

Product liability for Tilt-and-Turn systems

INDEX OF THE REVISIONS

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1. PRELIMINARY REMARKS

This document is intended for the operators in the manufacturing of windows and doors sector and in particular the **Dealers, Designers of profiles for doors and windows, Manufacturers, Contractors and Maintenance.**

Here in are specified to follow the obligations and limits of the liability of FAPIM SpA for the mechanisms with Tilt-and-Turn openings manufactured and commercialized by FAPIM SpA.

Furthermore the general rules are defined which must be respected by the staffs that handle the product during the several phases from the manufacturing to the final assembling and its following use.

It is understood that FAPIM SpA must respect the legal obligations relevant to their juridical liability as manufacturers of the mechanism.

2. DESCRIPTION OF THE PRODUCT AND ITS APPLICATION

The product described in this document is a mechanism for the opening and closing of windows and balcony-doors named Tilt-and-Turn, which has two different opening positions.

By moving a handle the sash of the window can be placed in the opening position following a vertical rotation axis (only turn opening) or in a lower horizontal rotation axis, limited by a scissor arm (Tilt opening).

The Tilt-and-Turn mechanisms here described are used on windows or balcony-doors manufactured with aluminium profiles, alu-timber profiles and aluminium-PVC profiles to be fitted in residential, public or private environments.

These windows and doors must only provide protection, and they do not have to meet the specific requirements of burglary resistance, thermal insulation, impermeability, sound-proofing and they must not to be installed in rooms with an atmosphere of high aggressive corrosion content or with a high degree of dampness.

These mechanisms are composed of several components, which are available singly at FAPIM SpA. The window and door designer decides on the composition of the mechanism.

In the case of strong wind or draught (pressure or depression) which could move the sash from one of its opening positions, the windows or balcony-doors must be kept closing

The resistance to the wind pressure in the closing position depends on the performance of the profiles used for the manufacturing of the window and door, in addition to the number of locking points fitted on the mechanism.

Generally speaking the Tilt-and-Turn mechanism here described has been studied and realized to satisfy the typical needs and requirements of a house. Any different use should be agreed upon in advance.

3. MISUSE

The misuse of the windows or balcony-doors with Tilt-and-Turn opening occurs when:

- obstacles are inserted near of the frame and sash, so as to prevent the correct operating of the sash;
- the windows and doors are moved banged or slammed (i.e. by wind or vandalism) against the reveal on the hinge side (contrast in opening), so that the mechanism (and in particular the hinges), the structure or the other components of the window and door, are damaged, deformed or even broken;
- extra loads are put on the windows or balcony-doors (i.e. if a person swings on the opened sash);
- extra loads are put onto the handle (i.e. if the handle is moved with the sash open, forcing it against the anti false-movement device);
- during the closing of the sash if a foreign body is put between the sash and the frame so as to obstruct the closing operation. The damage, which can be caused to the mechanism and in particular to the hinge, will be relative to the force applied and to the lever arm.

4. LIABILITY

The set of the whole mechanism must only be composed of components for the Tilt-and-Turn systems manufactured by FAPIM SpA and must conform to the technical assembling instructions supplied with the product.

No liability will be accepted due to the following motivations:

- components are used other than the original on the doors and windows, or if any of the components of the mechanism have been modified or adapted during the assembling of the window and door,
- if the mechanism or the window and door has not been correctly assembled,

- if the load capacity limits mentioned in the technical documentation supplied with the mechanism or made available, have not been respected (max. weights and dimensions),
- if, in the case of window and door assembled in public buildings, the limits of the additional load capacity have not been respected (see paragraph 5.6),
- if the window and door has been manufactured with profiles not conforming to the performances required by FAPIM SpA (see paragraph 5.4), or are not compatible with the dimensions required for the assembling of the mechanism regarding, both the shape and the tolerance,
- if the assembling instructions have not been respected, and in particular if the mechanism has not be correctly lubricated and adjusted,
- if the maintenance has not been carried out regularly,
- and, more generally, in case of misuse.

