



klimagiel.it



KLIMAGIEL S.r.l.
via Mezzacampagna, 52/37
37135 Verona (Italy)
tel. +39 045 916672
fax +39 045 8344222
klimagiel@klimagiel.it
Share Capital Euro 46,800.00 fully paid up
VAT and Fiscal Code No. 02868700234



KLIMAGIEL constantly strives to improve its products and search for innovative solutions and therefore reserves the right to change the characteristics indicated in this information sheet without prior notice.

Verona - 2024



GENERAL CATALOGUE





KLIMAGIEL®

l'aria che ti rispetta



KLIMAGIEL is the European leader in the production and sales of metal and fabric air diffusers, with more than 33 years of experience.

KLIMAGIEL's network of distributors, agents and agencies spans 40 countries worldwide.

With more than 40 agencies and 145 sales agents in Italy, KLIMAGIEL interacts efficiently and effectively with the entire aeraulic market.



MISSION

To create a healthy and comfortable environment, using the best cutting-edge technologies while respecting the planet's resources.



VISION

To offer the best customised solutions for comfortable space in civil and industrial environments.



FOCUS

To offer customised solutions by designing air diffusion perforation for each individual Customer. Strong technical and commercial support throughout project implementation.



STRENGTHS

- Technical and commercial assistance throughout the project.
- All products and semi-finished products Made in Italy.
- Each project is tailor-made according to Customer request.

PRINCIPLE OF OPERATION

The **high induction diffusion** system exploits the possibility generated by the airflow coming out of the calibrated holes to mix optimally with the ambient air flow, resulting in a **high level of environmental comfort**.

In particular, the KLIMAGIEL **JET-IN** system guarantees a very high exchange and mixing surface with the ambient air, which is moved by friction and the vacuums and vortices created by the movement of the air itself.

This phenomenon is due to the principle of conservation of momentum

$$Q_{IN} \times \rho \times V_{IN} = COST = K$$

Q_{IN} = volumetric flow [m^3/sec]; ρ = fluid density [kg/m^3]; V_{IN} = fluid velocity in motion [m/s]

This **inductive effect** makes it possible to move a much larger volume of air than the volume fed into the room, thanks to a certain initial impulse. Depending on the hole diameter, hole geometry and static pressure, it can reach values up to 50 times higher than the primary air flow rate.

The ratio between the volume of air moved and the volume of air supplied is called the **INDUCTION RATIO**.

Thanks to the choice of an inductive JET-IN system, the typical phenomena associated with traditional air distribution systems are avoided, which, being characterised by localised input points, do not allow for homogeneity of the thermo-fluid-dynamic characteristics of the air in the room.

Thanks to our software, it is also possible to assess the phenomenon of thermal pressure drop of the air flowing inside the duct. It in fact exchanges heat with the environment and, therefore, particularly in the case of long pipelines, a temperature variation is created within the diffuser.

It may therefore be appropriate in some cases to balance this thermal difference by increasing the specific flow rate into the room (flow rate per linear metre). This ensures an optimal distribution of the energy fed from the first to the last section of the diffuser.

THE PRINCIPLE OF INDUCTION

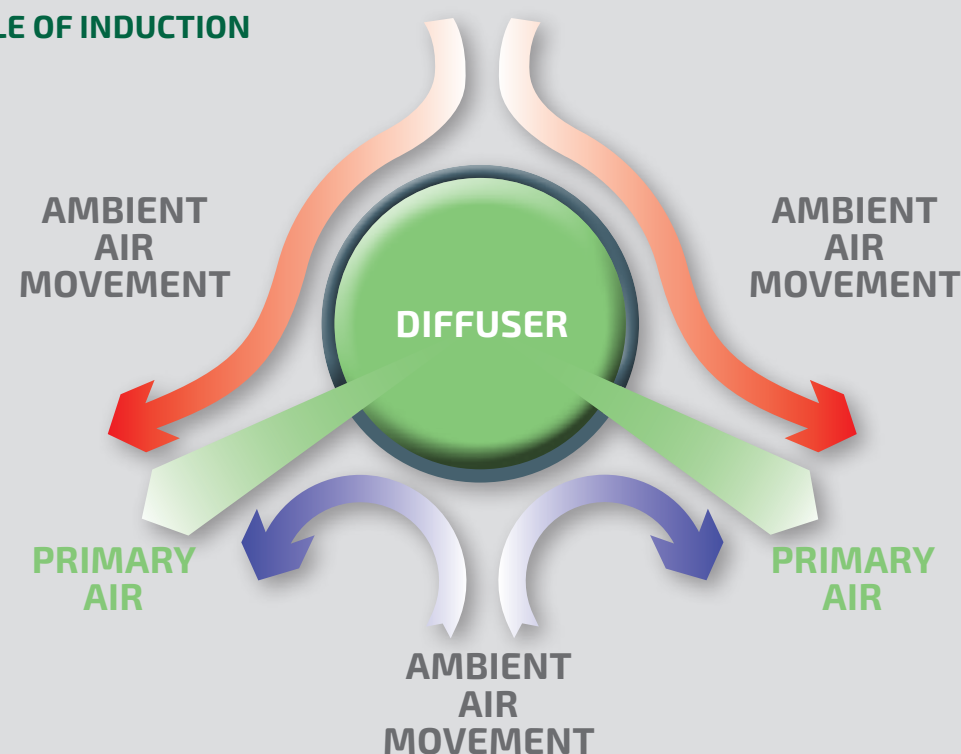


Fig. 1

SUMMER SEASON AIR SPEED RATE

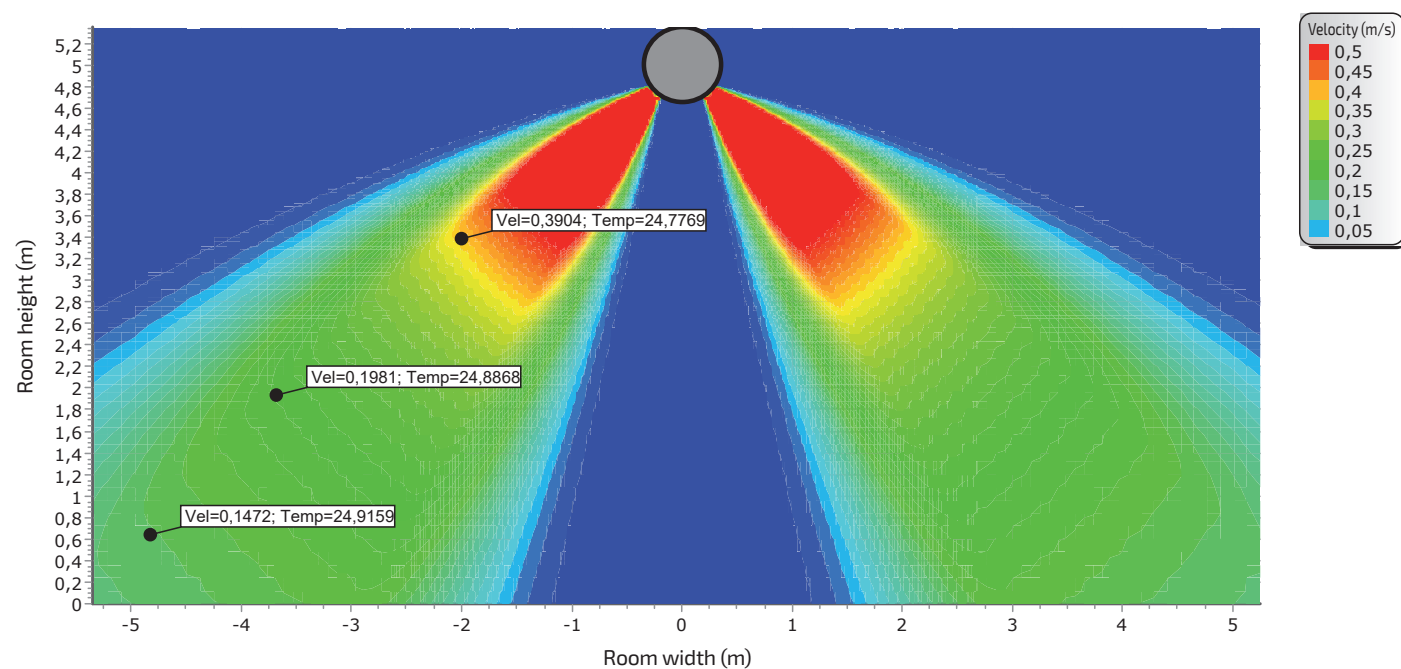


Fig. 2

WINTER SEASON AIR SPEED RATE

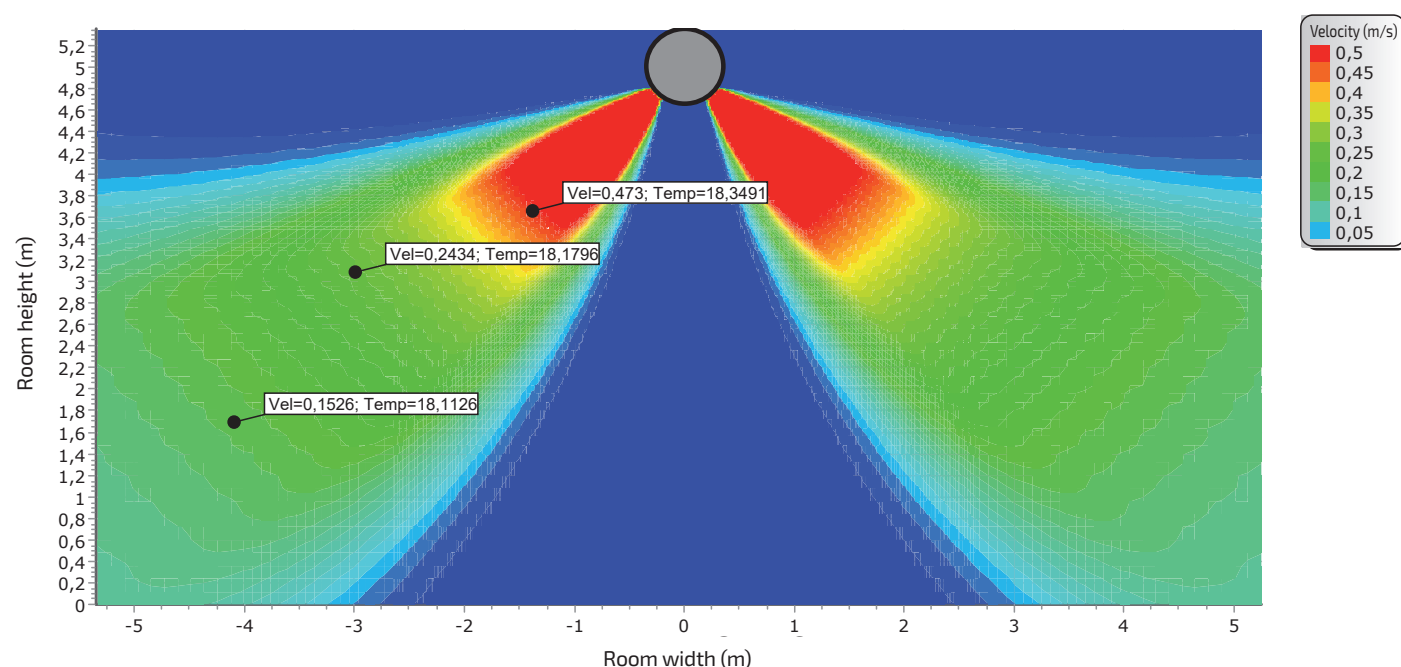


Fig. 3

The high degree of mixing guaranteed by KLIMAGIEL diffusers eliminates air stratification phenomena in the winter season, treating the entire air volume, **improving comfort and reducing consumption**. At the same time, during the summer season, air velocities in accordance with UNI 10339 and EN 13182 are ensured so as not to cause discomfort and to maintain a high level of comfort at all times.

Thanks to our calculation program, it is possible, for each project, to define the optimal phorometry (number size and arrangement of the holes on the diffuser) to guarantee high system efficiency. At the same time, this ensures compliance with air velocities in accordance with UNI 10339 and EN 13182.

It is possible through the use of software to determine air throws, graphically displaying their trend, for both summer and winter air conditioning. With this program, it is also possible to assess the thermal pressure drop suffered by the air flowing through the duct. This in fact exchanges heat with the external environment and, in the case of particularly long diffusers and/or with considerable temperature deltas between the ambient air and the air in the diffuser, can lead to considerable variations in the temperature inside the diffuser.

