## PRESENTATION

The Vetroventilato<sup>®</sup> technology was conceived and developed in order to achieve a very significant decrease in energy savings of buildings.

First and foremost, it allows investors to reduce very significantly the cost of construction of new buildings for following reasons:

- Strongly reduced size of heating and air conditioning installations.
- Less expensive power supply.
- Reduced air recirculation installations.
- Practically no need for opening windows in front walls.
- Usage of the total floor space in offices and houses.

It also brings to occupants/tenants significant running costs savings, both due to its conception and to the reduced size of above mentioned installations.

It is not only applicable to new buildings, but can as well be adapted to any type of existing ones, in order to ensure equivalent energy savings, based on a specific technical audit.

It finally brings an exceptional utilisation comfort, due to following advantages:

- Permanent recycling and very important introduction of filtered atmospheric air in the rooms.
- Suppression of condensation and icing.
- No need for sun blinds, mosquito nets and curtains.

Protected by a worldwide patent, the Vetroventilato® technology is nowadays the sole ideal solution allowing to window constructors and installers as well as to air-conditioning engineers to offer warranties beyond the strongest regulations of all countries of the European Union and of all other continents.





## FITTING AND INSTALLATION

- The Vetroventilato® technology can be adapted to any type of window frames.
- In new buildings, window frames remain identical to the ones planned in the projects and can be installed in the same way.





In existing buildings, the system can also be easily adapted and installed on any type of frames.

### VETROVENTILATO® IS A WORLWIDE PATENT



### **VETROVENTILATO® IS A WORLDWIDE PATENT**

VETROVENTILATO® OBTAINED THE CNR-ITO
CERTIFICATION N°2005.12.09.0094.

- Savings, comfort of use and security of Vetroventilato<sup>®</sup> technology are patented worldwide.
- The National Research Council of Italy (CNR) stated that Vetroventilato® technology converts a plate-glass window from the weakest part to the strongest part of a building as its thermal dispersion is inferior than a wall's. Indeed Vetroventilato® technology creates a thermal and acoustic buffer that insulates from heat, cold and noises.
  - Vetroventilato<sup>®</sup> thermal and acoustic buffer properties are more efficient than the most restrictive European Community regulation requirements. Transfer: Ug 0,3 W / m<sup>2</sup> K.
- Vetroventilato<sup>®</sup> performances were measured in comparison with standard windows systems, in laboratory by the ITC-CNR (Institute for building technologies of the CNR in Milan, Italy), based on an outdoor test cells methodology, as well as analytically by utilizing Energy Plus, a dynamic energy simulator developed by the US Department of Energy (DoE), in cooperation with the Illinois and California Universities.







It is now possible to design glazed curtain walls in full security with savings and comfort targets.



The design of standard large glazed walls reduces considerably the thermal transfer coefficients, when the Vetroventilato® technology increases them and allows architects and designers much more freedom.



## AUTONOMOUS WINDOWS

Higher costs due to other SUMMER Other windows With Vetroventilato® windows Energy needed for 49.328 MJ 180.326 MJ **MORE THAN 260%** COOLING

COLD

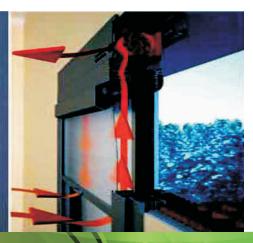




WINTER	With Vetroventilato®	Other windows	Higher costs due to other windows
Energy needed for HEATING	157.673 MJ	179.795 MJ	MORE THAN 14%

WARMTH





# WINTER COMPARISON

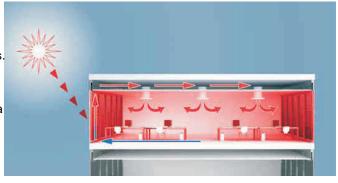
#### WINTER

External air temperature -5°C External window temperature -5°C

#### VETROVENTILATO®

#### Internal temperature of glass: 18°C

- · Greater thermal balance.
- Reduced size of technical installations.
- · Very high energy savings.
- Excellent thermal and acoustic comfort on the whole periphery, therefore no more need to keep a working distance to the glass window.
- Natural lighting.
- Suppression of any type of condensation or icing on the internal glass.



