RENSON
INNOVATION IN VENTILATION

RENSON
DESIGN IN SUNPROTECTION

FOR A HEALTHY, COMFORTABLE AND ENERGY-EFFICIENT INTERNAL ENVIRONMENT

HEALTHY BUILDING CONCEPT

INTRODUCTION

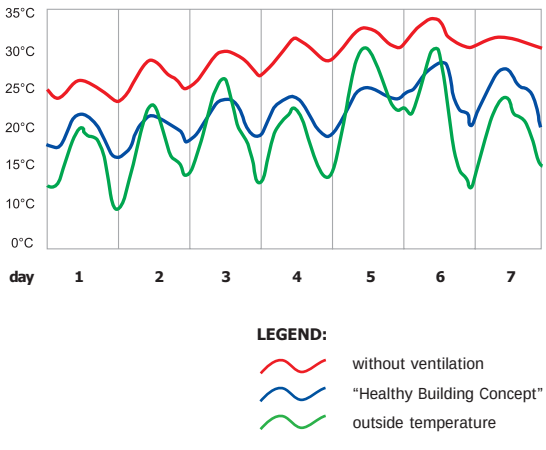
Over the last 10 years it has become obvious that the history of healthy and energy efficient building, avoiding overheating in summer and assuring a good air quality, is more complex than simply installing air conditioning. Various studies have shown that in airconditioned buildings health problems (Sick Building Syndrome, draught complaints, allergies, ...) are more frequent than in naturally ventilated buildings. According to these studies 90% of the people prefer a naturally ventilated over an airconditioned building.

RENSON's Healthy Building Concept offers you this alternative. This RENSON concept aims at a healthy comfortable and energy efficient indoor climate which complies with the new European Energy Performance Regulations, a direct result of the Kyoto protocol. This is reflected in a positive atmosphere for the people, who live and work in these buildings, and leads to increased productivity.

As a consequence, buildings that have been constructed according to the Healthy Building Concept offer advantages for the owners, the occupants and the environment.

The Healthy Building Concept offers good air quality through natural ventilation as well as a pleasant temperature during summer through controlling solar gain by means of sustainable exterior solar shading SUNCLIPS® and ICARUS® and by applying intensive natural ventilation at night. This concept can be applied to new builds as well as refurbishment. The Healthy Building Concept ... a friendly design for mankind and environment.

RENSON supports the integration of the Healthy Building Concept into the design of the building. This integration should preferably happen as soon as possible. Consequently the Healthy Building Concept is a combination of the following three elements: Background Ventilation, Night Cooling, Solar Shading



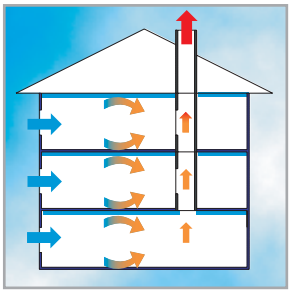
Background ventilation

Background ventilation guarantees a perfect indoor air quality (= IAQ). In accordance with the standards, sufficient fresh air forces the polluted interior air out according to the principle of supply, transit and extraction of air. (see detailed product information on page 8).

Night Cooling

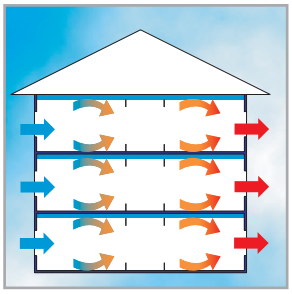
Night cooling is the concept of natural airflow overnight to cool down a building and its air content. In this way, an optimal thermal comfort is achieved with minimal energy consumption in summertime. Next to a sufficient amount of thermal mass to store the coolness, you need sufficient air circulation through the supply, transit and extract channels. RENSON's technique provides a full range of solutions for the supply, the transit and extraction of air.

The airflow necessary for Night Cooling is 10 times higher that the level of airflow necessary for background ventilation. This is why Night Cooling is also called intensive ventilation. (see detailed product information on page 8)



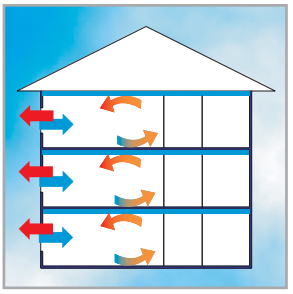
PASSIVE STACK VENTILATION

Ventilation through the whole building based on natural air flow. Air is supplied through louvres and extracted through a chimney for example. This is the ideal solution as there will be ventilation even when there is no wind. The areas that need to be cooled must be in direct contact with the chimney or via efficient transit grilles.