DIAGRAM OF A DIFFUSER DESIGNED WITH CONSTANT ENERGY DISTRIBUTION

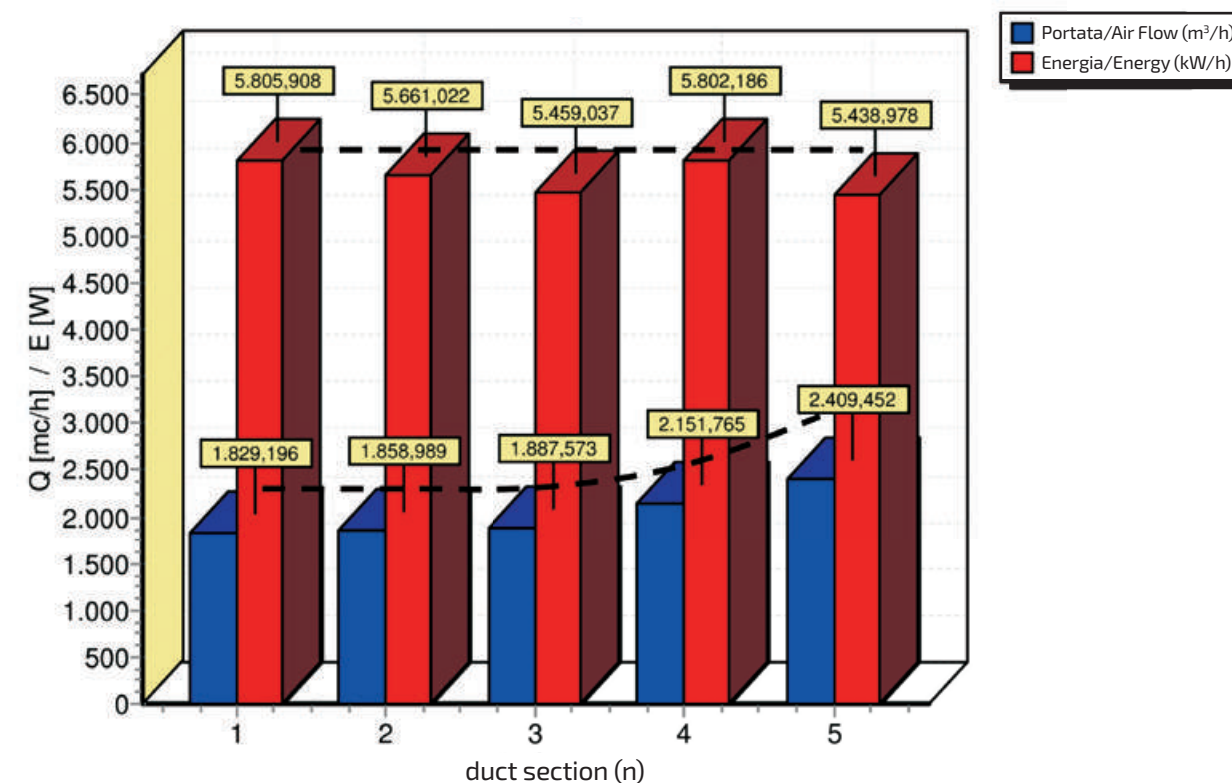


Fig. 4

Another peculiarity of our JET-IN diffusion system, which is particularly useful in the case of JET-IN METAL metal diffusers, consists in the possibility of exploiting the inductive phenomena that are created around the dif-

fuser to greatly **limit the phenomenon of condensation** that would be created on the external surface of the diffuser in the case of summer air conditioning, when the temperature of the supplied air is below the dew point.

