



# HC GROUP | INDOOR CLIMATE TECHNOLOGY

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ABOUT SUSTAINABILITY



## HC GROUP | INDOOR CLIMATE TECHNOLOGY

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HC GROUP | INDOOR CLIMATE TECHNOLOGY

ABOUT HC GROUP



## **SPECIALIST IN INDOOR CLIMATE TECHNOLOGY**

A healthy and comfortable indoor climate has a positive influence on people; as a market leader in the area of indoor climate technology, HC Group plays an important role.

We have over 100 years of experience in indoor climate technology. This enables us to realize and maintain a healthy indoor climate for every situation. By cleverly combining our products, systems and services with the latest (building) technologies, we create a living and working environment in which we put people's well-being first.

Within our solutions and services, sustainability performance, objectives and ambitions as demanded and required by market parties, are playing an increasingly important role. As an organization, we have also taken major steps in this direction in recent years, for example with the realization of two new offices including warehouses and production areas in Waalwijk (The Netherlands), in which many sustainability solutions have been implemented.

Innovative, socially responsible, environmentally conscious and committed, are core values that are consistent with HC Group's companies. Because new technology is constantly becoming available, our sustainability ambitions continue to increase and we are constantly investing in new and sustainable solutions.



**A SUSTAINABLE ORGANIZATION  
WITH SUSTAINABLE SOLUTIONS**







### SUSTAINABLE ORGANIZATION

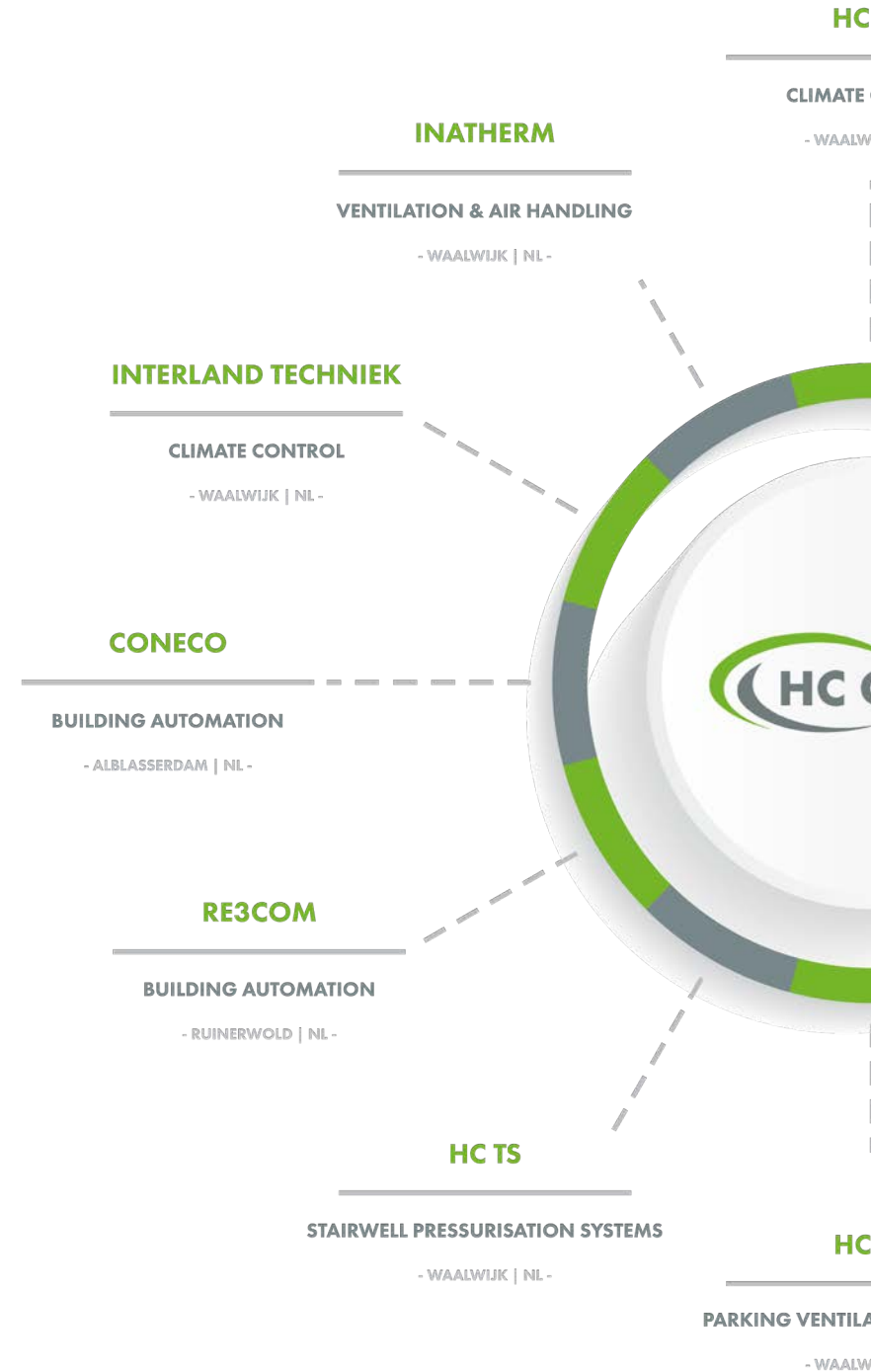
As HC Group has grown, sustainability had taken on an increasingly important role. This has resulted in the realization of modern and sustainable offices, production and storage facilities. Not only were the most sustainable solutions applied in terms of installation technology, but the most sustainable solutions were also chosen in terms of construction.

We also continue to improve our locations, with sustainable energy generation and transportation solutions, control of waste streams, certification, et cetera.

### SUSTAINABLE SOLUTIONS

From the beginning, HC Group has played an important role in developing, testing, supplying, installing, managing and maintaining sustainable products, systems and services. First as a member of the USGBC and immediately after its founding as an active member of the DGBC (Dutch Green Building Council).

With knowledge and certifications gained at the DGBC, we have actively supported the market with the implementation of a wide range of sustainable solutions, which are explained in this brochure in more detail.





KP

CEILING

TJK | NL -

GROUP

PS

ATION EQUIPMENT

TJK | NL -

### BARCOL-AIR

AIR DISTRIBUTION

- PURMEREND | NL -

### HC RT

SYSTEM INTEGRATOR

- PURMEREND | NL -

### PVE

PARKING VENTILATION EQUIPMENT

- BRIGHOUSE | GB -

### ULTIMAIR

HVAC SUPPLIES

- NIEUWERKERK A/D IJSSEL | NL -

### ROSENBERG

AIR HANDLING & VENTILATION EQUIPMENT

- DEN DOLDER | NL -

### OUR COMPANIES

Every day, spread across 8 locations in The Netherlands and 1 location abroad, over 400 employees are involved in resolving specialized issues in the area of indoor climate technology.