CROSS-FLOW VENTILATION

Ventilation supply and extraction on the same level in a building. The air is supplied and extracted through louvres. This system offers good results unless there is no wind. The internal doors must be opened or equipped with transit ventilation grilles.



SINGLE SIDED VENTILATION

Ventilation supply and extraction through the same louvres in the room. With single sided ventilation the openings should equate to 4% of the floor surface. This system is less efficient but is applicable almost everywhere and the internal doors may remain closed.

Solar shading

As a part of the Healthy Building Concept, RENSON's solar shading improves thermal and visual comfort of buildings: durable and permanent external solar shading systems SUNCLIPS® and ICARUS® prevent solar gain and allow a controlled amount of daylight in the building.

Besides the system's functional ability, RENSON's solar shading solution can give the building an aesthetically pleasing appearance. The fact that Renson mainly offers aluminium solar shading systems is a conscious choice which entails significant advantages with regards to maintenance, durability and aesthetics. (See detailed product information on page 10-11)

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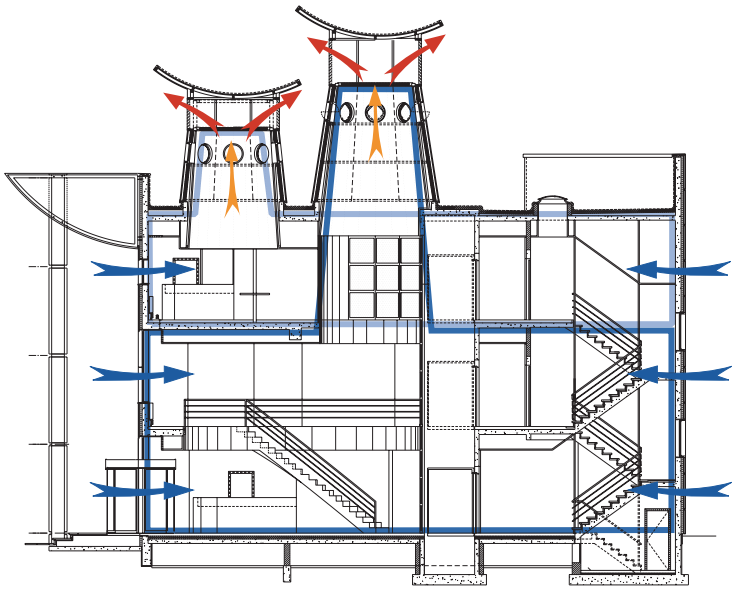
INNOVATION IN VENTILATION

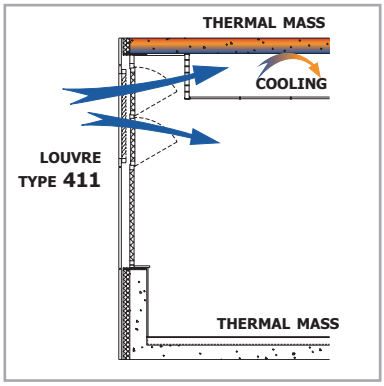
CASE 1 - IVEG

General

The office building that the Antwerp electricity provider IVEG engaged at the end of 1999 had to become a no-nonsense energy-efficient office building. One of the crucial conditions to create a comfortable atmosphere in an office building is heat control during warm days. Intensive ventilation overnight and storage of coolness create a comfortable daytime temperature even without the use of air-conditioning. Air-conditioning is the easiest solution but not the most environmentally friendly and definitely not the most price-conscious. Therefore the best solution is to make use of what nature offers and to make the building breathe regularly by itself. This happens through a very simple system called “Night Cooling”. The building gets its daily portion of fresh air.

Principle





A natural airflow enters the building through the round louvres (RENSON type 411-R) positioned on the front of the building. Behind the louvres, there are motorised shutters which are automatically operated by means of a computer programme. The programme takes the internal and external temperature, wind, etc. into account.