CIRCULAR DIFFUSER DIAMETER SELECTION TABLE

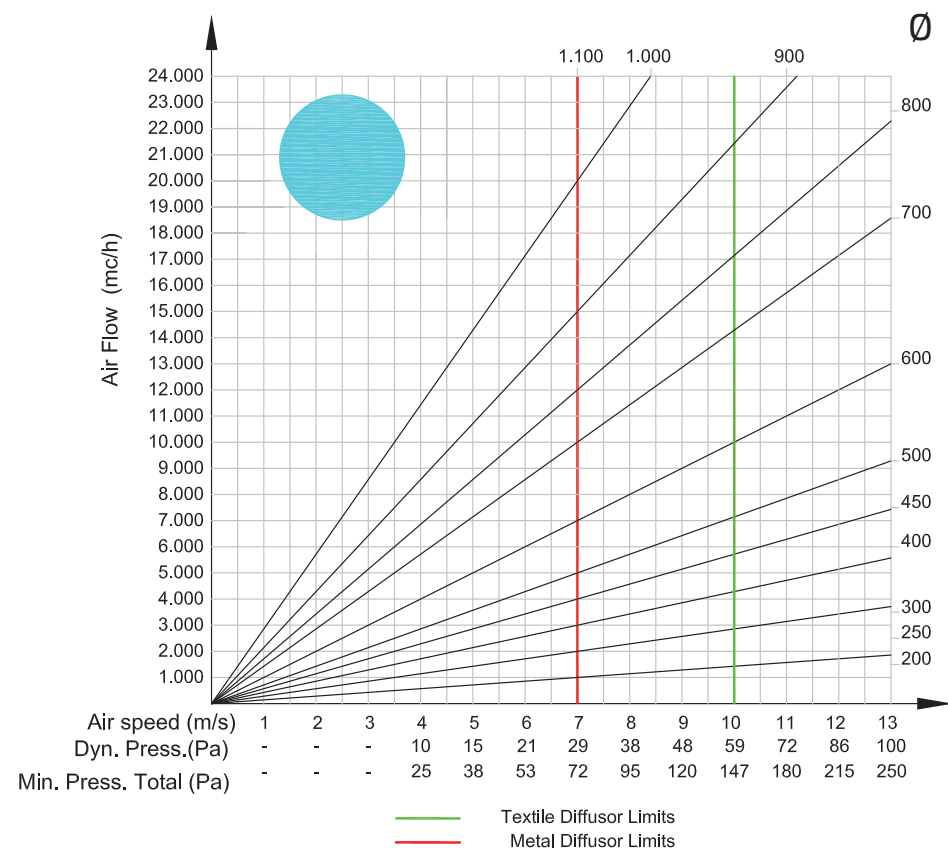


Fig. 5

QUARTER CIRCLE DIFFUSER DIAMETER SELECTION TABLE

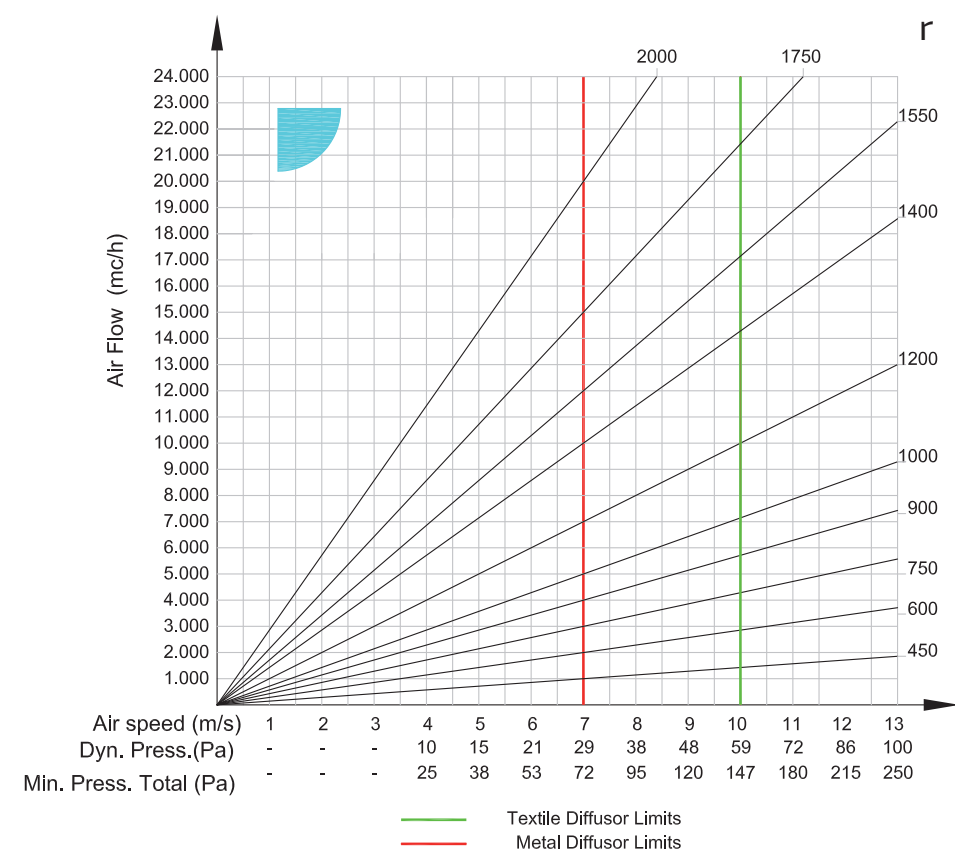


Fig. 7

SEMICIRCULAR DIFFUSER DIAMETER SELECTION TABLE

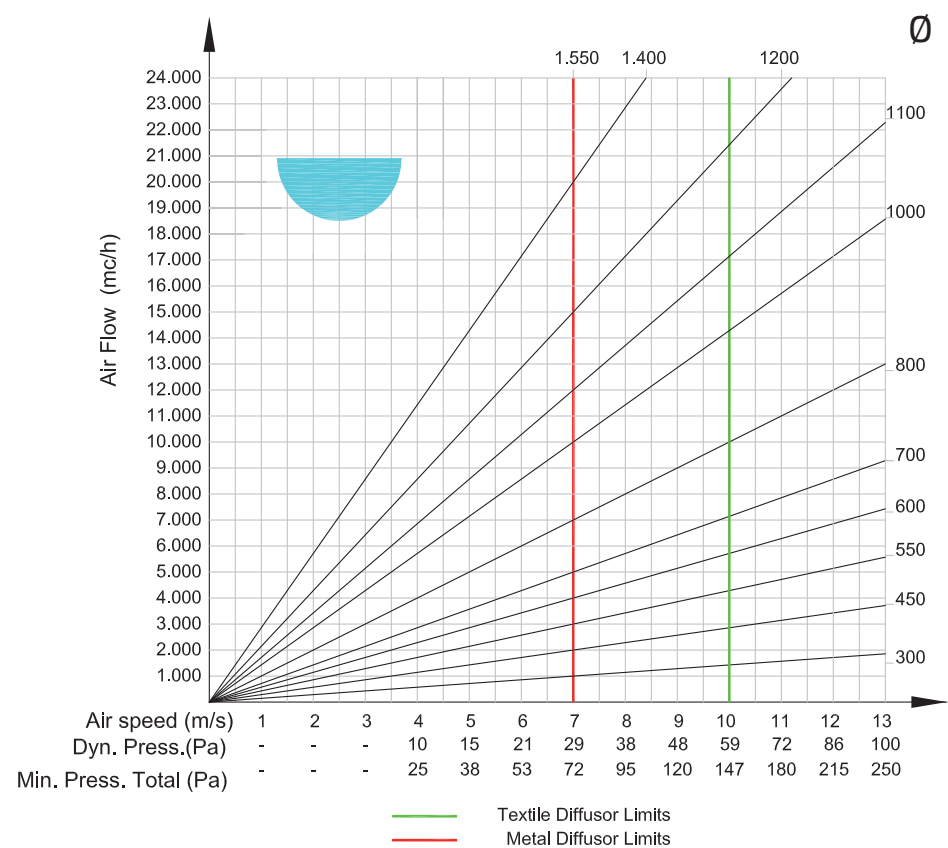


Fig. 6

OVAL DIFFUSER DIAMETER SELECTION TABLE

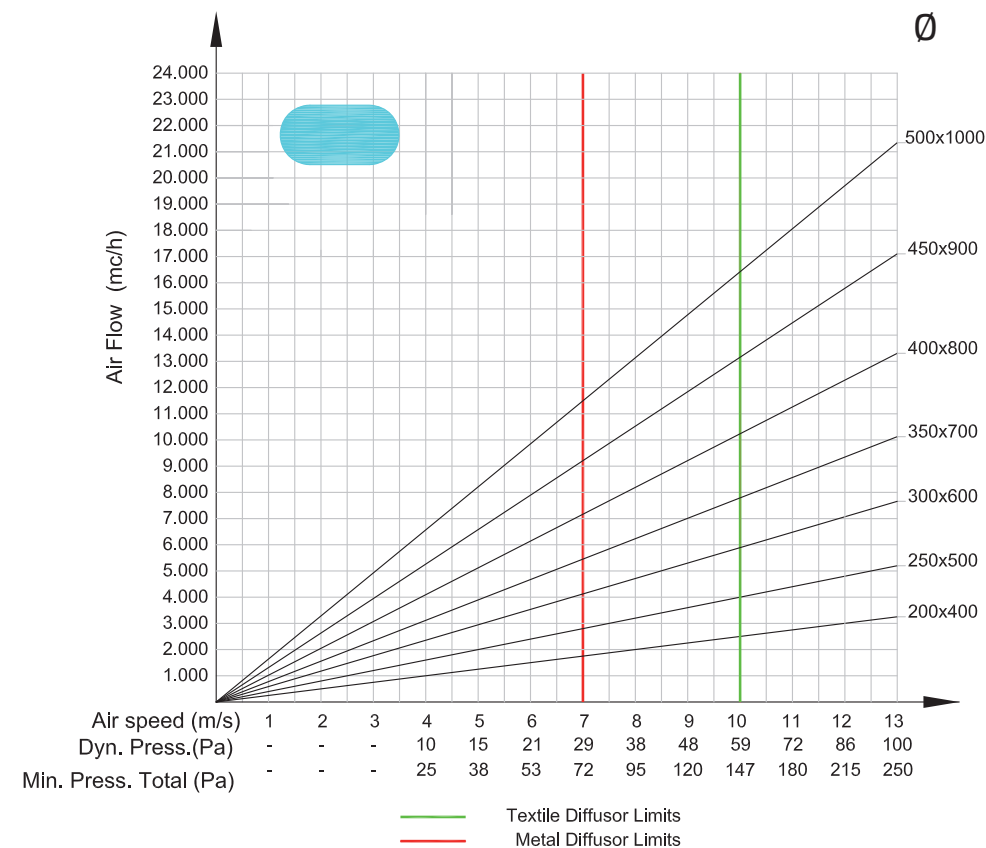


Fig. 8

GRAPH OF CORRESPONDENCE BETWEEN INSTALLATION HEIGHT AND SUITABLE PRESSURE

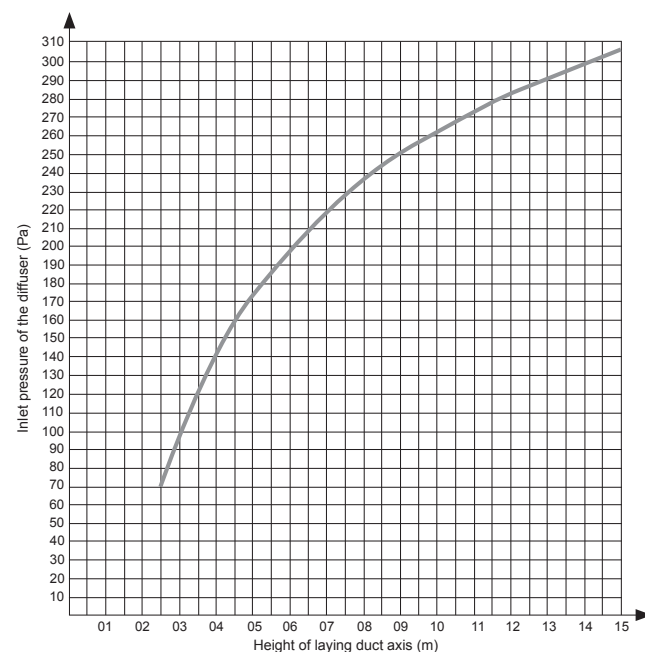


Fig. 9

KLIMAGIEL has recently updated a new CFD (Computational Fluid Dynamics) calculation program (Fig. 10) that allows the simulation of air flow in a realistic environment by considering its interaction with walls, vents, endogenous heat sources (lights, machinery, etc.) with any occasional or extensive obstacles (barriers), etc., thus being able to obtain a rather realistic simulation,

which allows the **temperatures** and air **velocities** in each point of the environment to be assessed. For a profitable use of this software, it is necessary to know precisely the thermodynamic and geometric parameters of both the room and the air conditioning system for the summer and winter seasons, data which must be provided by the Customer.

EXAMPLE OF SIMULATION AT CFD SPEED

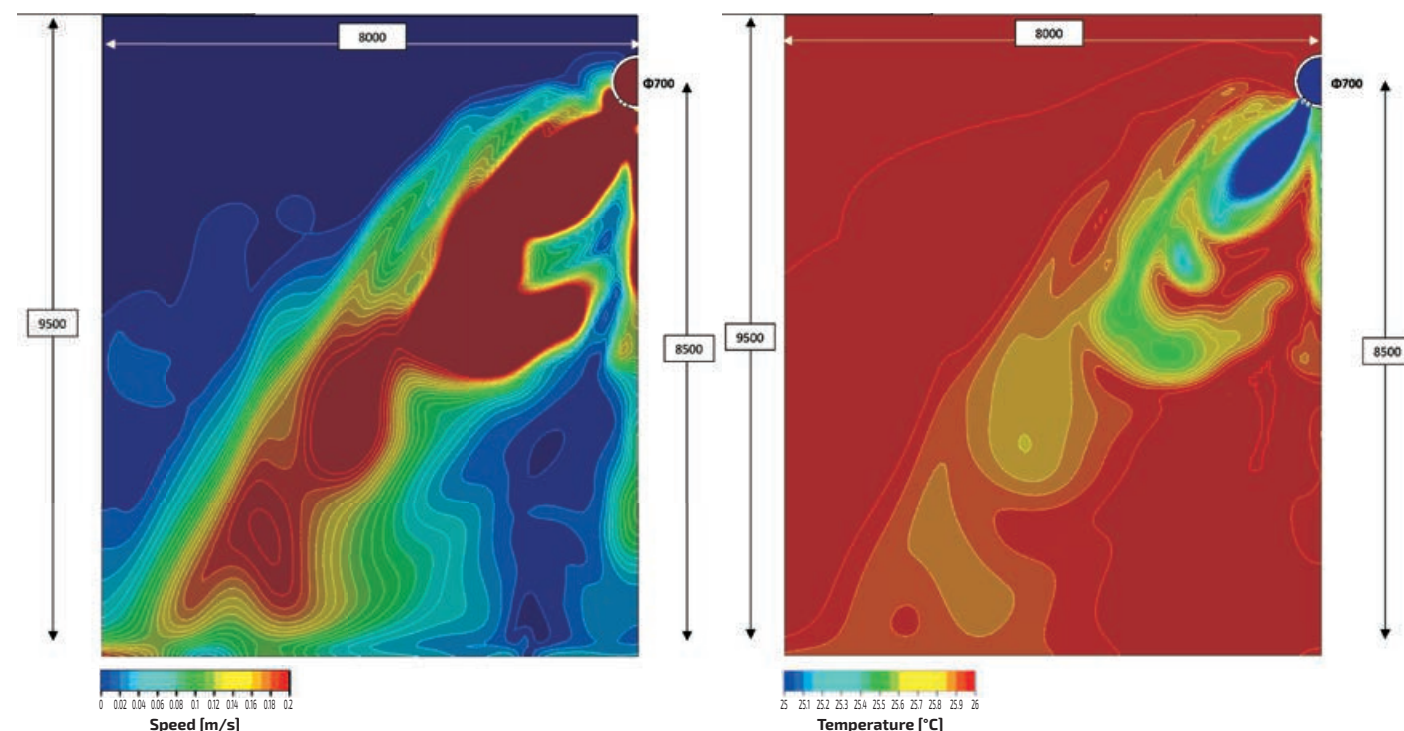


Fig. 10

APPLICATION EXAMPLE OF SIMULATION CFD TEMPERATURE

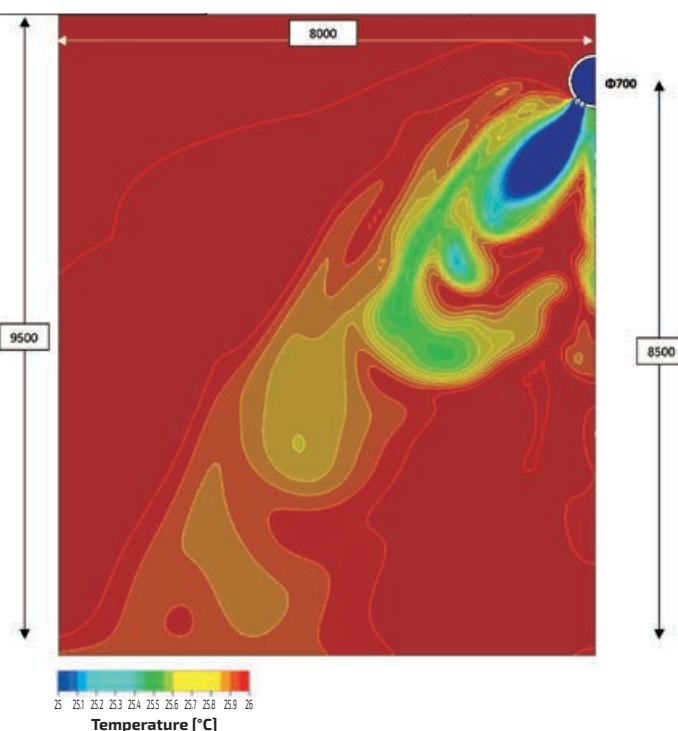


Fig. 11

An example of a CFD (computational fluid dynamics simulation software) simulation is shown above, which allows the airflow in the room to be simulated by checking both velocities (fig. 10) and temperatures (fig. 11). In this case, the diffuser is installed at a high height (8.5 m) and the aim of the simulation is to verify that the injected air can reach the floor while ensuring that the velocity of 0.2 m/s at head height is met.

With regard to velocity, fig. 10, the different isokinetic zones are represented with a colour scale ranging from red (velocities greater than 0.2 m/s) to blue (zero velocity). As far as temperature is concerned, fig. 11, the different isothermal zones are represented with a colour scale ranging from red (temperature above 26°C) to blue (temperature below 26°C).

COMPUTATIONAL FLUID DYNAMICS (CFD)

CFD is a fluid dynamic simulation tool used to analyse complex thermal and fluid dynamic phenomena using dedicated software. The timing of CFD varies according to the complexity of the project to be analysed.

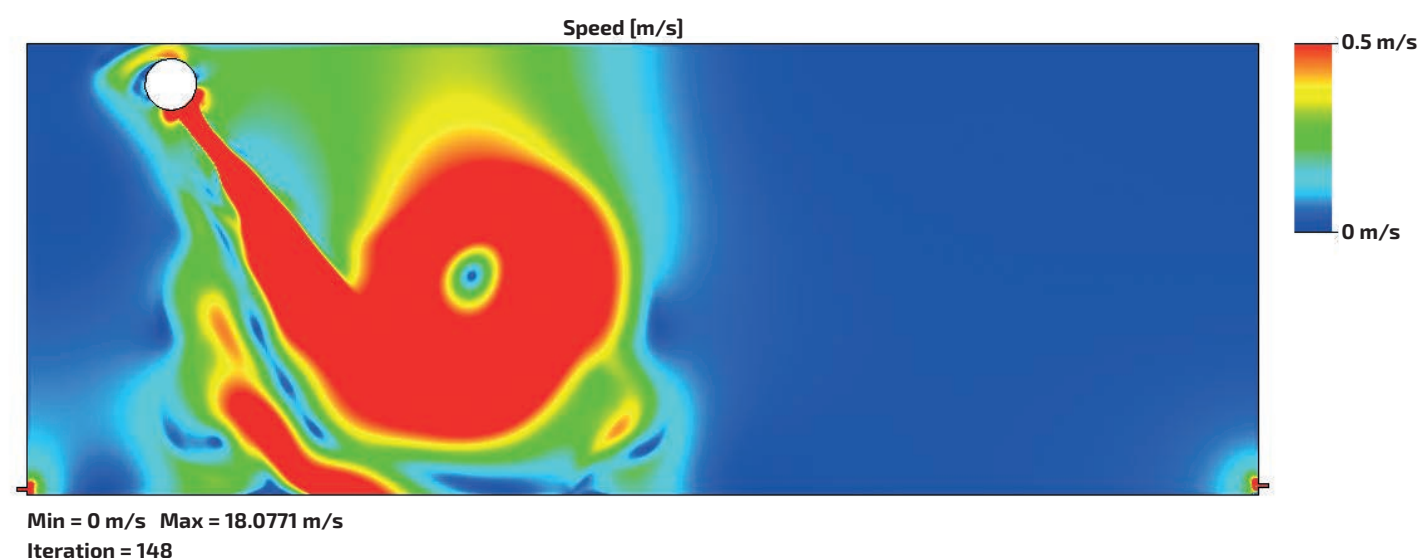


Fig. 12

SUMMARY OF STRENGTHS COMPARED TO TRADITIONAL SYSTEMS



High degree of comfort and homogeneity of the thermodynamic characteristics of ambient air.