Vetroventilato® re-uses the solar radiation on the glazed windows and includes it into the internal heating system, while comfortably utilizing the totality of the perimeter zones

#### SUMMER

External air temperature 35°C External window temperature 60°C

#### VETROVENTILATO®

#### Internal temperature of glass: 25°C

- Excellent thermal balance.
- Reduced size of technical Installations.
- · Very high energy savings.
- No hot zone near to the glass window, thus no need to keep a working distance to it.
- No need to install and clean neither costly curtains inside nor sun blinds outside.
- Lighting with natural light.



Vetroventilato® evacuates the heat of the windows thus lowering the internal temperature. All perimeter zones can be used comfortably.

#### OTHER WINDOWS

#### Internal temperature of glass: 0°C

- Discomfort of perimeter spaces because of cold radiations and draughts.
- Necessary working distance to the glass wall: 1,50 m.
- · Very important thermal asymmetries.
- Necessity of over-dimensioned installations.
- High running costs.
- Miss of natural lighting because of shadowed windows and curtains.
- Possibility of condensation or icing on internal glass.



#### OTHER WINDOWS

#### Internal temperature of glass 80°C

- Discomfort of perimeter spaces and thermal imbalance due to the high sun radiation and cold draughts generated by air conditioning.
- Necessary working distance to the glass 1,5 m.
- Installation of much larger air conditioning units.
- High energy consumption.
- Miss of natural lighting because of shadowed windows and curtains.





### Energy needed for COOLING

	VetroVentilato®	Other windows	Higher costs due to other windows
Milan	49.328 MJ	180.326 MJ	+265%
Paris	13.382 MJ	90.77 MJ	+573%
Séville	104.868 MJ	275.565 MJ	+162%
Abu Dhabi	456.035 MJ	825.145 MJ	+81%



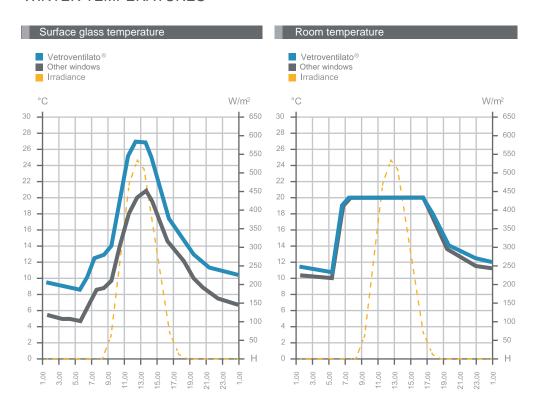
### Energy needed for HEATING

	VetroVentilato®	Other windows	Higher costs due to other windows
Milan	157.873 MJ	179.795 MJ	+14%
Paris	156.984 MJ	186.791 MJ	+19%
Séville	—		
Abu Dhabi			

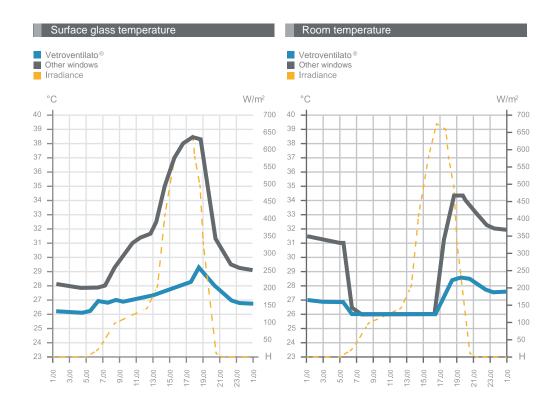


# TESTS

#### WINTER TEMPERATURES



#### SUMMER TEMPERATURES



Simulation with a building facing south - Milan



