door to fully closed position
- Lift lever behind handle engaging the door lock with bolts and cams.
- Turn the key to fully secure the locking mechanism.

To unlock:

- Insert key in cylinder and rotate the mechanism.
- Depress lever behind the handle, the bolts and cams will disengage the door.
- Slide door open.

Keep bottom track constantly free of dirt and debris and lubricate locking cams only.
Do not lubricate door cylinder.

COMPOSITE DOORS
MAINTENANCE INSTRUCTIONS

DRAINAGE	**DO NOT BLOCK DRAINAGE HOLES** By blocking the drainage holes in the frame it will cause build-up of water which will invalidate any warranty. If any plastering work is taking place take care when applying and cover door with dust sheet. Plaster can stain the PVCu frame and the hardware.

CUSTOMER CARE INSTRUCTIONS & ROUTINE MAINTENANCE

Clean door leaf & door frame with a mild soapy water	Never use abrasive cleaners, scouring pads etc. Stubborn stains can be removed using a non-abrasive cleaner. **DO NOT USE PVC CLEANER** **Every year** ensure drainage holes are clear of any debris.
Always **"throw the handle"** and engage the top and bottom hooks when the door is in its closed position.	Avoid just pulling the door shut and leaving it on the latch. Your door is designed to be closed with the door handle thrown. This enables the door to be closed fully using all the lock. Leaving it for long periods on the latch alone can be detrimental to the door leaf
Clean your door furniture regularly.	To keep the door furniture looking as good as when it was fitted our supplier recommends **"wiping it with a clean cloth soaked in warm water and mild detergent every month"**
Maintain your lock	Lubricate the working parts of the lock mechanism at least every **12 months.**
Adjustment to hinges	Your door may need to be adjusted from time to time dependant on use, this is done simply by the adjusting screws on the hinges or adjustment to the locking keeps.

Your door has a comprehensive guarantee including 10 year colour fastness for the door leaf. This guarantee only covers normal daily use of the door and not wear and tear, accidental damage, misuse, excessive force, or failure to carry out routine maintenance as recommended above.

CLEANING AND MAINTENANCE OF POWDER COATED ALUMINIUM PRODUCTS

a. In areas within the direct influence zones of salt water, industrial chemical plants, blast furnaces or other aggressive emission sources, the window should be cleaned at least every three months. In a relatively cleaner environment every six months should be sufficient.

   In carrying out regular maintenance outside, the internal surfaces are frequently neglected. After a period of time, grime and deposits from tobacco smoke, coal and oil fires, etc. can discolour the inside of the window frame and it is recommended that these should be cleaned at least once per year.

b. Procedure

   i. Wash down with clean warm water containing a non-alkaline liquid detergent (in a concentration which can be handled safely with bare hands) using a non-abrasive cloth, sponge or soft bristle brush. This will remove grime, grease and any excess chalking. All ridges, grooves, joins and drainage channels where salt or other deposits can collect should be well washed out, thus preventing corrosion sites from occurring!
   ii. Rinse thoroughly with clean water.
   iii. Dry using a soft cloth or leather.

c. Where a reduction in gloss is observed, chalking is evident or excessive staining has occurred, then an approved renovating cream may be carefully applied with a non-abrasive cloth.

   Note: T-Cut or similar automotive paint restorer may be used provided it is not too abrasive!

   Care must be taken not to abrade sharp corners of section or areas of beads too heavily where the paint film is normally thinner, and it should be remembered that this operation should not be carried out too frequently.

   Polish with a soft cloth to restore gloss and colour uniformity.

d. For extra protection a wax polish can be applied once or twice a year again with a soft cloth to restore gloss.

e. Cleaning chemicals must not be allowed to collect on surfaces, to ‘puddle’ on horizontal surfaces or to collect in joints and crevices. These surfaces, joints and crevices should be thoroughly flushed with water and dried.

f. Mild detergents and soaps which are safe for bare hands should be safe for coated

aluminium. Stronger detergents, such as some dishwater detergents, should be carefully spot tested. Some of the latter would necessitate using rubber gloves and long handled brushes. Some mild cleaning solutions are available for automatic washing machines.

g. Mild solvents such as mineral spirits may be used to remove grease, sealant or caulking compounds. Care should be taken to assure that no surface marring takes place in this manner since it could give an undesirable appearance at certain viewing angles. Cleaners of this type are usually applied and removed with a clean cloth. Remaining residue should be washed with mild soap and rinsed with water. Use solvent cleaners sparingly.

h. Dried concrete spillage on the painted surface may be quite stubborn to remove. Special cleaners and/or vigorous rubbing with non-abrasive brushed or plastic scrapers may be necessary.