Maximum energy efficiency.



Elimination of the phenomenon of stratification of warm air in winter.



Exploiting the inductive phenomenon by eliminating the formation of condensation.



Speed of assembly and ease of maintenance.



Aesthetically pleasing and adaptable to the context.

TEXTILE DIFFUSERS

Induction **TEX jet** THE CHARACTERISTICS

The polyester fabrics used by KLIMAGIEL are certified according to the **STANDARD 100 by OEKO-TEX®**, one of the most renowned brands worldwide for fabric certification. This certification attests that the fabrics used do not contain harmful substances to health and that the dyes used for dyeing are non-toxic. The certification also includes laboratory tests to assess the suitability of polyester fabrics for use in the food industry, ensuring safety and compliance. For this reason, KLIMAGIEL offers fabrics with **antibacterial coating** for use in cleanrooms or the food industry. Additionally, an **antistatic fabric** is available to reduce static charge buildup, ideal for sensitive applications. Designed with **inorganic fiber** fabrics, KLIMAGIEL products offer maximum hygiene and lightness, minimizing the impact on building structures compared to other distribution systems.



KLIMAGIEL is committed to environmental sustainability, offering air distribution ducts made from 100% **recycled fabric**. This fabric, derived from recycled polyester, ensures high-quality air distribution, ideal for increasingly sustainability-oriented environments. KLIMAGIEL's **laser technology** allows for optimal definition of the forometry for each solution. This cutting method seals the hole, prolonging the duct's lifespan and reducing fiber dispersion into the conditioned environment. Continuous research and development on fabrics and their technical characteristics have made micro-perforated textile diffusers an ideal solution in many applications. The fixing systems have been carefully designed, offering ease of installation, reliability, and flexibility. Leveraging the principle of high induction, the precise design allows for the mixing of primary air with ambient air, ensuring a high level of comfort.

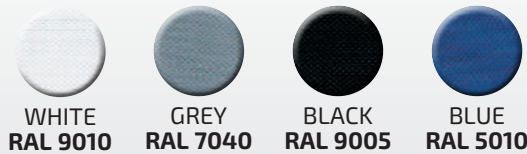
MATERIALS

| TYPE | MATERIAL | SPALMING | SPECIFIC WEIGHT | REACTION TO FIRE |
|----------------|-------------------------|----------------------------------|-----------------|--------------------|
| FEATHER | 100% polyester | Acrylic P.U. | 70 g/m² ± 5% | Euroclass B s1, d0 |
| PREMIUM | 100% polyester | Acrylic P.U. | 110 g/m² ± 5% | Euroclass B s1, d0 |
| FIBRE | 100% glass fibre | Fire-retardant P.U | 450 g/m² ± 5% | Euroclass A |
| RECYCLED | 100% Recycled polyester | N/A | 250 g/m² ± 5% | N/A |
| ANTISTATIC | 100% polyester | Acrilic P.U., Fire-retardant P.U | 160 g/m² ± 5% | Euroclass B s1, d0 |
| ANTIBATTERICAL | 100% polyester | Acrilic P.U., Fire-retardant P.U | 160 g/m² ± 5% | Euroclass B s1, d0 |

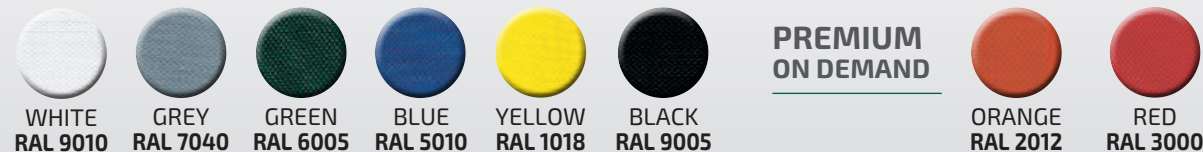
COLOURS

A choice of colours from the RAL classic scale is available (RAL for information only) depending on the type required:

FEATHER



PREMIUM



FIBRE



RECYCLED



ANTISTATIC



ANTIBACTERIAL



THE ADVANTAGES OF FABRIC DIFFUSERS AT A GLANCE



Extremely lightweight solution that does not burden load-bearing structures of buildings.



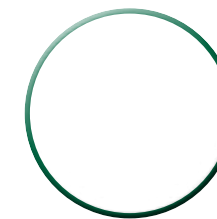
Quick installation and easy maintenance.



The most economic solution for homogeneous air conditioning of environments.

THE AVAILABLE CROSS-SECTIONS

Strongly focused on customer satisfaction, KLIMAGIEL researches and offers its partners the best possible solution, carefully evaluating every technical, functional, economic and architectural aspect. Fabric diffusers are available in circular, semicircular, ¼ turn or even lenticular cross-sections. On request, we also design and supply customised solutions with special cross-sections.



CIRCULAR



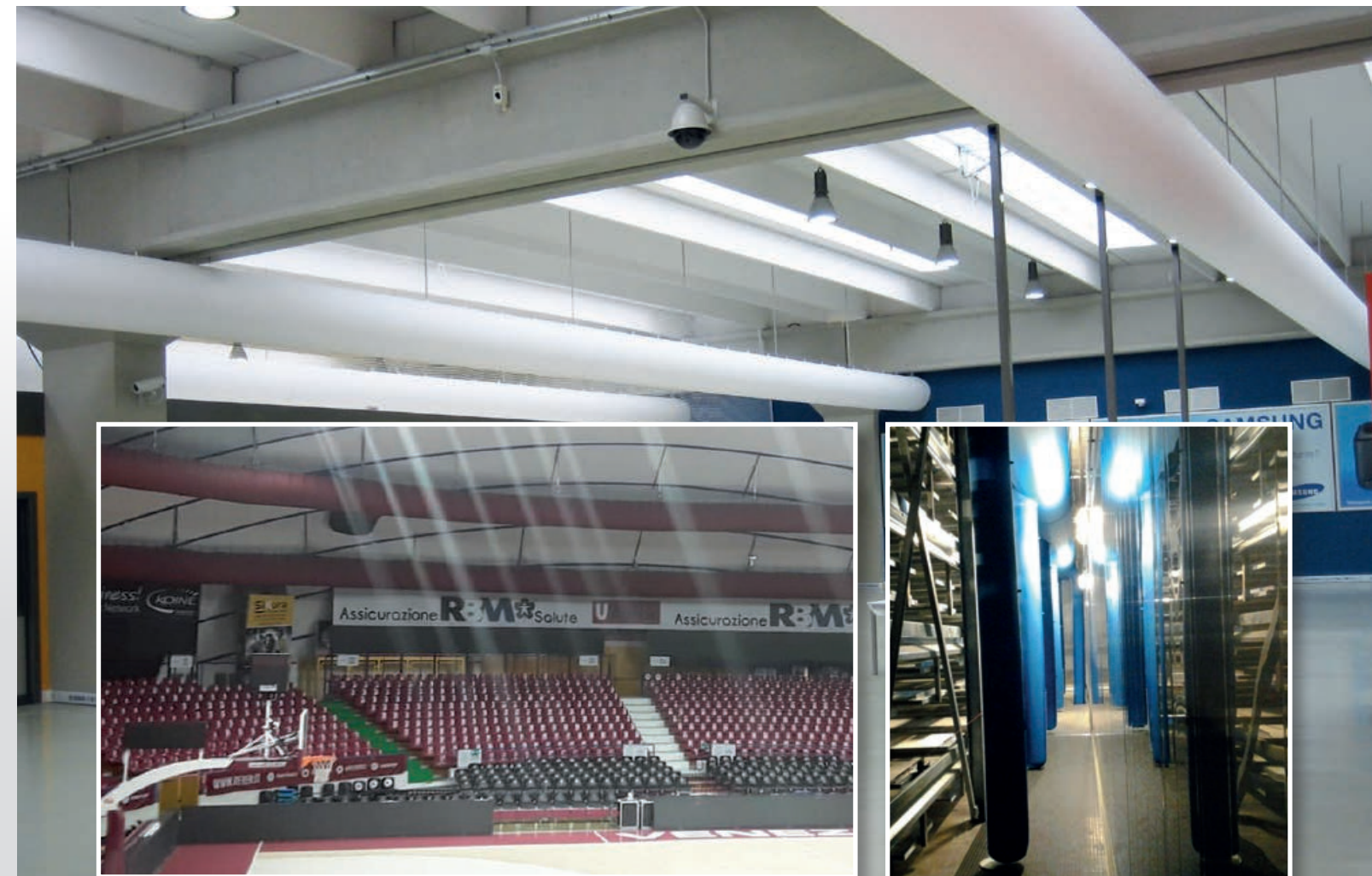
SEMICIRCULAR



QUARTER



LENTICULAR



TEXTILE DIFFUSERS

Screen-printed **TEX jet**

To respond to aesthetic market trends, KLIMAGIEL offers the service of **fully customised fabric ducts**. On request, KLIMAGIEL produces TEX jet designs with the company logo, colour of your choice, images, graphic motifs or lettering.

A graphic file with the layout of the duct in high-resolution pdf format is required for implementation.



TEXTILE DIFFUSERS

Light **TEX jet**

KLIMAGIEL offers an elegant solution for projects where it is necessary to integrate an aesthetic solution with a functional one: Light TEX jet.

We make fabric ducts with the possibility of inserting an LED strip/bar inside to provide diffuse ambient light.

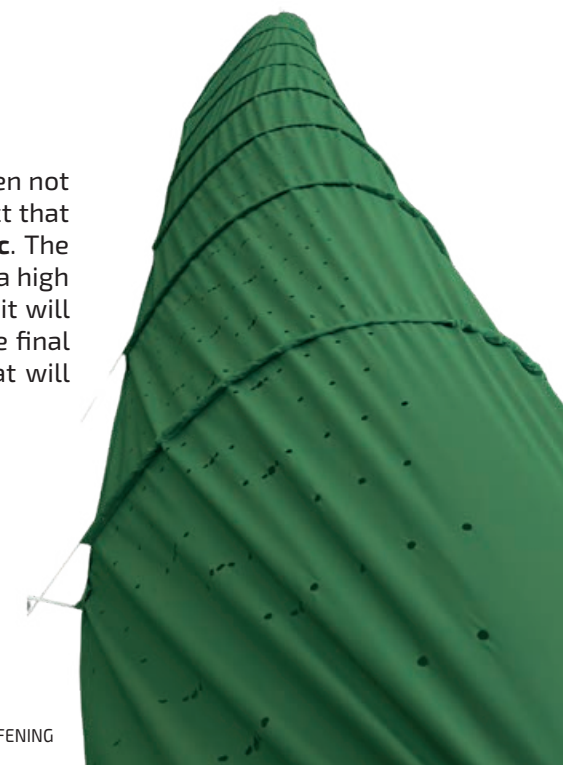
The installation of lighting inside the duct requires the intervention of a qualified electrician or specialized professional.



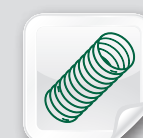
Duct stiffening rings **TEX jet**

AESTHETIC SOLUTION FOR STIFFENING FABRIC DUCTS

KLIMAGIEL stiffening rings serve to keep the circular fabric duct in shape when not in use. During the fabrication phase, special pockets are sewn inside the duct that will accommodate the stiffening rods made of **fibreglass-reinforced plastic**. The profile, therefore, is made of a light and particularly strong material, making a high quality final product. Since the machining is done on the inside of the duct, it will have a completely smooth aesthetic appearance once it is straightened. The final product is a **lightweight, safe and ready-to-install** KLIMAGIEL air duct that will keep its round shape even when air conditioning machinery is switched off.



STRENGTHS



Maintains the shape of the fabric duct even when it is not in use.



More lightweight structure compared to traditional skeletons.



Thanks to the integrated system, installation is faster than with traditional skeletons.



Logistics of the final product faster and less expensive.



The final product is safer compared to traditional skeletons in case of accidental falls.