HC Group companies are active in the areas of climate ceilings, ventilation and air treatment, air distribution technology, car park ventilation systems, controls and system integration, building automation, climate control and stairwell pressurisation systems.

### OUR TECHNOLOGY | YOUR WELLBEING

Through our motto, we convey that as HC Group, we use our extensive knowledge, expertise and more than 100 years of experience to create an environment that promotes human well-being.

Building systems and technology are not an objective, but a tool for creating and maintaining an environment that promotes human well-being.

### THE USER IS KEY

It is of great importance to put the well-being of users at the center of building development. Buildings and their technical installation should create a flexible environment that promotes well-being and productivity and, in part, reduces absenteeism. Certification systems such as WELL, ensure that developers and building owners put the well-being of occupants first and go far beyond just a healthy indoor environment.



## **HC GROUP'S CONTRIBUTION TO SUSTAIBILITY AT A GLANCE**

**INTERNAL  
MEASURES**



**SUSTAINABLE  
PRODUCTS &  
DEVELOPMENTS**



**LONG-TERM  
PARTNERSHIPS**



**KNOWLEDGE SHARING  
THROUGH WEBINARS  
& PUBLICATIONS**



**CHARITIES  
& INITIATIVES**



**CONTRIBUTION TO  
AWARD-WINNING  
PROJECTS**







HC GROUP | INDOOR CLIMATE TECHNOLOGY

ACCOMPLISHMENTS | GOALS | AMBITIONS





## HOW WE DEAL WITH SUSTAINABILITY

Sustainability at HC Group is a process of continuous development. Several developments have been realized, in addition to goals and ambitions.

### ACCOMPLISHMENTS

In the new construction of the offices, warehouses and production facilities in Waalwijk (The Netherlands), a large number of solutions have been integrated to make these premises sustainable. In our other facilities, we have made structural engineering improvements over time to increase sustainability.

### GOALS

In addition, goals were realized to make sustainability an even more important part of the organization and to further increase quality by having processes and methods certified, among other things.

### AMBITIONS

We want to express our ambitions to further increase sustainability. These include in the area of staff mobility, sustainability performance of our suppliers and logistic partners, but also by making our facilities even more sustainable.

## REALIZATIONS | HOUSING

LARGE WINDOWS FOR PLENTY OF NATURAL LIGHT  
(EQUIPPED WITH HIGH-EFFICIENCY GLASS)

DAYLIGHT THROUGH SHED ROOFS

PATIO FOR ADDITIONAL DAYLIGHT

ACCESS VIA LOCK-CONSTRUCTION

SEPARATE DRAINAGE SYSTEM, WHERE RAINWATER  
IS RETURNED TO THE NEARBY ENVIRONMENT

INDOOR SUN PROTECTION

LED LIGHTING, SWITCH BASED ON PRESENCE & DAYLIGHT

ENERGY TRANSPORT CLIMATE INSTALLATION WITH WATER

BICYCLE PARKING

PRESENCE-BASED CLIMATE CONTROL

NIGHT VENTILATION

BAMBOO DOORS & FRAMES

WOODEN BEAMS FOR INDUSTRIAL BUILDINGS

WALLS WITH WOODEN INNER STRUCTURE

CRADLE TO CRADLE CARPET

GREEN PARKING LOTS

PLANTING OLD FRUIT TREE

ELECTRIC CAR CHARGING STATIONS

## ACCOMPLISHMENTS | PROCESSES

ENCOURAGING ELECTRIC DRIVING

REDUCE PAPER USE

OPTIMAL DRIVING SCHEDULES FOR MECHANICS

REUSABLE TRANSPORT RACKS

OPTIMIZING USE OF RESOURCES

COMBINE & OPTIMIZE  
SUPPLIER TRANSPORT MOVEMENTS

IMPLEMENTATION OF DOCUMENT CAPTURE SOFTWARE

TOOLBOX MEETINGS

BIKE PLAN

WASTE SEPARATION AND QUANTITY MONITORING

DRIVER BEHAVIOUR TRAINING

PRODUCTION WASTE SEPARATION & RECYCLING

OPTIMIZE TRUCK LOADING RATES

TRANSPORT MOVEMENTS WITH SUSTAINABLE VEHICLES

PRODUCT DESIGN WITH CIRCULARITY IN MIND

SUSTAINABLE EVALUATION CRITERIA FOR SUPPLIERS



## CERTIFICATIONS | ACHIEVED & GOALS

Sustainability at HC Group is a process of continuous development.

Several developments have been realized, achievements and a number of developments have been defined. The main objective for the coming period is to achieve various certifications in the areas of sustainability and quality, so that all processes are secured.

### ACHIEVED CERTIFICATIONS

#### FSC PROJECT CERTIFICATION

In the beginning of 2022, HC KP, project organization of HC Group, was able to obtain the FSC project certification (license code FSC-P001896). This allows HC KP, after completion, to issue project specific certificates, demonstrating that certain forest materials have been certified.

#### BRL 6000-21

Coneco, part of HC Group, is BRL 6000-21 certified for the subfield Management of open soil energy systems of residential and/or utility buildings. Coneco has the ambition to grow its management activities in the future. Taking on management responsibility for soil energy systems is part of this.

#### CO<sub>2</sub> PERFORMANCE LADDER

HC Group is very aware of its environmental impact in CO<sub>2</sub> emissions. In order to deal with this responsibility, HC Group is certified on step 3 of the CO<sub>2</sub> performance ladder.

### TARGET SET

#### ISO 1400:2015 CERTIFICATION

This standard is aimed at controlling and improving environmental performance, both within the organization and throughout the chain. Sustainability is a core value of HC Group, which is why the goal had been set to achieve certification by 2023.







**2022**

**2023**

**2024**

## AMBITIONS

FURTHER INCREASE NUMBER OF  
ELECTRIC VEHICLES

INCREASE USE OF (ELECTRIC) BICYCLES  
TO COMMUTE TO WORK

ENCOURAGE USE OF PUBLIC TRANSPORTATION  
FOR COMMUTING & CLIENT VISITS

INSTALL SOLAR PANELS ON AVAILABLE ROOF AREAS

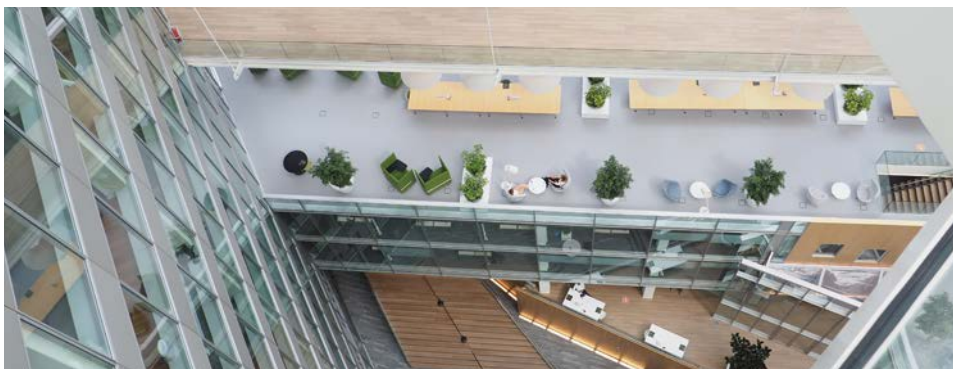
ISO 9001 & ISO14001 CERTIFICATION

MAKING PRODUCTION MORE SUSTAINABLE

INCREASE CIRCULARITY IN PRODUCT DESIGN

INCREASE CIRCULARITY IN PRODUCTION





## THE EDGE | AMSTERDAM

During the completion of this prestigious project in 2014, The Edge was the most sustainable project in the world with a BREEAM score of 98,36%.