INTEGRAL BLINDS
USER AND MAINTENANCE GUIDE

General

All units are fully tested leaving the factory; they should have been examined and tested by your installer on receipt and should have been tested for correct operation by your installer after the units have been installed.

On installation, if you have any issues with the appearance or operation of the blinds you should immediately refer to your installer for advice and help.

Failure to maintain the blinds may cause internal damage and invalidate the warranty.

Blind Operation

The blinds utilise a very stable and reliable system which requires low levels of maintenance to ensure full and long lasting operation.

Manually operated blinds are worked by either control magnets in a case sliding on rollers on the surface of the glass or a looped cord, the blinds can be fully raised and lowered, and, tilted and turned. Electrically operated blinds are worked by an actuator/ battery pack located on the glass unit or by remote, either by a remote control or through a home automation system.

The sliding magnets sit over tracks at the sides (and top or bottom for tilt/turn only blinds) of the sealed unit. The blinds can be raised/lowered and tilted/turned by sliding the control magnets up or down the tracks. The magnets will be held in position by the internal magnets. Guide rails may be fitted (these are generally for commercial installations) which ensure the magnets cannot be taken off the window or door. There will be no difference in operation of the blinds whether fitted with or without the guide rails. If guide rails are not fitted it will be possible to remove the magnetic controllers by sliding them sideways off the tracks on the surface of the glass.

The slats must be in the horizontal position before the blind is raised. When the slats are being raised or lowered it is advisable to look at the slats whilst operating the blind, in this way pressure can be reduced as approaching the fully raised or fully lowered position. This will avoid the magnet slipping out of alignment with the magnets inside the track.

It is acceptable for the magnets to come out of alignment with the magnets inside the sealed unit if forced beyond their correct limits of operation. This is to ensure the cords do not become stretched or broken through excessive force being applied on the system.

The looped cord operation both raises/lowers and tilts/turns the slats. To lower the slats pull one side of the cord downwards. At any stage during the lowering operation the slats can remain in the position achieved and can be tilted and turned by pulling down on the other side of the cord. To continue lowering the slats, carry on pulling

downwards on the cord until the slats are fully lowered. The slats can then be tilted and turned by pulling on the other side of the cord.

To raise the slats, pull downwards on the cord until the slats are raised to the desired position.

Electrically operated blinds if fitted with an actuator/battery pack then use the 'up' and 'down' arrowed buttons to raise and lower the slats. For Sunbell electric blinds a quick press of the arrowed button will move the slats quickly, a long slow press will operate the slats slowly. The slats can be halted at any stage of being raised or lowered by pressing one of the arrowed buttons.

To tilt the slats, ensure the slats are not being raised or lowered and press one of the arrowed buttons. Keep the button pressed until the slats begin to tilt/turn and release the button when the slats are at their desired position.

With normal use it is necessary to charge the actuators/battery packs with the mains charger approximately once a month unless the blinds are connected to the main electricity system or are charged by solar panels. The arrowed buttons will light when charging is required.

If supplied, the remote controller will show a light when it needs to be charged.

If in doubt, please refer to the instructions for the actuator/battery packs and remote controllers which were supplied on installation.

Replacing and Relocating the Magnets

To replace or relocate a magnetic controller in the correct location it should be positioned on the surface of the glass at the top of the track. The magnet controller should then be slid slowly down the track until a light pressure is felt as it begins to engage with the magnet inside the track. The magnet should be slid further downwards until a loud 'click' is heard; at this point the magnetic controller is fully engaged with the magnets within the unit. The blind can then be operated normally. This will apply to both the raise/lower and the tilt/turn buttons.

Bottom Rail

Very occasionally the bottom rail of the slats may become out-of-horizontal due to twisted internal cords.

If the bottom of the rail of the blind slats becomes out-of-horizontal, quickly raise the magnetic controller to the very top of the unit (it will become disengaged with the internal magnets). This will allow the internal cords to become untwisted.

Relocate the magnetic controller in its correct operating position.

It may be necessary to repeat the above process several times(a minimum of six times).