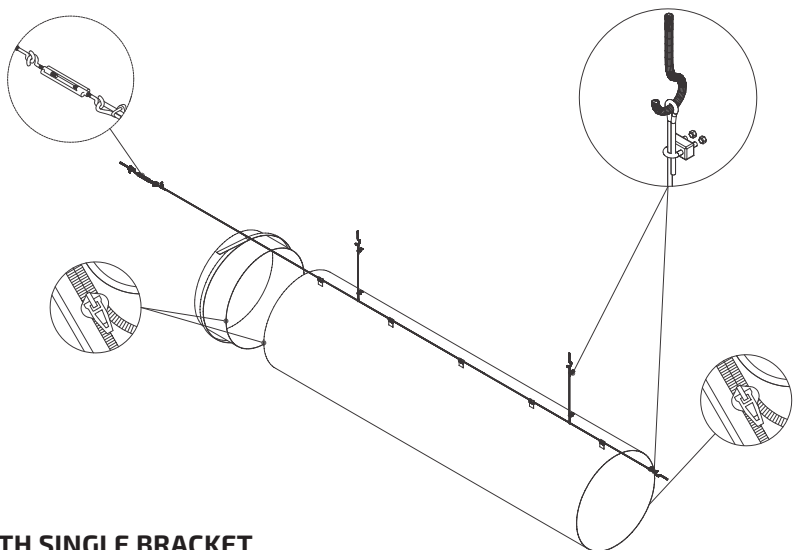


Easily washable and sanitised.

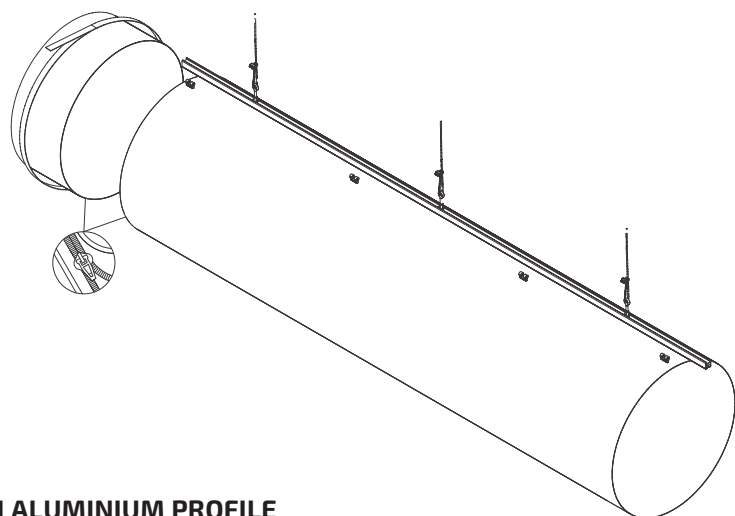
TEXTILE DIFFUSER FIXING SYSTEMS

All textile diffusers are supplied complete with installation accessories. The fixing system can include cables or aluminium profiles, depending on the type of cross-section or the customer's choice. Strips with clips, tie-rods and cable glands are calculated for each individual job and made available for quick and easy installation. Fabric diffusers can be supplied with single or double suspension cable (depending on diameter or design requirements).

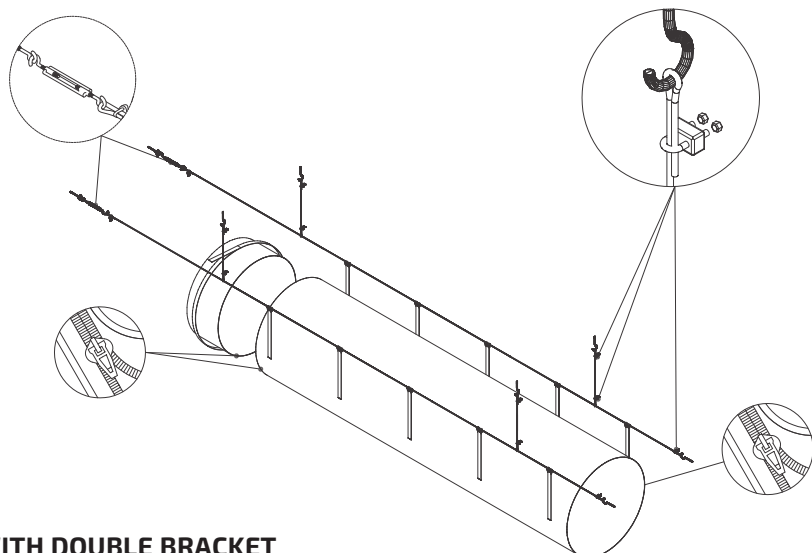
The semicircular duct, which is ideally suited for rooms with flat ceilings and low heights, is supplied as standard with aluminium profiles for ceiling installation (see all KLIMAGIEL accessories on page 33).



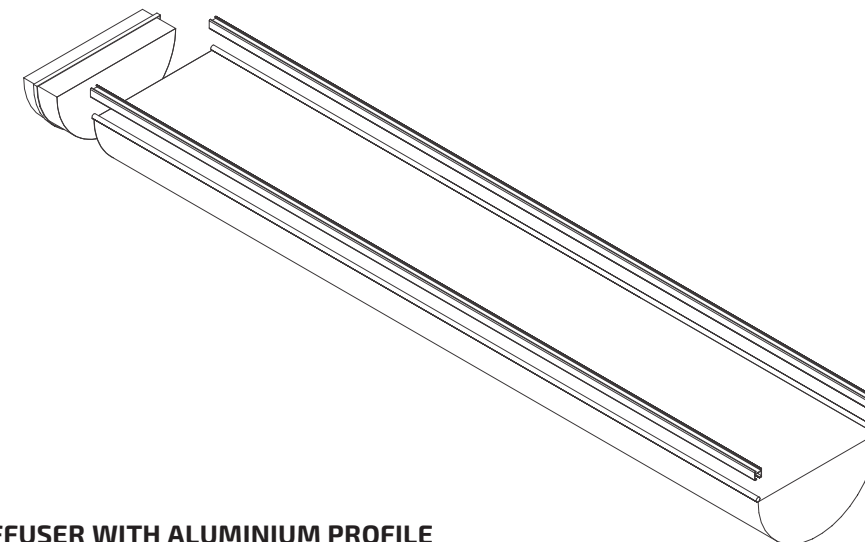
CIRCULAR DIFFUSER WITH SINGLE BRACKET



CIRCULAR DIFFUSER WITH ALUMINIUM PROFILE



CIRCULAR DIFFUSER WITH DOUBLE BRACKET



SEMI-CIRCULAR DIFFUSER WITH ALUMINIUM PROFILE

MAINTENANCE INSTRUCTIONS

The following PPE **MUST** be used when servicing the machine:



Maintenance includes general cleaning of the duct, to be carried out as **needed**.

EUROCLASS B, S1-D0 FABRIC DUCT CLEANING

The following requirements **MUST** be observed when cleaning the duct:



To clean the duct, perform the following steps in this order:

1. Disassemble the duct.
2. Carry out a washing cycle, either by hand or by machine, in accordance with the following requirements:
 - Use of neutral detergent

- Temperature of 40°C
- Maximum duration of 15 min
- 3. If necessary, rinse the duct.
- 4. If necessary, run another wash cycle.
- 5. Let the duct to dry at room temperature.
- 6. Reassemble the duct.

If you wish to request washing service, please contact the Manufacturer.

EUROCLASS A1 GLASS FIBRE DUCT CLEANING

The following requirements **MUST** be observed when cleaning the duct:



To clean the duct, perform the following steps in this order:

1. Disassemble the duct.
2. Carry out a hand-wash cycle at a maximum temperature of 40°C.

3. If necessary, rinse the duct.
4. If necessary, run another wash cycle.
5. Let the duct to dry at room temperature.
6. Reassemble the duct.

METAL DIFFUSERS

Induction METAL jet

THE CHARACTERISTICS

Induction METAL jet diffusers offer a wide range of solutions.

They can be produced from different materials, depending on application and environmental characteristics, guaranteeing long life and reliability.

By exploiting the high induction principle, they generate optimal distribution and diffusion of the treated air.

The flow generated by the air coming out of the calibrated holes, the distribution of which over the duct is carefully studied, generates an optimal mixing of the primary and ambient air, achieving maximum room comfort.

The perfect calibration and distribution of the holes, together with the correct sizing for controlling the internal speeds, will allow for ambient **noiselessness** suitable for all applications.

The wide range of available fittings allows the design of routes that can be adapted to any environment. The diffusers are designed for quick and safe assembly using only a few tools.

KLIMAGIEL can offer its microperforated metal diffusers in the following materials:

| MATERIAL | REGULATION | STRUCTURE | SURFACE APPEARANCE |
|----------------------------|------------------------|---|---|
| GALVANISED STEEL | EN 10346 | Carbon steel + galvanisation 200 g/m ² | MICRO-HOLED |
| PRE-PAINTED STEEL | EN 10346 | Carbon steel + galvanisation 200 g/m ² | Anticorrosive PRIMER basecoat + polyester paint |
| PAINTED STEEL | EN 10346 | Carbon steel + galvanisation 200 g/m ² | Hot-dip galvanised with powders |
| AISI 304 STAINLESS STEEL | EN 10088 - LEGA 1.4301 | Austenitic | 2B, 2D, BA, satin or scotch brite |
| AISI 316 L STAINLESS STEEL | EN 10088 - LEGA 1.4404 | Austenitic | 2B, 2D, BA, satin or scotch brite |
| AISI 316 L STAINLESS STEEL | EN 10088 - LEGA 1.4016 | Ferritic | 2B, 2D, BA, satin or scotch brite |
| ALLUMINIUM | EN 485-2 - LEGA 5005 | Alluminium 100 g/m ² | MATTE |

COLOURS

5 colours are available for pre-painted steel:



WHITE
RAL 9010



ALUMINIUM GREY
RAL 9006



ANTHRACITE GREY
RAL 7016



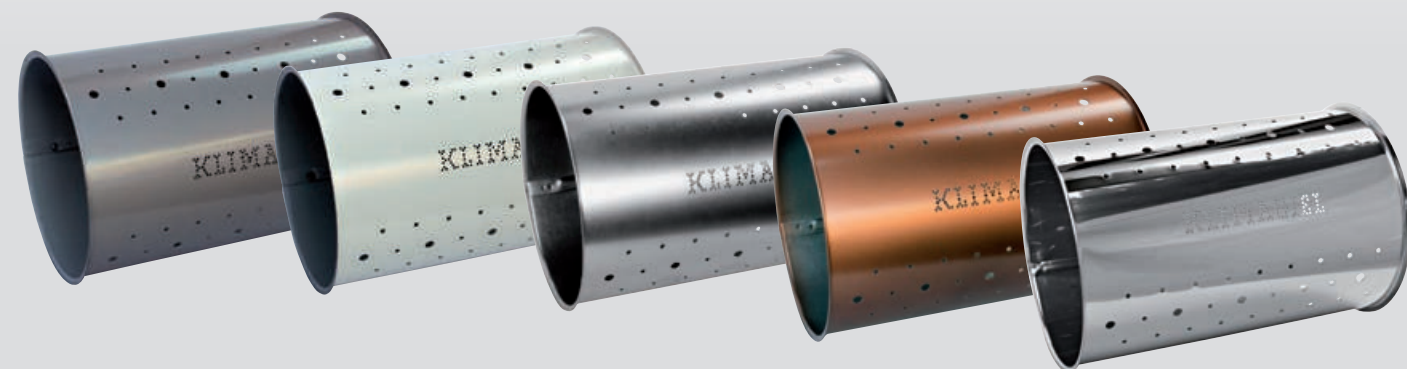
BLACK
RAL 9005



BLUE
RAL 5010

Design and architectural firms will have all the colours of the RAL CLASSIC scale available when powder-coated steel is chosen. A special COPPER EFFECT coating is also available in which a percentage of copper powder is present inside, with great cost advantage and invariability over time compared to solutions in this material. The wide range of available fittings allows the design of routes that can be adapted to any environment.

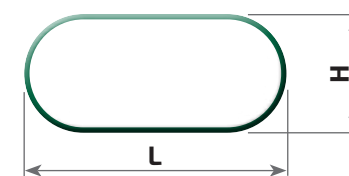
The diffusers are designed for quick and safe assembly using only a few tools (see all KLIMAGIEL accessories on page 33).



Induction OVAL jet

An elegant solution for metal applications where a lower height profile is required compared to traditional circular ducts is the **OVAL jet** metal duct.