5. PRODUCT PERFORMANCES

The performances of the Tilt-and-Turn mechanism are defined in the technical documentation supplied inside the product pack. The dealers, the designers, the manufacturers, the contractors and maintenance are requested to ask for the documentation if they shouldn't have it.

The information given in such documentation must be respected. Any possible variations and modifications must be authorized each time by FAPIM S.p.A.

5.1 Maximum sash weight

The maximum weight applicable on the mechanism is established in the load capacity diagram, showed in the technical documentation, and depends on the dimensions of the window and door.

In no case can the limits be exceeded

The component of the window and door with the minimum permitted load capacity determines the max. sash weight.

5.2 Maximum sash dimensions

As per the max. weight, the max. dimensions permitted are defined in the load capacity diagram showed in the technical documentation. In such diagram shows the ratio permitted between the height and width of the sash, and the max. thickness of the glass to be used for each combination.

These indications are compulsory and they can't be exceeded.

5.3 Mechanism combination

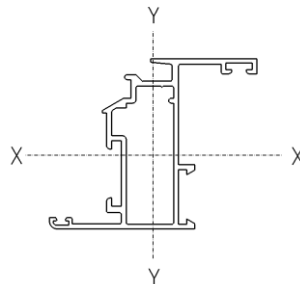
The indications supplied by FAPIM SpA concerning the combination of the mechanism (i.e. choice of the dimensions of the arm, use of the additional arm and the opening limiter arm, are obligatory and they must be respected.

5.4 Features of the profiles used for the windows and doors

The dimensions and the max. weights indicated in the load capacity diagram are guaranteed only if the profiles used for the manufacturing of the window and door have sufficient mechanical resistance. The manufacturer must make sure that the dimensions of the grooves where the mechanism is fitted permit the correct anchorage and fastening of the components.

Furthermore, it is necessary that the figures for the resistance to flexion of the sash profile must be the same as or higher than:

- $J_{xx} = 14.70 \text{ cm}^4$
- $J_{yy} = 8.50 \text{ cm}^4$



Any eventual construction of profiles with inferior characteristics is only possible with the authorisation of the technical dept. of FAPIM SpA. If this should be granted it only applies to this specific construction and must be newly requested for any following construction.

5.5 Features of the connection rods

The rods used for the connection and operating of the several components of the mechanism must have a mechanical resistance at least equal to the one of the components where they are connected. During their operating any dust or slag due to the sliding have not to be created. These features must be granted also in presence of a high temperature range due to atmospheric agents.

5.6 Restrictions for windows and doors fitted in public buildings

If the windows are fitted in public buildings, such as schools, hospitals, hotels, sport centres and in other buildings with the same typology of use, the following restrictions shall be applied:

- ratio between height/width ≥ 1 ,
- max. weight permitted: -20% compared to the diagram.

6. INSTALLATION

The manufacturer is required to respect the assembling and fitting instructions, and in particular:

- the locking screws of the hinges and the **cremone bolts** have to be tightened by a torque **between 3,5 and 4,5 Nm**, those of the keepers by a torque **between 1,5 and 2,5 Nm**;
- the locking screws of the arm must shear the leg of the sliding groove of the mechanism;
- the mechanism must slide smoothly without any effort inside the groove of the sash profile. The max. admissible force for the rotation of the handle is of 10Nm. In any case any rotation force more of Nm15 must be applied on the handle;
- it is extremely important that after having fitted the glass and carried out the installation, to check the diagonals of the frame and of the sash and that the window be in "plumb" (correct vertical position);
- on the building site it's required to avoid that cement powder or of other sort of powder can settle itself on the mechanism making obstacle to the sliding or making prejudice to the functioning of the internal parts of the mechanism;
- on the building site windows, which have not yet been adjusted or fitted with glass, must not be opened or accessible to unauthorised people.
- before delivering the windows to the customers, the manufacturer must assure that whilst the building was under-construction, the window and door did not undergo any damage from misuse;
- the manufacturer is obliged to report any malfunctioning or faults immediately;
- it's strictly required that the final user be informed in detail on the functioning of the mechanism, on the max. applicable force on the handle, on the risks arriving from misuse, on the need to carry out periodical controls, maintenance and lubrication.