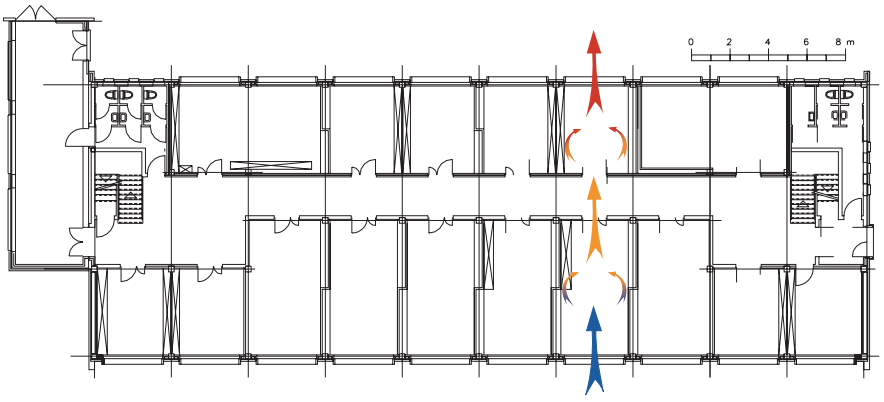
The airflow leaves the building through two ventilation towers. In these towers, the outlet flaps are operated by means of the same computer programme. In this way, a natural airflow circulates through the building at night and extracts the excess heat of the preceding day. The heat that has been stored in the thermal mass of the building (ceiling and floors) is emitted overnight. In this way the thermal mass that has cooled down can again store excess heat during daytime. In this way the occupants enjoy a comfortable working environment in summer.

General

The BBRI (Belgian Building Research Institute) started the PROBE project to renovate existing buildings and create an improved energy efficient internal climate. The project's goal is applying pragmatic refurbishment measures on these buildings that have a positive influence on the environment and an evaluation of these measures. For this PROBE-project the BBRI office building in Limelette, Belgium, was used.

Principle

The Night Cooling principle was successfully applied in the framework of the PROBE-project. The solar heat gain in summer was drastically diminished by installing external solar shading on the windows and by improving the insulation level of the walls and the roof. Furthermore the internal heat gain was strongly diminished by replacing the old lighting by a highly efficient and intelligent lighting system. The office building did not have any false floors or ceilings, so the thermal mass was easily storing heat during daytime. By means of intensive ventilation with fresh air the thermal mass can cool down overnight, in order to have a comfortably fresh temperature in the offices in the morning and so that the building is again ready to store any excess heat. The intensive ventilation is realised by cross-flow ventilation through the building from one side to the other. Therefore in the PROBE-building large louvre panels (RENSON type 431) were integrated in both façades. Overnight the windows behind the louvres and the internal doors are opened in order to achieve a good air flow (13 air changes per hour on average).



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CASE 3 - RENSON VENTILATION

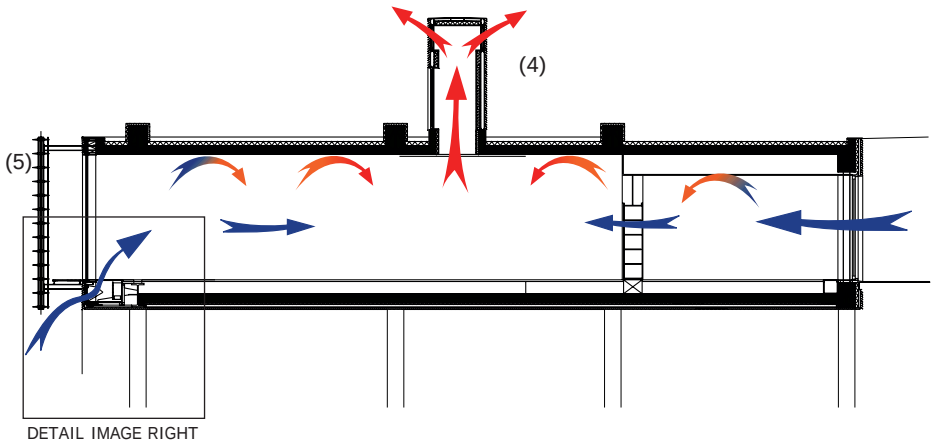
General

Being a specialist in natural ventilation and solar shading RENSON built its open plan office in accordance with the “Healthy Building Concept”. In order to apply this idea the most innovative ventilation concepts were used in combination with the external solar shading “ICARUS®”.