AVAILABLE SIZES



| H | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|-----|-----|-----|-----|-----|-----|------|
| L | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |

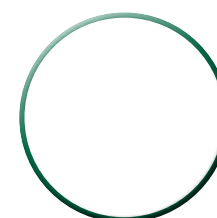
AVAILABLE CROSS-SECTIONS

METAL jet metal diffusers are available in **circular** cross-section with diameters from 200 to 1700 mm, **semicircular** with diameters from 200 to 1000 mm and **oval** with height from 400 to 1000 mm.

Each size and shape is available in all material and colour variants provided.

KLIMAGIEL researches and offers its partners the best possible solution by carefully evaluating every technical, functional, economic and architectural aspect.

The fixing systems are based on criteria of absolute **reliability** and **speed** of assembly.



CIRCULAR



SEMICIRCULAR



QUARTER



OVAL

THE ADVANTAGES OF METAL DIFFUSERS AT A GLANCE



High degree of environmental comfort thanks to the homogeneity of air treatment in the room.



Easy installation thanks to plug-in bayonet and connecting clamps.



Anti-condensation effect on the duct surfaces.



Ambient quietness suitable for all applications through calibration and the distribution of holes and the strict control of speeds.



METAL DIFFUSERS

Klimagiel Custom Metal Ducts: Sinergy of Aesthetics and Advanced Technology

We proudly present our premium range of KLIMAGIEL custom metal ducts, designed to combine refined aesthetics and superior performance.

*These solutions have been carefully developed to embellish every environment-from **BEAUTY SALONS** to functional spaces in **AIRPORTS**, from cozy **RESTAURANTS** and **BARS** to elegant **HALLS in HOTELS**, as well as facilities such as **POOLS**, **SUPERMARKETS**, **OFFICES**, **BOUTIQUES** and **FOOD INDUSTRIES**.*

In addition, our ducts are designed to operate without compromise over a wide thermal range, demonstrating stability and integrity from -35 to +85 degrees Celsius.

Such exceptional thermal resistance makes them ideal for applications in demanding environments, while maintaining unaltered aesthetic and structural properties.

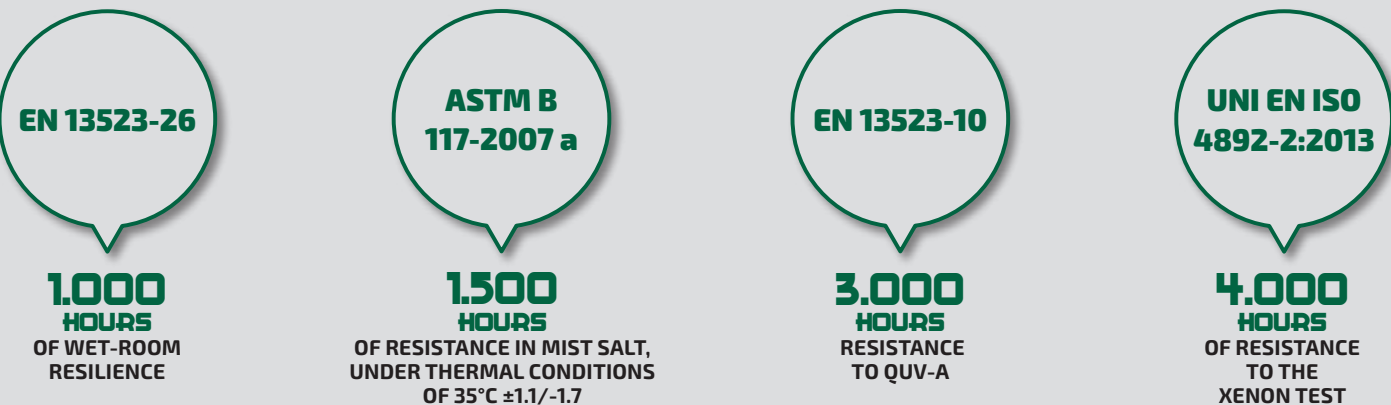
CUSTOM DESIGN AND ADVANCED FUNCTIONALITY

With a palette of customizable finishes-both transparent and opaque, plain or artistically decorated, and the option of highly polished surfaces-our collection offers high cleanability and outstanding resistance to solvents, scratches and chemicals.

Compatible with contact food, Klimagiel ducts meet all the safety criteria required for use in food environments.

CERTIFIED PERFORMANCE IN ALL CONDITIONS

The resilience of our metal ducts is validated by stringent tests and rigorous standards:



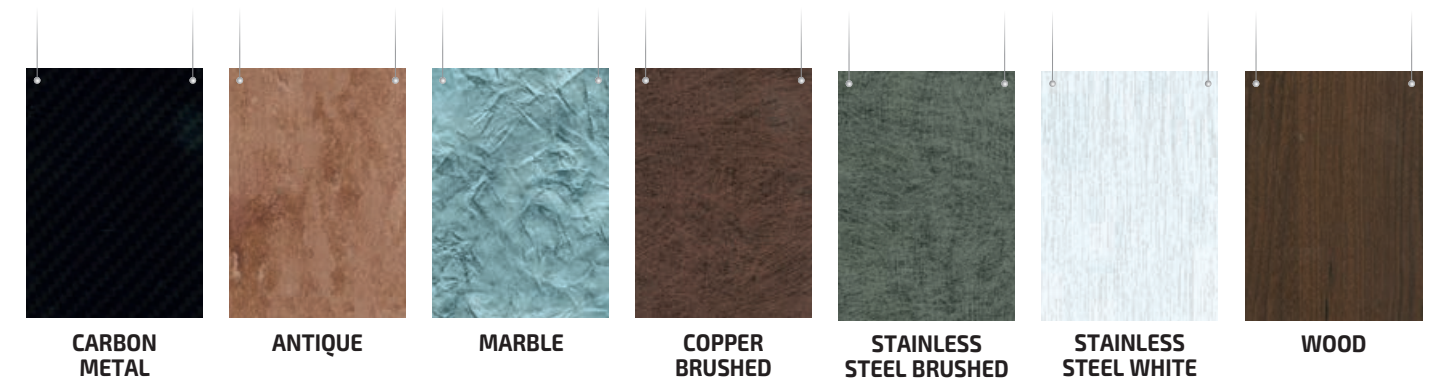
METAL DIFFUSERS

COMMITMENT TO THE ENVIRONMENT

In addition to exhibiting superior quality, our ducts are fully recyclable and produced without the use of PVC or solvents, reflecting our commitment to supporting a greener and more sustainable future.

WE INVITE ARCHITECTS, DESIGNERS AND PROFESSIONALS TO DISCOVER HOW OUR LINE OF METAL DUCTS CUSTOMIZED CAN ENRICH THEIR PROJECTS, LENDING A DISTINCTIVE CHARACTER TO ANY SPACE.

COLOURS



STRENGTHS



INSTALLATION SOLUTIONS

With a focus on ease of installation and quality of the end result, KLIMAGIEL's experience has led to the design and implementation of unique solutions for the benefit of its partners.

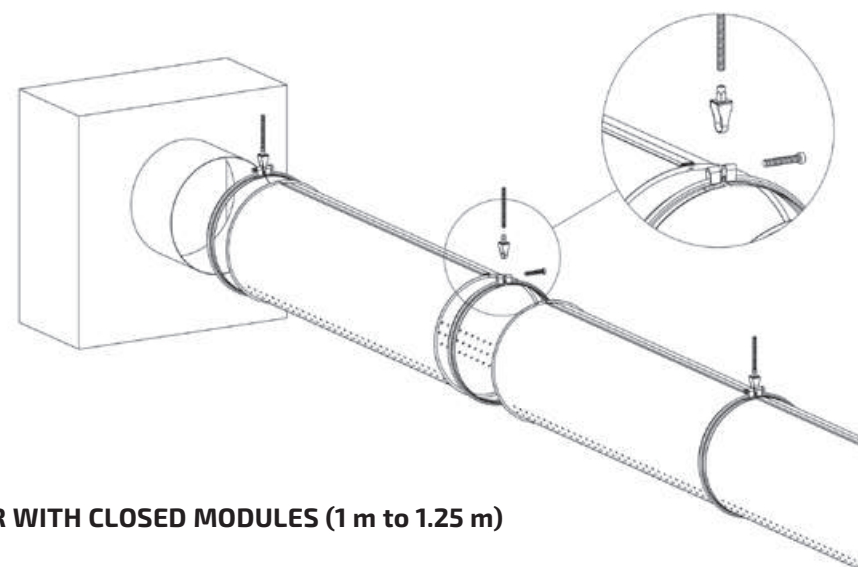
FAST-FIX circular ducts, with a length of 1250 mm, are normally supplied with a longitudinal bayonet joint for on-site fixing (thus reducing transport costs), without the need for riveting.

The flaps are suitably shaped with a **patented folding system** to relieve material tension. For diffusers with a diameter of 1,050 mm or more, the **internal stabilising frame** (patent application filed, see "ACCESSORIES" section) is supplied, which facilitates assembly and maintenance of the circular shape.

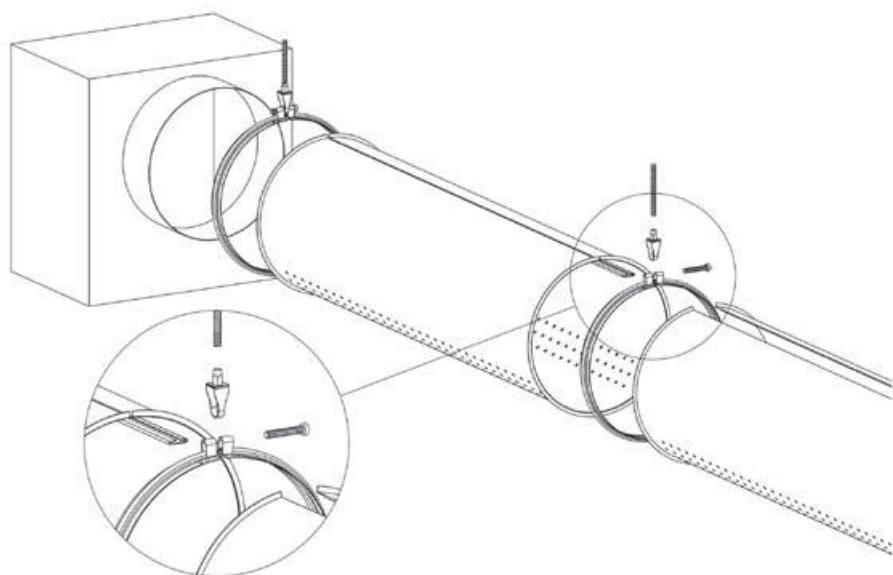
This is particularly useful during assembly, in order to avoid ovalisation and difficulties in coupling between duct sections, in often already complex working conditions.



