

FIRAT

**PVC DOOR
& WINDOW
SYSTEMS
OPERATING
MANUAL**

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MANUAL

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Introduction

Dear Customer,

We would like to extend our thanks to you for choosing our PVC profile joineries made with PVC profiles used in **“PVC Door and Window Systems”** produced by FIRAT.

Our joineries have been produced with the most quality raw materials acknowledged in the world, the state-of-the-art technology used in the profile manufacturing and the top level workmanship provided by our technical staff featuring any kind of technical knowledge and experience and these joineries have been assembled in your houses or business places with the same delicacy.

This operating manual has been prepared both for our manufacturer dealers and our customers that utilize our products. For this reason, you should firstly read this manual carefully, and then apply what is written here and keep this manual so that the manufacturer dealer and/or those other manufacturer dealers that shall be involved in this occupation can benefit from it in the future.

A First of Its Kind...

Apart from the profile used in PVC Door and Window Systems, FIRAT has been manufacturing reinforcement metal, rubber gasket, door and window handles, metal jointing elements and plastic jointing elements in its own facilities equipped with the latest technologies in Büyükçekmece, Istanbul that is the largest facility of Turkey achieving something first in Turkey and all around the world.

This feature, which hasn't been owned by any of the firms in this sector up to now, ensures the quality integrity of FIRAT, answers any kind of requirement and moreover enables our customers enjoying the privilege of FIRAT to experience the comfort of conducting stock, control and tracking mechanisms from a single source.

Expected useful life of PVC Door and Window Systems is 10 years as designated by the Ministry of Industry and Trade. However, it is also known that nature can't dispose PVC for nearly 1000 years. If the maintenance of the joineries is conducted in accordance with the technique and operating manual, we can say that “PVC joineries have a life span equal to that of the building” as long as there are not implementations contrary to the normal conditions in moving systems and mechanisms of the joineries. You can see that the PVC joineries implemented in buildings operate without any problem even after long years of operation. We kindly request you to read this manual and comply with the operating rules so that you can use your joineries efficiently and hassle-free for many years.

Description of PVC Door and Window Systems:

Determined and shaped in accordance with the life style and requirements of the architecture in residences and other living spaces **“the objects that are placed in the spaces on the wall, adapted to the building with the aim of illumination, ventilation, communication and isolation are called windows”**. PVC Door and Window Systems adopt different names according to desired specifications. The main system is consisted of doors and windows. Sliding, roller blinds and shutters are auxiliary systems. One or some of these systems can be utilized according to the requirement of the final consumer or the living space.

It should be remembered that, the most important two features of PVC Door and Window Systems are the values of **“long life and perfect isolation”**. For this reason, it shall undoubtedly be for the advantage of our customers to benefit from the experiences of window manufacturer firm authorities while choosing the place and system of your joinery. Consequently, we are sure that you shall choose the best option complying with the principles of contribution to country's economy and efficiency while determining your preferences.

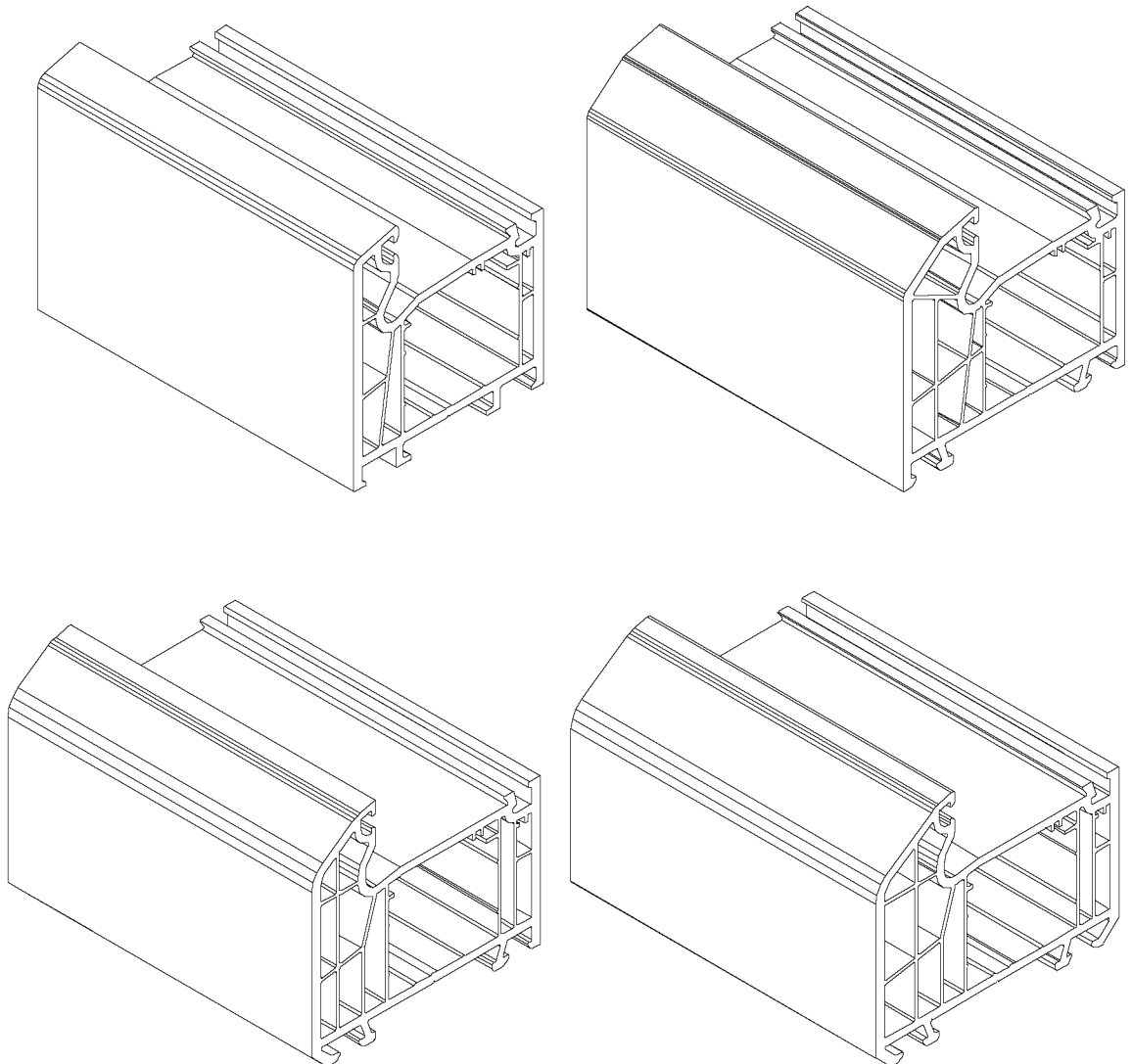
What do PVC Door and Windows Systems Consist of?

PVC Door and Window Systems consist of 38 components at most in total. Among them, all the components other than the glass and screws are manufactured in the proprietary facilities of FIRAT.

They can be examined under 7 main titles.

1.PVC Profile:

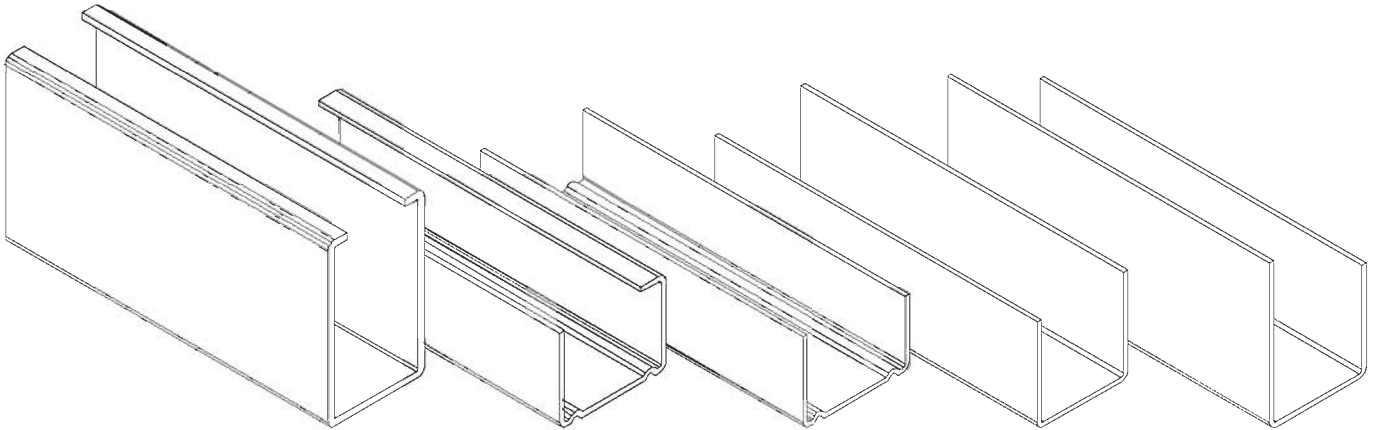
The profiles are named according to their width. Since every door and window profile is designed as differently from one other, the profiles of two series or different brands are generally not mutually compatible. Therefore, no main profile of FIRAT can be used with profiles of other brands, similarly, it is not possible to use the main profiles of any other brands in conjunction with profiles by FIRAT.



What do PVC Door and Windows Systems Consist of?

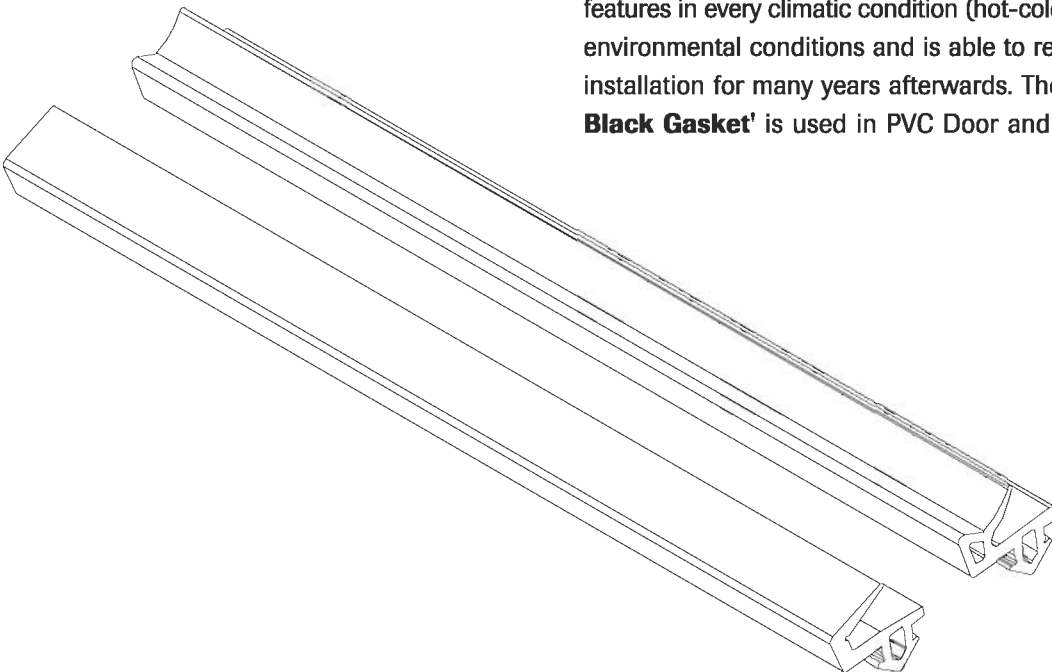
2. Galvanized Reinforcement Metal:

They are implemented to enhance the static characteristics of PVC profile and to ensure form stabilization of the profile in the face of temperature differences. It is obligatory to use it in all sizes -large and small- and in a single piece in all parts of the joinery. The inertia value of a Galvanized Reinforcement Metal is more important than its form and thickness.



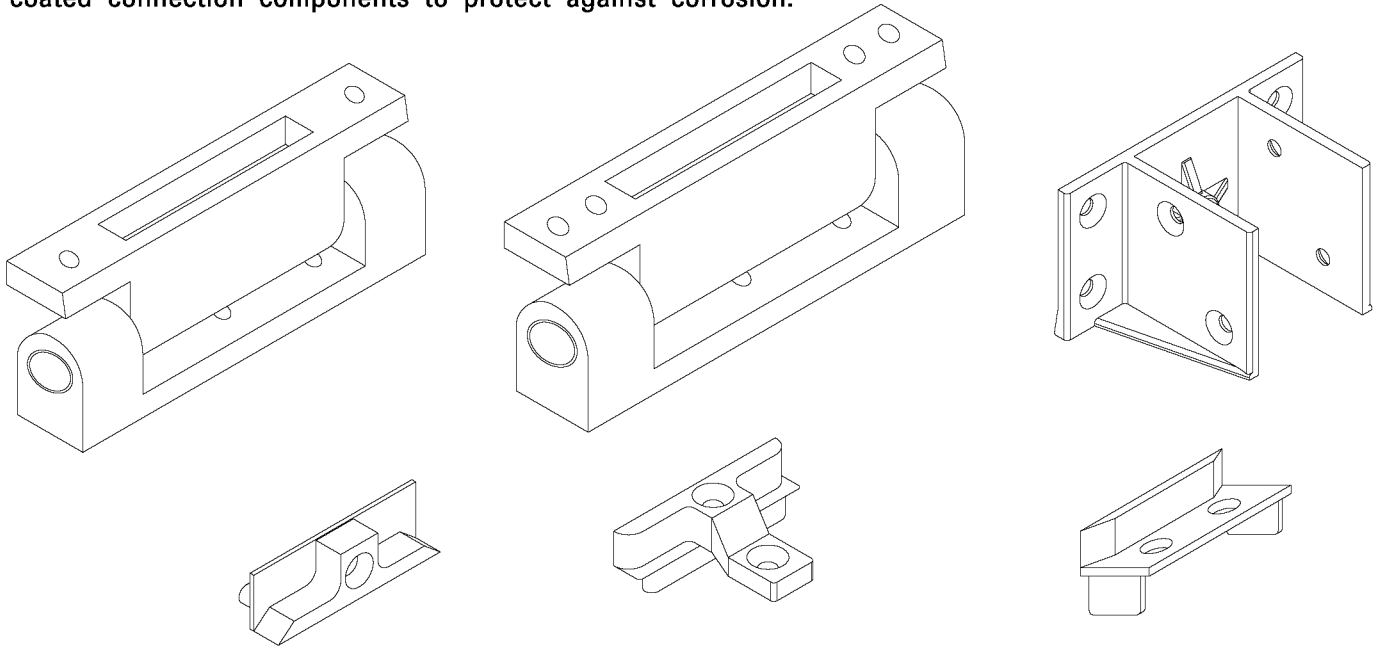
3. EPDM Rubber Gasket:

EPDM Rubber Black Gasket is the sealing and insulation component with the longest life cycle, which maintains its high quality and technical features in every climatic condition (hot-cold), even under harsh external environmental conditions and is able to resume its original features in installation for many years afterwards. Therefore, the '**EPDM Rubber Black Gasket**' is used in PVC Door and Window Systems of FIRAT.



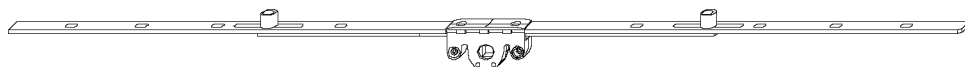
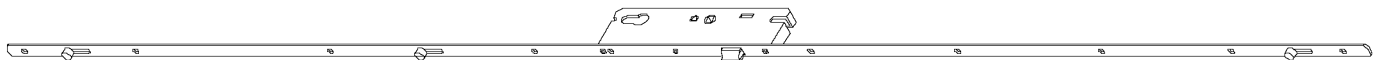
4.Metal connection components:

All the connection components to be used in PVC Door and Window Systems are metal or metal-reinforced. It is obligatory to use painted or coated connection components to protect against corrosion.



5.Accessories (equipment):

With FIRAT PVC Door and Window Systems, all kinds of equipments can be implemented in keeping with consumers preferences and likings such as single-opening (hinged), double-opening, vasistas, high transom, below-opening, locked system, standard sliding, lift-pull slide, folding, pivotal, vertical sliding (Guillotine), etc.



What do PVC Door and Windows Systems Consist of?

6. Assembly materials:

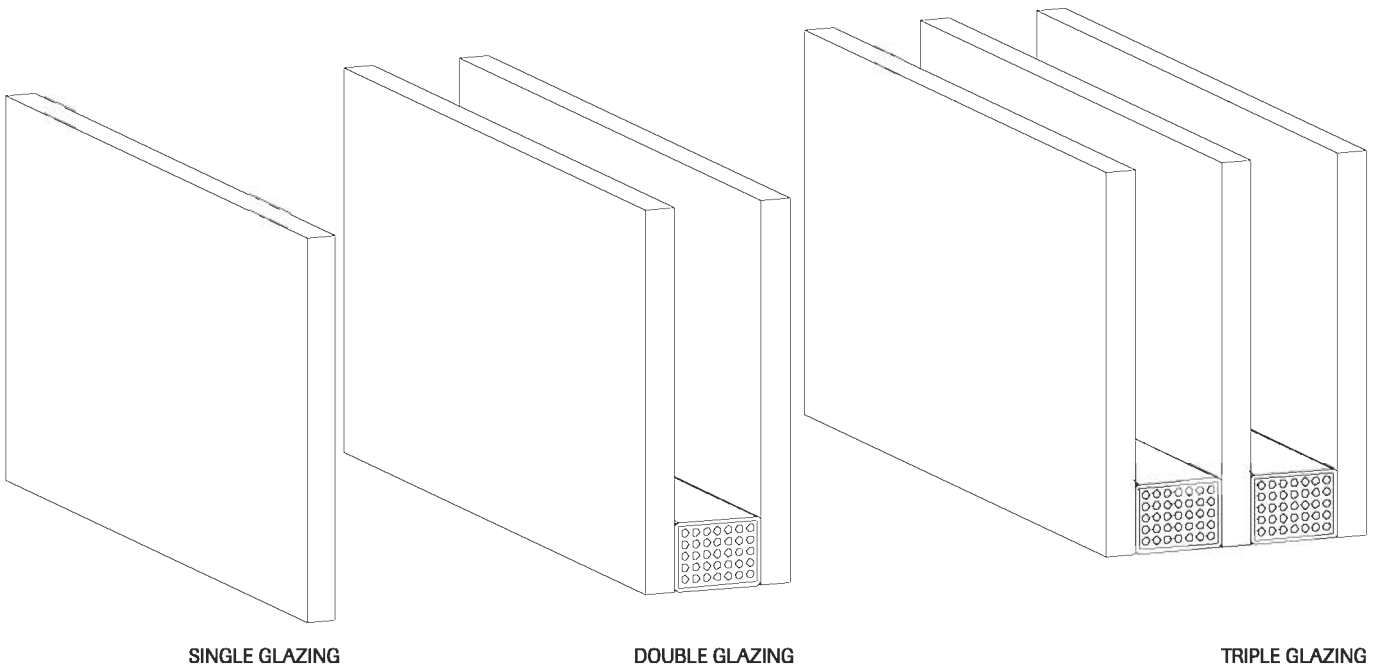
All detailed solutions can be implemented in line with the sui generis architecture of every building and our customers' preferences. **The recommendations by the joinery manufacturer should never be ignored in that regard.** Especially, the insulation is the vital point of PVC Door and Window Systems.

7. Glass:

Our PVC Door and Window Systems offer the convenience of using all glass thicknesses ranging from 4 mm to 40 mm and implementing all different types of glass.

The end user does not have the right to choose on the first three of these main headlines. The way in which these components are used, their quantity, features and quality values with respect to the place, form and technique of joinery are under control as determined and followed up by standards and by FIRAT.

Our esteemed end customers have the liberty to make a choice in all the other main headlines. Your insistence on making a choice in the first three headlines may bring about a result that is at your expense. Therefore, it would be correct not to offer that. Your desires and preferences other than the technique of PVC Door and Window Systems shall be guaranteed by the joinery manufacturer, they will be able to be put into implementation under your signature representing that you as our esteemed customer have undertaken the responsibility.



Types of PVC Door and Window Systems:

The PVC Door and Window Systems manufactured by FIRAT can be enumerated as below depending on the profile width and mode of utilization.

