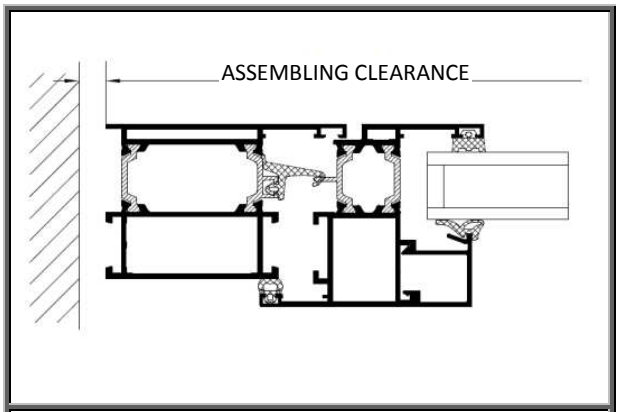
# ABRIDGED INSTRUCTIONS FOR ASSEMBLY AND USE OF ALUMINIUM JOINERY

Modern aluminium constructions retain their very good operational properties provided that they are properly mounted in the wall. The following operations affect the correct building of the construction into the wall: checking and preparation of the hole in the wall, setting up the construction in the wall, mounting the frame in the wall, insulating the frame, regulating the sash opening mechanisms and finishing the surface around the construction.

These instructions include the assembly rules and operations to be carried out when building in the standard structures (windows, doors, shop windows etc). For building in complex elements (curtain walls, winter gardens, internal walls and others) the design which specifies the individual assembly method for a given facility should be followed. During the assembly of windows, doors or shop windows (hereinafter referred to as the constructions) the assembled construction is joined to the building. This joint has the following functions:
- ensures the transfer of loads from the construction to the building,
- forms an expansion joint for mutual deformations of the construction and the building,
- allows sealing to ensure air and water tightness.

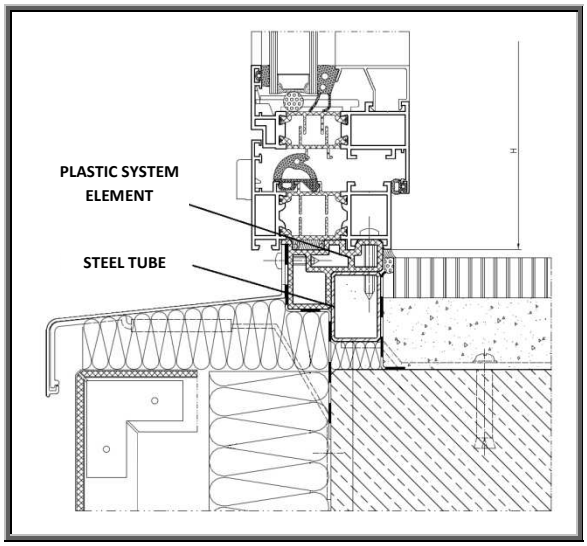
## I. PREPARATION OF THE HOLE IN THE WALL

Every construction to be built in should be inserted into hole made in the wall. Encasing the frame with a wall during its erection is impermissible. The construction built in like that is set tightly, with no clearances or correct insulation, which causes stresses from the wall to be transferred through the construction, and the construction has no right to function properly. Thus, the principle applied when building the construction in should be that the external dimension of the frame is smaller than the dimension of the holes prepared when erecting walls. For windows the hole in the wall should be by 2-4 cm wider (1-2 cm on each side) and by 6-8 cm higher (1-2 cm from the top and 5-6 cm from the bottom when window a sill is used) than the frame. For doors the hole in the wall should be by 2-4 cm wider (1-2 cm on each side) and by 1-2 cm higher (1-2 cm from the top, the threshold is on the floor level) than the frame. The angles of the hole should be 90 degrees and their diagonals should not differ by more than 1 cm, which can be checked with a tape or string. If the hole is bigger than recommended, then more insulation material is used unnecessarily, and if angles are not right, they may result in “skewed” frame. All the internal surfaces of the hole should be smooth and have no voids. The bottom surface of the hole should be uniform and built of a layer of laced material which the construction can rest stably on.