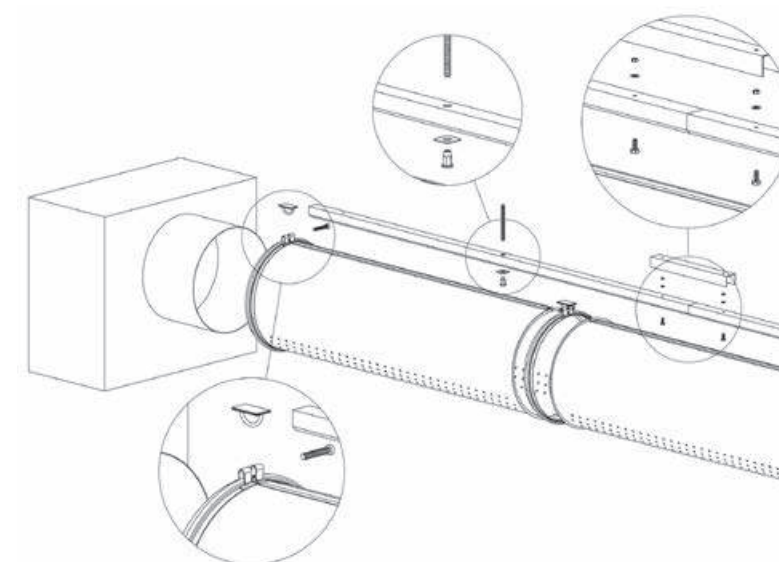
Video of the installation



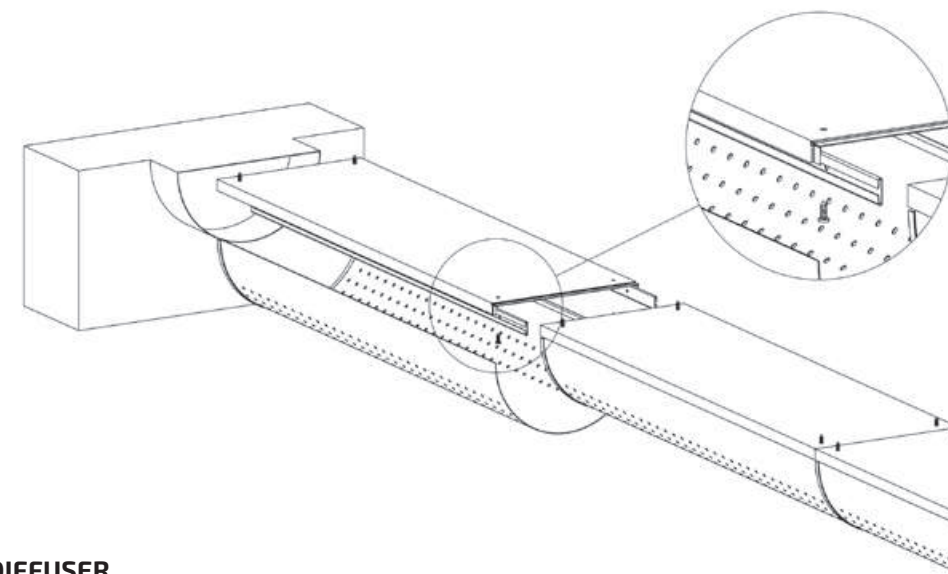
CIRCULAR DIFFUSER WITH CLOSED MODULES (1 m to 1.25 m)



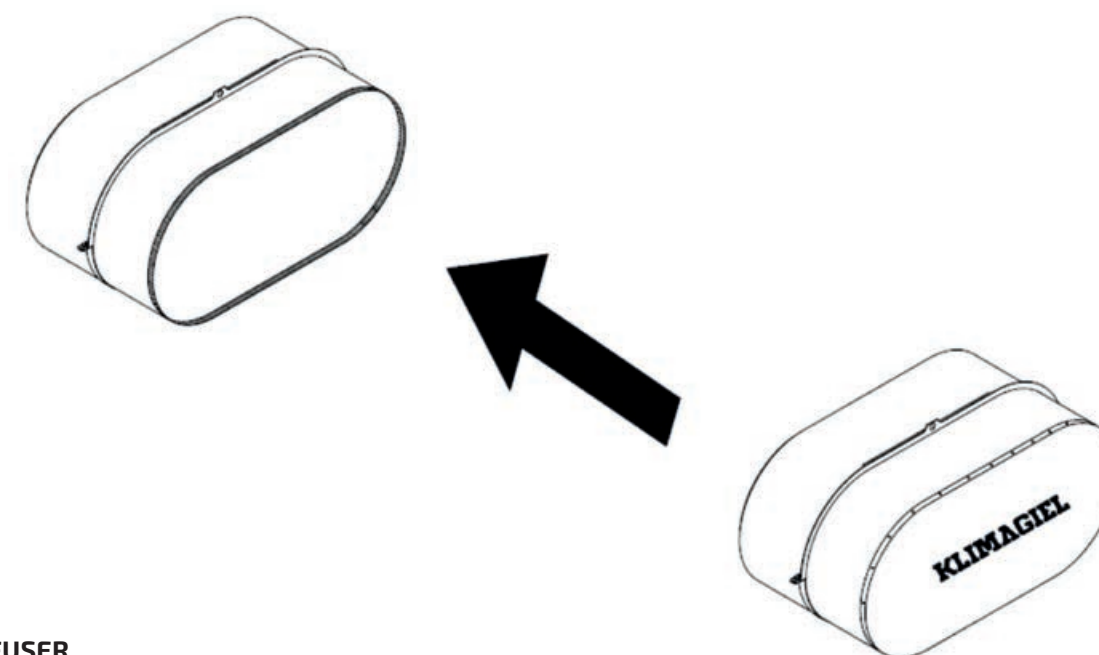
CIRCULAR DIFFUSER WITH OPEN MODULES (FAST-FIX 1.25 m)



CIRCULAR DIFFUSER WITH GALVANISED STEEL PROFILE



SEMICIRCULAR DIFFUSER



OVAL DIFFUSER

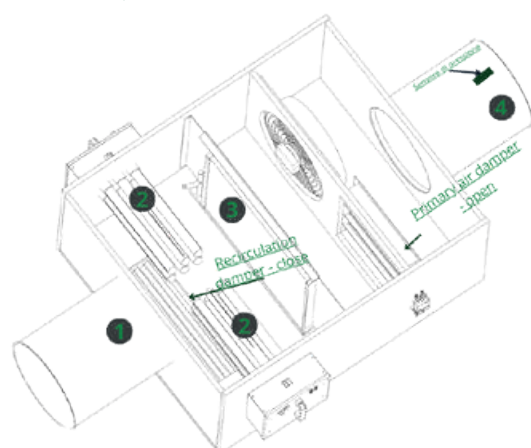
INDUCTIVE SUPPORT POST-TREATMENT UNIT

ESA Energy Safe Airflow

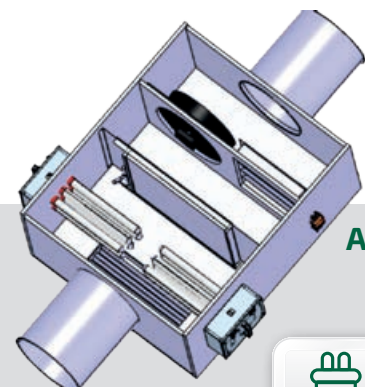
In all-air or mixed systems, current controls include temperature and CO₂ (air salubrity) control with a detector on the extraction at the inlet of the machine and a pressostatic control at the outlet by INVERTER on the booster fan.

How can zones be separated so that sectors can be turned off and thus save energy, and/or an accurate control of the temperature and an healthful air?

FULL-SCALE OPERATION (HIGH SPEED)



1. Primary air from the Air Handling Unit (AHU or CTA) enters the ESA plenum. The recirculation damper is closed, all primary air exits only from the Klimagiel air distribution duct.
2. Primary air passes through the optional KLIN-AIR air sanitizing system.
3. The sanitized primary air passes through the heating/cooling after-treatment coil to reach the desired temperature, optional.
4. Primary air is distributed uniformly in the room through Klimagiel ducts.



ADVANTAGES



Energy savings up to 60%.



Ionized and sanitized air.

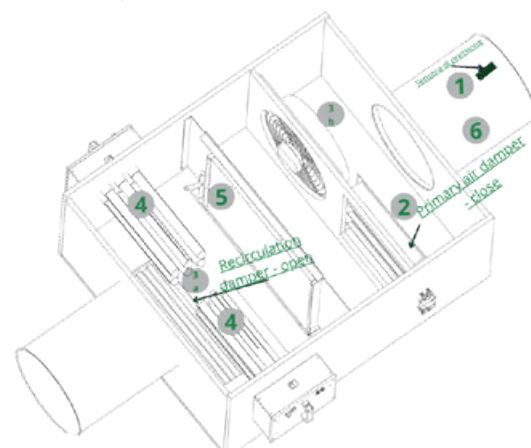


Uniform and comfortable diffusion.

Klimagiel's Energy Safe Airflow (**ESA**) system is designed to maintain optimal working conditions on the air diffusion line. This allows the homogeneity of energy distribution in the room resulting in a reduction of relative dispersion.

Klimagiel's **ESA** can be equipped with the KLIN-AIR air sanitizing system and air quality control via CO₂ sensor. This allows zonal regulation of salubrity and temperature of the enslaved environment.

PARTIAL OPERATION (LOW SPEED)



1. The duct pressure sensor detects a pressure lowering.
2. The damper closes to avoid that recycled air would come into either the duct or the AHU duct.
3. The recirculation damper opens and the EC (electronic control) fan works in order to keep the required pressure and air flow for the diffusion recirculating the existing air in the room.
4. Recycled air comes through the KLIN AIR system for further sanitization, optionally.
5. Recirculation air passes through the heating / cooling after-treatment coil to reach the desired temperature, optional.
6. Air is distributed uniformly in the room through the Klimagiel ducts.

AIR DISTRIBUTION SYSTEM

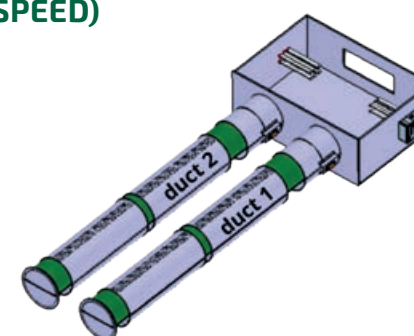
OPTI AIR for AHU Systems with Variable Flow Rate

COMFORT WITH PRECISE CONTROL

The **OPTI AIR** system, designed for Air Handling Units (AHU) with variable flow rate and pressure variations, offers uniform air distribution, ensuring optimal comfort in every environment.

OPERATION EXAMPLE

FULL SPEED OPERATION (HIGH SPEED)



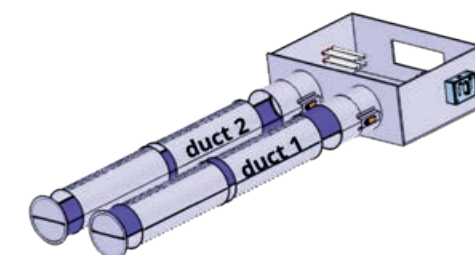
1. The UTA works at the maximum speed.
2. The air, going through the plenum, is sanitized by Klin-Air (optional).
3. The air is distributed between the 2 membrane ducts.
4. The signal from the control unit, received by the Opti Air electronic sensor, turns on the actuator which lifts the membrane of both ducts, covering the upper perforation.
5. The duct diffuses the air inductively through the projected perforation.

OPTI AIR OFFERS MAXIMUM COMFORT WITH PRECISE REGULATION, ADAPTING DYNAMICALLY TO THE CONDITIONS AND NEEDS OF EACH ENVIRONMENT.

MAIN COMPONENTS

1. **PLENUM**: allows uniform diffusion of air in the ducts, contributing to sanitization through Klin-Air (optional).
2. **DOUBLE JET DUCTS WITH MEMBRANE**: the channels dynamically adapt to the flow rate, displacing or diffusing the air according to the specific needs.

PARTIAL OPERATION (LOW SPEED)



1. The AHU works at reduced speed (lowered pressure and flow).
2. The air, passing through the Plenum, is sanitized by Klin-Air (optional).
3. The air diffuses between the 2 membrane ducts.
4. The signal from the control unit, received by the Opti Air electronic sensor, keeps the membrane in duct nr 1 raised, covering the upper perforation.
5. Duct nr. 1 diffuses high induction air.
6. The signal from the control unit, received by the Opti Air electronic sensor, lowers the membrane in channel 2, covering the lower perforation.
7. Duct nr 2 displaces the air from the upper side, through the designed perforation.

SYSTEM ADVANTAGES - OPTIAIR IN ACTION



Homogeneity of temperatures, regardless of the height of the building.



Advanced comfort with optimal control of the served area.



Destratification in particular for high-rise buildings.



Ease installation of the extract ducts.



Total recovery of all the energy produced in the room.



Ease of avoiding any large obstacles present in the room.

MEMBRANE DIFFUSERS

Induction **DOUBLE jet**

SEASONAL OPTIMISATION WITH SWITCHING KIT

KLIMAGIEL high induction diffusers are available with a membrane system for optimal summer/winter season management.

This system is strongly recommended in all applications where sufficient static pressure is not available at the duct inlet, also with reference to the installation height.

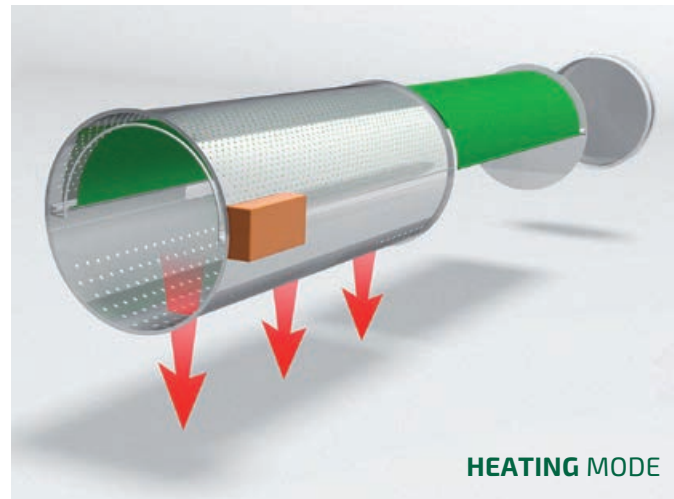
This is an **internal polyester membrane** which is placed longitudinally along the entire length of the diffuser. The movement is controlled by a servomotor and allows the selection of the lower or upper hole opening of the diffuser.