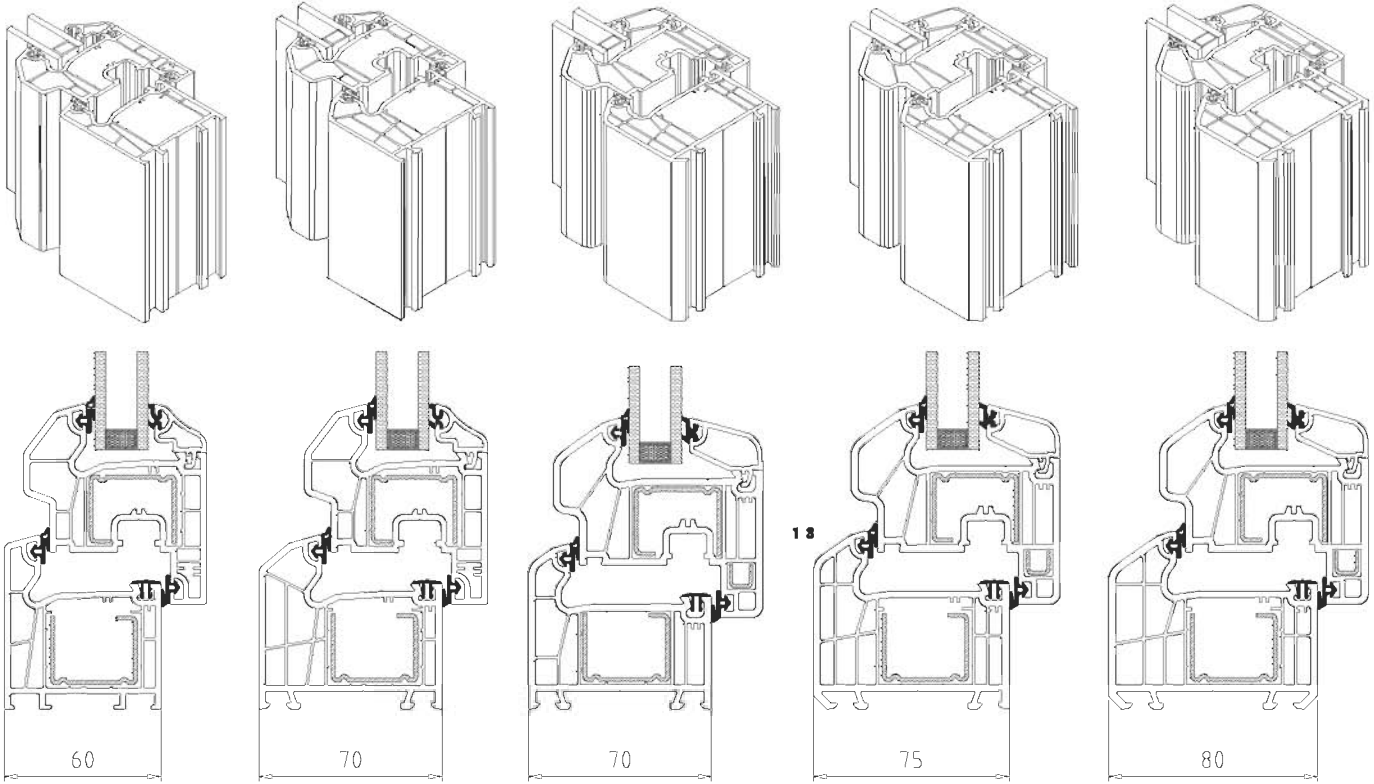
S60 Series: It is a 60 mm-wide, 4-chamber series and it is possible to install panes and panels with thicknesses ranging from 4 mm to 32 mm. The isolation is ensured via rubber gaskets.

S70 Series: It is a 70 mm-wide, 5-chamber series and it is possible to install panes and panels with thicknesses ranging from 4 mm to 32 mm. The isolation is ensured via rubber gaskets.

W70 Series: It is a 70 mm-wide, 5-chamber series and it is possible to install panes and panels with thicknesses ranging from 4 mm to 40 mm. The isolation is ensured via rubber gaskets.

S75 Series: It is a 75 mm-wide, 6-chamber series and it is possible to install panes and panels with thicknesses ranging from 4 mm to 40 mm. The isolation is ensured via rubber gaskets.

S80 Series: It is a 80 mm-wide, 6-chamber series and it is possible to install panes and panels with thicknesses ranging from 4 mm to 40 mm. The isolation is ensured via rubber gaskets.

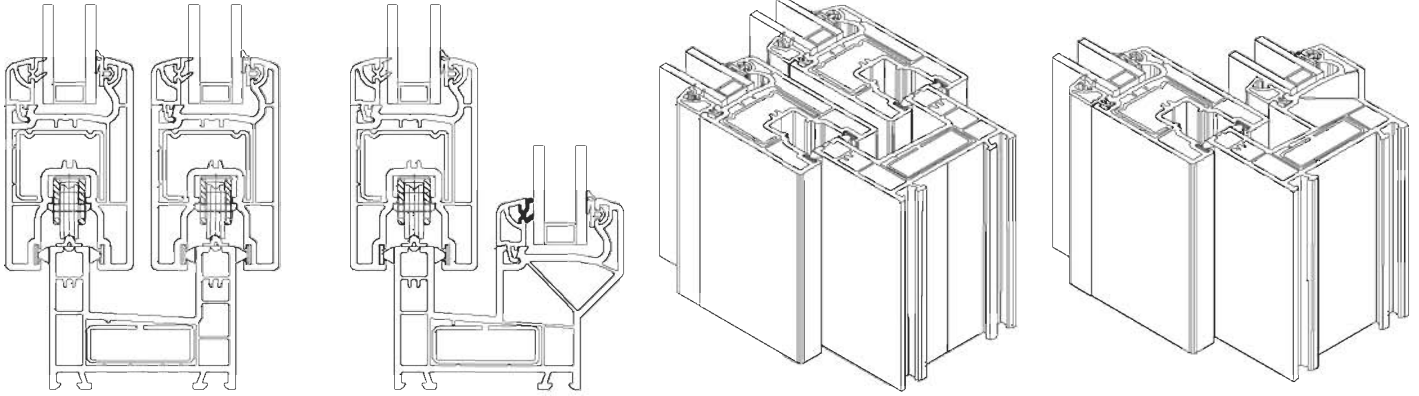


Types of PVC Door and Window Systems:

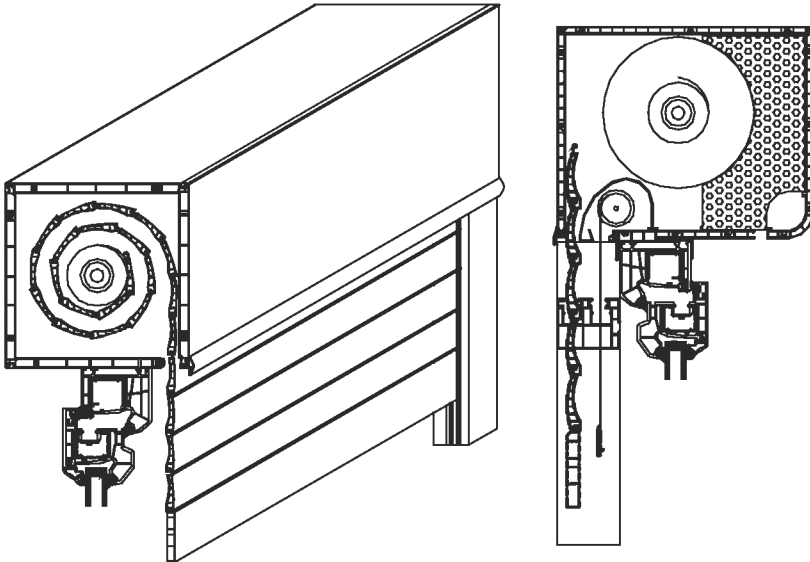
Sliding Series: These are systems with aluminum rail profile that are moved on the horizontal axis sliding on wheels and of which the isolation is ensured via brush (brush inserts) gaskets. There are two series available according to profile thicknesses.

- **Type E Sliding Series:** This is a series with single and double sliders two having a profile thickness of 95 mm and one 83 mm, three chambers and three frames and it is possible to install panes and panels with thicknesses ranging from 4 mm to 20 mm.

- **Type Y Sliding Series:** It is a series with a profile width of 70 mm, single and double sliders, three chambers and it is possible to install panes and panels with thicknesses ranging from 4 mm to 24 mm.



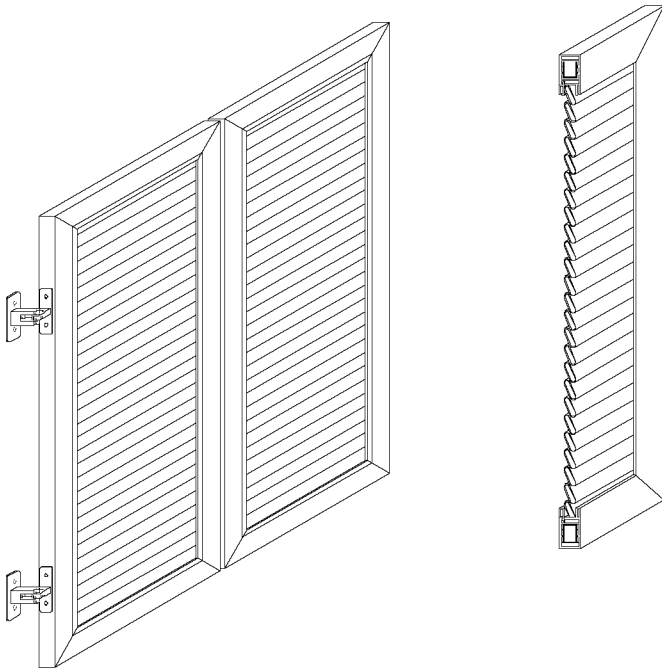
Mono-Block Roller Blind: It is installed on the PVC window along with the PVC joinery. All the parts other than some moving parts are PVC. There are two systems available depending on the box dimensions. sebep olabilirsiniz.



- **19X19 mono-block roller blind:** It is used with PVC lamel for joineries with a max. width of 115 cm and a height of 205 cm. It is an economical model, it can be manufactured in manual and automated (button control or remote control) modes.

- **21X23 mono-block roller blind:** It is used with PVC lamel for joineries with a max. width of 150 cm and a height of 250 cm. Inside the box, it is possible to implement a fly roller, shade and isolation; it can be manufactured in manual and automated (button control or remote control) modes.

Blind Series: It is a system mounted from outside the window, opened towards outside and intended to protect against sunlight and ensure esthetic appeal. It can be installed with a single sash or double sash. It is entirely PVC other than the hinge and locking mechanisms. By means of the two lamels that it has, mobile or fixed lamel can be implemented as desired.

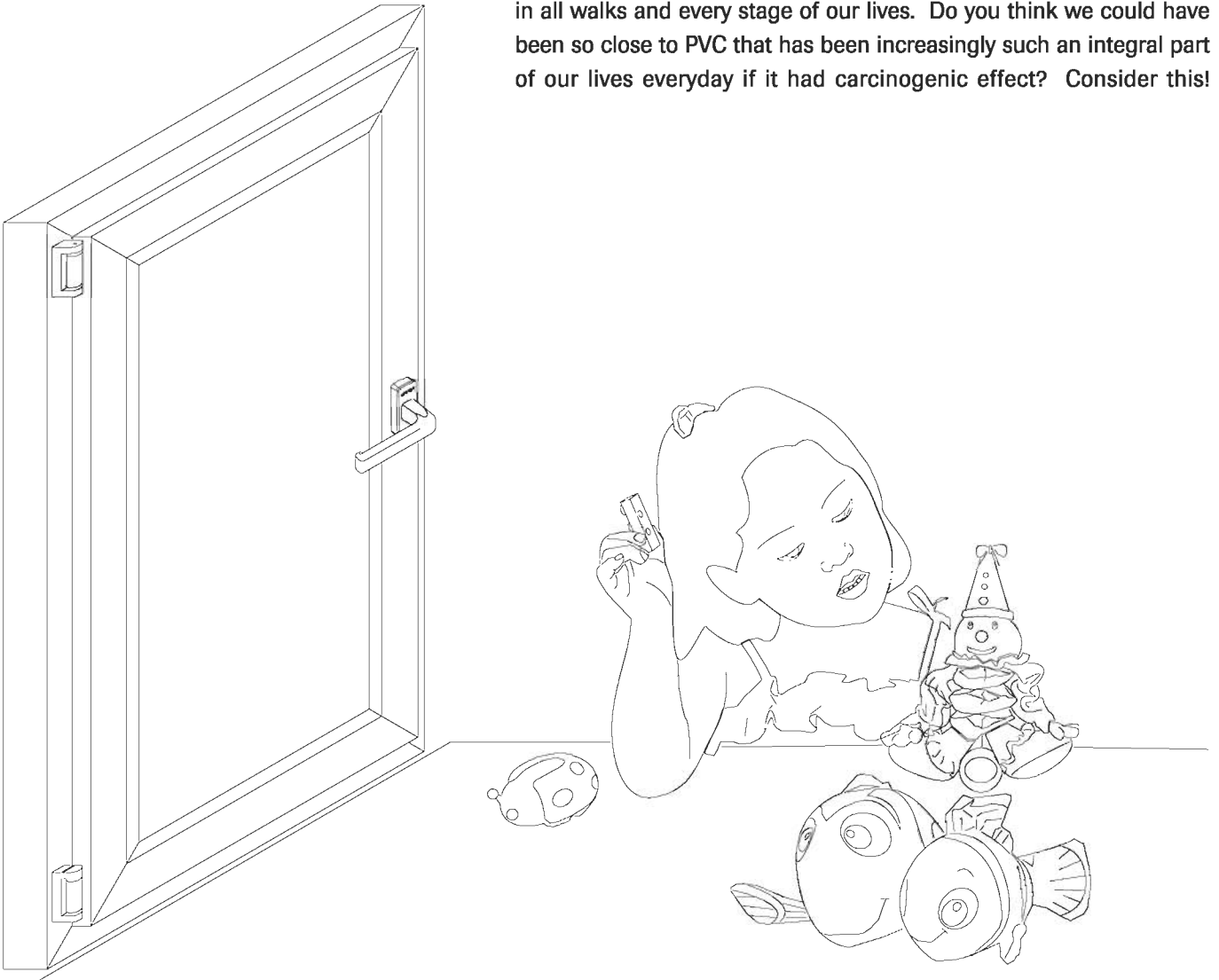


Fly Net: It is available in many varieties such as practical, hinged, sliding and roller. For sliding series, sliding fly nets should be preferred while roller fly nets should be preferred for especially roller blinds. They are mounted on the outer side of PVC joinery, while the fly net performs its function with its net, the brush gaskets ensure isolation.

Essential Information, Warnings:

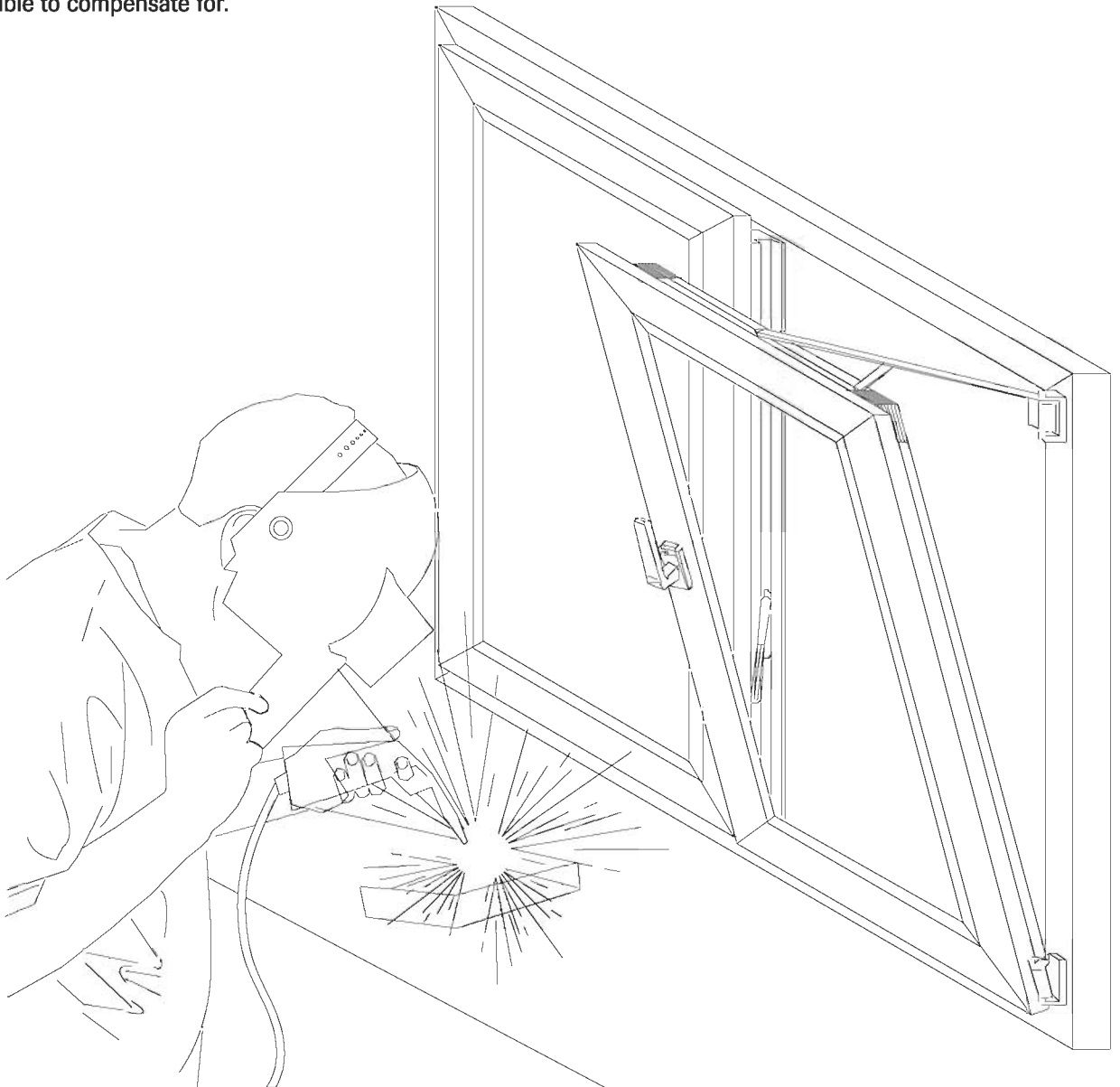
Although no conditions that may potentially be dangerous and hazardous for human and environmental health during the use of PVC doors and windows, there are some considerations to be observed taking into account all kinds of possible negative factors. Please follow carefully the below-mentioned points in order not to harm or be harmed.

- Your PVC joineries have no carcinogenic effect. They emit no carcinogenic secretions, smokes or odors. It should be remembered that PVC is the raw material of toys, dish bowls, water pipes, injectors, serum bottles and blood packs. It is unavoidable for us to live with PVC in all walks and every stage of our lives. Do you think we could have been so close to PVC that has been increasingly such an integral part of our lives everyday if it had carcinogenic effect? Consider this!



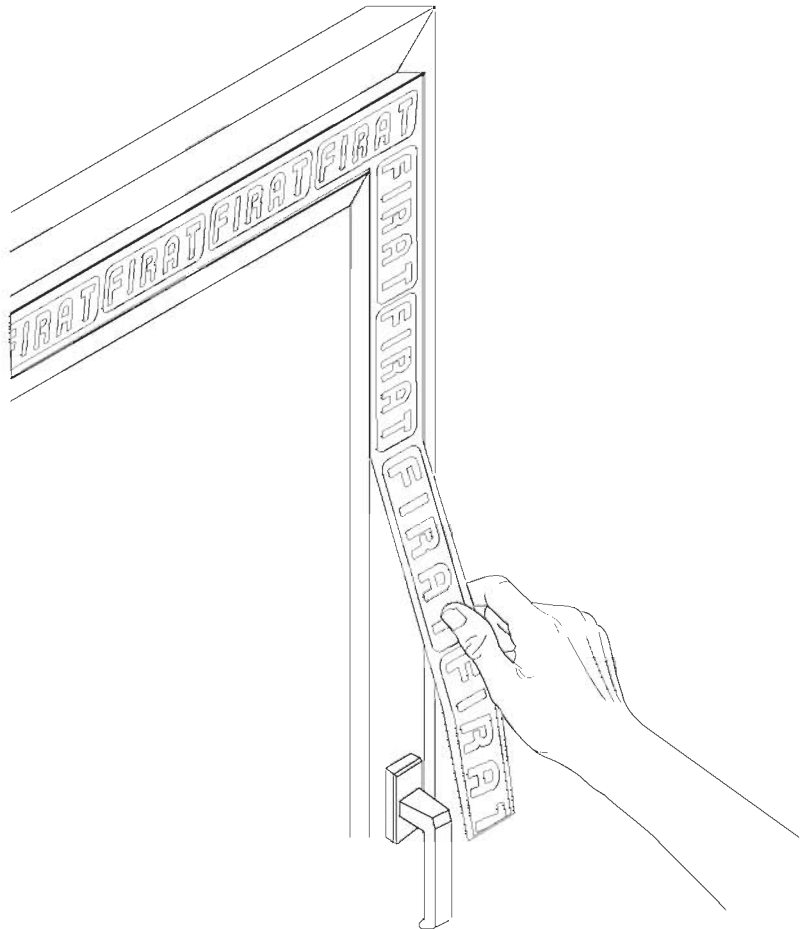
- PVC should not be eaten or swollen in any way since it cannot be disintegrated by the digestion system. Otherwise, one will encounter digestion problems and indigestion.