Cleaning

To ensure that the control magnets remain easy to operate it is necessary to clean the glass tracks and back of the magnets at regular intervals.

The glass tracks should be cleaned a minimum of every three months to maintain satisfactory operation. The backs of magnets and the rollers on their carriages should be cleaned at the same time.

Cleaning should be done with a cloth damped with water only. No solvents or cleaning fluids should be used.

If fitted, cords should only be cleaned with a cloth damped with water.

A suitable silicon based anti-friction dry PTFE spray (which dries to a colourless film) may be used to resist dirt and dust on the sliding magnets. Apply the spray sparingly. Immediately after spraying on the track, the magnetic control should be run over the sprayed area to spread the application over the entire track used and the back of the magnetic control.

It is recommended that the application be reapplied after washing/cleaning the glass.

Please contact your installer if you need any further advice.

EXTERNAL CONDENSATION & VISIBLE MARKS

We receive a lot of enquiries about the appearance of external condensation particularly in the spring and autumn. This is a natural phenomenon which confirms that your new double or triple glazed windows are working to their optimum performance.

CONDENSATION:

Condensation forms on an object when that object's surface temperature goes below the dew point. The dew point is defined as the temperature where the air is 100% saturated with moisture - or where the air is at 100% relative humidity. This window probably has condensation because the surface of the window is below the dew point.

This is not considered a defect. What is happening on this window with the condensation is that the window is performing exactly as designed. It is blocking heat from one side of the IGU from reaching the other side. Exterior condensation on energy efficient windows is quite common, and it is perfectly normal.

It does not affect either the performance or the longevity of the IGU. The limited warranty is still applicable. Whether a window develops exterior condensation or not is actually a rather complex subject that involves environmental and performance issues. For example, condensation is much less likely to form on a cloudy night.

Trees or other obstructions close to the windows, bushes under the windows, and even the length and angle of the soffit or other overhangs can affect the formation of condensation.

A tiny change in either temperature or humidity from one room to the next might raise or lower the dew point just a little bit and you might see a whole different level of condensation.

EXTERNAL CONDENSATION

SUCTION CUP/LABEL MARKS:

These marks can become visible on the glass face when condensation occurs.

They may appear on the glass surface as a result of the manufacturing or installation process. During these processes, identification labels are applied to the clean surface of the glass as it exits the glass washer, and suction cups are sometimes used to move the glass around the factory.

What causes them is this: If you examine the glass surface under a microscope, you will see the glass has peaks and valleys in it.

Very small, minute particles on the suction cup/label may be deposited on the glass surface and settle into these valleys. The particles are typically not visible, but change the surface composition of the glass surface enough that it affects how water droplets adhere to the glass.

This explains why suction cup/label marks are more visible on wet glass than on dry glass. Over time, with normal exposure to the elements, the suction cup/label marks will diminish or disappear.

In the meantime, they can sometimes be minimized or removed with the use of an acidic cleaning agent (i.e. white vinegar) and brown paper.

INTERNAL CONDENSATION

THIS LEAFLET EXPLAINS WHY CONDENSATION OCCURS ON INTERNAL AND EXTERNAL SURFACES AND OFFERS SOME ADVICE ABOUT CONTROL

Internal condensation

Condensation on windows and in conservatories, and the damage it can do to paintwork, curtains, wall coverings and window fittings, are problems sometimes encountered in all types of building.

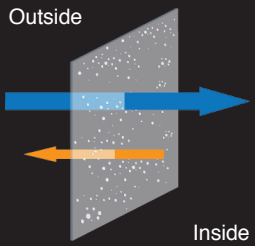
Modern aids to home comfort have created rooms which are warmer but which often have less ventilation and fewer air changes. The result is that the water vapour produced by normal living activities is no longer able to escape up the chimney or through door jambs, window joints and other outlets.

In certain circumstances, all these aids to comfort combine to create ideal conditions for the formation of condensation, which could form on the coldest surface within the room. This may not necessarily be on the glazing.

The question of how to reduce condensation without sacrificing the benefit of increased comfort is covered within this leaflet.

External condensation

Due to recent innovations in the efficiency of double and triple glazing, along with updated requirements of building regulations and the lowering of carbon emissions, certain weather conditions may allow the formation of external condensation on energy efficient windows and doors. This is a natural phenomenon and a clear indication that the window or door is preventing heat loss from your house. Further explanation can be found within this leaflet.