| Length of element in metres | | | |
|---|---|---|---|
| from 1.5 | up to 2.5 | up to 3.5 | up to 4.5 |
| Minimum assembling clearance | | | |
| 10 | 10 | 15 | 20 |

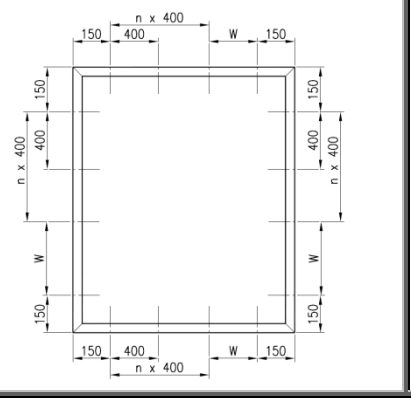
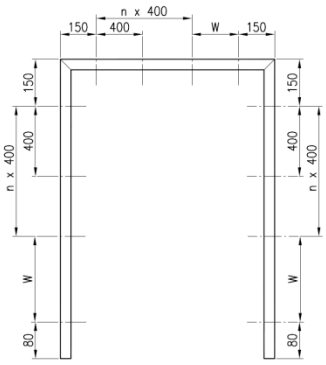
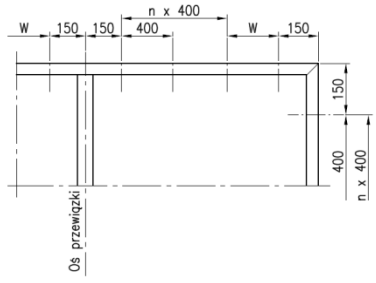
## II. SETTING UP THE FRAME IN THE WALL

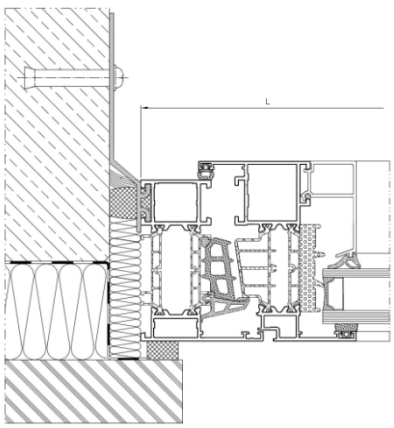
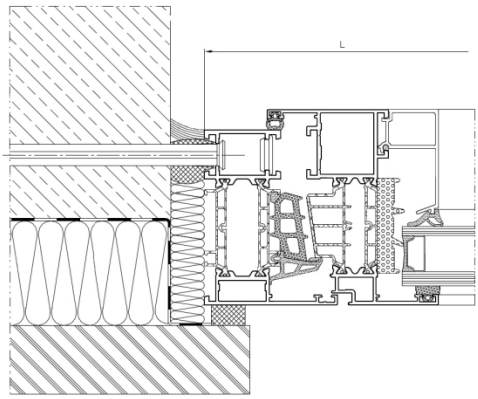



To facilitate manipulating the window when mounting, its sashes should be removed and the frame should be used alone. The recommended solution is to assemble it on the window sill which is comprised of a steel tube and plastic system element. Other assembly methods which ensure the stable support of the element and allow its levelling are also permissible. For depth at which the window and its sill are mounted in the hole in the wall it is essential that the dew-point isotherm (10°C) for the wall goes through this window. Only then steam condensation on the internal side of the window will be avoided. In the multiple-wythe masonry wall insulated with mineral wool or foamed polystyrene, this isotherm is limited by the layer of insulation material, therefore the window should be mounted at the depth of this material. After the frame has been set up, its sides should set vertically and horizontally with a spirit level and pre-wedged in the correct position. It should be remembered that the distance on both sides must be identical.