- In frame of fire, it neither becomes untouchable like aluminium joinery by raising the heat excessively and amounting to high temperatures nor does it become inapproachable like wooden joinery by catching fire and glosash in flames to feed the fire. It absorbes the heat of fire and has an effect to extinguish the fire by being scorched; since it does not conduct heat, direct contact is possible, thus it facilitates escaping the fire.
- Please do not approach your PVC joinery with a lighter, match or flame-exuding devices, protect it against fire, do not put out a cigarette on it. Extreme heat and flame will cause your joinery to be discolored, warped in shape and turn yellow. It may bring about problems that may not be possible to compensate for.



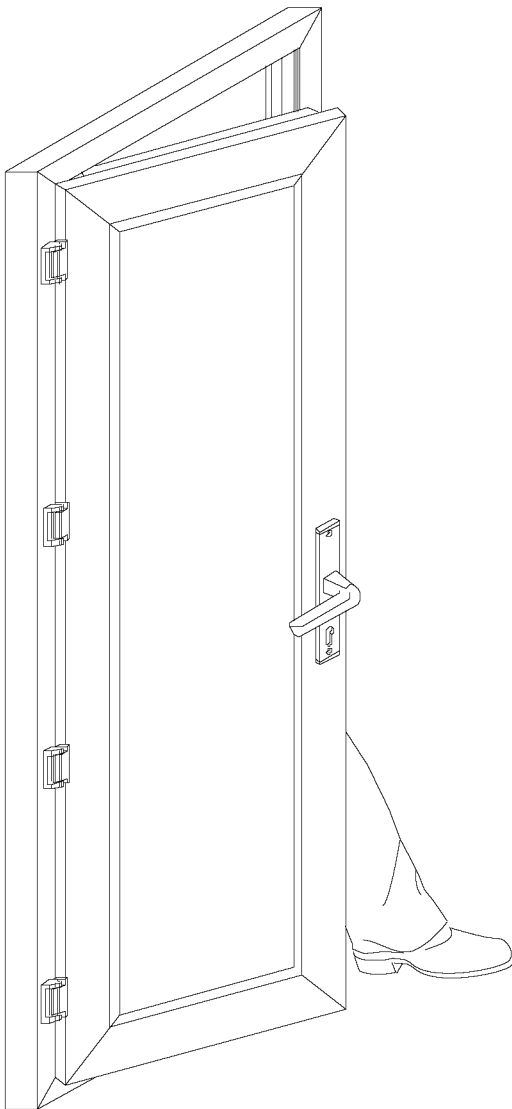
Essential Information, Warnings:

- Ensure that you remove the protective folio, which was applied so that the profiles were not damaged, joineries were not scratched during manufacturing and transportation, in three months at the latest after you receive your joinery. Since the protective folio will stick to the joinery surface in frame of delay and it will not be possible to remove it in any way afterwards, one will have to wait for it to flake off in time. This process may take years. You may also get rid of those bands by heating the protective band for 1 min. at a distance of approximately 15~20 cm with a heat air blower (hair dryer, etc.) and then pulling it off.



- In order not to encounter injuries and unwanted situations, you must use your windows according to the technique as explained in this operating manual. Otherwise, it may not be possible for you to obtain your desired performance from your PVC doors and windows.

- Do not put your hand or foot in the spaces between the moving mechanism and the frame sash in an uncontrolled way. You may not only be harmed and injured as a result of compression, you may also cause your PVC window and the mechanism to be disrupted.



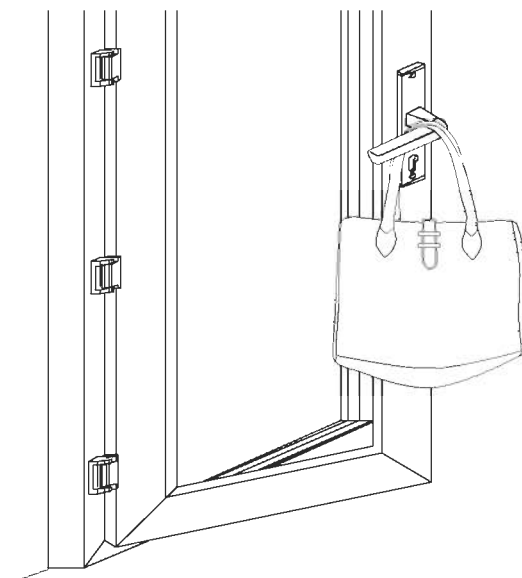
- Make sure that the window and door sashes are fully locked. Otherwise, sashes may be banged due to a wind or air current. Your joinery may be damaged permanently, the glass may be broken, cracked, settings may be distorted and its isolation may deteriorate. It may cause injuries.
- For the health and safety of children, keep safety locks locked or activate child safety mechanisms if any.

Essential Information, **Warnings:**

- Avoid any impacts on your PVC joineries by hard objects.



- Never place or hang additional loads and weights the window and door sashes, do not pull down on them, either.

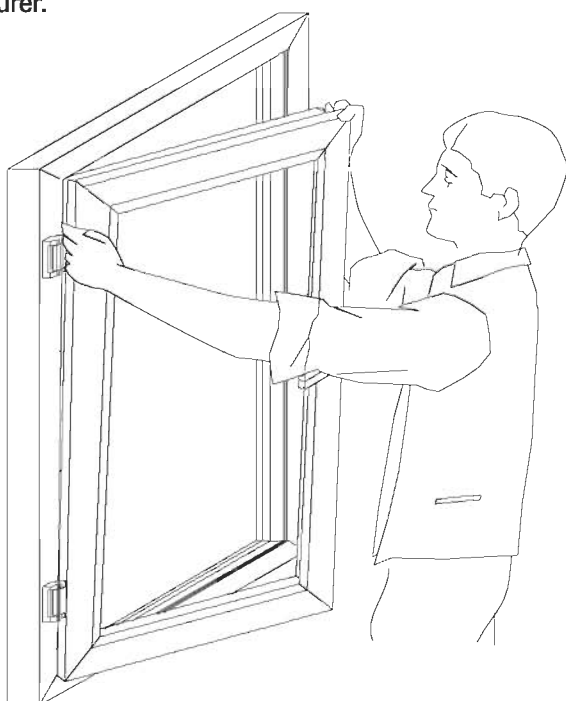


- Do not force the sashes to open more than the maximum opening angle. All kinds of forcing actions may harm the joinery, it may also cause permanent damage.

- Do not force the system to close while there are foreign objects among moving parts or between the frame and sashes.



- Do not intervene on your PVC joinery and equipment in order to solve potential problems; you can ensure the problems to be solved in a much shorter period and much suitable way by contacting your joinery manufacturer.



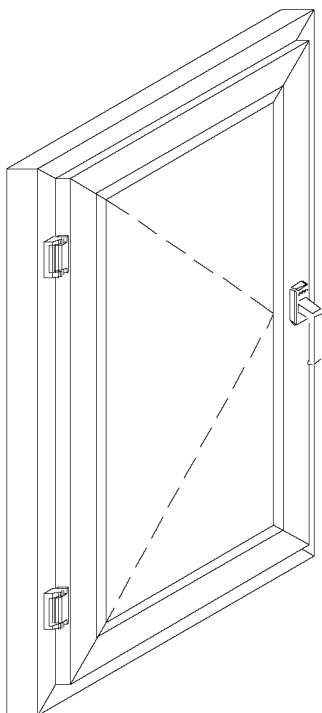
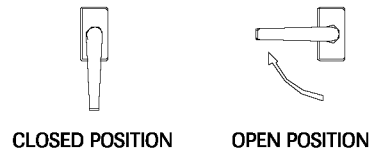
Utilization of PVC Door and Window Systems:

Your PVC doors and windows made with profiles which were manufactured in FIRAT facilities where state-of-the-art technology is used in plastics sector, and which you have bought believing that it was value for your money, are delivered to you as a result of diligent work by the technical staff of FIRAT.

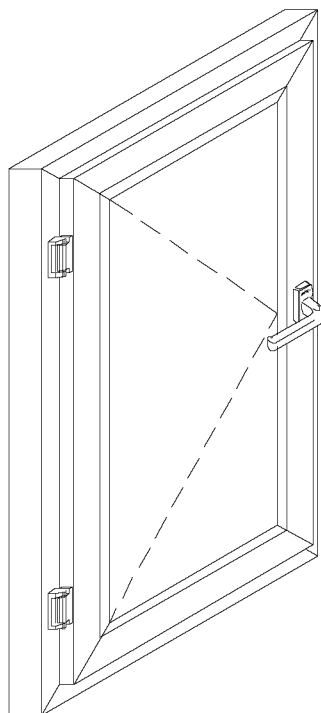
PVC Door and Window Systems may operate distinctively and differently from one another depending on the features of the accessories that are used. FIRAT offers for its customers' appreciation many PVC Door and Window Systems that will respond to all kinds of requests and requirements by its customers, match their tastes and fulfill all their expectations. These may be frequently used, standard doors and windows, but they may also be rarely used doors and windows, which can be termed as being on the extreme points. Therefore, this product by FIRAT as all its other products, will not only be a source of confidence, pride and happiness beyond words with your children, not to say, your grandchildren using our products that have served our customers for long years, but it will also enhance further the circle of friendship and intimacy with our customers. Furthermore, you will have used the PVC doors and windows by FIRAT in a sound and proper way with the sensitivity you will show. We would only like you to abide by our recommendations below. That is all.

Single Opening Windows:

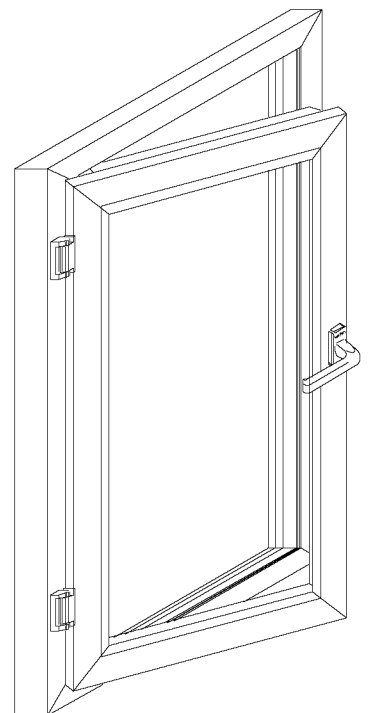
These windows are opened to the right or left by means of the handle on one of the vertical sashes and around the axis of hinges around the axis of other hinges connected on the other vertical sash. They are named after the arm you shall use while opening the window (Such as single opening to right or single opening to left). The downward position of the handle is the closed position. It is necessary that the sash has been pushed towards the frame while the handle is brought to the closed position. In this position, the technical performance of your window is actualized. The reinforcement metal and PVC profiles that make up the static state (the stable balance) reach the desired levels of water and air tightness, heat and sound isolation by means of the hinges and espagnolette as well as the rubber seal crushed between. To open a closed window, just turn the window handle by 90° to bring it to horizontal position and pull the sash towards yourself. Providing assistance by pushing the sash with the second hand while closing the windows that are in very large sizes as required by architecture will ensure the mechanism to be closed securely and the lifetime to be longer. Trying to turn the handle to the closed position and to close the sash while the sash is in open position may cause the espagnolette to bang, thus the mechanism to be damaged. The single opening should be from the isolated vertical parts of windows. Since the horizontal ones will be weak when there are wide sashes, isolation problems may occur. For such types of wide, single-opening windows, it would be correct to use additional locking systems for horizontal parts.



SINGLE OPENING WINDOW CLOSED
HANDLE IN CLOSED POSITION



SINGLE OPENING WINDOW
HANDLE IN OPEN POSITION



SINGLE OPENING WINDOW OPEN
HANDLE IN OPEN POSITION

Utilization of PVC Door and Window Systems:

Double Opening Windows:

In these windows, the espagnolette set surrounds all four corners of the sash. It both works as a single opening window and opens from the top by rotation on the lower horizontal axis as if there is a hinge on the lower horizontal part of the sash (like bathroom and WC Windows). If perfect isolation values and ventilation quality are desired, double opening windows represent the definitive choice. The double opening windows are named after the arm you use while opening the window (Such as double opening to right or double opening to left). The downward position of the handle is the closed position. When the handle is brought to the horizontal position as parallel to the ground, it is in the single opening position. When the handle is turned by 180° from the closed position as turned upwards, it is switched to the position of opening from top (transom). Pulling the handle gently towards yourself will be enough to open the sash in both positions. When you would like to close your window, no matter in which position it is, you should hold and push the handle, then switch the handle to closed (normal) position by turning it after the sash is fully rested on the frame. When there are large sashes, assisting with your other hand will aid the system to work more smoothly, hence it will ensure the mechanism to be secured in place and perfect isolation to take place. For simple double openings, it is possible to leave all three corners by opening from both sides and top when it is wanted to open the window in intermediary positions without setting the handle at the fully horizontal or vertical position. You do not need to worry, because the frame-sash switch will prevent the sash from falling down. Set the handle to the upwards position, push the sash towards the frame with the assistance of your other hand, ensure that the sash is secured on the frame and turn the handle to the closed position.

Double opening positions represent the most appropriate and correct position for PVC Door and Window Systems. Because, it is possible to provide totally different solutions by making additions to the double opening espagnolette system.

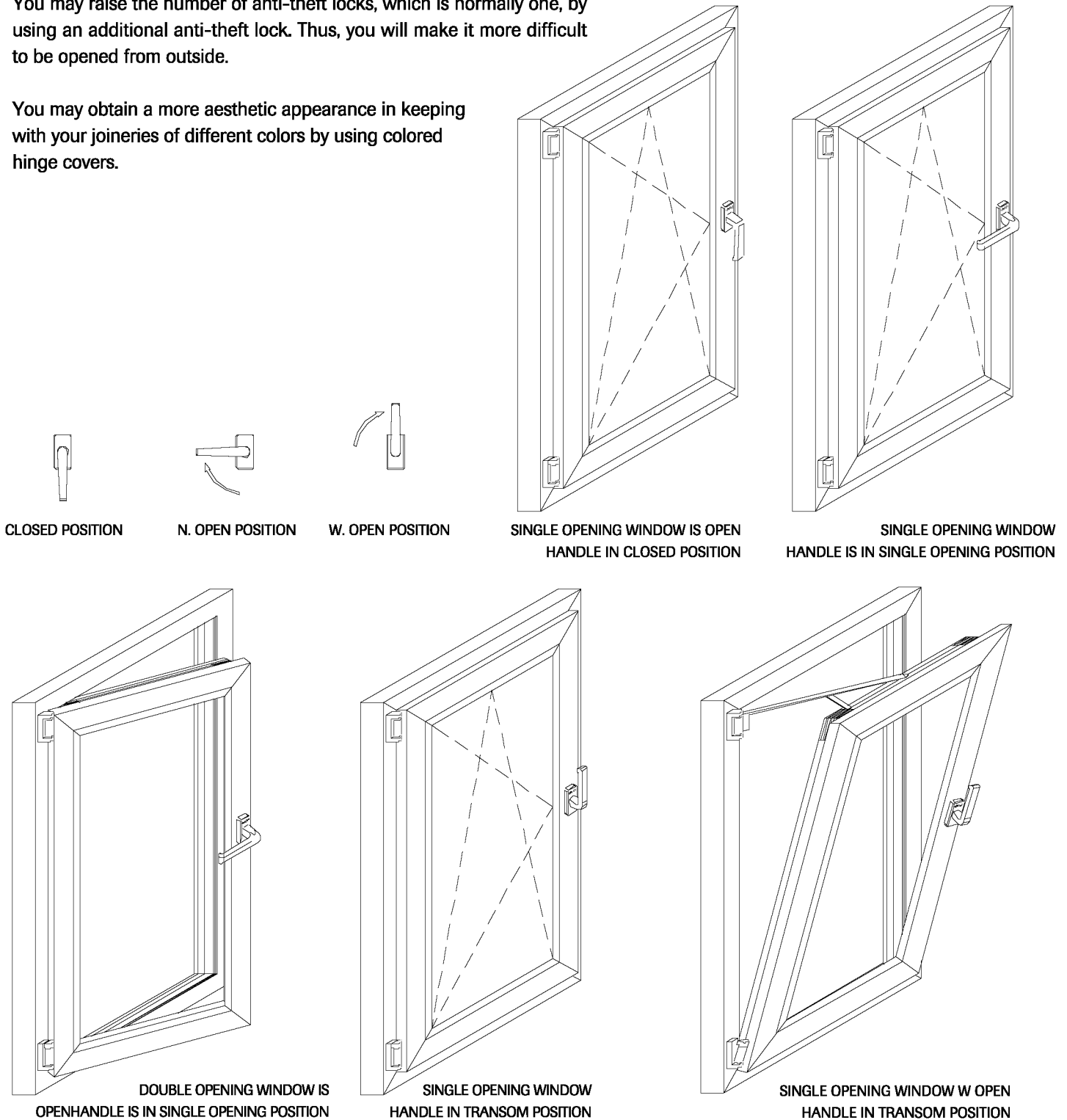
In the Topstar model, double opening hinges are not visible. Using the double, opening lock, it is possible to prevent the window handle to operate in intermediary positions. Thus, the window will be opened simultaneously as in the single opening and in transom position to prevent the mechanism from being released as explained above.

Using the gradual opening lock, it is possible to ensure that the window is opened in transom position at four different ranges. This will provide you with the possibility to ensure ventilation at different amounts and in a safe way in different weather conditions.

Using additional locks, it is ensured that the number of locking actions normally performed in seven spots is increased. Higher isolation values are achieved especially in the frame of large joineries.

You may raise the number of anti-theft locks, which is normally one, by using an additional anti-theft lock. Thus, you will make it more difficult to be opened from outside.

You may obtain a more aesthetic appearance in keeping with your joineries of different colors by using colored hinge covers.

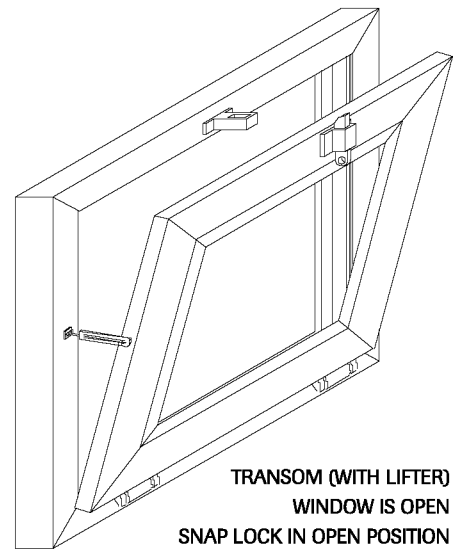
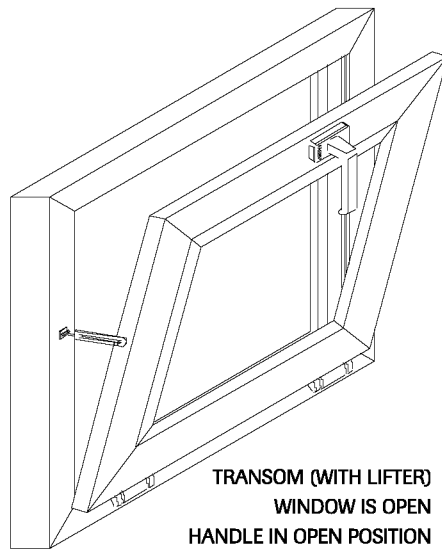
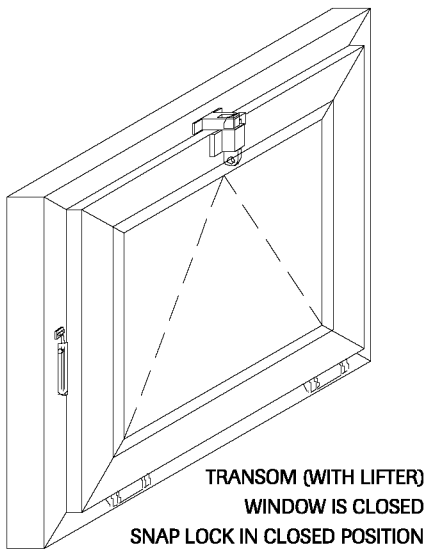
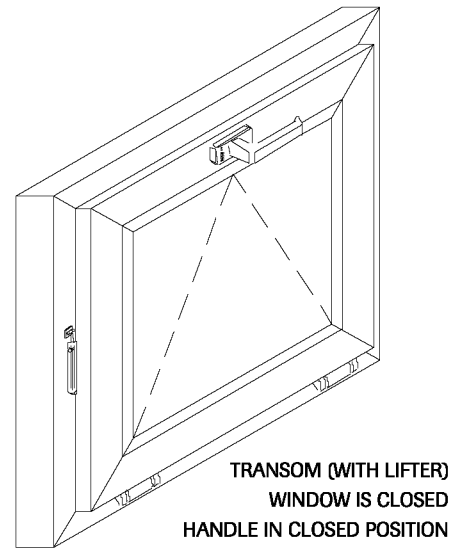
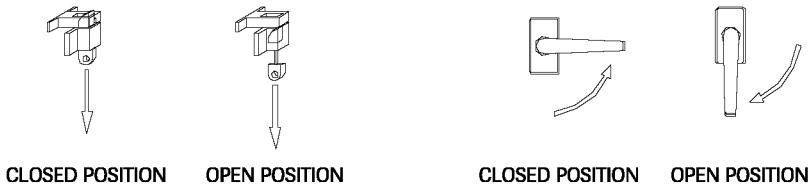


Utilization of PVC Door and Window Systems:

• **Transom Opening Windows:**

This is the horizontally operating application of single opening windows. The hinges are connected to the horizontal part of lower sash. The handle is on the upper horizontal part. The handle is in closed (normal) position while it is parallel to the ground, namely, horizontal. The handle is opened by being turned in downward position, by turning the sash on the axis of hinges on lower horizontal part. A transom switch is available on the side of the sash so that the profiles or hinges are not damaged due to the fully turned (180°) sash hitting the wall or being strained. The switch will allow the sash to be opened to a certain extent. Switches that accommodate different opening sizes can be used in line with the magnitude of the joinery or customer's preference, the locks that are closed with a strike can also be used instead of handles. To close the window, it is enough to hold it by the handle and push the sash towards the frame, then turn the handle once the sash has been secured in the frame. Sometimes, double switches can be used in especially large size transom windows. Assisting with the other hand while closing transom joineries that are large and in different forms (triangular, round, elliptical, trapezoid, etc.) will be beneficial in terms of the functionality and lifetime of the mechanism. For stricken lock applications, the closure of the window is performed by pulling down the latch of the lock and pushing the sash (then, immediately releasing the latch). It is enough that you pull down the latch of the lock and pull the sash towards yourself while opening the sash. When it is intended to set the sash released for cleaning purposes, the transom switch pin is removed from its slot while the sash is semi-open, then the sash is slowly released downwards. The window is cleaned after necessary precautions to ensure that the sash, hinge and mechanism are not damaged have been taken. After cleaning, make sure that the switch is secured in place and the system is operating smoothly.