On the A10-Zuid highway in Amsterdam, OVG (now EDGE Technologies) has developed the prestigious new headquarters for Deloitte & AKD. The building consists of a total of 14 building layers for a combined area of 40.000 m<sup>2</sup> and two underground parking layers with an area of 12.000 m<sup>2</sup>. The building has a U-shape with a fully enclosed atrium on the highway side and is designed to make maximum use of daylight. In addition to the roof, both the west, south and east facades are equipped with solar panels. We are particularly proud of the contribution to this project we were able to make as HC Group.

**HC RT** supplied, installed and integrated the complete building automation, for all primary installation and post controls. HC RT's Building Management System functions features the backbone for all technical installations in the building and covers their integration.

**HC KP** supplied and installed the climate ceilings for this prestigious project. The choice was made to use a band grid system in combination with ClimaPe activation. A total over 30.000 m<sup>2</sup> of climate ceiling was installed.

**HC PS** designed, installed and certified the car park ventilation system in the car park of of nearly 12.000 m<sup>2</sup>.

Finally, **Barcol-Air** supplied 1.000 VAV units and over 2.000 air diffusers, with the air diffusers largely installed hidden from sight on the HC KP climate ceilings.

Both Bloomberg and the World Economic Forum have named the building as "The world greenest and smartest office building."

**REFERENCE PROJECT**





Deloitte





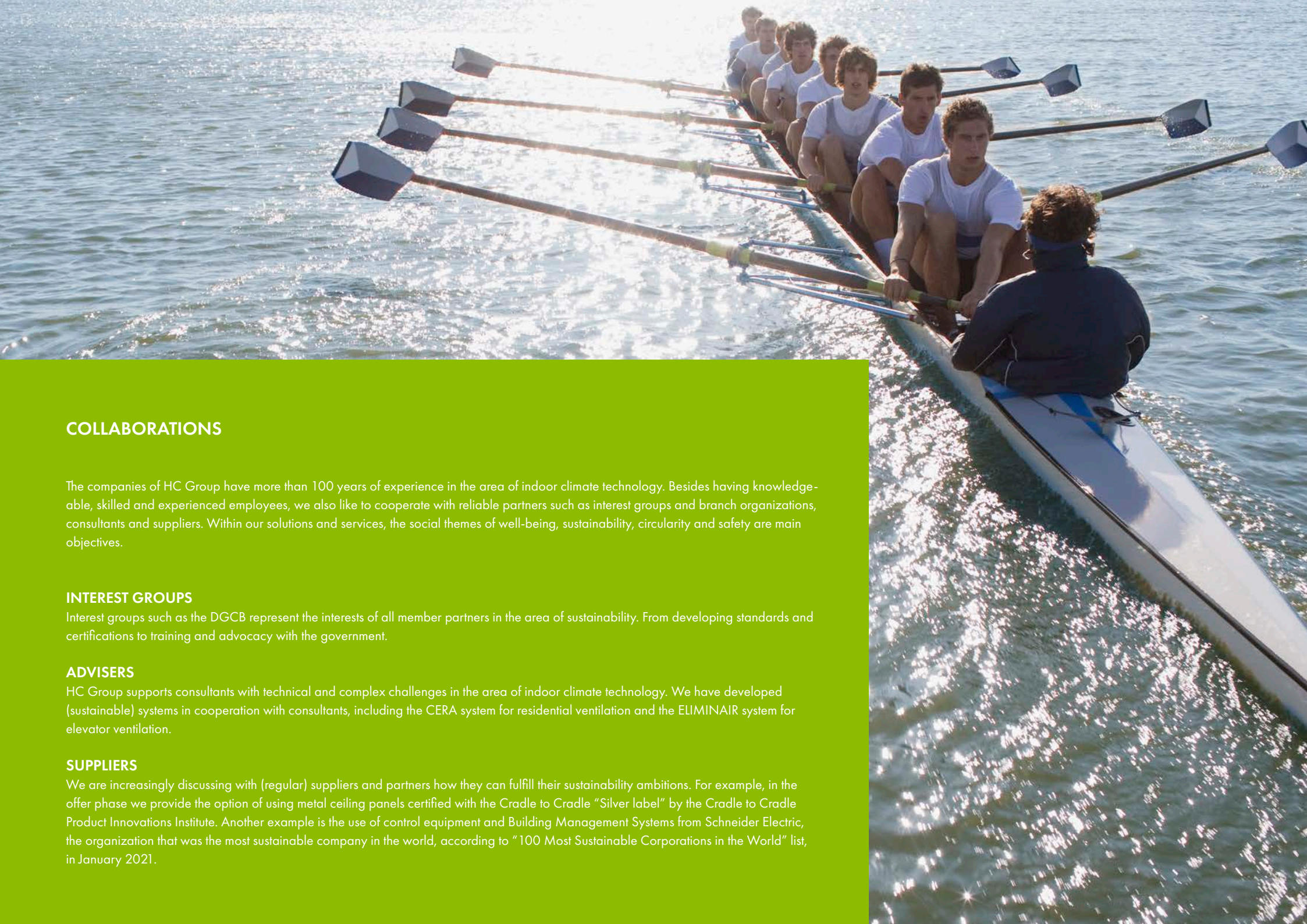


HC GROUP | INDOOR CLIMATE TECHNOLOGY

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**COLLABORATIONS**





## COLLABORATIONS

The companies of HC Group have more than 100 years of experience in the area of indoor climate technology. Besides having knowledgeable, skilled and experienced employees, we also like to cooperate with reliable partners such as interest groups and branch organizations, consultants and suppliers. Within our solutions and services, the social themes of well-being, sustainability, circularity and safety are main objectives.

## INTEREST GROUPS

Interest groups such as the DGCB represent the interests of all member partners in the area of sustainability. From developing standards and certifications to training and advocacy with the government.

## ADVISERS

HC Group supports consultants with technical and complex challenges in the area of indoor climate technology. We have developed (sustainable) systems in cooperation with consultants, including the CERA system for residential ventilation and the ELIMINAIR system for elevator ventilation.