A single glazed window cannot retain the heat within the room and the lower temperature of the glass allows the moisture in the air to condense on the cold surface. This is often more evident in rooms in which there is a lack of ventilation.

WHAT IS CONDENSATION?

CONDENSATION IS THE POINT AT WHICH WATER VAPOUR TURNS TO LIQUID

Technical definition of condensation

Condensation is defined as the physical process by which a gas or vapour changes into a liquid. If the temperature of an object (e.g. grass, metal, glass) falls below what is known as the 'Dew Point' temperature for a given relative humidity of the surrounding air, water vapour from the atmosphere condenses into water droplets on its surface.

This 'Dew Point' varies according to the amount of water in the atmosphere and air temperature (known as relative humidity). In humid conditions condensation occurs at higher temperatures. In cold conditions condensation occurs despite relatively low humidity.

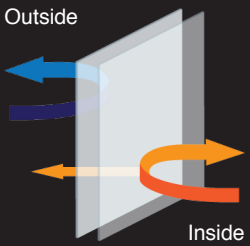
With regard to windows and doors, it is the difference in temperature between the internal and external environment, and the glass, that causes condensation to form.

What this means to the Householder

The air surrounding us in our homes always contains water vapour, which is 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).



Although a double glazed window is capable of retaining far more internal heat, the less efficient types allow a certain amount to pass through the air space and thus warm up the outer pane. This would not therefore allow condensation to form on either pane. This assumes the room is heated and ventilated.

SOME EXAMPLES OF WHERE THE WATER VAPOUR COMES FROM INTERNALLY

Breathing:
Two sleeping adults produce approximately 1 litre of moisture in 8 hours, which is absorbed as water vapour into the atmosphere.

Cooking:
Steam clouds can be seen near saucepans and kettles, and then seem to disappear. The clouds have been absorbed into the atmosphere. The heat source itself may be a source of water vapour; e.g. an average gas cooker could produce approximately 1 litre of moisture per hour.

Washing up:
The vapour clouds given off by the hot water are rapidly absorbed into the atmosphere.

Bathing, laundry, and wet outer clothing:
These are often major sources of water vapour in the home.

Heaters:
A flueless gas heater can produce up to 350cc of moisture per hour. Paraffin heaters produce 4 litres of moisture for every 3.5 litres of fuel burned.

Indoor plants:
A frequently unrecognised but nevertheless significant source of water vapour.

New property:
The bricks, timber, concrete and other materials in an average 3-bedroomed house absorb about 7000 litres of water during construction. Much of this is dissipated into the indoor atmosphere during the drying out period.

WHERE THE WATER VAPOUR COMES FROM EXTERNALLY

It is always present and the levels are dependent upon atmospheric conditions (temperature and humidity).

A typical example is the formation of condensation on the entire surface of a car, including the glazing, when left in an exposed area. This condensation would typically be removed using both the wipers blades and a squeegee.

THE FACTORS GOVERNING CONDENSATION

THE FOUR 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.

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.

Inside room temperature
This can be controlled to some extent by replacing single glazing with double 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.

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.

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, localised atmospheric conditions, shelter from nearby trees or buildings, air currents, wind speeds and nearby vegetation.

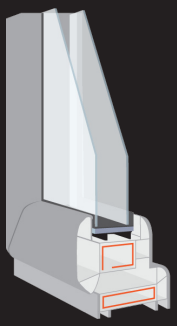
NOTE: It is often the case that external condensation will appear on some windows but not on others due to variable micro-climates in differing locations.

HOW DOUBLE OR TRIPLE GLAZING HELPS

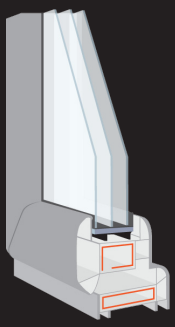
Double or triple glazing is an insulator, designed to reduce the loss of heat by conduction from the inside to the outside of a building. Current Building Regulations, (Approved Document L: Conservation of Fuel and Power), specify that all new or replacement windows must meet a minimum performance criteria. This requirement can only be met by the installation of energy efficient windows and doors.

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 or triple glazing is an insulator and not a source of heat; it does not control the amount of water vapour in the air. When rooms are inadequately heated and there is little heat to retain, double glazing cannot fulfil the purpose for which it was installed.