If the transom windows are outside the range of reach, namely, if they are high above (garage windows, factory windows, etc.), then a different accessory is used. There is no handle on the sash in this application which is called high transom. The transom sash and espagnolette are activated by means of a different mechanism. This mechanism, which extends downwards from the side of the high transom window as being built in the wall ensures that the high transom window is opened and closed by means of a special mechanism handle fixed on the wall that will ensure convenient control from the ground at the normal distance of an arm. The high transom mechanisms enable simultaneous control of multiple transom windows. If necessary, the same mechanism is also used in reverse transom systems. Multiple high transom applications can also be implemented on condition that they are one on top of another or side by side.



Balcony Doors:

They operate like large size, single opening windows. The only difference is that the sash profile used has been changed and converted to a locked door profile. The balcony doors can be controlled from inside just like the windows. They are opened and closed from the inside. Since it has no external handle, it is not possible to open and close it from the outer side. They are not fitted with keys, they may be fitted with keys by inserting a special handle (lock on handle) upon request as is the frame with the windows. The balcony doors can be adjusted to open to outside by changing their sash profile upon request. Special hinges manufactured for this purpose are used in the balcony doors that open to outside. Although these hinges are on the outer side, it is not possible to intervene on them for burglary purposes or open them since their connections are in the inner part between the frame and the sash and they are fitted with special pins. On the other hand, the glass beads are inside since the sash profile has changed although the frame profile operates in reverse mode.

Utilization of PVC Door and Window Systems:

Lockable Doors:

The lockable doors should be controlled from both outside and inside. Furthermore, they should be kept locked against theft. For this purpose, special locked door espagnolettes are available for doors. The feature of being able to be locked by means of the barrel on the mechanism is available in lockable doors. While the lockable become more safe thanks to the key, they also have the advantage of being opened from inside and outside in both directions by means of the handle. They operate like large size, single opening windows. The only difference is that the sash profile used has been changed and converted to a locked door profile so that the mechanism can be accommodated in it. The door handle mechanism has been designed to be fitted with a spring. It is in the closed (normal) mode while the handle is horizontal. This position is the position that ensures high impermeability and safety. While opening the door, it is necessary to ensure that the pawl is released by turning the key in the lock if it is locked, then to pull the sash gently to oneself by turning down the door handle that is in horizontal position. The door handle will automatically revert and switch to horizontal position thanks to the spring mechanism. The handle shall remain in horizontal position while the sash is open.

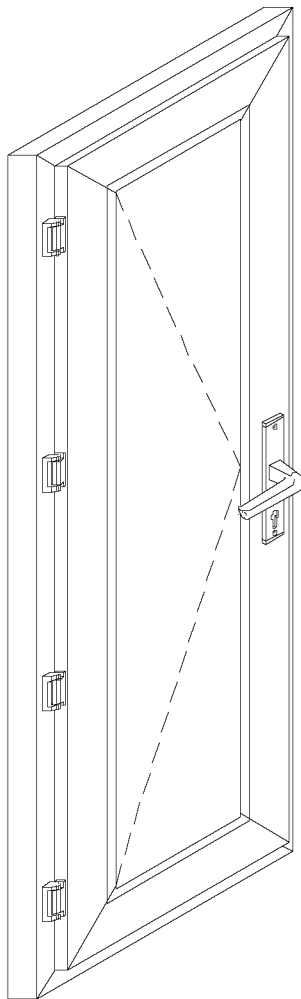
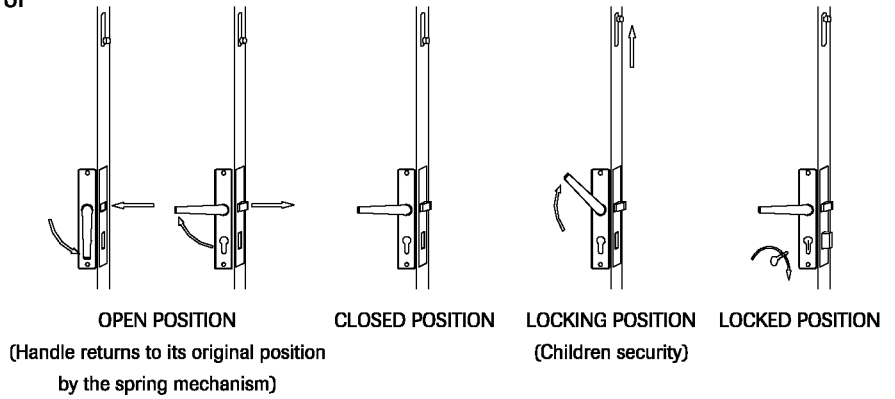
The closure of lockable doors varies depending on the types of locks.

The systems locked via the handle are used in exactly the same way as the single opening windows or balcony doors. After the door sash is pushed towards the frame, it is ensured that it is settled in its slot inside the frame. The locking action is enabled by turning the key. The key remains in its slot in the locked position.

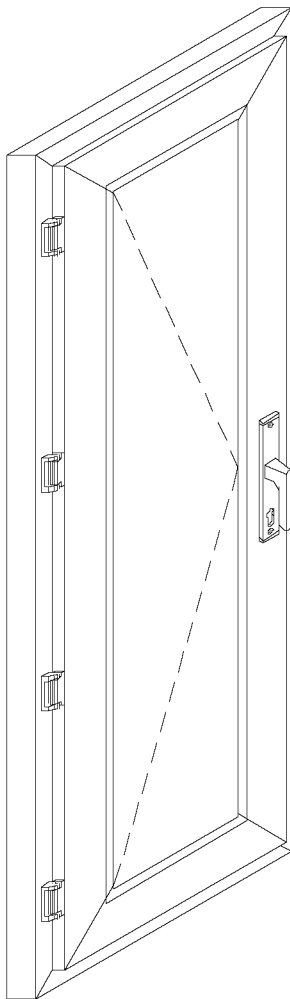
In locked doors, in the frame of espagnolettes locked with both the handle and the key, the second locking action takes place by ensuring that the espagnolette mechanism is activated and pins enter behind the metal espagnolette rests upon lifting up the handle at an angle of 45° after the sash has been secured in the frame and the espagnolette pawl entered the slot of the rest on the frame. Then, the key is turned and it is ensured that the lock pawl enters its own rest and the third locking is realized. Since the locking action that ensured real isolation is enabled by lifting the handle in such types of locks, there is no load mounted on the lock during the turning action and the mechanism has a longer lifetime. Furthermore, since there shall be no locking without lifting the handle, it is not possible for children to inadvertently lock the door. To open the door, it is enough to turn the lock in reverse direction and rotating the handle.

In systems that are locked only with a key, solely locks or special

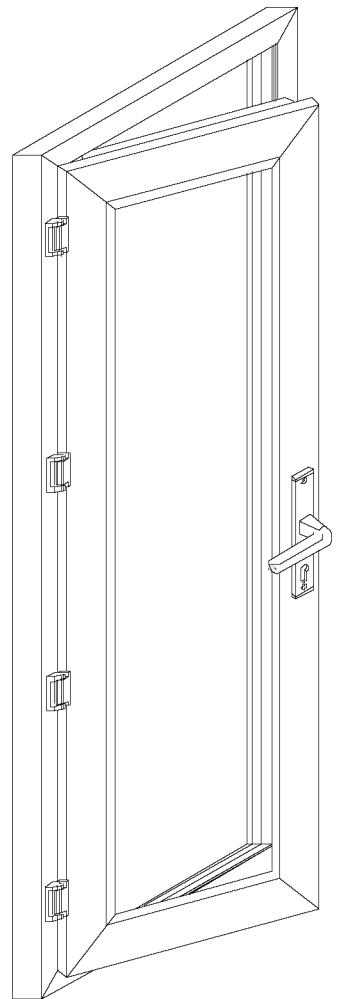
espagnolettes are used. They operate like the other lockable mechanisms. The mechanism moves as the key is turned, the pins enter behind their rests and the locking action thus takes place. It is enough to turn the key in reverse direction while opening it. Since the locking action that ensures isolation is triggered with a key in such types of locks, the load on the key is too much. The force required to crush the gasket will cause the key lifetime to be shorter.



LOCKED DOOR IS CLOSED
HANDLE IN CLOSED POSITION



LOCKED DOOR IS CLOSED
HANDLE IN OPEN POSITION

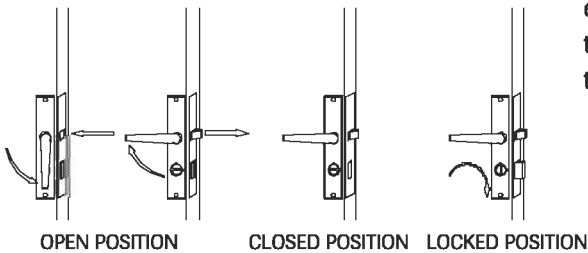


LOCKED DOOR IS OPEN
HANDLE IN OPEN POSITION

Utilization of PVC Door and Window Systems:

WC Doors:

As can be deduced by the name, they are used in toilet doors. They have no locks or barrels. They operate like the balcony doors. It is possible to lock them only from the inner side. A latch functions as a lock. They can be opened from both sides by means of a handle. Pushing the sash by means of the handle, it is ensured that it settles in the frame. The locking action takes place by turning the lock latch by 90°. It thus becomes unable to be opened from outside. Furthermore, a warning message appears on the outer side in the window beneath the handle indicating that it is full-empty or symbolizing it with colors. To open the door, it is necessary to turn the latch in reverse direction to release it from the pawl, then pull the sash by turning the handle.



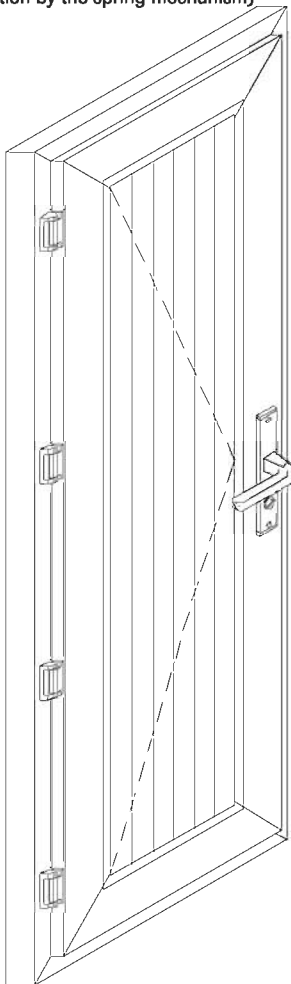
OPEN POSITION
CLOSED POSITION
LOCKED POSITION
(Handle returns to its original position by the spring mechanism)



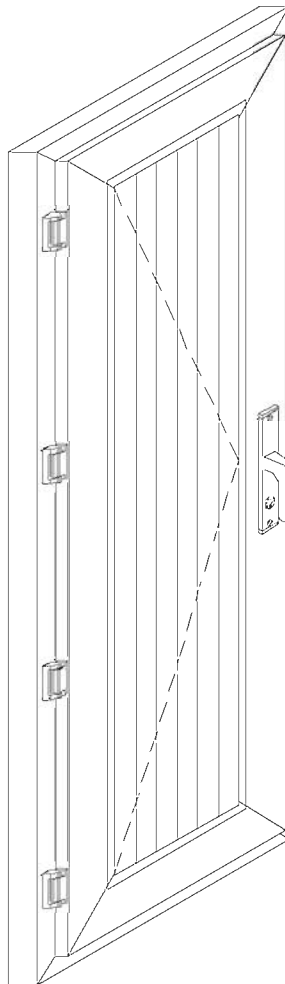
empty
APPROPRIATE FOR USE
(Green)



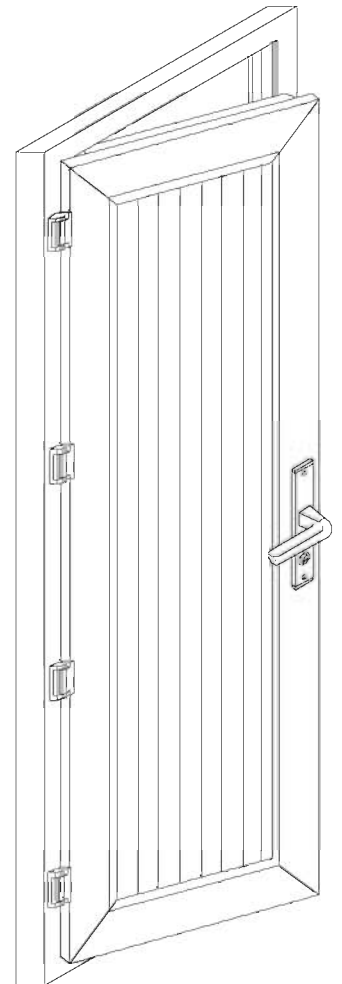
full
IN USE
(Red)



WC DOOR IS CLOSED
HANDLE IN CLOSED POSITION



WC DOOR IS CLOSED
HANDLE IN OPEN POSITION



WC DOOR IS OPEN
HANDLE IN OPEN POSITION

Double Sash Opening Windows:

They are used in double sash or no-mullion profile windows and doors. A sash adaptor profile called moving-mullion profile has been connected to one of the vertical parts of the sashes that open to right or left where the two sashes are joined. This sash is called the passive sash and it is initially closed during closing and is opened after the opening. The passive sashes operate like single opening windows. The active sash may operate as single opening window, double opening window or lockable door depending on the customer's request.

It is possible to implement three types of double opening sash window depending on the mechanism of the passive sash.

1. Shoot Bolt Fitted System: Two sliding locking systems are connected on top and in the bottom in the vertical profile of the passive sash fitted with an adaptor profile. In this application which is generally used in doors, the handle is single and is located on the active sash. While opening the window, the active sash is initially opened by means of the handle. Then, the lower and upper slides are retracted to ensure that the passive sash is opened. The shoot bolt locking system is controlled with the opening-closing handle or traction latches in different models. In the closing action, initially the passive sash is suppressed by being manually pushed towards the frame. The handle of one of the lower or upper slides is turned to the closed position while the suppression is on the passive sash to ensure that the sliding prowls are secured on their rests. Then, the other shoot bolt sliding handle is turned to the closed position and it is ensured that the passive sash is closed. As for the closing of the active sash, it is closed in a way as similar to the single opening window, double opening window or lockable doors due to its internal espagnolette. Make sure that the sliding pawls are fully secured in their slots on the rests while the passive sash is being closed. Trying to close the active sash before the slides are fully closed will cause the locking action not to take place. The sashes may seem like they have been closed by turning the handle. However, it can be seen that the two sashes are easily opened from the middle later on or in frame of coercion from outside. Please do not turn the slide handles to the closed position while the sashes are open. If it is forgotten in this position and is attempted to be closed, the slides or their rests may be damaged. Shoot bolt-fitted system is a system with low isolation and high risk for double sash opening windows since it is not possible to ensure locking in the horizontal parts of sashes.

2. Double-Levered System: These are systems that are operated via control with the handle after installation of an espagnolette also in the passive sash. The handle on the passive sash activates the espagnolette and the passive sash is locked on its lower and upper horizontal parts. Therefore, it is slightly more advantageous in terms of isolation as compared to shoot bolt systems. Passive sashes are hinged and they are used entirely in the

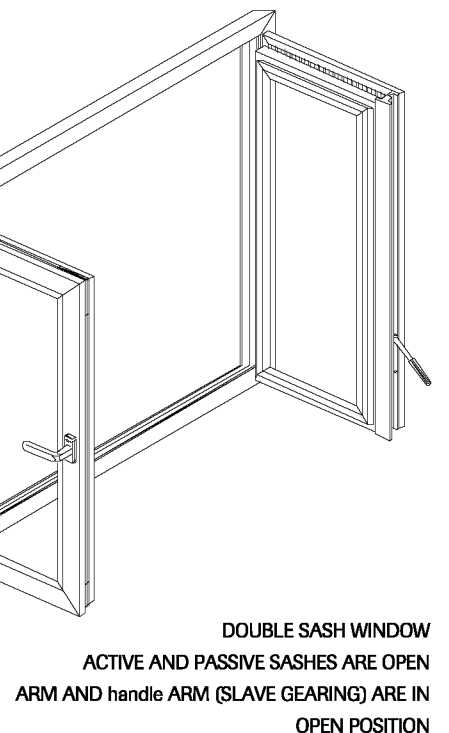
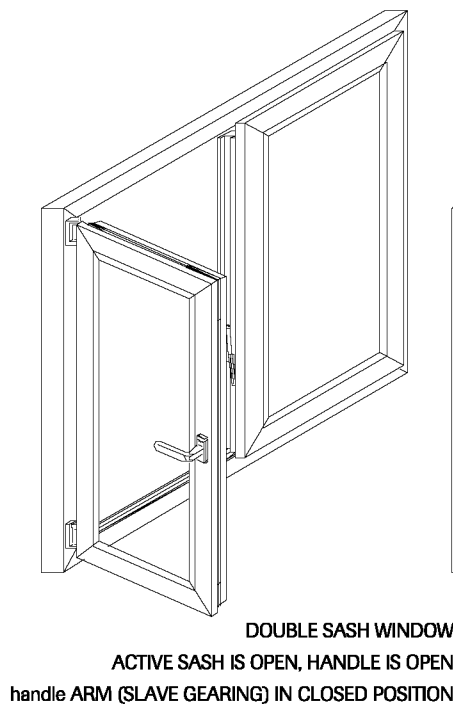
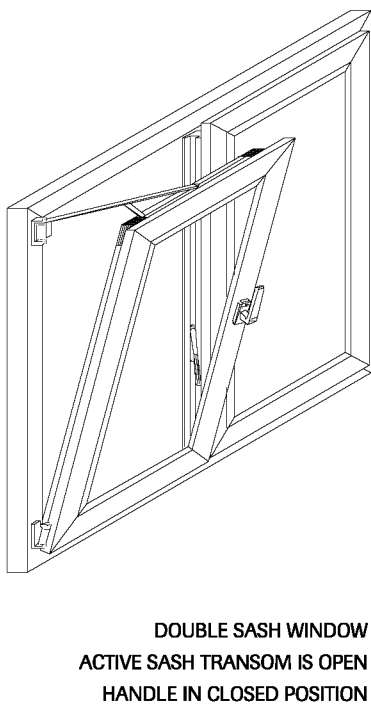
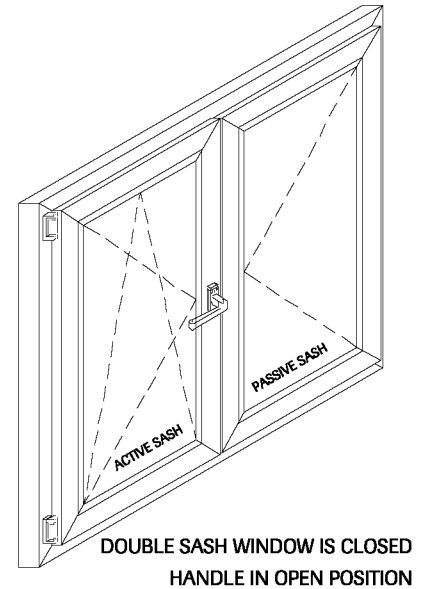
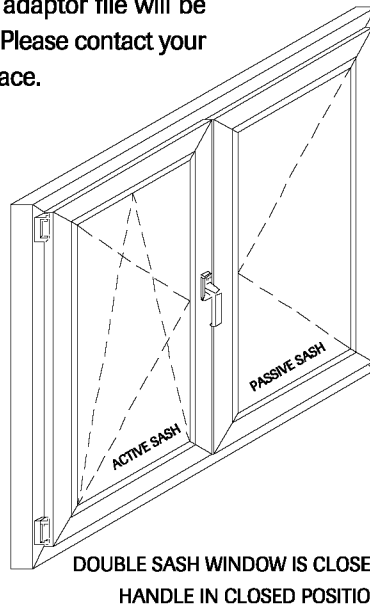
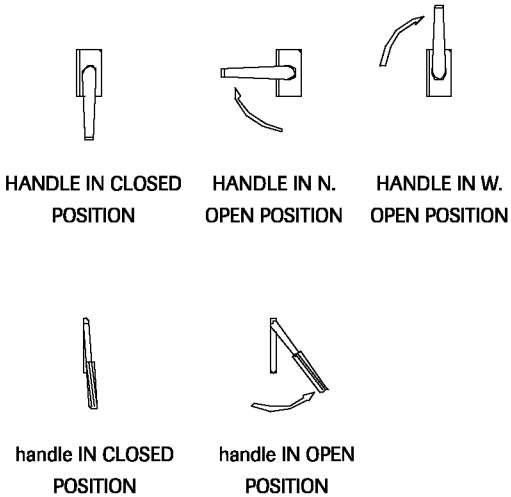
Utilization of PVC Door and Window Systems:

same way as the single opening windows. While the sashes are closed, it is not certain which one is active and should be opened beforehand. However, it is identified via method of trial and error. It is possible that the equipment will be harmed during this operation. Do not attempt to open double-handle, double-sash windows without know which one is the active sash, do not open or close the handles at the same time. The handles on sashes being close to one another may potentially cause fingers to be compressed. First, hold the passive sash by the arm, push it to make it rest against the frame and turn the handle. The handle is in the closed position while it is in vertical mode. As for the closing of the active sash, it is closed in a way as similar to the single opening window, double opening window or lockable doors due to its internal espagnolette.