## SUPPLIERS

We are increasingly discussing with (regular) suppliers and partners how they can fulfill their sustainability ambitions. For example, in the offer phase we provide the option of using metal ceiling panels certified with the Cradle to Cradle "Silver label" by the Cradle to Cradle Product Innovations Institute. Another example is the use of control equipment and Building Management Systems from Schneider Electric, the organization that was the most sustainable company in the world, according to "100 Most Sustainable Corporations in the World" list, in January 2021.



## COLLABORATIONS | INTEREST GROUPS



### DGBC

#### DUTCH GREEN BUILDING COUNCIL

From the beginning of 2009, HC Group has been a member of the Dutch Green Building Council. Together with partners, they are working on a future-proof built environment. DGBC provides tools and products to make sustainability evident and measurable. Through this knowledge platform, knowledge and innovations are being shared between our partners.

Based on four central themes, the DGBC develops impactful programs. These are Circularity, Paris Proof, Climate Adaptation and Health; themes that are also highly valued by HC Group.

The DGBC is also a developer and an implementer of the BREEAM-NL label, the assessment method to determine the sustainability performance of buildings, areas and projects. The companies of HC Group have extensive knowledge and experience with BREEAM-NL and work with BREEAM-NL projects on a daily basis.



### EFA

#### EUROPEAN FEDERATION OF ALLERGY AND AIRWAY DISEASES PATIENTS ASSOCIATION

HC Group has entered into a cooperation agreements with the EFA. This is an organization that represents 39 national interest associations from 25 countries at an European level. These associations all have responsibilities in the area of respiratory diseases and/or allergies.

Caring for a healthy indoor climate contains more than just cooling, heating and comfort. After all, a healthy indoor climate always has a positive impact on your health.

EFA makes European Union regulations on indoor climate control transparent and accessible, keeping us -as a partner- well-informed.



COLLABORATIONS | ADVISERS



## HIENSCH ENGINEERING

### CERA RESIDENTIAL VENTILATION

Hiensch Engineering B.V. is a Dutch leading and independent installation engineering consultant for building-related installations. Besides the welfare and well-being of people, quality in its various forms, energy and sustainability are of high importance.

CERA is the innovative total ventilation concept for application in stacked housing constructions. The quiet, compact CERA units control the required amount of fresh air in homes 24/7, demand-controlled based on local CO<sub>2</sub> measurements.

An unique ventilation system developed by Barcol-Air & HC RT in cooperation with consultancy firm Hiensch Engineering, providing a healthy and comfortable living environment. The system is characterized by a particularly low energy consumption and makes a favourable contribution to the BENG calculation and NTA8800 method.



## ABT

### ELEMINAIR ELEVATOR VENTILATION

ABT is a Dutch multidisciplinary engineering firm that combines the available knowledge of its more than 250 employees quickly, flexibly and purposefully. Its services focus on the knowledge areas of structure, civil engineering, structural engineering, building physics and installation engineering.

Together with Interland Techniek, ABT developed the ELEMINAIR air treatment system for elevators. With this system, elevator users can always rely on clean, virus-free air and normal elevator occupancy can be restored. The principle of the ELEMINAIR system is based on scientific research into the spread of virus particles through the air. Not only is the air cleaned, but the air flow from the ceiling prevents larger droplets and tiny droplets (aerosols) from being transmitted from person to person.



## SAMENWERKINGEN | LEVERANCIERS/PARTNERS



### SCHNEIDER ELECTRIC

#### CONTROLS & BUILDING MANAGEMENT SYSTEMS

HC RT, part of the HC Group, has been supplying, engineering, installing and servicing Schneider Electric products, systems and solutions. The company's goal is to enable everyone to make the most of available resources and energy, making progress and sustainability accessible to all.

In 2021, Schneider Electric has been named the most sustainable company in the world by Corporate Knights. It is ranked first in the "2012 Global 100 Most Sustainable Corporations in the World" list.



### PRIVA

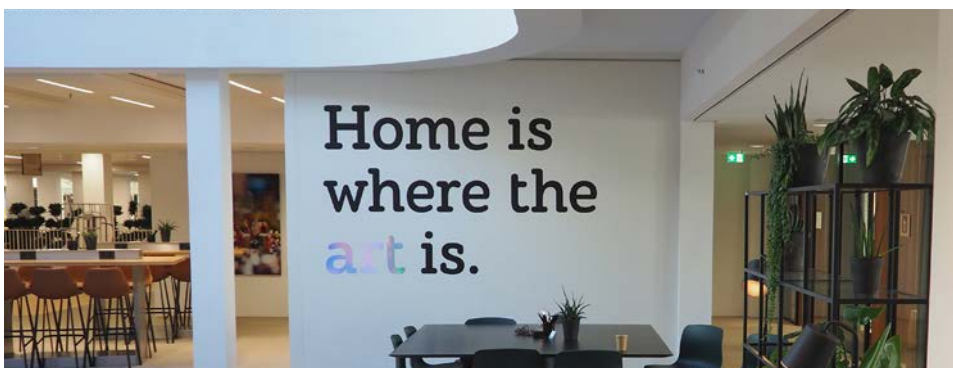
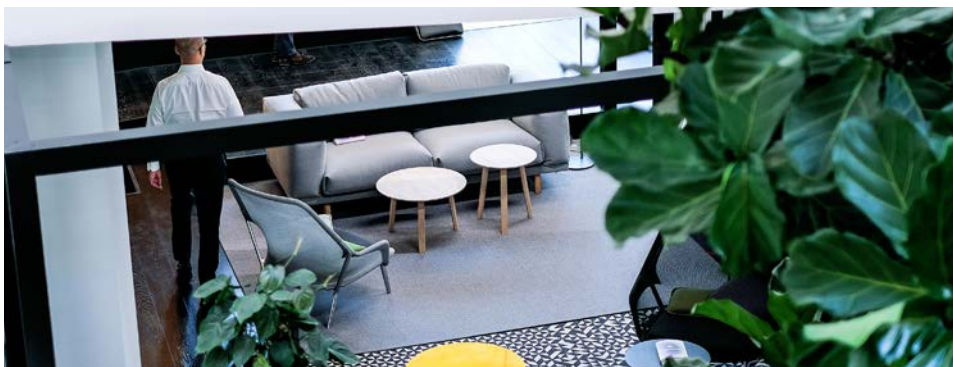
#### BUILDING TECHNOLOGY

Coneco, part of HC Group, has been a Priva partner since 1995. Priva develops hardware and software in the area of climate control and energy savings for utility buildings such as offices, stores, hotels and hospitals.

Priva's mission is to contribute to a sustainable world in which a growing global population can experience healthy and comfortable living. With the combination of hardware, software and services, Priva is able to provide solutions to the challenges facing the urbanizing world.







## EDGE OLYMPIC | AMSTERDAM

At the Zuidas in Amsterdam, EDGE Technologies has completely redeveloped the former PPT office sorting center into EDGE Olympic.