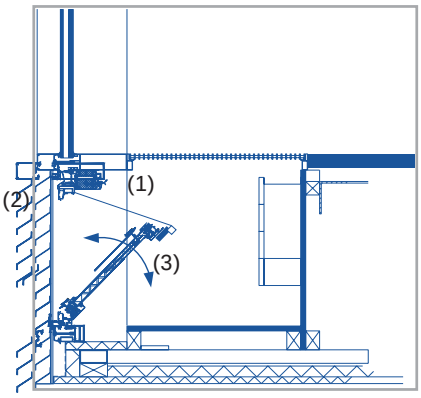
Principle

BACKGROUND VENTILATION

Background ventilation is permanently guaranteed through supply of fresh air via flap ventilators. Therefore both an acoustic INVISIVENT® AK was placed above the windows that supply the air for the overnight ventilation, as well as TH90 that were glazed in the windows in the meeting rooms. Air extraction is done through roof turrets.



DETAIL IMAGE RIGHT



NIGHT COOLING

NIGHT COOLING is applied in summer months in order to intensively cool down both the internal air and the thermal mass (concrete) in the building. During daytime the cooled thermal mass is used to cool the internal air and to reduce the ceiling's radiant heat.

How to supply fresh air? Around the building horizontal blades (RENSON Type L.066) (2) are provided at the bottom of the curtain wall structure. Behind the blades first there is an insect mesh and behind it there are windows(3) that open and close by means of computer control (depending on temperature, wind, etc…).

The hot air is extracted via fifteen passive stacks (4) that are finished by means of RENSON turrets. These extraction stacks are also provided with automatic opening and closing windows.

SOLAR SHADING

To successfully apply NIGHT COOLING, both internal and external heat gains should be avoided as much as possible. Through durable and adjustable external solar shading ICARUS® (5) (movable) on the south west elevation an excess heat gain in the building is avoided.

The total of NIGHT COOLING, Solar Shading and Background Ventilation assures a comfortable, energy efficient and healthy building …

WORD FROM THE MANAGING DIRECTOR, MR. PAUL RENSON

On regional, federal as well as on European level, there has been a sharpened attention from governing bodies towards the energy performance and the internal climate in buildings. This interest has converted in information campaigns but increasingly also in new legislation.

Despite the best efforts of the governments there still is the impression that the decision makers in the building process are not always aware of the different techniques available to achieve an energy efficient, healthy building where it is pleasant to work. With our own new building we have demonstrated the range of useful technology that is currently available. We converted the philosophy of the company into the new building. We wanted to harness nature to a maximum effect in an aesthetical and functional building in order to create a comfortable work environment with minimal energy consumption.

The curtain walling all around the building enables natural light to enter. The building is ventilated in an intelligent way via background ventilation with acoustic supply louvres and it is cooled with intensive ventilation overnight. In addition we have the ICARUS® solar shading which optimally steers the daylight and limits heat gain in summer.

Background ventilation

RENSON offers a full range of possibilities. The newest and most innovative product is the INVISIVENT®, the invisible self-regulating flap ventilator.

The invisivent is a thermally broken, invisible self-regulating ventilator for installation ABOVE aluminium, timber or uPVC windows. The depth of the ventilator ranges from 50 to 140 mm thanks to an ingenious slide and click system. An acoustic extension box is available as an option.

The INVISIVENT® AK is world's most discrete ventilation solution.
Additional advantage are: continuous supply of fresh air without draughts, excellent acoustic performance, easily cleaned and removable, insect proof, weather proof, burglar proof,...

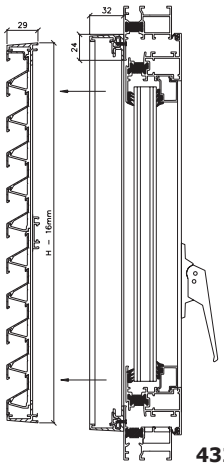
RENSON's SCREENVENT® combines ventilation with a sun protection screen for a total living comfort.

Night Cooling

In order to ventilate in a safe, intensive and natural way, RENSON has a full range of louvres for the supply and extraction of air. The louvres which are used for intensive ventilation are achieving large air flows. Therefore, a flyscreen is fitted in every louvre at some distance from the blades. In this way the air flow of the louvres is maximised. Nevertheless RENSON louvres restrict water penetration, give added security and do not require intensive maintenance. The Nightcooling principle can be applied in domestic buildings, public buildings (hospitals, schools,...) and industrial buildings (e.g. garage doors).