3. Adaptor-Fitted Espagnolette System: These are the most appropriate espagnolette systems designed and developed for double sash opening systems. The handle is on the active sash. The upper and lower horizontal parts of passive sash and the vertical part to which the sash adaptor profile is connected is completely surrounded by an espagnolette assembly. They have their own proprietary hinges. Since the passive sash equipment looks just like the double opening window equipment when the sashes are closed, namely, it is seen as if it is a double opening system upon looking inside through the window in the closed position -if the active sash is double opening-, it constitutes a fully symmetrical image. To make sure that the passive sash is closed, it is necessary to push the sash towards the frame manually, to exert pressure on the gasket, then to push forward the lever or switch in open position close to the lower corner on the sash adaptor profile in order to switch it to closed position. This switch on the passive sash will pass above and under the sash adaptor profile conveying the movement to horizontal parts, thus ensure perfect locking in place. The number of locking actions will increase depending on the size of sash dimensions. As for the closing of the active sash, it is closed in a way as similar to the single opening window, double opening window or lockable doors due to its internal espagnolette. While opening the double sashed and adaptor-fitted espagnolette system, the active sash is initially opened by turning the handle on which it is located from the vertical-closed position to the horizontal position that is parallel to ground. The lever or adaptor switch that remains hidden between the two sashes in closed position will be exposed on the passive sash. The passive sash is opened by pulling the switch towards oneself. Do not turn the passive sash switch to closed position while the sashes are in open position. Do not attempt to close your window if it was turned to the close position in any particular way. Make sure that the switch remains in the closed position after closing the passive sash.

When double sash opening windows are opened, they become ideal windows for situations where wide ventilation areas are required. To be able to meet adequate and necessary isolation values as required by the

system, it may be perceived as if the sashes are being strained since the pressure on gaskets of double sash opening windows is a bit too high. This situation is normal for such types of windows and doors. Prevent the sash connected to the vertical part of the passive sash as well as the covers located on the upper and lower parts of the adaptor profile from during cleaning or due to any other reasons. Otherwise, the isolation will be disrupted, incursion of water and wind may occur from beneath the sashes. More dangerously, the support plate inside the sash adaptor file will be corroded more rapidly since it will contact air and rain. Please contact your window manufacturer if the small covers are not in place.



Utilization of PVC Door and Window Systems:

Sliding Doors or Windows:

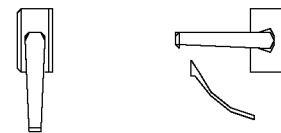
These doors and windows that are also called simple sliders are available in two different application modes. Sliders fitted with double sliding and single sliding sash systems are operated by moving the sashes to the right or left with the help of the lever on the sash. The movement is achieved via the mobile wheels on the aluminum rail profile located on the lower horizontal part of the frame. The sashes are moved by being pushed or pulled on the horizontal plane while the window lever is in horizontal position as parallel to the ground. The locking action is enabled by turning the lever downwards by 90° to horizontal position after sash has been engaged with the frame. Simple sliding windows do not have really high values with respect to water, sound and heat isolation. Because, brush gaskets (brush inserts) are used instead of rubber gaskets for isolation. Especially, their use in windows that cannot be turned to the outer side might cause some drawbacks. They are appropriate for balcony doors, balcony windows and doors that open to a garden. We do not recommend their use in balcony coverings and room windows that overlook the outer façade on high floors.

- **Double Sliding Sliders:** Two rail systems are available. They can be implemented as containing two movable sashes or four movable sashes. There is a sash on every rail in the frame of two sash sliders. There are two sashes on every rail in the frame of four sash sliders. On a rail, the sashes are locked onto the frame by means of the simple sliding espagnolette and lever with one sash on the right and the other one on the left. The two sashes on the other rail converge in the middle and they are locked into one another by means of aluminum adaptor profile, simple sliding espagnolettes and the lever. Namely, there are four sashes, however three handles in these types. The espagnolette and counterplates that ensure locking are located on the vertical part of the sash where the lever is located. While the sashes are in closed position, the back rests engage into one another back-to-back by means of the sash closing profiles used in this site, thus they form the locking system called the inter-lock. Isolation between sashes is ensured via the interlock. Very harsh and rapid hitting should be prevented while the sashes are slid especially in the frame of four sash systems. The sash or closing profiles that make up the interlock will be damaged in frame of hard hits. The closing may be dislocated or the sashes may jump over one another and cross to the other side before interlock is enabled. All of these are unwanted conditions. They may cause damage to occur in your doors and windows that cannot possibly be compensated for. To make sure that the sashes operate more smoothly and unwanted interventions to come from outside do not take place, make sure that there is no damage in the closure profiles and that the interlock connection has been properly realized.

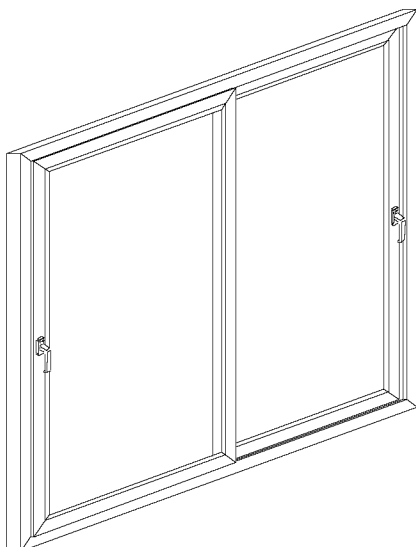
- **Single Sliding Sliders:** They are fitted with a single rail. Implementations can be done in the mode of one movable sash, one fixed pane or two

rail. In the frame of single sash, single sliding slider, the sash is pushed to the direction of the lever by means of a lever located on its vertical part on the right or left as well as a simple sliding espagnolette connected to this vertical part, it is thus shifted and after it is settled in the frame, the lever in horizontal position is turned and switched to the vertical position, hence locking is enabled. In the frame of single sash, single sliding slider, the sashes are conjoined in the middle and they are locked into one another by means of the aluminum adaptor profile, simple sliding espagnolettes and arm. In both applications, an espagnolette and a handle is available on a single sash. While the sash or the sashes are in closed position, the back rests engage into one another back-to-back by means of the sash closing profiles used in this site, thus they form the locking system called the inter-lock. Isolation between sashes is ensured via the interlock. The sashes should be prevented from hitting too harshly or fast while they are being slid. The sash or closing profiles that make up the interlock will be damaged in frame of hard hits. The closures may be dislocated or the sashes may jump over one another and cross to the other side before interlock is enabled. All of these are unwanted conditions. They may cause damage to occur in your doors and windows that cannot possibly be compensated for. To make sure that the sashes operate more smoothly and unwanted interventions to come from outside do not take place, make sure that there is no damage in the closing profiles and that the interlock connection has been properly realized.

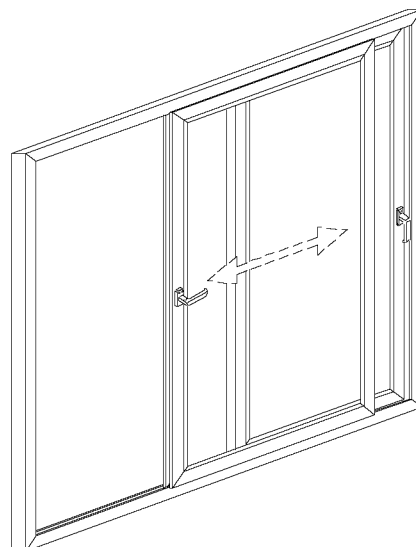
Sliding windows can only be controlled from inside since they are fitted with an inner lever. Depending on consumers' requirements, sliding doors may also be fitted with handles inside and outside, they can be opened, closed and locked from inside and outside. On the sashes, handles, built-in handles, lockable handles or removable pin-fitted handles can be used.



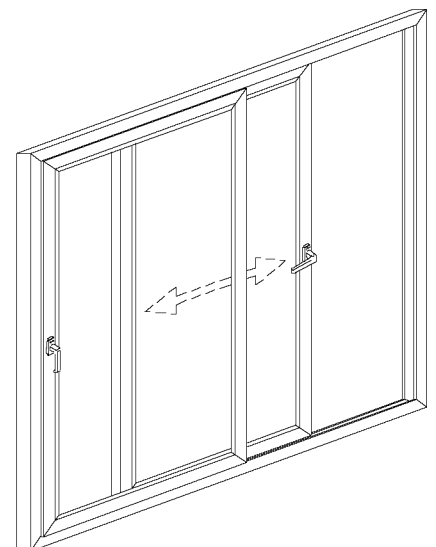
CLOSED POSITION OPEN POSITION



SLIDING WINDOW IS CLOSED
HANDLE IN CLOSED POSITION



SLIDING WINDOW' LEFT SASH IS OPEN,
RIGHT ONE IS CLOSED, LEFT HANDLE IS IN OPEN,
RIGHT HANDLE IS IN CLOSED POSITION



SLIDING WINDOW' LEFT SASH IS CLOSED,
RIGHT ONE IS OPEN, LEFT HANDLE IS IN CLOSED,
RIGHT HANDLE IS IN OPEN POSITION

Utilization of PVC Door and Window Systems:

Pull-to-Open Sliding Windows:

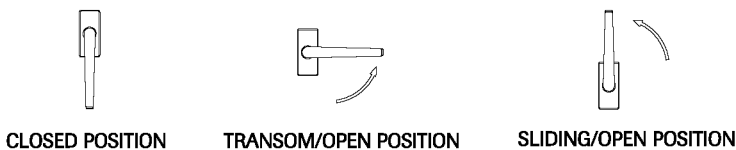
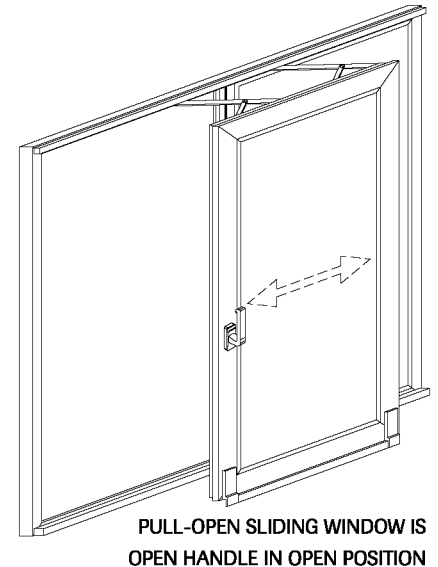
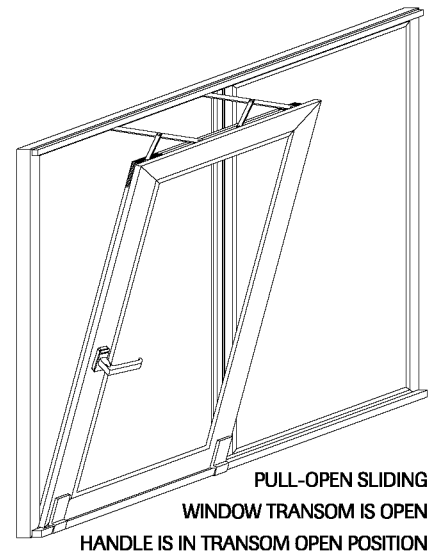
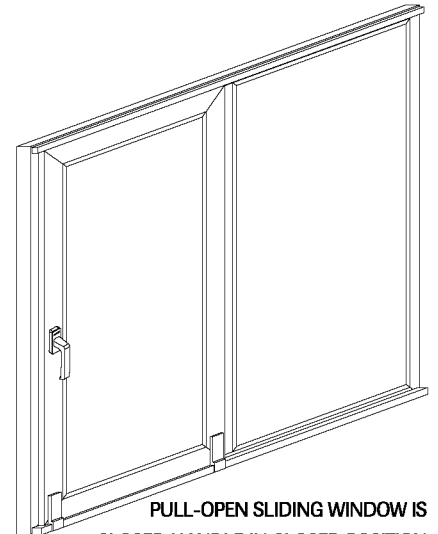
They are used in four-corner windows or doors. Normal door and window systems are used and they are operated as simple, single sliding slider doors and windows with their special accessory. Since a rubber gasket is used as in standard PVC windows and locking is ensured at many points with the espagnolette surrounding all around the sash, isolation values are perfect. The joinery is divided by the mullion profile in the vertical part and half is implemented as mobile sash and the other half as fixed pane. In the frame of pull-to-open sliders, half of the joinery should certainly be implemented as fixed. The movable sash is driven onto the fixed part to ensure that it is opened. It can be implemented as one movable sash and one fixed pane and it can also be implemented as two movable sashes, two fixed panes on right and left sides in the frame of wider joineries. In the frame of two movable sash applications, a sash adaptor profile is used in the place where the sashes meet in the middle as with the double sash opening windows. There are handles in both sashes and the passive sash to which the sash adaptor profile is connected should be the one that is closed earlier and opened later. One of the sashes moves to the right, the other one moves to the left. While the sashes are in closed position, it is not understood which one is active and which one is passive sash. Since the sashes are moved on special aluminum rails added and connected to the upper and lower horizontal parts of the frame, an opening of around 8 cm is formed between the opened sash and frame, thus potential cleaning problems are eliminated thanks to this gap. Pull-to-Open Sliding Windows cannot be manufactured smaller than certain sizes. The sash dimensions should be large to ensure more smooth operation of the system. Since the carrying mechanism with different weights that operate perfectly according to the sash size magnitude and specifications of the panes are used, it has the feature of operating more properly in larger sizes. Since it operates in large sizes, it is controlled with a large lever that is peculiar to itself. For smaller sizes, the risk to cause problems with respect to convenience of operation is increased as the sash becomes lighter. Therefore, the Pull-to-Open Sliding Windows are more frequently used in doors in actuality. Pull-to-Open Windows are used in three different modes depending on their operative functions.

- **Manual Pull-to-Open Sliding Window:** When it is closed, depending on the type of opening (to the left-right), the lever on one of the vertical parts of the sash is in the vertically downwards position. When you turn the lever to turn it to the horizontal position parallel to the ground, the sash will let itself go from the upper part and switch to transom position. This is the position in which ventilation is performed. When you continue to turn the lever and it reaches the vertically upwards position, you will see that the sash is released also from the lower horizontal part and is distanced away from the frame approaching you. It means that the sash has been opened and the load has been exerted on carrying mechanism. By pushing the vertically upwards lever to the right or left (depending

on the opening), it is ensured that the sash slides on rails and the sash is opened until it touches the stopper latch. Never ever turn the lever when the sash is in the open position. When you would like to close your Pull-to-Open Sliding Door or Window, pull the sash by the vertically upwards position and drag it until it reaches the sash gap. When the sash is in front of the sash gap, the lower horizontal part will pull itself towards the frame. With the help of your other hand, push the sash towards the frame, after making sure that it is secured in place, turn the lever by 180° to ensure that it is locked. In the frame of double sash pull-to-open sashes, both sashes are used in the same way without forgetting the rule that 'the passive sash should be closed earlier and opened later than the other one'.

• **Semi-Automatic Pull-to-Open Slider:** They are opened in the same way as the manual pull-to-open sliders. The only difference is in the way they are closed. When you would like to close your semi-automatic pull-to-open sliding door or window, pull the sash by the vertically upwards position and drag it until it reaches the sash gap. When the sash is in front of the sash gap, the lower horizontal part will pull itself towards the frame. This is the transom position where ventilation will be enabled. The sash may stay at the same position while it is being opened and closed. Without the need for help from your other hand, push the sash towards the frame with the lever gripped. After making sure that the sash is secured in place, enable the locking action turning the lever by 180°. In the frame of Double sash Semi-Automatic Pull-to-Open sashes, both sashes are used in the same fashion without forgetting the rule that 'the passive sash should be closed earlier and opened later than the other one'.

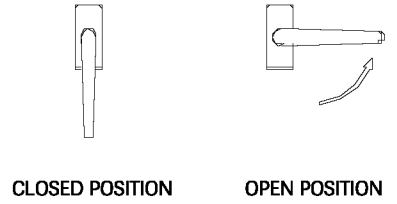
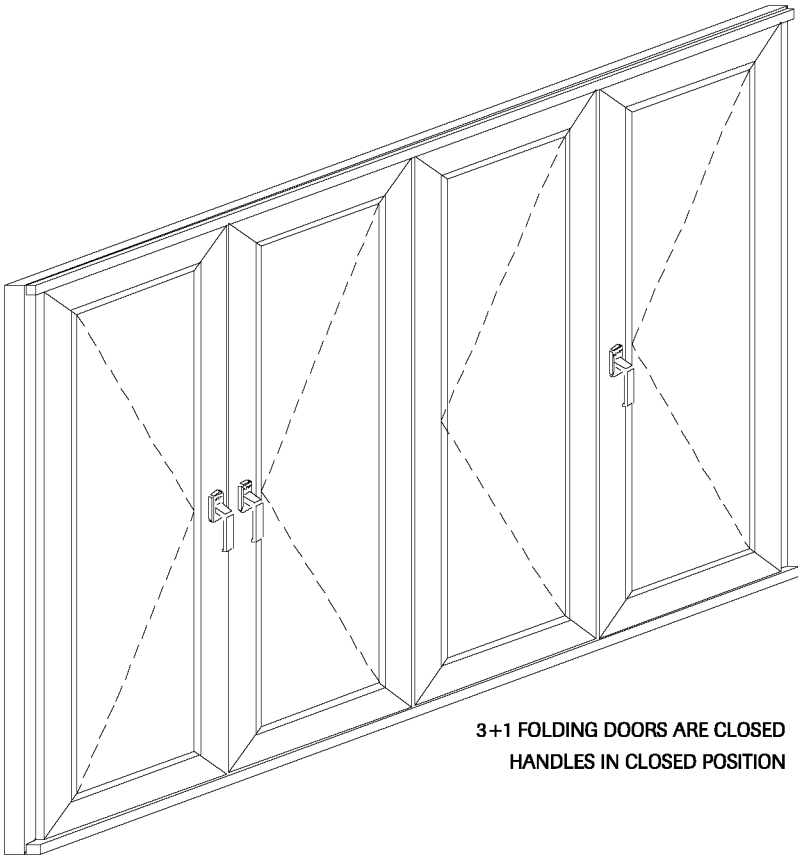
Fully Automatic Pull-to-Open Slider: They are opened in the same way as the manual or semi-automatic pull-to-open sliders. When you would like to close your Fully Automatic Pull-to-Open Sliding Door or Window, pull the sash by the vertically upwards position and drag it until it reaches the sash gap. When the sash is in front of the sash gap, the lower horizontal part will pull itself towards the frame. This is the transom position where ventilation will be enabled. The sash may stay at the same position while it is being opened and closed. Start to turn the lever of the sash that remains in the transom position. When you continue to turn the lever without pushing the sash to the frame without needing any help from your other hand and having grapped the lever, you will see that the sash automatically approaches to the frame and the lever completes its 180° rotation to switch to downwards position, the sash has been settled automatically in its slot in the frame and it has become automatically locked.