High standards were set in the areas of sustainability, well-being and circularity, including incorporating façade components into the new floors and constructing the superstructure in wood. All these ambitions resulted in the following certifications:

- BREEAM 4 start
- Energy label A
- WELL Platinum (Core & Shell) – as the first building in the world
- Madaster registration

HC Group companies made a significant contribution to this project.

**HC KP** installed the climate ceilings, both climate ceiling islands and closed climate ceilings.

**HC RT** supplied, installed and integrated all room controls, control technology, Cloud BMS, Smart Building infrastructure and technology and Cyber Security solutions.

**Barcol-Air** supplied all VAV units, balance controls, air and fire dampers and diffusers.

**HC PS** designed, installed and certified the car park ventilation system.

**REFERENCE PROJECT**







A close-up photograph of a person's hands typing on a laptop keyboard. The laptop screen is the central focus, displaying the word "WEBINAR" in large, white, sans-serif capital letters. The text is enclosed within a white, rounded rectangular frame that has a tail pointing towards the bottom left. Below the main text, several white line-art icons are arranged horizontally: a house, a folder, an envelope, a video camera, a telephone handset, and a magnifying glass. The background is softly blurred, showing the person's arms and the laptop's keyboard. A green horizontal bar is positioned at the bottom of the image, containing white text.

# WEBINAR

HC GROUP | INDOOR CLIMATE TECHNOLOGY

**KNOWLEDGE SHARING**





## KNOWLEDGE SHARING BY HC GROUP

The area of indoor climate engineering has been evolving for over 100 years. In recent years, development has been accelerating, with more and more complex technology being developed and implemented.

### CLIMATE CITY



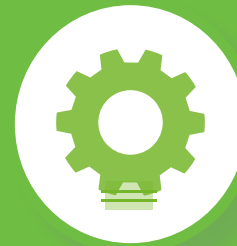
Our knowledge, development & advice platform through which we support the market in the realization of a working and living environment. This environment supports well-being and is sustainable, safe and circular.

### DEMONSTRATING & TESTING



We have unique demonstration and testing facilities in which the operation of each product and system, in any environment can be demonstrated and additionally scientifically demonstrated.

### INITIATIVES



Based on social or technological developments, we launch special initiatives that solve the challenges and problems of these developments.

### WEBINARS



For some time, our companies have been hosting webinars to share specific knowledge with our relations. This program continues to expand.



## CLIMATE CITY | INTRODUCTION

The environment in which HC Group operates is changing rapidly. This is partly due to the rapid development of trends and technology, as well as the introduction of new standards and legislation.

Also, there is an increasing amount of specialized technology in buildings and an ever-increasing integration of mechanical, electrical and smart building solutions.

In addition, an increasing trend can be seen where one party is responsible for consulting, design, delivery, installation, integration as well as management & maintenance.

Therefore HC Group has introduced Climate City. Climate City is the knowledge, advice and development platform through which we support the market in realizing healthy, sustainable, circular and safe working and living environments.

## TRENDS AND DEVELOPMENTS

Climate City tracks the latest trends and developments in wellness, sustainability, circularity and safety and examines how they affect developers, managers and, most importantly, building users.

We are always aware of the latest wishes and requirements in the area of standards (both national and European), laws, regulations and certifications. To this end, we are members of national and international industry associations, interest and knowledge organizations.

With the gained knowledge, existing products, systems and services are adapted and further developed. New integrated solutions are being developed so that they always meet the latest technology, standards, laws, regulations and certification criteria.



## CLIMATE CITY | SOCIAL THEMES

HC Group's main concerns are well-being, sustainability, circularity and safety. These challenges are addressed integrally, with control engineering and smart building technology playing a connecting and central role. Through the Climate City platform, HC Group advises and supports companies, relations and partners with issues and certification in these areas.

### WELL-BEING

People spend 90% of their time indoors, so it is of great importance that the indoor climate should support and improve human well-being.

Climate City closely follows all developments in the area of well-being and certification of buildings according to the WELL and Fitwell method.

### SUSTAINABILITY

Sustainability can no longer be ignored in the build environment. After years of making buildings increasingly sustainable, the energy transition has entered its next phase: moving entirely to sustainable generated energy.

Climate City closely follows all developments in the field of generating, distributing, storing and applying renewable energy.

### CIRCULARITY

After fossil fuels, nature resources are becoming increasingly scarce. It is therefore of great importance that products can be reused, modified reused or easily recycled at the end of their life span.

Climate City follows all developments in the area of circularity, including the Madaster materials passport.

### SAFETY

Creating a safe escape route from (tall) buildings and providing a safe access for emergency services in case of an emergency (fire) is of great importance. In modern smart buildings, digital safety (cyber security) is also very important. Ventilation -given current developments- is taking on an increasingly important role within the theme of safety.

Climate City tracks all developments in building and digital security.

#### REFERENCE WELL-BEING

##### EDGE OLYMPIC | AMSTERDAM

The world's first PLATINUM WELL certified building.

#### REFERENCE SUSTAINABILITY

##### THE EDGE | AMSTERDAM

The most sustainable building in the world with a BREEAM score of 98,36%.

#### REFERENCE CIRCULARITY

##### TRIODOS BANK | DRIEBERGEN-RIJSENBURG

A circular wooden building kit with 165.312 screws, building of the year 2019.

#### REFERENCE SAFETY

##### JUBI GEBOUW | DEN HAAG

Fully automatic stairwell pressurisation system with automatic fault detection.

### SMART BUILDING TECHNOLOGY

Smart building technology integrates all technical systems of a building and ensures that energy (cold and heat) is sustainably generated, stored and distributed throughout the building and allows all the installations to work together energy efficiently.

Smart building technology has three primary functions: to use energy sustainably, to use the building as efficiently as possible and to give users control over their environment.

For this purpose, data is collected and securely stored. The data is available through smart building apps or via dashboards.





2



3



4



5



1



6



8



7



## KNOWLEDGE SHARING | DEMONSTRATING & TESTING

### 1 | CLIMATE LABORATORY

Climate laboratory for conducting full-scale indoor climate tests. Using the special climate facades, the influence of the seasons can be simulated.

### 2 | CERA RESIDENTIAL VENTILATION

Permanent, working demo facility of the energy-efficient CERA residential ventilation system. Different versions of the system are shown.

### 3 | LUKA TEST FACILITIES

Various test facilities, to test and certify products for airtightness class in accordance with the Dutch LUKA standards.

### 4 | VENTILATION SOLUTIONS

Showroom demonstrating various ventilation solutions, from school ventilation to units with a heat recovery function, special grilles and ELEMNAIR, the virus-free elevator.

### 5 | REVERBERATION ROOM

Reverberation room for conduction sound engineering product development tests.