SUPPLY

SURFACE MOUNTED LOUVRE TYPE 432: This type of louvre is installed on the outside of the window. It is a safe alternative for a fly screen. These louvres can be fixed temporarily (e.g. only during summertime) or permanently. Behind the louvre there is a window that can be opened overnight. The windows can also be operated automatically (centrally or individually). The physical free area of this louvre is 43%. A shorter blade type 8S is available as an option to achieve bigger vision through the louvre as well as allowing extra entry of daylight.



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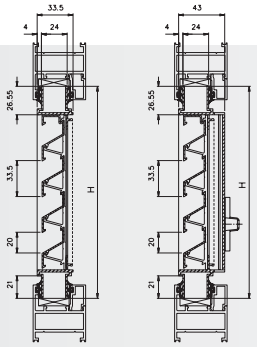
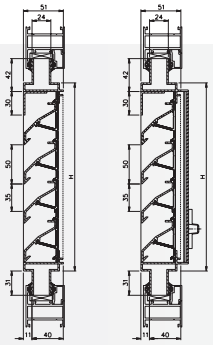


414 414 (VA)

GLAZED-IN LOUVRE TYPE 414 (VA)

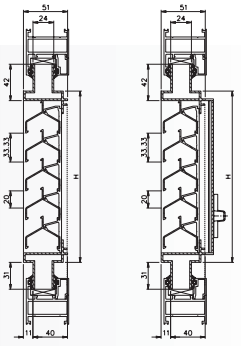
This type of louvre replaces the glass unit of a window. It is a permanent louvre which can not be removed. The air flow of the louvre is constant (standard variant) or can be controlled with a hit and miss vent (va) or an integrated aluminium door. This louvre can be fitted in aluminium, uPVC or timber window frames and is installed in a similar way as double-glazing. The physical free area is 43%.



424 424 (VA)

GLAZED-IN LOUVRE TYPE 424 (VA)

This type is comparable to the type 414 as it also replaces the glass unit in the window. However, the big difference is that the louvre has a larger blade which increases the physical free area from 43% to 49%.



428 428 (VA)

GLAZED-IN LOUVRE TYPE 428 (VA)

This type is a variant to the standard type 414. It also replaces the glass unit in the window. The physical free area is 43%. This louvre consists of chevron section blades ensuring a non-transparant and non-penetrating construction.

Besides this standard range, RENSON offers special solutions such as sliding louvre shutters, as a combination of intensive ventilation and solar shading.

TRANSIT

Intensive ventilation also requires the transit of air. If it is not possible to open the internal doors at night, RENSON door grilles can be used for transit of air.

EXTRACTION

The extraction of air with passive stack ventilation can be achieved with a continuous louvre system or turret in an aesthetic and safe way.
With cross-flow or single sided ventilation the extraction happens through the same louvres that are used for the air supply.

Solar shading SUNCLIPS®

The SUNCLIPS® system is constructed using light aluminium blades which can be assembled continuously or in a frame. Numerous assembly methods are possible: horizontally projected solar shading systems, assembly at an angle or as a vertical panel.

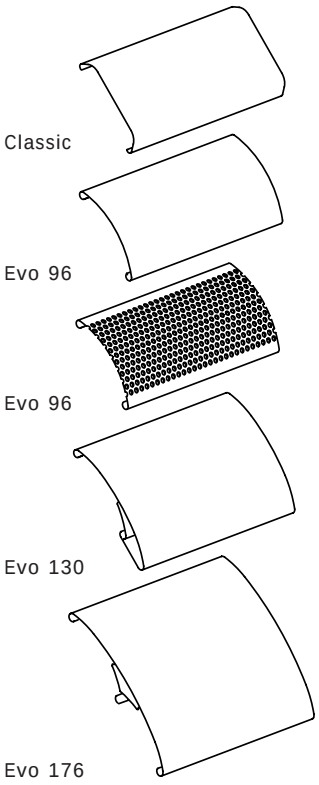
The SUNCLIPS® blades can be assembled in different ways:

Continuous blades fixed with clips:
the blades are fitted under, between or above the aluminium support profiles with blade clips. The blade panels can be placed horizontally, at an angle or vertically.