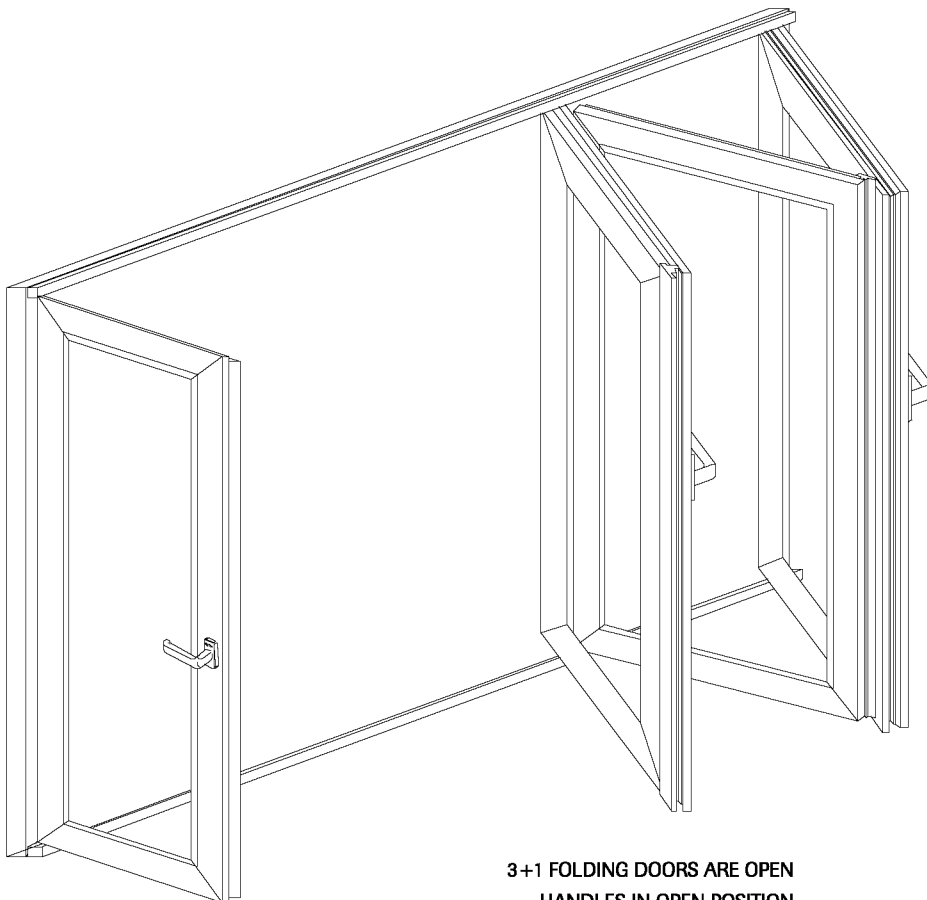
Utilization of PVC Door and Window Systems:

Folding Doors:

Folding systems are used in frames where the joinery width in doors and windows is too high or to make sure that the widest possible openings are obtained when door-window systems are opened. It is generally used in doors. It is compulsory to implement it in a door if both the width and height are high. These are door applications where the sashes can be folded onto one another like an accordion and there are no fixed elements or pillars in wide openings. It is available in many different applications depending on the number of folded sashes. There are two or more sashes on one side as in 3+0, 2+1, 3+1, 3+2, 4+1, 4+2, etc. All the sashes can be collected in a single direction (right-left) while the most accurate and proper option is to have a single sash in either of the directions. In applications such as 2+1, 3+1, 4+1, the single sash becomes the active sash while the other ones become passive sashes. Thus, the single sash also has a chance to have double opening. Connection between sashes is ensured via sash adaptor (moving mullion) profiles. The foldable passive sashes move on special aluminum rails screwed onto the inner surface of the frame as cushioned by one of their vertical parts. As for the active sashes, they operate like double opening windows or doors. While they are opened, initially the active sash is opened as required by its proprietary espagnolette, then the switches or handles on the passive sashes are turned to ensure that the locks are released, the sashes are pushed to the sash on the outermost side and dragged by ensuring at the same time that they are folded. Without the cushioned horizontal parts of sashes being dislocated from the aluminium rail, their other free vertical parts will be angled as compared to one another and they will actualize the folding action as a result of the increasingly acute angle. If the number of passive sashes is more than two, then aiding the movement with the other hand during opening and closing will not only ensure the system to operate more smoothly, but it will also prolong its lifetime. It will be enough that you do everything in the order/in the reverse order while opening/closing the sashes. The vertically downwards position of handles is the closed (normal) position. All the handles should be turned to open position while the sashes are open. Turn all the handles to closed position while the sashes are closed. While the sashes are in closed position, make sure that the espagnolette switch on the vertical adaptor profile in the junction spot of passive sashes and active sashes is in closed status. Never turn the switch to closed status while the sashes are in open position or never force close the sashes while the switch is in the closed position. Since folding doors are used in large size sashes, all kinds of unwanted forcing actions will have an impact that is multiple times bigger than the force exerted as required by the moment-moment handle rule, hence cause malfunctions. Avoid sudden and harsh movements during the opening and closing actions. Acting rapidly in these frames may cause lack of care, hence injuries.



**3+1 FOLDING DOORS ARE CLOSED
HANDLES IN CLOSED POSITION**

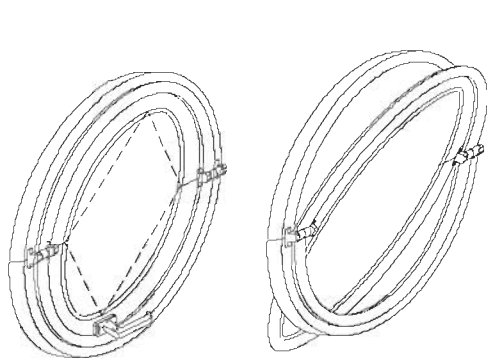
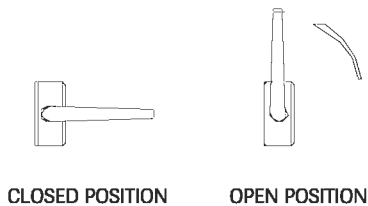


**3+1 FOLDING DOORS ARE OPEN
HANDLES IN OPEN POSITION**

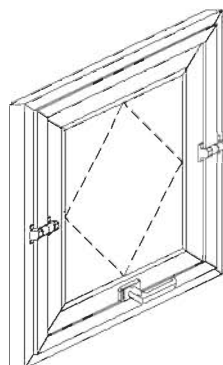
Utilization of PVC Door and Window Systems:

Pivot Windows:

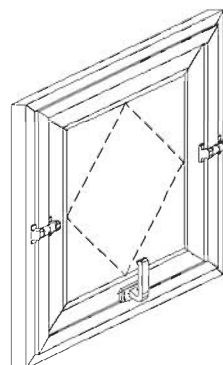
These are very special windows that can rotate by 360° around an axis. They are generally preferred as they do not occupy a lot of space in the inner setting while operating the windows. Half the window is opened inwards while the other half is opened outwards. It can be implemented in four-corner windows, however, the ideal is to implement it in round (circular) windows. Depending the requirement of the customer, it can be implemented as rotating around a horizontal axis and it can also be implemented as rotating around a vertical axis. They can be stopped at the desired angle around 360°. Since they can be locked in open and transom positions in addition to the closed position, it provides safety against being banged as a result of wind or air current. The handle is located in either right or left side or in the lower part depending on the operative axis. To open it, it is necessary that you rotate the handle with one hand, pull the safety latch with the other hand and push the sash outwards. If you would like to continue to rotate it, it is necessary that you release the lever, hold the lever that began to open inwards from its opposite end with your other hand and exert pressure depending on the rotation direction. When the movement continues along 360°, the sash will remain in the ajar position as having approached you from the frame by around 5~6 cm. This position is the fully open position and the locking has been actualized with the safety latch released. When you would like to close it, you should pull and release the safety latch and push the sash with one hand to rotate it in the reverse direction. The sash part that is activated outside will approach you. When the handle is close enough to reach, you should grab the handle, pull it towards yourself and ensure the completion of the rotation action. After the sash has pressed the frame on the handle side, pull and rotate the handle. When the sash is in certain positions, the safety latch on one of its two hinges will automatically be released and locking will be enabled. In that frame, the sash should not be moved without pulling the safety latch. Otherwise, the system may fail due to the moment effect. Damages that cannot be compensated for can occur in profiles, hinge guides or the espagnolette equipment. Uncontrolled use may result in injuries.



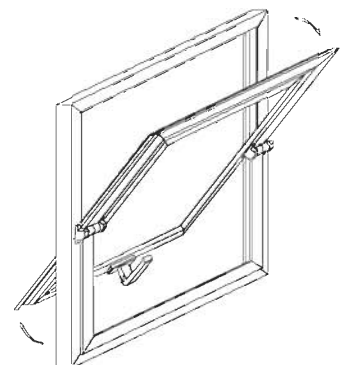
PIVOT WINDOW IS CLOSED HANDLE IN CLOSED POSITION



PIVOT WINDOW IS CLOSED HANDLE IN CLOSED POSITION



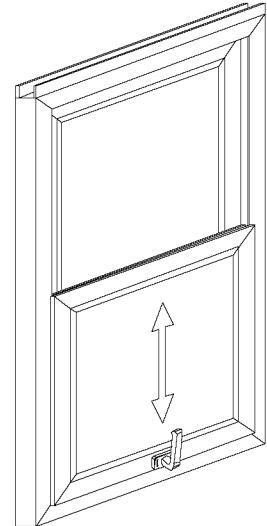
PIVOT WINDOW IS CLOSED HANDLE IN OPEN POSITION



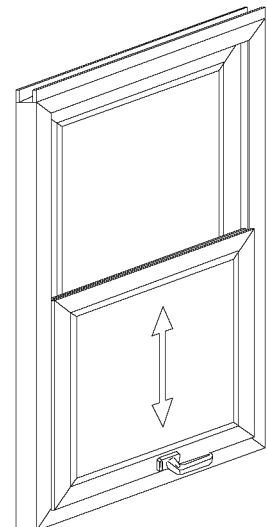
PIVOT WINDOW IS OPEN HANDLE IN OPEN POSITION

Guillotine Windows:

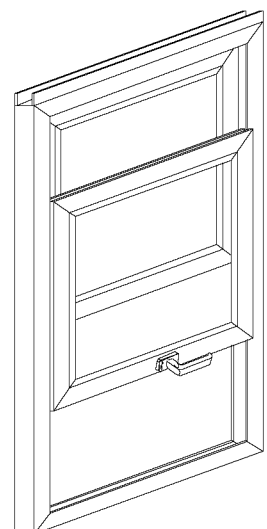
These are similar to sliding systems that operate in a vertical fashion. They are made of two parts divided on the horizontal dimension. The upper part is generally fixed. The moveable sash operates in the inner side of the joinery. If the sash is in the downward position and the handle is in vertically downward position, then the guillotine window is in the closed (normal) position. To open the window, the handle is initially turned and switched to the horizontal position parallel to the ground and it is ensured that the lock is opened. Then, by hauling the handle upwards, it is ensured that the sash performs cushioning with the aid of aluminium rails in the vertical part of the frame and moves upwards. Once the highest possible point on the fixed pane has been reached, the traction latch or latches screwed onto the frame are opened and it is ensured that the sash is rested on these traction latches. As for the opening procedure, it is necessary to hold the sash by the handle lifting it slightly and to remove the sash load away from the traction latches. Then, it will be necessary to release it slowly downwards and to ensure that the sash is fully settled in the frame, then to lock it by turning the handle. Leaving the sash down without turning the handle is disadvantageous in terms of safety against theft, because, the locking procedure has not yet been completed. When the sizes of guillotine windows are big, it will be disadvantageous to use simple guillotine accessories. The sash will become heavier as it is bigger and that will cause it to be more difficult to be lifted and the danger of dropping it while lowering it will arise. Therefore, using special guillotine accessories or motors in large size guillotine windows will be the most correct choice. The motorized guillotine windows may be controlled with an electrical button; they can also be implemented as remote controlled. We recommend motorized guillotine windows so that potential "window accidents do not occur and there are no injuries". Guillotine windows also cause problems in cleaning the outer surface of one of the panes as is the frame with the single sliding slider windows (on the outer surface of movable pane). Therefore, two moveable sashes must be preferred in guillotine windows, too. The most appropriate choice is to have one sash (on the outer side) fitted with a manual accessory and the other one with a motor.



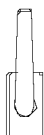
GUILLOTINE WINDOW IS CLOSED
HANDLE IN CLOSED POSITION



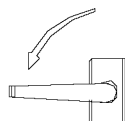
GUILLOTINE WINDOW IS CLOSED
HANDLE IN OPEN POSITION



GUILLOTINE WINDOW IS OPEN
ARM IN OPEN POSITION



CLOSED POSITION

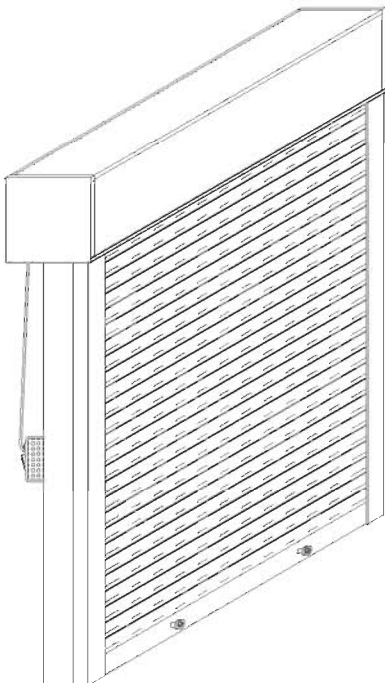


OPEN POSITION

Utilization of Auxiliary PVC Door and Window Systems:

Roller Blind-Fitted Windows:

While roller blinds are used for aesthetic purposes in buildings, they are also used for blocking sunlight and wind and partially keeping rain. Since they don't have isolation features, they can't be used alone. They should be certainly used in company with joinery. They are almost defenceless against theft. However, roller blind is a perfect product for protection against sun light and for architectural aesthetic aspects. Named as mono-block, these roller blinds are manufactured in single partition or multi partition mode according to the door or window on which they are mounted. While partitions can be controlled individually, they can also be controlled all together. There is the box of the roller blind above the joinery. Boxes can be manufactured with or without isolation. Today, roller blinds have developed to such an extent that there are boxes that can provide many functions such as fly net and swatter, shade and isolation from within. In the event of a malfunction or maintenance, demountable rear cover of the box can be dismantled and intervention can be made. While the roller blind is open lamellas are in a wrapped position. The lamellas at the end of the winding should not enter the box. For that reason, there are ending stoper on the aluminum weight lamel (end lamels) that is mounted at the end. If all of the lamellas are winded within the box due to absence of ending stoper or inability to do their duty, you will see that it shall not be possible to reverse the roller blind in order to close it. For that reason, you should check that there are ending stoper and they are actively fulfilling their duties. In order to close the roller blind, lamellas should be moved downwards with the help of the aluminum weight lamel (end lamel) at the end among the channels screwed outside the joinery. The system that enables this movement is called roller blind command mechanism. PVC mono-block roller blinds that are implemented on windows, that operate outside the window and that can be mounted and dismantled by the window are used in three different ways in accordance with the commanding mechanisms.



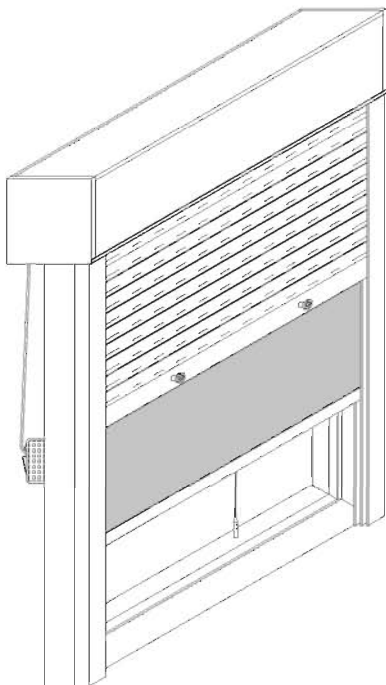
ROLLER BLIND IS CLOSED
SWATTER IS CLOSED

- **String Roller Blinds:** Movement is stimulated by means of a string that is attached to the vertical of the frame of the joinery. The string coming out of the string box enters the roller blind box on the upper side and lamels are winded on a winding axis with the help of string crane. These roller blinds are also called manual control since the string is stimulated manually. Enter your hand behind the string that is parallel to the frame from a close region to the string box so that the roller blind can be closed and pull the string towards yourself and downwards without holding it. While the string slides in your hand or above your fingers, it shall come out of the string box. After your hand is removed from the frame by 10-15 cm, the string shall have formed a triangle. When you slowly release the string you shall see that roller blind lamels come out of the box and move downwards. In the mean time, the string shall get tenser and it shall again be parallel to the frame. Roller blind lamels shall slide downwards as long as the string permits. The roller blind shall be closed when you

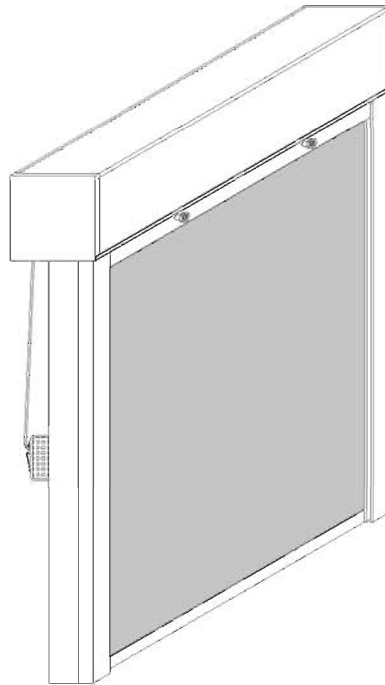
repeat the same movement a couple of times and bring out and bring down all of the lamels. While opening the roller blind, enter your hand under the string that is parallel to the frame and pull the string towards yourself without holding it. See that lamellas move upwards. Lift the moving cap in the entrance of the string box and release the string. The string box shall pull within the moving cap and wind it in accordance with the spring mechanism. When you repeat the same movement a couple of times, you will see that lamels enter the roller blind box. Do not force implement the same movement again. Because, it will mean that the ending stoper have rested against the box and the roller blind has completed its opening.

- **Bar-Controlled Roller Blinds:** The string crane within the box is stimulated by means of an iron bar. At the tip of iron bar hanging out of the roller blind box, there is a crank in the shape of "L". When you rotate the bar arm using both of your hands, lamellas shall be stimulated. You can enable the opening-closing of the roller blind by rotating the arm in reverse direction.

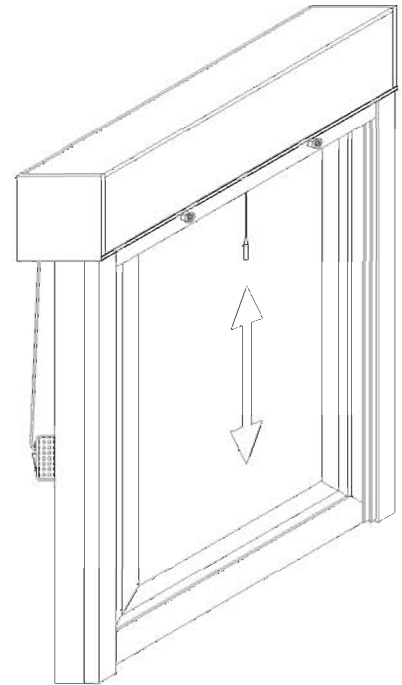
- **Motor-Fitted Roller Blinds:** Movement is stimulated by means of an electrical motor within the box. Roller blind can be opened-closed by means of a latch attached on the wall. The motor can be applied as fitted with a remote control upon request.