### 6 | SHOWROOM OFFICE

HC Group's HQ also serves as a showroom, displaying over 20 different types of ceiling systems, including components such as air diffusers and lighting.

### 7 | COMPUTATIONAL FLUID DYNAMICS & 3D PRINTING

Facilities to modify existing products or develop new ones.

### 8 | SOLUTIONS CENTER

Facilities for developing and testing control engineering and Smart Building applications and integrations.



## KNOWLEDGE SHARING | WEBINARS

We are happy to share over 100 years of knowledge, skill and experience in the area of indoor climate technology and our wide range of innovative and integrated products, systems and services.

In addition to traditional presentations, several HC Group companies are hosting an increasing number of webinars. Therefore, we have created a special "menu" in which clients can select topics of interest. The webinars are given not only during working hours, but also as breakfast, lunch or end-of-working-day sessions.

In our offices in Waalwijk (The Netherlands), we have a permanent studio for hosting these webinars.



## INITIATIVES | NUBES VENTILATICA

Research by HC Group has produced a number of clear findings regarding airborne contaminants, their health effects and methods to eliminate or deactivate them.

It has also become clear that no quick and cost-effective solutions are available to prevent the spread of viruses in buildings. However, it has become clear that the ventilation system plays a central role in supplying sufficient fresh outside air in buildings and preventing the spread of viruses, among other things.

The ventilation system is the focus of recommendations issued by various bodies to prevent the spread of viruses in buildings. Because this advice is very generic, building owners, managers and users lack action perspective; in other words, they don't really know what to do. In addition, almost every building and its use is unique, this means that the (ventilation) solutions must be building- and user-specific.

As a final point, comfort is often forgotten with all the attention paid to making the indoor climate safe; it is important to (continue to) pay attention to this as well.

### 5 STEP-PLAN

HC Group has developed a 5-step plan on the subjects that are important in designing, creating, maintaining and sustaining an indoor environment that is not only safe, but also supports and promotes human well-being.

We call this method: **NUBES VENTILATICA** and the plan includes the following 5 steps:

#### 1. VENTILATE WITH FRESH OUTDOOR AIR

To ventilate, use as much fresh outdoor air as possible, remove (filter) contaminants from the outdoor air before it enters the building, and recirculate as little "used air" as possible.

#### 2. SUFFICIENT VENTILATION

Ventilate with sufficient fresh outdoor air to promote well-being and dilute contaminants and remove them with the return air. The air volumes specified in the Building Decree are insufficient; the recommendation is to use 50 to 60 m<sup>3</sup>/h of fresh air per person.

#### 3. MONITOR AIR QUALITY

Monitoring, central filtering and cleaning outdoor air. Continuously monitor indoor air quality; in addition to temperature and relative humidity, measure CO<sub>2</sub>, particulate matter, Ozone and VOCs. Taking corrective actions based on measured deviations.

#### 4. APPLICATION SPECIFIC VENTILATION

Supply ventilation air with air distribution equipment (e.g. VAV units, air supply grilles, sensors, controls) specific to the function and use of the building (office, school, hospital, cinema, museum, laboratory, et cetera).

#### 5. THE IMPORTANCE OF COMFORT

A safe indoor climate must also be a comfortable indoor climate. In addition to sufficient fresh air, it is important to properly regulate the other comfort parameters, being air temperature, air velocity, humidity, personal influence, lighting and noise.

**Nubes Ventilatica**

Our 5 steps for safe ventilation



## INITIATIVES | CERA RESIDENTIAL VENTILATION

### CLIMATE-NEUTRAL VENTILATION

Modern homes are so well insulated that the share of heating in energy costs is decreasing. A large proportion of building-related energy consumption (< 25%) is caused by ventilation.

This is precisely where the CERA system saves on energy costs.

The system consists of a ventilation control unit (CERA unit) specially developed by Barcol-Air, which is placed in the apartment. The unit is combined with a special, heat recovery unit on the roof. Setting up the system in this way, reduces the energy consumption for ventilation and transmission by 30-50% compared to conventional systems.

The system was developed together with the Dutch consulting firm Hiensch Engineering.



## INITIATIVES | SCHOOL VENTILATION

### HEALTHY & COMFORTABLE VENTILATION

The quality of the indoor climate in schools is often substandard.

An unhealthy indoor climate affects both learning performance and student health. Various studies have shown that CO<sub>2</sub> concentrations in Dutch schools are often too high. In an estimated 80-88% of all classrooms, the indoor air does not meet the reference value used in laws and regulations.

The total solutions are based on the program called "Fresh Schools" issued by the Dutch Government (RvO). This program of requirements is aligned with the Building Decree and provides advice on creating a good indoor environment in schools.

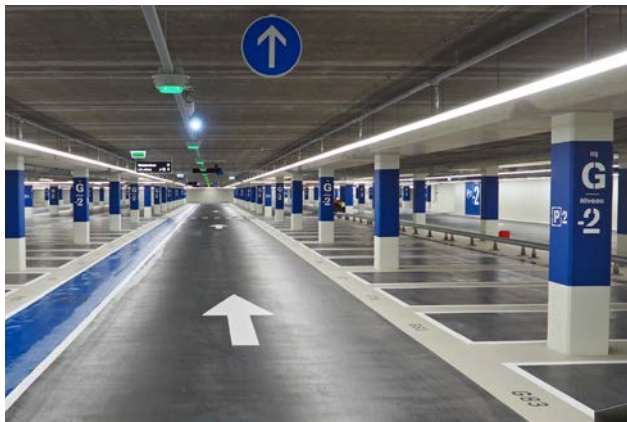
## INITIATIVES | CAR PARK VENTILATION SYSTEMS

### ENERGY SAVINGS ON AN EXISTING SYSTEM VIA RENOVATION

Older car park ventilation systems, especially those with extensive ductwork, consume a lot of energy. A new ventilation design is made after an inventory of the current system.

This design is accompanied by a consumption analysis that immediately shows the savings in energy costs, as well as the payback period of your investment based on the new ventilation system.

Also, by using energy-efficient induction fans and LED lighting, the payback period can be shortened.



## INITIATIVES | ELEMINAIR

### FOR HEALTHY AIR IN ELEVATORS

Every day, millions of Dutch people use about 100.000 elevators in offices, hospitals and residential complexes. Since COVID-19, elevators have become a bottleneck. The compact, crowded spaces are barely ventilated or cleaned. As a result, there is a high risk of contamination, because users are standing close to each other.

For this purpose, we developed the ELEMINAIR air treatment system, which provides clean, virus-free air for all users. ELEMINAIR brings healthy air into the elevator and enables normal elevator occupancy. Professor Bonn of the UVA conclusion is clear about the ELEMINAIR system: "The air treatment system very significantly reduces the risk of corona contamination via aerosols."

The system was developed with the Dutch engineering firm ABT.







HC GROUP | INDOOR CLIMATE TECHNOLOGY

**SOCIALLY ENGAGED**



## HC GROUP | SOCIALLY ENGAGED

It is important to be socially involved and to support various initiatives in this area.