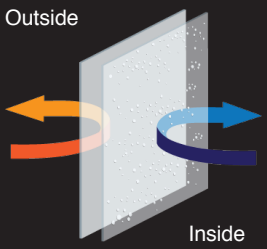
One reason why condensation forms in a room not normally occupied is that many householders, for reasons of economy, do not heat such rooms. Consequently the surface temperature of the inner glass gets very close to the outside temperature. In addition, the windows in such rooms are generally kept closed,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



Double glazed



Triple glazed



The new generation of thermally efficient double and triple glazed windows allow little or no heat through to warm up the outer pane. This creates the condition which allows condensation to form on the outside surface of the outer pane under certain weather conditions. This is strong evidence that heat is not escaping from your house through the window.

INTERNAL CONDENSATION

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.

Internally

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.

Within the cavity

Condensation within the cavity of a hermetically sealed double glazed unit or Insulating Glass Unit (IGU) denotes a failure of the seal.

Where the double glazing is achieved by the installation of secondary glazing, condensation on the cavity surface of the outer glass generally (but not invariably) indicates leakage from moist air from the room into the cavity. However, the reader should note that it is not possible to hermetically seal secondary windows; therefore some migration of air from the room into the cavity is to be expected. Condensation can occur occasionally on the cavity surface of the inner glass when the sun is shining on the window. This means that something in the air space itself, such as an unsealed wooden separator or desiccant, contains moisture. It should be noted, however, that this source can also be responsible for condensation on the cavity surface of the outer glass.

Externally

Condensation forms on the outside surface of glass 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

It is important to remove excess moisture by ventilating rooms. A room can be ventilated without making draughts or causing it to become cold. One way to do this is to open the window slightly or use the trickle vent if fitted. By opening windows or ventilating your home it may appear that you are losing some heat, but what you are actually doing is allowing warm moisture laden air to escape and permitting cool dry air to enter your home. Dry cool air is actually cheaper to heat than warm moist air.

When formed on the room side surface of the inner glass

a. Provide natural ventilation through an opening section of the window, through a proprietary ventilating unit, or through an airbrick.
b. 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.
c. Open at least one window in each room for some part of the day to permit a change of air.
d. Ensure permanent ventilation of all rooms where gas and oil heaters are used.

   NOTE: This is a statutory requirement which will be monitored by the heating engineer.

e. Fix hoods over cookers and other equipment producing steam, and ventilate them to the outside air.
f. Ensure that bathrooms and kitchens are ventilated in accordance with National Standards.
g. Draught proof internal doors and keep them closed, to prevent transfer of air with 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:
   i. The air 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
   ii. Air movement will carry it through the house.
h. Increase slightly the air temperature within the house.
i. In cold weather, keep some form of heating on permanently in the house.
j. Wherever practicable, fix radiators under windows to maintain the temperature of the inner glass at a reasonable level.

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 windows and doors. 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 a lack of ventilation is suspected, the householder 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 localised heat near the windows, will probably provide the answer.

External condensation

Our industry is aware of this climatic phenomenon and is investigating processes to help the home owner manage it.

CONSERVATORIES

- Consider crossflow ventilations with the use of vents in walls and roofs especially if the conservatory is south facing.
- Trickle ventilation in the wall, eaves and ridge zone can also help.

KITCHENS & LAUNDRIES

- Close internal doors and keep a window open. Alternatively, install extractor fans or cooker hoods, ventilated to the outside air.

LIVING ROOM

- Allow the rooms warmth to reach the windows. Position heaters under the windows, and use firing which holds the curtains at least 15cm to 20cm away from the glass to allow free movement of warm air.
- Open windows for at least a few minutes each day to permit air changes.
- Where open fires are not provided, or existing flues are blocked off, see that wall vents are fitted and kept clear, When a gas fire has been installed in an open fire aperture, the back plate should have vent holes below the fire, unless this is provided for in the fire design.
- Where possible, avoid glazed or non-absorbent wall coating, as these can promote condensation on walls.

MAINTENANCE RECORD

At Advanced Glazing Systems we operate an ethical duty of care program to ensure that all of our clients have continued satisfaction with our products and service provided.

Please note that the maintenance handbook will provide this when following our basic steps of maintenance and service on your new purchase.

Otherwise please contact our service department to arrange for an engineer to visit and take advantage of our service contract. For a one-off yearly fee, one of our trained service engineers will visit once every twelve months and carry out all the routine maintenance for you to ensure your guarantee stays current.

Date	Work Carried Out / Notes

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