ROLLER BLIND IS HALF-OPEN
SWATTER IS HALF-OPEN

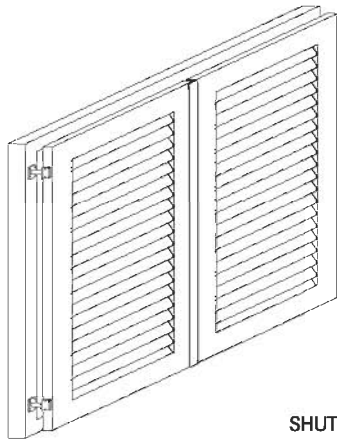


ROLLER BLIND IS OPEN
SWATTER IS CLOSED

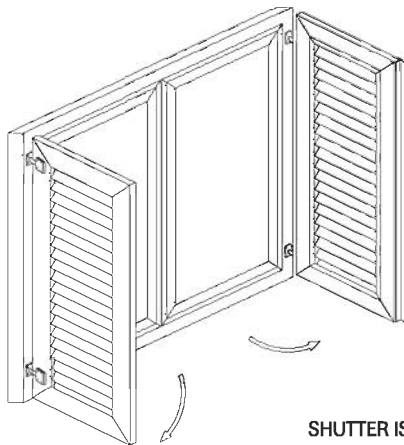


ROLLER BLIND IS OPEN
SWATTER IS OPEN

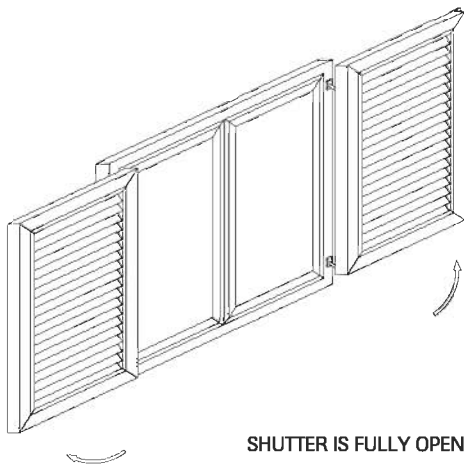
Utilization of Auxiliary PVC Door and Window Systems:



SHUTTER IS CLOSED



SHUTTER IS OPEN



SHUTTER IS FULLY OPEN

Shutter-Fitted Windows:

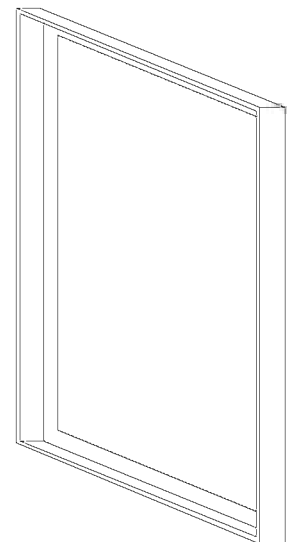
These are systems that are implemented from outside PVC joineries and open towards outside, thus ensuring a controlled passage of the sunlight that shines. They do not prevent rain and wind. Since they do not have isolation feature for that reason, they cannot be used on their own. They should be certainly used in combination with joinery. They are almost defenceless against theft. However, shutters are perfect products for protection against sun light and for architectural aesthetic aspects. They have lamels parallel to one another inside their sashes that open outwards. Since the lamels can be implemented as fixed or movable depending on the customer request, they have more advantage to control the daylight. They are implemented as single sash or double sash depending on the width of the joinery. In closed position, they are parallel to the window at a distance of about 10 cm. When you would like to open it, firstly, press the latch located on the steel arm located in the middle of one of the vertical parts of the shutter sash to release the lock. Pull the handle towards yourself and release it from the hooks on the lower and upper horizontal parts. Push the shutter cover outwards. The sash will turn by 360° around its hinges, become parallel at a distance of about 2 cm from the wall and special hinges will be engaged with a "click" sound. Do not leave the shutter sashes in a semi-open position without the hinges being engaged. They may be banged due to the wind. While closing the shutter, initially press the automatic locking latch on the lower hinge and make sure that the lock is opened. Hold the released sash from beneath and pull it towards yourself. When the steel handle on the sash that approaches by turning on the axis of the hinge within your reach, hold the handle, pull it, when the sash is against the shutter dock, push the handle forward and make sure that the safety latch on it is locked. Observe that the espagnolette mechanism hooks are in open position, the hooks are engaged with their rests once the shutter is against its dock and the safety latch is locked while the shutter sash approaches you. In double sash shutters, the passive sash is closed first, then the active one is closed. While opening, first the active sash, then the passive sash is opened. There are no handles or espagnolette on the passive sash, the sash operates in a vacuum. Generally, it is opened and closed by being held at its lower horizontal part. If the lamels are moveable, then the lamels are moved by being rotated around their axes by means of the control handle located on the sash bead. The movement of lamels ensures more convenient control of the incoming sunlight depending on the requirement. The lamels that remain in parallel to one another and at the same angle turn as a result of the movement changing their angles and they close onto one another in the vertical position, thus providing the possibility to fully prevent sunlight. If the shutter covers are also turned to the close position when the lamels are close, the sunlight will have been totally blocked. Do not exert extra loads on the sashes while cleaning the shutters. Do not hang down on the sashes. Not having a very resistant structure as a system, the shutters may be broken down quickly, they may be faulty or hinge and locking mechanisms may be damaged.

Fly Net-Fitted Windows:

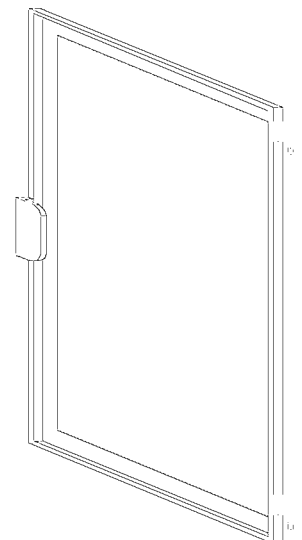
Fly net can be implemented in both windows and doors. They are used to prevent flies and other insects from entering in. They perform their functions when the sash of the window in front of which they are attached is open. They may be made of PVC or aluminium. The fly net wire is manufactured with a glass fiber material that is not burnt and not affected by sunlight. It has a high resistance against inner and outer impacts as well as forces. They are not corroded and not easily torn. They are made to be removed easily so long as they are not used (in winter months). Thus, they can be stored at a safe place so long as their functions are not needed and they can be fitted easily when required. They have a light and delicate structure due to both their functions and their ease of use. Their exposure to unwanted forces may cause them to be broken down quickly. Four different fly net types are available depending on how they are implemented.

Practical Fly Net: They are fixed by being screwed on the PVC or aluminium frame in such a way that they will reach from the outer side of the window to the front of the sash. A practical tape is sewn on four corners of the fly net wire and the inner part of its frame. When the window sash is in open position, the fly net wire is affixed and immovable as being taped on all four corners, flies and insects cannot possibly enter inside. When it is intended to open the fly net, the tape on one corner of the wire is lifted and pulled so that it is released from every corner. Since the fly net wire will be released, it has to be stored in a secure place. When it is intended to be re-attached, it is necessary to affix the wire on all corners inside the fly net frame without leaving a slightest gap. The tape will lose its adhesive quality if it is removed and re-attached very frequently. Its use in large size windows or doors has certain drawbacks.

Hinged Fly Net: They are fitted from the outer side of the joinery in such a way as to be in front of the sash. They operate as sashes opening outwards. They are attached to the frame of joinery via hinges mounted on one of its own vertical parts. They are locked in place with the stricken latch, magnet or handle on the other vertical part. Its opening and closing are performed with the aid of this latch, magnet or handle. The fly net sash is opened by turning around the hinge axis and rests against the wall. When it is intended to be closed, it will be enough to hold the sash by the lower horizontal part and pull it. Since there is no locking in the open position, it may be banged due to wind or air current. The fly net wire is stretched inside the sash. Slackening of the fly net wire due to being banged or other unwanted loads will cause it not to perform its functions.

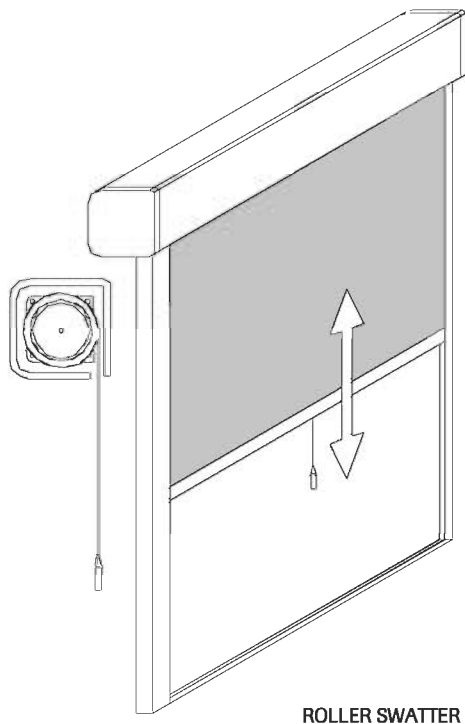


PRACTICAL SWATTER



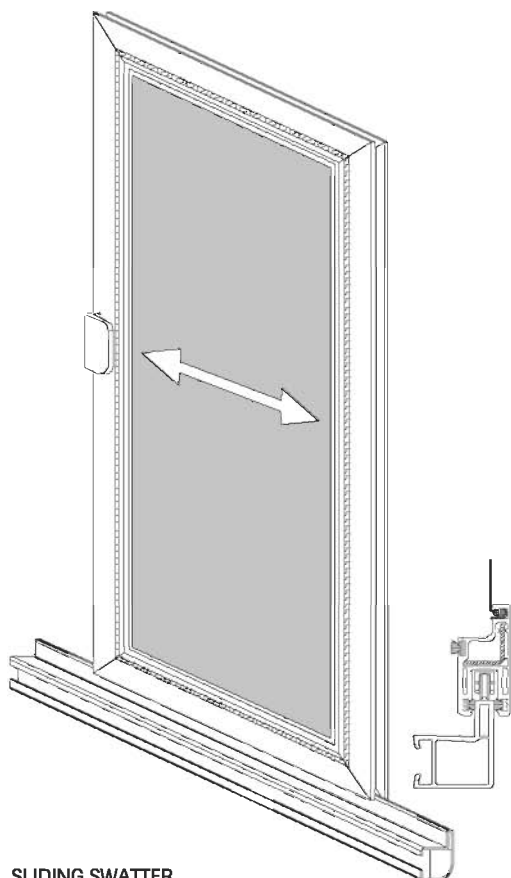
HINGED SWATTER

Utilization of Auxiliary PVC Door and Window Systems:



ROLLER SWATTER

Roller Fly Net: They are generally attached in roller blind fitted windows as freely under the box along with the roller blind or inside the box. They can be used for all windows and doors. They operate like roller blinds. They are connected to the higher horizontal part from the outer side of the joinery and the fly net has special rail profiles it can move inside. The right and left edges of the fly net wire has been crimped and sewn. The lower horizontal part of the wire is thoroughly fitted with a PVC or aluminium traction bar. In open position, the fly net wire is wrapped in the roller box. When it is intended to be closed, it is held by the traction bar outside the roller box and its both sides are pulled downwards at the same alignment and speed without disrupting the right-left balance. When the fly net as been reached to the lowest point in the side rail profiles under the guidance of the traction bar jutting out of its box, the right and left jet handles inside the traction bar are pushed to ensure locking. In this position, the fly net wire is stretched and inside the side rail profiles. The brush inserts (brush gaskets) on both sides of the wire will prevent flies and insects from entering inside. When it is intended to open the fly net, the right and left jet handles are pulled to release the traction bar, then it is slowly let go to ensure that the roller box wraps the fly net wire inside itself. One should be extremely cautious in using roller fly nets in large joineries. Roller fly nets are delicate systems, their careless use may cause the fly net wire to be torn and damaged.

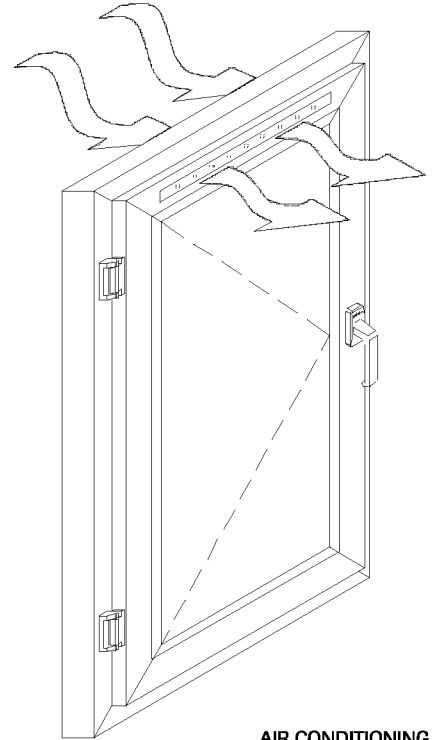


SLIDING SWATTER

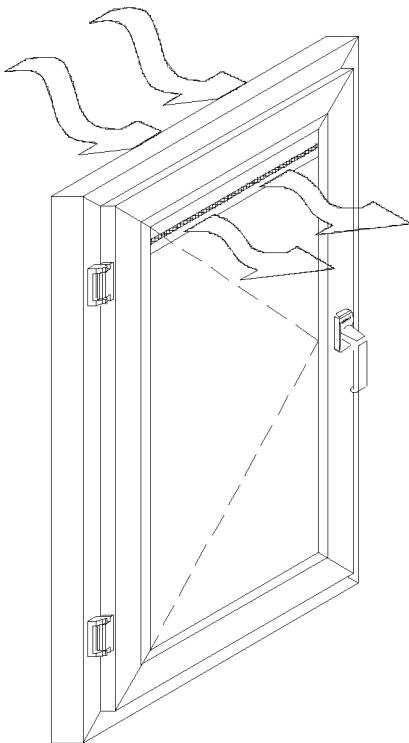
Sliding Fly Net: They are generally used in sliding doors and windows. They can be produced as a whole with the sliding door and window, there are also implementations that can be added to the outside of joineries later on. A fly net stretched inside sashes that move on special wheels on a rail specially developed for fly net without the need for an aluminium rail has also been formed. Since contact with the sliding joinery is ensured via the brush inserts placed inside the slot on the sliding fly net sash, the incursion of flies, insects or vermin will be prevented. Opening and closing are ensured with the aid of the handle on one of the vertical parts of the sashes. To make sure that the fly net remains closed while the sash of sliding joinery is open, it is necessary push on the handle, to drag the fly net sash to the outermost point it can reach and to make sure that the stricken lock is engaged with its rest (settled in its slot). To open the fly net, it is necessary to hold it by the handle, pull it in parallel to the sliding axis, remove it from the stricken lock, continue to pull it and move the fly net sash throughout the rail on which it is cushioned. In frame of large size, sliding fly nets, aluminium box profiles placed in horizontal and vertical position in front of the fly net wire through the fly net sash are used. Attempting to cross to the opposite side while the fly net is in closed position, trying to take certain things to the other side or placing unwanted loads on the sash may cause malfunctions, breaks, tears in the delicate fly net system or to

Ventilation Systems:

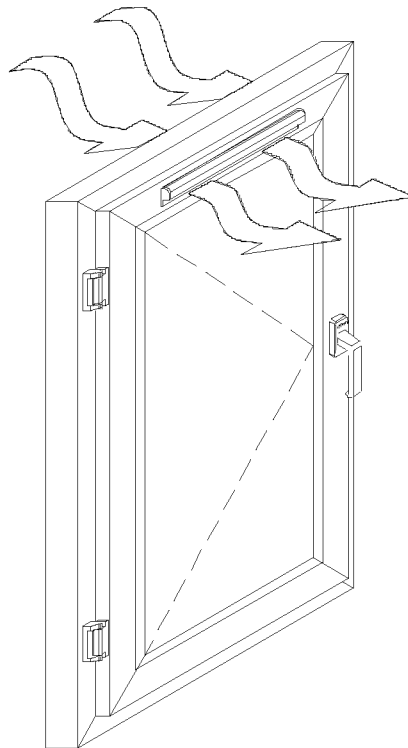
Despite all the advantages of PVC Door and Window Systems, one feature of them should be kept under continuous control. This is to ensure adequate ventilation in order to enable comfort in the living space. For this purpose, ventilation systems have been developed. The best ventilation method is to open the window ajar periodically. However, different ventilation systems that can be implemented on all window types due to the possibility of this action being forgotten or not being carried out by end users. It is obligatory to implement ventilation systems in environments which are rich in terms of vapor, where there is air pollution and extreme humidity. The ventilation profiles, ventilation grills, ventilation vents or air-conditioning systems are the most frequently used ones. For the health of people inhabiting the living space, do not neglect the ventilation of the space.



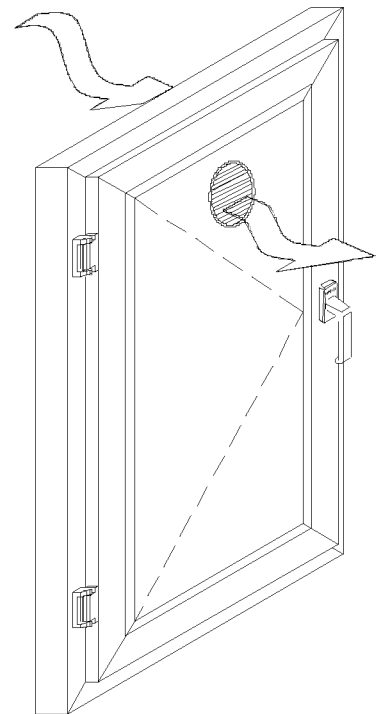
AIR CONDITIONING WITH AIR CONDITIONER PROFILE



VENTILATION THROUGH THE GLASS



AIR CONDITIONING WITH AIR CONDITIONING SYSTEM



AIR CONDITIONING WITH AIR CONDITIONING VENT

Maintenance of PVC

Doors and Windows:

Doors and windows are restricted by the lifetimes of the components that make up them. It is now known by almost everyone that the nature is not able to obliterate PVC for 1000 years. However, a window does not mean a PVC profile. The most important components constituting the door and window systems are the resistance materials, insulation materials and accessories that determine the system performance and lifetime. For that reason, the maintenance of materials other than the profile is as importance as their selection.

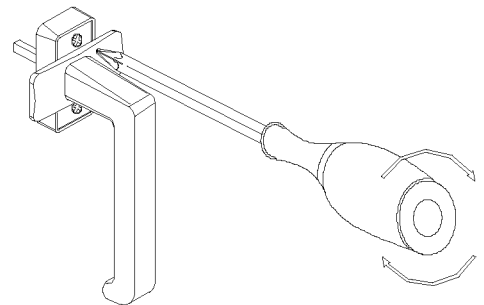
Your PVC doors and windows that are used as of the day they are fitted and perform their functions will be exhausted or aged due to natural conditions and the loads that they tolerate. All these negative effects will cause some symptoms. For your doors and windows to have a longer lifetime and to perform their functions in a proper way, it is necessary to follow up the operative functions in time and to prevent negative happenings that may occur. This process is called maintenance. Maintenance should not be perceived as cleaning. Maintenance is the detection (early diagnosis) and technical treatment of a disease that can potentially emerge.

Effects like the expansion, compression, softening and hardening of the material due to erosions as a result of normal use, weather changes depending on seasonal conditions and such differentiations will impact the function of your joineries. For those reasons, your PVC doors and windows have been designed in such a way as to make the compensation of faults that may occur in the parts that may potentially arise in the components that make them up will be able to be compensated for with a few small adjustments or corrections. Especially for adjustments that can be made in the espagnolette set, please receive information from your manufacturer.

No matter what type and model your windows are, the priority in their maintenance is assigned to movable parts. espagnolettes, handle, hinges, metal components, wheels, gaskets, brush inserts, etc. all form the movable parts in the door and window systems. These elements also determine the isolation values of the system. The failures and damages in these elements will mean that your doors and windows will not be able to perform their most important functions.

Maintenance of Door and Window Handles:

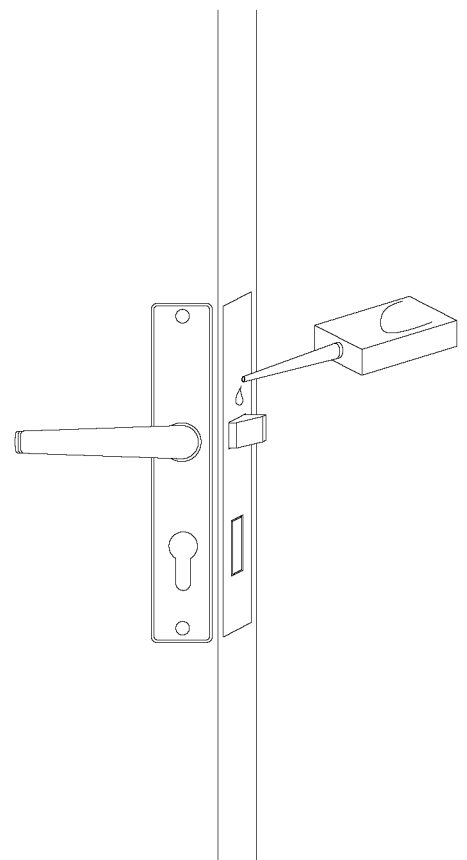
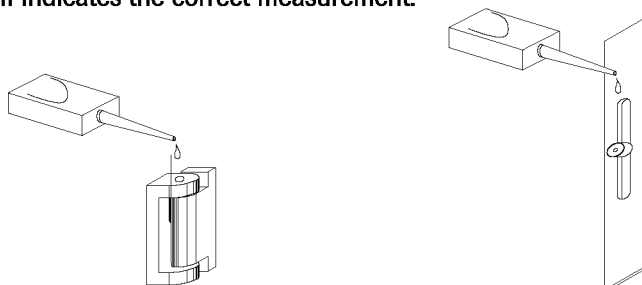
The first and most frequently contacted element in PVC Door and Window Systems is the lever. For that reason, the handles are the hottest elements of a system. Since they are continuously used and subjected to force, problems like breaks, loose screws or discolorations may potentially arise. To prevent the problem of a lever being broken, there is a 7x7 mm iron bar inside window handles and a 8x8 mm iron bar inside door handles. The mirror cannot stay fixed while the lever is turned since the screws are slackened. This situation will cause the movement mechanism to be strained, movement to be more difficult and the locking not to take place. Securely hold the cover on the lever mirror on both ends, pull it towards yourself making sure that the tips are raised and turn the cover by 90°. Tighten slackened screws with the help of a screwdriver and make sure that it is closed by turning the mirror cover again in the reverse direction.