### CHILDREN

Children are a vulnerable group within our society who can use extra help and support. HC Group supports specific projects for this purpose.

### DEVELOPMENT AID

HC Group supports small-scale development aid. Not only through financial support, but also through the active participation of employees.

### SUPPORT THROUGH SPORTS

Sports are not only beneficial for body and mind, but can also be a means to support charitable causes.

### ACCREDITED STUDENT COMPANY

As a technology company, HC Group likes to do its part in providing student workplaces to learn the trade through on-the-job training.

### NATURE

Nature in all its facets plays a crucial role in our society. HC Group supports initiatives that actively contribute to this.



## CHILDREN

PINIDRAF  
FOUNDATION



The Pinidraf Foundation is a General Benefit Organisation that aims to provide support to children suffering from isodicentric marker chromosome 15. This very rare and therefore relatively unknown genetic disorder is incurable.

In addition to scientific activities, the Pinidraf Foundation also focuses on the patients.

Because the group of patients is small, no large-scale research is conducted by, for example, the pharmaceutical industry.



## DEVELOPMENT AID

HOMEPLAN  
FOUNDATION



HC Group has been a sustainable partner of HomePlan since 2013, we structurally support HomePlan's projects.

HomePlan is committed to helping the poorest of the poor in developing countries. Together with local partner organizations they build houses for the local population.

In doing so, not only do they offer these people a roof over their heads, but also a sense of self-worth and an opportunity for further development, including education and healthcare.



## SPORTS

ALPE D'HUZES



Sports are good for physical and mental development and relaxation. The greater the challenge, the greater the reward. When you can raise money for charity with your sports performance, the reward is enormous.

Every year HC Group colleagues climb the Alpe d'Huez by bike or on foot to raise money for CliniClowns.

An unique sportive event that raises as much money as possible for cancer research and towards improving quality of life of people -especially children- with cancer.



## EDUCATION

ACCREDITED  
STUDENT COMPANY



HC Group cooperates with several schools that offer different education courses. From these schools, students come to our companies to gain practical knowledge and experience.

The companies hold the Approved Training Company designation from various training programs.

We also cooperate with various social work facilities to give people who are distanced from the labour market a good chance in society.







NATURE

BEELIFE



BEELIFE

Bees play a crucial role in nature, however, the bee is not doing well. Without bees, we would no longer have vegetables, fruit, nuts, chocolate and coffee. In fact, bees provide pollination for 70% of crops.

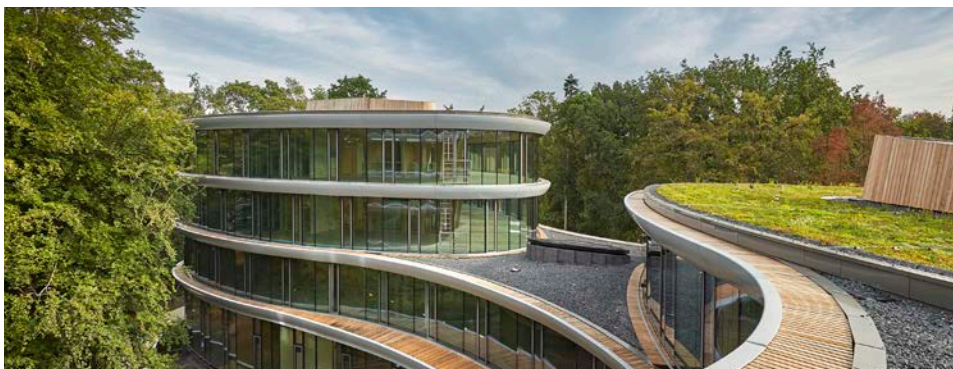
In cooperation with BeeLife, there are a total of 4 bee hives on the roof of our offices in Purmerend and Waalwijk (The Netherlands).

A hive provides shelter for about 40.000 bees. Good for our food chain and the diversity of plants and flowers in our living and working environment. Twice a month a professional beekeeper comes by to care for the bees.

The honey harvested from our hives receives a special HC Group label and we use this as a gift to our business relations.







## TRIODOS BANK | DRIEBERGEN - RIJSSEBURG

The new headquarters of Triodos Bank is situated near Driebergen. The building was granted many awards for excellence in sustainable and circular construction.

### CIRCULAR DESIGN

RAU Architects writes "The building, also called the wooden cathedral, is a fully remountable building that sets the tone for innovative, circular and sustainable buildings around the world". The building was designed and developed by applying circular construction principles at every stage of construction.

### SUSTAINABILITY AS A DESIGN PRINCIPLE

The development of the new office building for Triodos Bank has had a positive effect on the local environment; it has even added 2,5 hectares of nature. Smart heat and cold storage was another innovative application. In 2021, Triodos Bank's main office won the BREEAM award in the Commercial Project Category: Post Construction Award.

### CONTRIBUTION HC GROUP COMPANIES

HC KP supplied and installed all the climate ceiling systems for the Triodos Bank project, along with integrated air distribution equipment from sister company Barcol-Air. With these climate ceiling systems, they made a significant contribution to the achieved sustainability and circularity goals.

Commissioned by the Dutch company Bosman Bedrijven, Coneco contributed to the measurement and control technology of the building management systems. In addition, Coneco supported soil drilling company Haitjema with the control technology of the ATES installation according to BRL 11000 and 6000-21: from project supervision and engineering, to software programming and commissioning.

**REFERENCE PROJECT**











HC GROUP | INDOOR CLIMATE TECHNOLOGY

**SUSTAINABLE SOLUTIONS**



## SUSTAINABLE SOLUTIONS

In addition to sustainable housing and processes, HC Group is an organization with over 100 years of experience in the area of indoor climate technology and provides numerous innovative sustainable solutions.

All HC Group companies have products and systems in its portfolio, that significantly help in making our clients buildings and installations more sustainable. HC Group companies are involved in a majority of projects in the Netherlands with a BREEAM-NL Excellent or Outstanding score.

Moreover, we are also developing solutions that contribute greatly to BENG and the so-called zero on meter and energy negative initiative.

### CLIMATE CITY

With Climate City, HC Group's knowledge, advice & development platform, we follow all developments in the area of sustainability and the energy transition. It advises and supports HC Group companies, their clients and partners with issues and certifications in the area of sustainability.

New technology coming to the market is assessed and where possible quickly implemented in our portfolio, not only by adapting existing products, systems or services, but also by developing new solutions.



## SUSTAINABLE SOLUTION | HC RT

### SMART BUILDING TECHNOLOGY

With the completion of office building The Edge in Amsterdam to main tenant Deloitte – after decades of talking about it – the first true Smart Building in the world was finally delivered (Bloomberg).