## III. MOUNTING THE CONSTRUCTION IN THE WALL

ALUPROF S.A. recommends that windows and doors should be mounted with steel anchors manufactured by the plant. These anchors are mounted to the frame before it is placed in the hole, at a distance of no more than 40 cm. After the frame has been provisionally placed and wedged, the anchors are mounted to the wall using rawlplugs. Then the wedges holding the frame are removed and the vertical and horizontal setting and frame diagonals are checked once again. Mounting the construction directly to the floor using dowels inserted through holes drilled in the frame is also permissible. The spacing of dowels is the same as the spacing of anchors.

| window frame | door frame | construction with lacing |
|---|---|---|
|  |  |  |

| anchor assembly | dowel assembly |
|---|---|
|  |  |

## IV. REGULATION OF MULTI-POINT LOCKING FITTINGS

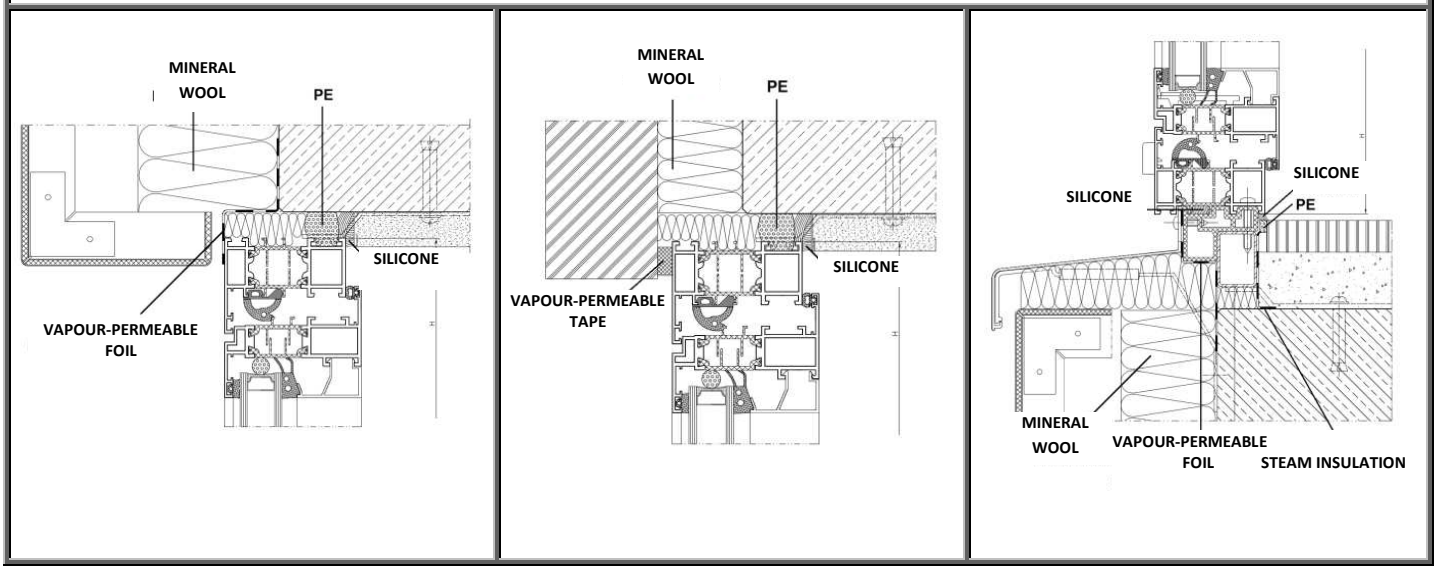
Modern windows are equipped with multi-point locking fittings which interlock sashes in several points over their entire perimeter and allow the window to be opened and tilted the window with a single handle. The multi-point locking fitting is a very precise mechanism, which however has the tolerance of a few millimetres for regulation in several directions. The working order and condition of fittings can be checked based on the following criteria:

- smooth operation of mechanism – check by moving the window handle. The moment of interlocking the handle is determined in accordance with DIN 18055 for maximum value of 10 Nm. A torque spanner can be used for checking. For tilt-and-turn fittings the possibility of regulation in 2 or 3 planes is provided. Wrong or unprofessional regulation may cause that windows equipped with such fittings are unable to operate properly.
- fastening of fittings – the correct and stable fastening of fittings affects the efficiency of window functions and its safe use. It is necessary to check the stability of screwed connections between the fitting and window material. In the case of any indications that these connections have loosened or screw heads have come off the screws should be tightened or replaced.
- greasing of fittings – regular greasing and oiling (min. once a year) of all the components on the window sash and frame that are crucial for the functioning of fitting elements will ensure the smooth operation of fittings and protect them from early wear. Steel anti-force catches need to be greased on a continuous basis to avoid unnecessary friction.