Blades in cassettes:
the Evo blades are fitted between two support profiles, which are cut from aluminium laser profiles. The cassettes can be placed horizontally, at an angle or vertically.

SUNCLIPS®Patio:
the blades are fitted in vertical support panels. These sun shading panels may be controlled manually or automatically and they provide an adjustable solar protection of the façades or balcony barricades.

Overview of the SUNCLIPS® blades :



Solar shading ICARUS®

The ICARUS® solar shading system is constructed using aluminium extruded aerofoil blades for an optimal management of sunlight. Most of these blades exist of one piece of aluminium extruded profile with invisible seams. The largest blades are extruded in different parts which are then fixed together to form one blade by means of clips.

The architectural system ICARUS® has different assembly methods:

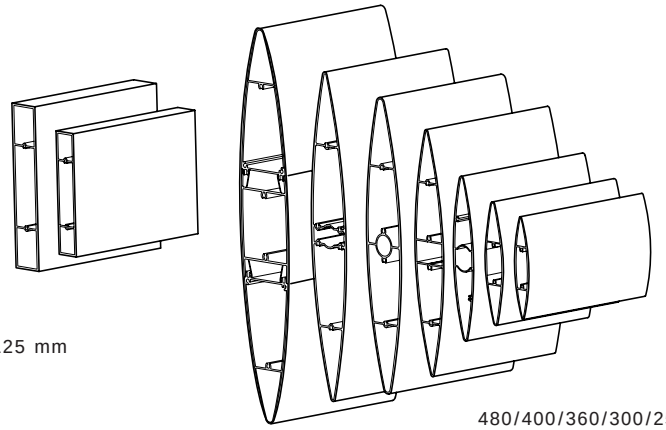
ICARUS® Quickfix: the blades are attached to the façade under different angles by means of a patented aluminium clip system.

ICARUS® Fixed: fixed installation where the blades are attached between the cast or laser cut pre-assembled end cap plates with end caps. The blade panels can be placed horizontally, at an angle or vertically.

ICARUS® Movable: Motorised installation for a vertical or horizontal application where the blades can be adjusted in different angles.

ICARUS® Patio: Assembly of blades in vertical sliding panels that offers adjustable solar shading of the façades or balcony barricades. Those solar shading sliding panels can be manually or automatically moved.

Overview of the ICARUS® blades :



150/125 mm

480/400/360/300/250/150/125 mm

RENSON: YOUR PARTNER IN NATURAL VENTILATION AND SOLAR SHADING

RENSON, WITH ITS RICH TRADITION IN INNOVATION AND EXPERIENCE SINCE 1909, IS PROFILING ITSELF AS AN UNDISPUTED MARKET LEADER IN NATURAL VENTILATION AND SOLAR SHADING. SINCE 2003, OUR HEAD QUARTERS HAVE BEEN LOCATED NEXT TO THE E17 KORTRIJK - GENT MOTORWAY IN WAREGEM (BELGIUM). THIS REMARKABLE BUILDING IS A REAL AND WORKING MODEL OF OUR HEALTHY BUILDING CONCEPT AND IS A PROTOTYPE EXHIBITING OUR TECHNOLOGICAL STRENGTHS.

A HEALTHY INTERNAL CLIMATE IS RENSON'S PRIORITY AND THIS IS FAR MORE THAN JUST A TREND. WE DEVELOP AND COMMERCIALISE PRODUCTS THAT CONTRIBUTE TO LOWER ENERGY CONSUMPTION. IN THIS WAY, RENSON PROVIDES AN IMPORTANT LINK TOWARDS THE REGULATION APPLICATIONS FROM THE KYOTO CLIMATE TREATY

RENSON HAS IT ALL

• Our multidisciplinary R&D department is co-operating with leading European research organizations. The outcome is a complete range of innovative concepts and products.

• Our automatically powder coating installation, anodisation unit, PVC injection installation, PVC mould construction, assembly department and warehouse facilities are spread over a surface area of 50.000 m^2. Thanks to its consequent vertical integration, RENSON delivers high quality products.

• RENSON's head quarters, sales and marketing department are in Belgium, but we also have plants and offices in France and the UK. RENSON also has a sales structure beyond the European borders.

• The diversity and capability from RENSON's project team are our warranty for correct solutions for each individual building project. The creation of constructive long term relationships with construction specialists is our priority.

Conditional technical changes

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