SCREWS ARE TIGHTENED BY A SCREWDRIVER

Lubrication of Accessories:

To prolong the lifetime of the PVC Door and Window Systems you are using, it is necessary that the hinge and espagnolette are lubricated now and again with thin machine lubricant or solid grease. With a lubrication you will perform once a year, you will ensure that the sashes operate more smoothly, movement is facilitated and the functions are performed effectively for a longer period of time. After making lubrication by dripping or smearing lubricant on the hinge or espagnolette, the lever should be held and turned to right-left for a few times to activate the mechanism or the sash should be opened and closed to that the lubricant flows into the mechanism. If solid lubricant is used, it is necessary that it is well-absorbed by being pressed and that the lubricant overflowing around is removed. Using plenty of lubricant does not mean that lubrication is being done perfectly. Using lubricant that will not flow away by itself indicates the correct measurement.



Maintenance of PVC Doors and Windows:

Maintenance of Rubber Gasket:

The impermeability element of your PVC doors and windows is EPDM Rubber Gasket. A rubber gasket has to be black colored. However, not every black colored gasket is rubber. Do not propose the use of gaskets (PVC gasket, TPE plastic gasket, TPV plastic gasket) other than rubber gaskets in your doors and windows and prevent them from being used.

During the manufacturing of your windows, gaskets were put through a silicon-added water bath to ensure easier implementation. This silicon-added water remains on the rubber gasket even after the assembly of joineries has been completed. For that reason, it is necessary to moisten a cloth with water containing yellow soap or soft soap and wipe all the gaskets after your panes are fitted since it will collect the dust on itself. This cleaning process you shall perform two or three times at intervals of 15 days will soften your gasket, increase their brightness and ensure smoother operation of sashes. Sometimes, the gaskets may be dislocated while the doors and windows are being actively used. Necessary controls should be performed from time to time, the dislocated gaskets, if any, should be pushed so that they enter back into their slots. Sharp and incisive tools should never ever be used. In frames where the necessary cleaning is not performed on your gaskets, a black spot on the profile where the gasket is seated may remain. You do not need to panic. If the stain is new, dip a cloth in water with liquid soap and wipe the profile surfaces, the black spot will be eliminated. However, if it is an old stain, namely, if the profile remained like that for a long time after it was stained, the only thing to do is to contact your window manufacturer and obtain a profile cleaning substance.

Use woolen or velvety clothes in washing the gaskets. Hard or fibered clothes will cause the profile to be scratched or its brightness to diminish.

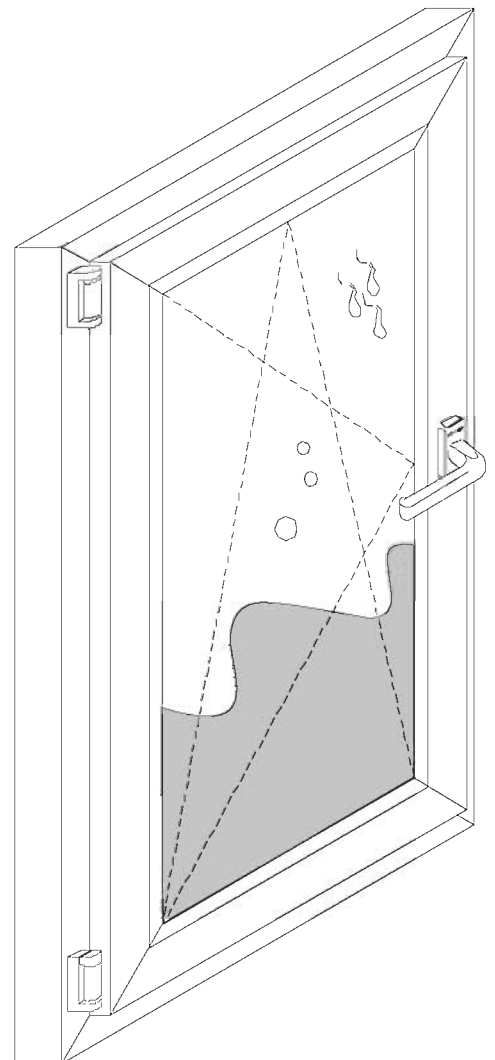
Lubricate the gaskets on your PVC doors and windows once a year. The lubrication you will provide with a soft cloth dampened with thin machine lubrication will not only make your gasket brighter, but it will also prevent the occurrence of potential deformations. Thus, your gaskets will perform their functions for many years completely and they will operate with no problems.

Maintenance of Windows Panes:

Window panes occupy the largest area in PVC Door and Window Systems. Since the window pane is the effective and dominant element in visible surfaces, maintenance of window panes should never ever be ignored. After you have received your joineries, the stuck tapes or labels on the window panes should be removed with the aid of warm water. In the meantime, incisive or puncturing materials that will harm the surface of window panes should not be used.

A very fine crack that will emerge on the double glazing, in either the inner or outer window pane will cause the window pane not to be able to perform its functions any more. Such cracks that are not visible and very small isolation failures will cause perspiration and evaporation between the two window pane, thus spoiling the heat isolation of the window pane, furthermore, it will deteriorate the image spoiling the transparency of the window pane. In frame of such incidents, you should consult your joinery manufacturer and ask the window pane to be replaced.

No matter what happens, prevent your window panes from being hit. If the sashes are banged due to wind or other reasons, your window panes may be tilted in their place or the sash settings may be deteriorated. Do not attempt to adjust the sashes yourself, ask for assistance from your joinery manufacturer. Any kind of disruption in form may cause permanent problems to emerge. Do not paint or cover the window panes without consulting your manufacturer first. When it is intended to carry out some actions on the window pane, to open chimney holes or manholes, the most correct solution will again be to request assistance from the company that manufactured your window.



Cleaning of PVC Doors and Windows:

Cleaning Of Pvc Doors And Windows:

Your PVC joineries are never effected by outer factors (sun, heat, rain, cold, snow, wind, etc.) and different climatic conditions thanks to the high technology and high performance raw materials used in their production. They can preserve their technical specifications under all kinds of natural conditions and demonstrate the same performance. Despite all these advantages, a few points should be observed in cleaning the windows.

Cleaning at the Construction Phase:

Your windows may be dirtied during painting, plastering and similar construction works. Some chemicals may cause your windows to be discolored or the surface quality to be spoiled. The best way of protection will be that you do not remove the protective tape on your joineries during the construction works. However, please observe that this period does not last longer than three months. If the construction activities will last longer than three months, then please remove your protective folios and mask your joineries using a painter's folio. If protective tapes have been exposed to sunlight for a long time, it is necessary to heat the folio using hot-air-blowing devices (hair dryer, etc.) at a distance of approximately 15-20 cm for 1 minute, then to remove it piece by piece pulling it with devices like tweezers. This process should be performed very carefully. Otherwise, the brightness of the surface of your profile may be lost or it may go yellow.

The joinery should be wiped clean with a damp cloth before all sorts of construction dirt, splashed plaster, mortar or paint are dry. Otherwise, there may be disruptions, tarnishes or matte spots that occur on profile or window pane surfaces. The scraping process should never be performed.

Do not work nearby joineries with devices that generate high amount of heat or exude dew (welding machine, stoning engine, metal cutting machine, etc.). These may cause damages that cannot be compensated for in the joinery profiles and in window panes.

Do not prop buttresses on door sills. Do not load weight on sills and window marbles of which plastering and isolation have not been completed. You may cause detailed gradients to be foiled or breaks to occur. The spoilage of gradient will cause in the future water leaks or failure to discharge water even if it seems like there are no problems.

Make sure that the water discharge channels located on the lower horizontal part on the outside of the joinery is not obstructed. If there is a water channel that was clogged during operations like plastering and painting, open these channels with a pointed object without harming the profile. Sweep dust or dirt with a vacuum cleaner and wipe clean it using a damp cloth.

The initial cleaning should be made with plenty of water so that the profiles are not scratched in cleaning the construction dirt and dust stuck on your windows.

Periodical Cleaning of Windows:

Your windows are periodically cleaned by wiping with a cloth dampened with warm water while cleaning the house. Chemicals used in house cleaning should not be used as cleaning agents. Especially if the power detergents, chemical soaps and washing sponges that contain abrasives are used, the profile surfaces of your windows will be scratched, thus the profile will become matte. Its tolerance against sunlight will fall and it will begin to be discolored early. For that reason, the windows should be cleaned by means of a soft, white cloth dampened with liquid and cream detergents (such as Yellow Soap) that do not contain abrasives melted and foamed in warm water. The inner and outer surface of the window will be cleaned with detergent containing cloth - like wiping windows - and washed a few times, immediately afterwards it will be wiped dry with a soft, dry cloth without pressing on it too much. The same care should be applied in cleaning all windows that are colored, coated or white.

To protect your windows at the maximum rate against inner and outer atmospheric conditions and to minimize the damage they will incur, cleaning should be done every 15 days on average. As the interval of cleaning is longer, the cleaning process will become more difficult.

In cleaning windows, do not use abrasive chemicals, oil derivative liquids and greases, solvents, power and liquid detergents containing solid parts, cleaning wires and sandpapers. The slight amount of wet layer that will remain on the profile after cleaning will delay it getting dirty afterwards.

Prevent the metal equipment from contacting water while doing the cleaning. When there is contact, wipe dry with a dry cloth immediately afterwards. During this process, observe that the lubrication which was applied to prolong the life of mechanism during has not been wiped. If the grease on the equipment has been erased or disappeared, then do not forget to lubricate it again after cleaning.

The dirtiness occurring on PVC doors and windows as a result of all kinds of air and environmental pollution require periodical cleaning. Factories, treatment plants and other similar organizations around houses, extreme hot and cold weather effect, sun, frequently changing weather conditions cause environmental and air pollution. This pollution as well as the effect of salt in areas close to the sea impact the window profiles. There may be various spoilages occurring on the profiles such as stains, mosses, dusts

Cleaning of PVC Doors and Windows:

and discolorations. There may also be soiling on the inner surfaces of windows in addition to outer surfaces. The dimension of soiling may vary depending on the geographical positions of houses. In frame of all kinds of extreme soiling in the inner and outer side, make sure that you always use warm water foamed with liquid soap. If bleach is used instead of liquid soap, the windows should be dried with a dry cloth immediately afterwards and the normal cleaning process should be continued after the soiling has been removed.

Cleaning the Window Panes

The window panes are also cleaned during house cleaning. In a way similar to your windows being cleaned, the window panes should also be cleaned in the same periods and with the same techniques so long as no special panes are at stake. There is no drawback in using plenty of water in cleaning window panes. Do not remove window panes by dismantling beads for cleaning purposes. Continuous removal-placement will cause deformation of profiles. Removing or changing the sash panes for any reason whatsoever is certainly inconvenient. The most frequently received request is the request to replace window panes. In your windows, different beads appropriate for glass thicknesses are used. Therefore, request assistance from your window manufacturer if need be.

Perspiration on PVC Doors and Windows:

The buildings are subjected to many inner and outer factors. Many factors including weather temperature, humidity ratio in the air, air pressure, vapor pressure in the air, wind, fog, rain, sun, etc. will affect the window performance. Since PVC doors and windows assure perfect isolation, they separate inner environment and outer environment from one another. The air inside always stays inside, the air outside always stays outside. It is not possible to clean the air that is captured inside. However, the vapor resources inside will continuously raise the humidity ratio in the air. If the amount of vapor is not controlled and it is not discarded, the humidity that cannot escape outside will be condensed in the coldest place of the environment and perspiration will begin.

In the buildings, the aim of protecting against humidity is to create a healthier home atmosphere for people, to reduce unwanted effects of humidity and to prolong the lifetime of the building. There are a few humidity factors in buildings, the humidity ratio continuously changes with the effect of those factors. Humidity is decreased or increased depending to a great extent on the outer weather conditions (outer climate), inner environment generators, size of the inner environment and changes in weather.

The humidity generators in the inner environment (vapor resources) can be enumerated as follows:

- Humidity remaining from the construction of the buildings,
- Inner vapor generators (bath, kitchen, etc.),
- Humidity caused by living beings,
- Humidity caused by plants,
- Humidity occurring as a result of assembly faults,

The reasons for condensation (perspiration) are as follows.

- Weather changes causing high heat loss,
- Heat loss on outer building elements via transmission (outer façade isolation problem),
- The room walls or window panes being at low temperatures (under such circumstances, a discernable air current occurs),
- The heat loss due to radiation being more than normal,

What is called humidity in everyday life is the water that is in the air in the form of vapor. Humidity changes depending on the environment temperature. In places that are hot in enclosed living spaces, the vapor of heated air influxes to cold areas since its pressure is higher. The coldest areas in buildings, houses or living spaces are the areas adjacent to the outer façade (namely, windows, window panes and walls). It should be remembered that the windows have to be mounted on outer walls. When the air that is heated in the inner environment and is moving meets cold surfaces, some of the

vapor in it loses its heat on those surfaces and emerge as water droplets. This incident is called condensation (perspiration).

It is quite recent in our country that precautions have been taken in the buildings constructed in our country against vapor condensation and all kinds of consequent damages. In the 2000s, human health and comfort became more prominent in construction, innovations and differentiations in building construction techniques have become more distinctive.

The new conditions emerging as a result of industrial development have caused condensation in buildings; they also constitute the technical background and solutions targeted at eliminating the damages of condensation. Even though the large wall thickness in old buildings was a disadvantage, it provided heat isolation and condensation could not occur since materials like stone, brick, adobe, lime plaster with low absorbance (diffusion) resistance were used and it did not show too much resistance against the escape of vapor from inside to outside.

Today, the use of modern construction methods has caused the walls to become thinner and their transmission (breathing through walls) tasks to be eliminated. This causes the vapor to decrease below the condensation temperature easily becoming water and the walls to have perspiration during diffusion.

To ensure energy saving and sound isolation, walls with high diffusion resistance is required and to prevent condensation, walls with low diffusion resistance are required. This dilemma has yet to be solved in construction technology. For that reason, today, the walls started to be constructed as layered and heat isolation materials started to be used in order to raise the permeability resistance of walls and to prevent the perspiration in the inner surface of walls. However, errors are committed in implementation since this raises cost and requires workmanship and some measures that need to be taken are not taken.

Covering the outer walls with materials like mosaic, ceramic, glass and similar, non-vapor-transmitting materials to protect them against outer effects causes the vapor moving from inside to outside to condensate inside the window and results in the emergence of many failures in coatings such as cracks, explosions, discolorations. In old buildings, floor heights, space dimensions were much bigger than the current ones, thus the amount of air per person was higher and relative humidity ratio was lower. Furthermore, in old buildings, there were systems available in every room such as cookers, fireplaces, chimneys to dismiss humid air outside; however, in today's buildings, ventilation is not enough and it causes the air humidity to remain

Perspiration on PVC Doors and Windows:

at a high level. In our age, more people live in smaller volume spaces, requirements such as cooking, doing the laundry, drying it and taking a bath are met in the same building.

Generally, the fuels like gas, liquid gas, air gas and natural gas used at homes are carbohydrate based, hence they emit considerable amount of vapor while burning. This causes the relative humidity ratio to be higher. Like in every building element, the vapor is transmitted from the body of outer walls due to inner and outer vapor pressure differences. During a diffusion event, vapor loses heat, condensates and is captured in the wall, causing the wall to be humidified. Especially, painting the inner walls with oil paint based paints or using plastic based wallpapers render the vapor diffusion transmission of windows impossible. The vapor occurring in the building cannot be absorbed by walls and the relative humidity in the atmosphere is raised.

The fact that the sash-frame gaps are big in windows raises air flow (infiltration) and causes extreme humidity to occur. The air flow mentioned does provide the function of natural ventilation in the building and balances the humidity ratio in the air. However, the rubber gaskets used in PVC joineries to ensure heat, sound and water isolation provide 100% impermeability, thus, the chance that humidity will decrease with infiltration is totally eliminated. For that reason, extra relative humidity enhances the condensation and perspiration formation.

Thus, overcoming this unsolvable problem of building is incumbent on the user. It becomes obligatory to open the sashes in appropriate times and to provide ventilation periodically. For the mentioned ventilation process to be able to be performed under the control of the user at the proper times as desired, the most suitable system is the double opening systems pioneered by FIRAT. Besides, ventilation is also very important in terms of providing the clean air needed by the human body in addition to balancing the humidity ratio.

There is no rule that there will be no perspiration in double-pane applications. Environment temperature, humidity ratio and surface temperature are the most important factors in the formation of perspiration. If the temperature of the surface the air with vapor contacts is beneath the condensation point temperature, then perspiration begins on that surface. Therefore, perspirations occur on windows and walls. For air of 10°C that contains 60 % of humidity to cause perspiration on the window, the surface temperature should have decreased to 7°C. However, for air of 10°C that contains 90 % of humidity to cause perspiration on the window, it is enough for the surface temperature to decrease to

9°C. Namely, if the room temperature is 20°C and humidity ratio is 95 %, then perspiration will begin when the window surface is at 19°C. However, then the humidity ratio is 60% at the same temperature, the window surface will not begin to have perspiration until the temperature of 12°C. This means that the most effective method to prevent perspiration is to keep the humidity percentage low at all times.

To prevent perspiration that will occur on the surfaces building elements, a few different methods may be implemented.

- It is possible to enhance the resistance of building elements, namely, raising the heat in the building (20-22°C), if necessary, to make heat isolation addition for walls to raise the surface temperature of the wall,
- It is possible to decrease the relative humidity in inner air, to reduce the inner atmosphere humidity generators, to make sure that the vapor inside the environment is dismissed outside via ventilation systems,
- It is possible to ensure that the environments where there are inner vapor generating resources are ventilated by opening windows and operating the aspirators. It is enough to ventilate 2-3 times a day. Ventilation should only be done with clean air in the outside environment. The used air in other settings in the house should never ever be used for ventilation purposes. This will only ensure the transfer of the air ready for condensation in the environment to be transferred to another room.
- To keep the doors of places where there are vapor generating resources closed and to prevent the humidity being transmitted to other environments.
- Never to dry laundry in the inhabited environments of the building, if that is compulsory, to keep the door of the room where laundry is dried closed.
- To heat artificially the surface where there is perspiration.
- To ventilate perspiration-emitting places obligatorily, to ensure that hot air moves to that surface to raise its temperature.
- To place heat resources in different locations of the building, to keep doors open and to make sure that the environmental temperature is the same everywhere.
- Not to use vapor generating heaters such as gas stove, catalytic heaters.
- Not to place vapor generating resources on heat resources such as kettle, etc, not to boil water.

Perspiration on PVC Doors and Windows:

- It is possible that you ensure ventilation via your double opening windows even in rainy conditions. The ventilation mode and period in varying weather conditions can be detected by means of the trial and error method. When you open your windows for ventilation purposes, you will see that the outer surface of the window is slightly misty. When this mist disappears, it means that adequate and correct ventilation has been performed. You must immediately close your window.
- At specific times during the day, double opening windows should be switched to the transom position to ensure that the environment is ventilated. It is enough for your window to remain in the transom position for 15 minutes so that the used, humid air is replaced by clean, cold, but less humid air. This ventilation will not cause loss of energy. The clean air with abundant oxygen that entered in after the windows were closed will raise the room temperature. Ventilations for longer durations will reduce the inner wall temperature, leading to energy loss.

It should be remembered that if the required sensitivity is demonstrated with respect to the measures to be taken enumerated above, it will be possible to have healthier environments. The most effective method to discard the vapor totally from the environment is climation.

Namely, it should never be forgotten that the water dripping from behind air conditioning devices is actually the vapor that was sucked and condensed from the environment.

If you abide by the rules in your operating manual, your PVC doors and windows will offer you, our esteemed customers, high performance, comfortable and healthy living conditions for many years to come.

FIRAT always prepares healthy environments for its customers.

FIRAT wishes its customers health, peace and happiness.

FIRAT

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