## V. WINDOW INSULATION

A modern aluminium window is characterised by high thermal insulating power and total water and wind resistance. To maintain these parameters for the entire hole, the gap between the frame and the wall should also be sealed to make it resistant to cold and water penetration. For this, fitting foams or polyethylene rolls, silicones and windproof and steam insulation foils are most often used. The insulation layer around the frame should be uniform, with no gaps and with the same thickness. On the external side the water-proof insulation is installed, which is made particularly carefully along the bottom frame, corners and at the joint with the flashing.

example of construction insulation



## VI. TRANSPORT, STORAGE AND ASSEMBLY OF VARNISHED CONSTRUCTIONS

The joinery should be carried by a covered, dry and clean means of transport. For the time of transportation the constructions should be protected against damages by placing them closely together and protecting them against moving in relation to each other. The load should be tied with transportation belts in such a manner that any damage to the construction is impossible. Paint coatings are sensitive to, among other things, organic thinners, concentrated alcohol, acids, bases and oil derivatives. In particular, protection against the contact between paint coatings and lime, cement and other alkaline building materials should be ensured. Sealing masses and other auxiliary materials used for assembly and finishing that have contact with paint coatings must be pH-neutral. Leaving the protection foils/tapes on the paint coating surface, especially during sun exposure and at a high ambient temperature, may result in the foil/tape fusing together with the coat of paint. Protection foils/tapes should be removed immediately after the assembly has been finished.

## VII. MAINTENANCE

To ensure the proper operation and long service life of the joinery, regular inspections and regulations should be performed. The movable parts of fittings and guides should be greased so that they operate smoothly. The profiles should be cleaned at least twice a year. Use preferably clean water for cleaning – strongly acid or strongly alkaline cleaning agents must not be used. You must also not use any organic solvents containing esters, ketones, alcohols, aromatic compounds, glycol esters, chlorinated hydrocarbons, etc. You must neither use abrasive cleaners nor clean the surfaces by rubbing. The use of delicate cotton fabrics for industrial cleaning is admissible. When wiping, you should not press the fabric against the surface being cleaned too strongly. When cleaning, the temperature of paint coatings cannot exceed 25°C and the ambient temperature cannot be lower than 0°C. The temperature of water used for cleaning cannot exceed 25°C. Coats of paint must not be cleaned with a steam jet. The maximum time of cleaning agent action cannot exceed one hour. If required, the cleaning process can be repeated after 24 hours.

| Points to be checked during periodic inspection | |
|---|---|
| doors | windows |
| • whether closing mechanism is properly regulated<br>• whether door can be easily closed shut and locked<br>• whether locks are lubricated and function properly<br>• whether fittings and locks are tightened properly<br>• whether rubber seal of glazing fits tight in corners<br>• whether drainage holes are not clogged<br>• whether rebate gaskets and brush seals are whole and clean | • whether sash can be easily closed shut<br>• whether fittings and closures are tightened properly<br>• whether sliding fittings are lubricated slightly<br>• whether rubber seal of glazing fits tight in corners<br>• whether central seal and rebate gaskets are whole and clean<br>• whether bottom part of frame is clean and drainage holes are not clogged. It also concerns drainage at the bottom edge of sash |

## VIII. FINAL REMARKS

Detailed solutions for joining the construction and wall can be very different as constructions of walls themselves and the requirements of architects are different. So, there is no single standard solution which would be good in all situations. There are usually several correct solutions, even for one specific case. Therefore, we recommend that the assembly method should be agreed with the investor's representative. If there are any problems with the selection of an appropriate solution, we recommend support at the point of sale. The assembly of windows and doors below 5°C in unheated rooms (buildings in unfinished conditions) is not recommended. The assembly at negative temperatures can be conducted when materials for assembly can be used at such temperatures.