7. PRODUCT MAINTENANCE

In order to guarantee the correct functioning of the Tilt-and-Turn mechanism over a long period of time, the following operations should be carried out at least every six months.

- Clean the mechanism and extract only dirt residues. Use only neutral cleaning agents. The use of other acids or products with an alkaline base can damage the anti-corrosion coats.
- Check all the components considered important for the security (hinges, arms) giving particular attention to the fixings and wear and tear, tighten the screws and replace, if necessary, all the worn out components. In particular check that the hinges have not been damaged or deformed due to a violent impact.
- Adjust the mechanism to reset the correct functioning of the sash.
- Lubricate the movable parts and the locking points as indicated in the document of the assembling instructions (use neutral lubricant).
- In the case that opening restrictor has been assembled, check the assembling position and brake adjusting.

The adjustment of the mechanism, the replacement of its components and the assembling or the disassembling of the window and door must be carried out exclusively by qualified people.

7.1 Protection against the corrosion and retention of the surface finish

The Tilt-and-Turn mechanism is manufactured in a way that its components are protected against corrosion by atmospheric

agents thanks to an adequate surface finish, so that the gear is not attacked in a room normally acclimatized, when no forms condensation could be made on the hardware or occasionally when condensation is present and can dried quickly.

In order to permanently preserve the surface quality of the hardware and to avoid wear and tear due to corrosion, it is imperative to respect the following points:

- the mechanism must be sufficiently ventilated particularly during the building phases, to avoid any exposure to dampness and condensation.
- The mechanism must be kept free of dirty and dust caused by building materials (i.e. cement, plaster and so on).
- The aggressive vapours (i.e. formic acid or acetic acid, ammonia) in connection with the small formation of condensation can cause corrosion to the hardware. In case such aggressive vapours should occur, a general adequate ventilation is to be ensured.
- The hardware can be only cleaned with PH neutral cleaning agents in diluted form.
- Under no circumstance may aggressive acids cleaner agents or aggressive cleaner agents can be used.

8. OBLIGATION OF TRAINING AND INFORMATION

The technical documentation of support to the product is made available by FAPIM SpA in order to permit to the dealers, designers, manufacturers and contractors to obtain the necessary information for a correct installation of the mechanism and the following maintenance.

- The dealers are obliged to respect the information on the product made available by FAPIM SpA and they must give them to the manufacturers and/or designers.
- The designers are obliged to ask to the dealers or directly to FAPIM SpA for the information on the product and to respect it.
- The manufacturers and the contractors are obliged to ask for the information on the product and to respect it. Furthermore they are obliged to give instructions to the final users on the methodology of use and on the necessity of the maintenance of the window and door.

9. CLAIMS

Any case of malfunctioning of the mechanism must be reported to us immediately, using the forms provided for this purpose. Any claims reported using different means will not be taken into consideration

After having examined the first information, FAPIM SpA will advise on what measures should be taken or if a further examination is necessary.

FAPIM SpA will bear the cost for any intervention or inspection as well as the cost of restoring the correct functioning of the window and door only if these are caused a fault in the manufacturing of the mechanism.

For the article or component which present an evident and easily verifiable fault before its installation on the doors and windows and if this is equally used, FAPIM SpA will provide with the free replacement of the faulty component.

FAPIM shall not be liable for loss of profits of the customer with regard to claims and for the rules of this paragraph.

If it should be established that the fault is caused by a fault in the other components of the window and door such as not having respected the specifications for assembling and maintenance, etc. Supplied with the mechanism, the cost of the intervention shall be borne by the part requesting the examination on the premises. This includes the hourly hours plus the travel and hotel expenses.

10. ATTACHMENTS

- M-SRCL – Form for claim information
- M-SRCL01 – Expertise Report for Tilt-and-Turn window - 1 sash
- M-SRCL02 – Expertise Report for Tilt-and-Turn window - 2 sashes
- M-SRCL03 – Expertise Report for T-b-T window - 1 sash
- M-SRCL04 – Expertise Report for T-b-T window - 2 sashes