HC RT, System Integrator of HC Group, played a major role as a development partner of developer OVG (now EDGE Technologies) and tenant Deloitte in designing, detailing, installing and integrating not only all the control technology and the Building Management System, but also the Smart Building technology and infrastructure.

During the completion of this prestigious project in 2014, The Edge was the most sustainable project in the world with a BREEAM score of 98,36%.



## SUSTAINABLE SOLUTION | BARCOL-AIR

### CERA RESIDENTIAL VENTILATION

A large portion of building-related energy consumption (>25%) is caused by ventilation. This is precisely where the CERA system saves on energy costs.

The system consists of a ventilation control unit developed by Barcol-Air (CERA unit), which is placed in the houses. This unit is combined with a special, central heat recovery unit on the roof.

Setting up the system in this way reduces the energy consumption for ventilation and ventilation transmission by 30 – 50% compared to conventional systems.



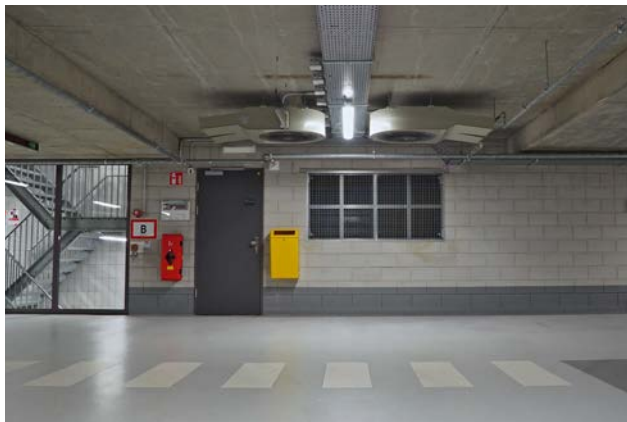
## SUSTAINABLE SOLUTION | HC PS

### INDUCTION FANS

In 2003, HC PS developed, patented (patent 1018285) and introduced the modern induction fan. The second generation was then implemented in 2007.

This new and unique generation of fans has been developed to offer many technical advantages, using the unique patented exhaust venturi and ultra-flat centrifugal rotor.

This unique design requires 65% fewer fans, significantly improving system performance and energy use.



## SUSTAINABLE SOLUTION | HC KP

### CLIMATE CEILINGS

HC KP's climate ceilings make a positive contribution to comfort, in part because energy is transferred by radiance. The perceived temperature is about 1 to 1,5 degrees lower with a climate ceiling during summer time. This saves energy because less cooling is necessary to get the desired temperature.

HC KP's climate ceiling systems add value in both BREEAM and WELL projects.

By combining the climate ceilings with integrated air distribution technology, energy-efficient lighting solutions, building automation and Smart Building solutions, building users can have a sustainable environment in which both well-being and performance are optimally promoted.

## SUSTAINABLE SOLUTION | INATHERM

### NEX-T SCHOOL GENERATION UNITS

Decentralized balanced ventilation unit with heat recovery, making it an ideal solution to create an optimal indoor climate for each classroom.

Equipped with energy-efficient EC motors, a highly efficient heat exchanger (up to 91,2%) and a 100% bypass for summer cooling. The unit provides demand-controlled ventilation based on CO<sub>2</sub> and meets Class B according to the Dutch program called "Fresh Schools".

In addition to energy-saving components, several parts are 3D printed and manufactured from PLA: a biodegradable plastic. Replacement parts can also be manufactured this way. The NEX-T SG: a very durable choice for school ventilation.



## SUSTAINABLE SOLUTION | INTERLAND TECHNIEK

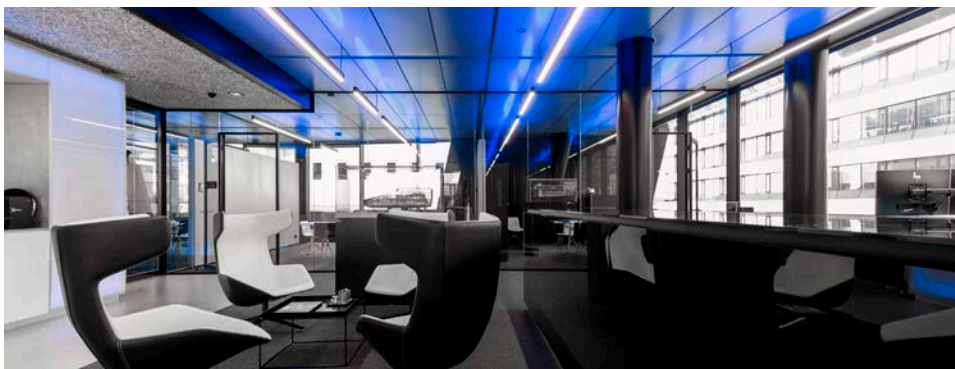
### MAGNELIS OUTDOOR AIR DIFFUSERS

Applying Magnelis outdoor air diffusers is a durable solution, as the special metallic steel coating provides long-term surface protection against wear and tear. Thanks to its unique chemical composition, Magnelis offers better corrosion resistance than standard hot-dipped galvanized or sendzimir steel.

With Magnelis, a coating layer has been developed that provides the steel surface up to ten times better. The cladding layer is unique: it consists of zinc alloyed with 3,5% aluminium and 3% magnesium. The magnesium ensures that the steel is protected from corrosion for up to 25 years.

One of the most remarkable properties of the coating is that it can repair itself on cut edges. That is usually where corrosion occurs. This makes the Magnelis outdoor air grille an extremely durable product.





## THE FLOW | AMSTERDAM

The Flow in Amsterdam has a special appearance, distinguished by a powerful design with unusual lines. It is the first Dutch building to achieve the Well core v2 Platinum certificate. The Flow has also achieved the BREEAM 4 star certificate with a BREEAM score of 75,31%.

HC KP, part of HC Group, actively contributed to the design phase of the various climate ceiling solutions used in the project. The result is an expressive design, which focuses on an optimal indoor climate and a flexible layout of the building.

In the context of flexibility, it was decided to use grid profiles at a few positions so that, in the future, it will be very easy to install walls under the climate ceiling. These grid profiles are set back a few centimetres from the underside of the ceiling panels.

A narrow joint was created between the ceiling panels. On one hand an architectural choice, on the other hand the intent for hanging pendant luminaires under the climate ceiling. Since these pendant luminaires also illuminate the climate ceiling, the joint is made of the same material as the ceiling panels, so that the entire ceiling is closed. The steel joint is on the same level as the grid profile.

The climate ceiling is powder-coated in the gray RAL colour 7037 and equipped with ClimaPe activation for heating and cooling the room. To supply fresh air into the ceilings, hidden supply grilles are used which are concealed in the ceiling tiles. The draught-free air is blown in the indoor area.

**REFERENCE PROJECT**





## SOURCES

**Project Bouwbedrijf Van Middendorp Wekerom**

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**Project Gebouw KB Arnhem**

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**Project The Flow Amsterdam**

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