When cooling has been requested, the membrane adheres to the lower part of the duct, allowing air to flow over the upper part.

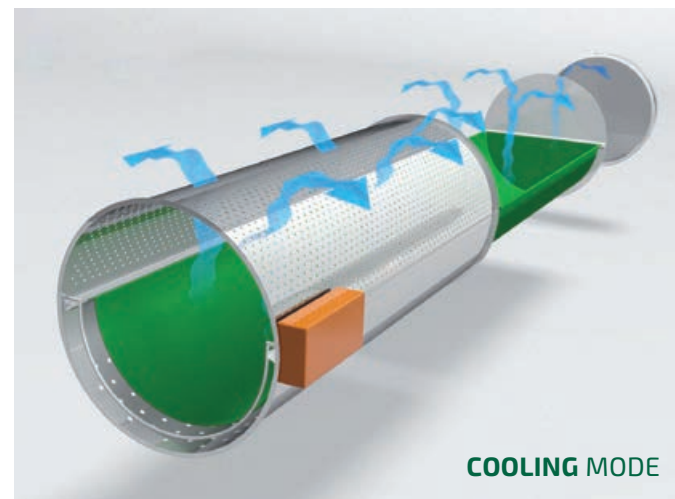
Conversely, when the system is set in heating mode, the system closes the upper holes and the flow is ducted directly downwards.

This optimises operation of the system, ensuring better temperature homogeneity and comfort in the room.

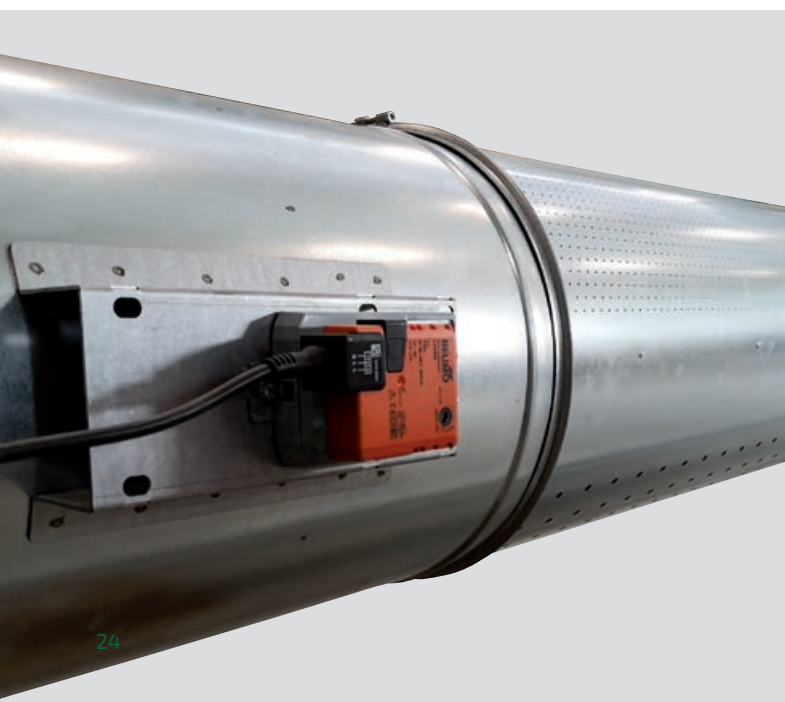
The membrane solution is available for both **fabric** and **metal** ducting (Patent Pending).



HEATING MODE



COOLING MODE



STAINLESS STEEL DIFFUSERS

Inspection **METAL jet**

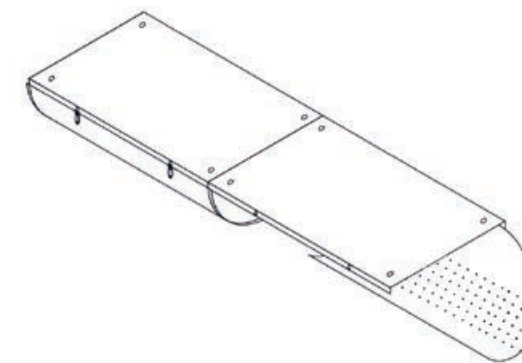
Inspection METAL jet diffusers were created in response to the specific maintenance and maximum hygiene requirements of large food production chains. KLIMAGIEL has responded to the need to reduce maintenance, cleaning and sanitising time for air conditioning systems in high productivity industrial environments with a specific, innovative project.

The internal cleaning of air ducts is normally carried out by specialised companies that can only reach and properly clean the internal surfaces of the ducts using specific equipment and particular methodologies.

The metal diffusers with SEMICIRCULAR SECTION CAN BE INSPECTED at every metre and allow quick, effective intervention at every point of the system, greatly facilitating any checks.

The semicircular frame made entirely of STAINLESS STEEL can be opened on one side by means of a quick-release locking system.

The reduction of bacterial load on surfaces is up to 99%.



THE ADVANTAGES AT A GLANCE



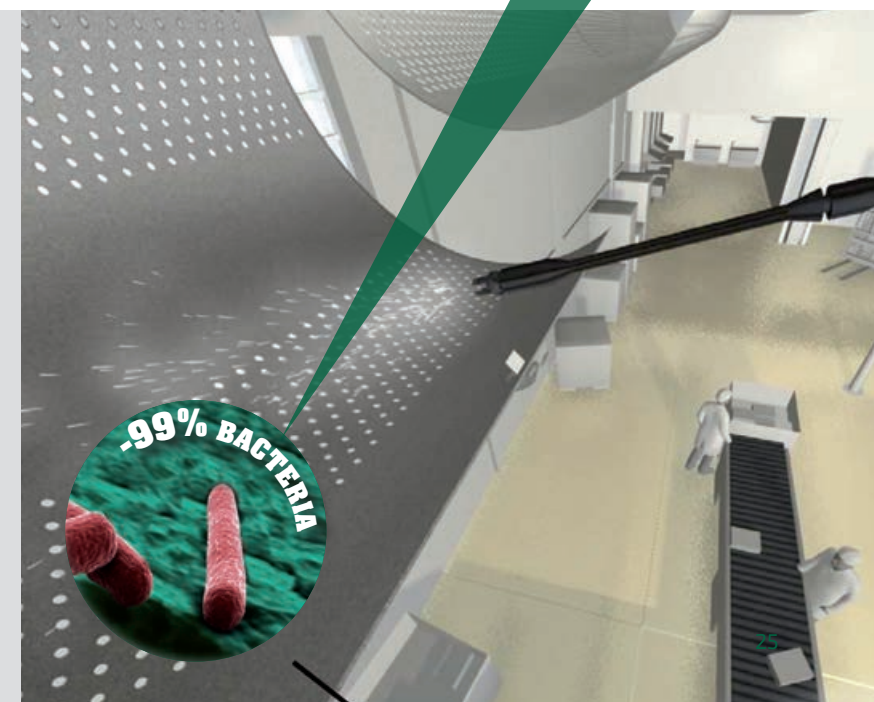
Cutting maintenance and cleaning costs and reducing production downtime.



Easy monitoring of technical and hygienic conditions of the aeraulic system.



Virtually eliminates the total presence of bacteria.



SYSTEM COMPLEMENTS

High induction destratifiers **ABS**

THE PHENOMENON

Air **heating** systems for **large volumes and heights** present the need to break down the thermal gradient between the occupied zone and the higher zone, close to roofs.

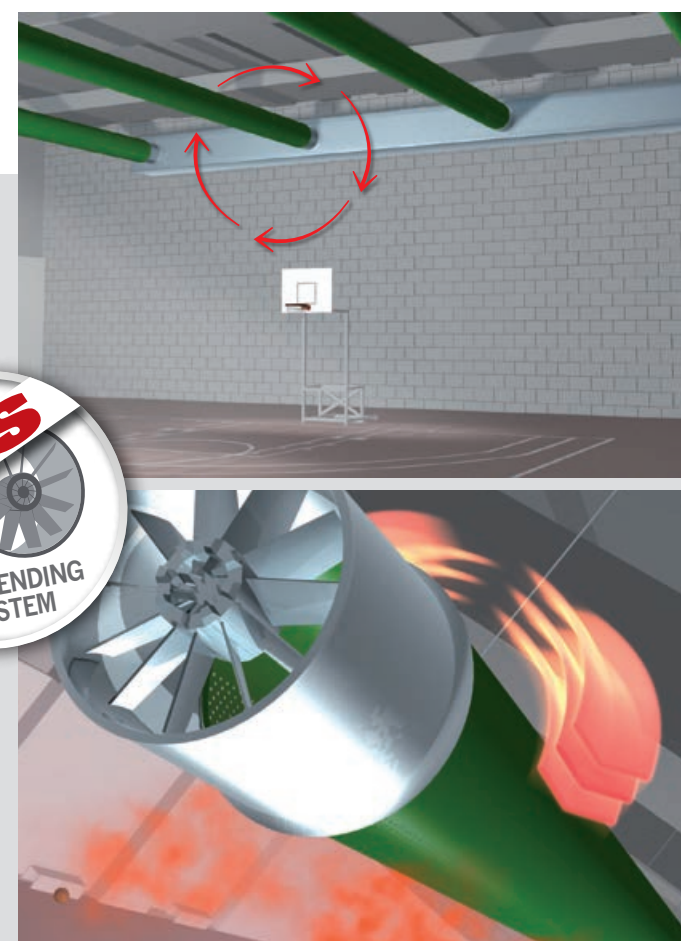
In cases where the system is designed for both winter and summer, the design air flow rate **allows** the **gradient between supply and room temperature** to be sufficiently **reduced**.

On the other hand, when the system is designed for heating with direct exchange hot air generators or unit heaters, the design ΔT triggers the stratification phenomenon. Typically involved are industrial halls, trade fair exhibitions, sports centres, and all cases where air heating is still considered the most effective.

THE SOLUTION

The ideal solution is to install one or more systems consisting of an axial fan that feeds air into a micro-perforated duct, which will have the task of managing its speed and orientation so as to achieve **a high induction** of air into the room and allow for **homogeneous** temperatures.

Depending on the characteristics of the environment and the intended use, the installation can be completed with a staged speed regulator or inverter and appropriately sized silencers.



THE ADVANTAGES AT A GLANCE

- Increased comfort thanks to temperature homogeneity anywhere in the environment.
- Energy saving, thanks to the elimination of stratification.
- Quick and inexpensive solution, without modification of existing installations.
- Perfect aesthetic integration.

DIRECTIONS FOR OPERATION

Depending on the room volume involved, and remaining in the field of installations with average heights (approx. 5 to 10 metres) an initial assessment can be made by dividing the air flow rate (roughly set at 2 changes/hour) using the table showing the air flow rate for each system for the various diameters.

A wide range of diameters from 300 to 900 mm and air flow rates from 1850 to 16,000 m³/h are available.

| Fan diameter | | 300 | 350 | 400 | 450 | 500 | 550 | 630 | 710 | 800 | 900 |
|------------------|-------|------|------|------|------|------|------|------|------|-------|-------|
| Polarity | Poles | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 |
| Absorption | kW | 0.35 | 0.35 | 0.55 | 0.75 | 1.1 | 1.1 | 1.5 | 2.2 | 3 | 4 |
| m³/h with 250 Pa | m³/h | 1850 | 2490 | 3250 | 3950 | 5070 | 6030 | 7230 | 9620 | 12800 | 16200 |

SYSTEM COMPLEMENTS

I-STOP for reducing defrosting times

THE PHENOMENON

In food cold rooms, the **defrosting time** is a key element affecting the temperature rise in the stand-by phase and thus **energy consumption**.

Inefficient defrosting can also cause water vapour to be emitted into the cold room, resulting in ice formation on the room surfaces.

THE SOLUTION

The KLIMAGIEL **I-STOP** system consists of a **waterproof** fabric nozzle, specifically designed to be installed on the mouth of evaporators and thus accelerate the defrosting process.

The fabric part of **I-STOP** is made of 100% high tenacity polyester with a special **hygroscopic treatment**. Available in different colours, easily **washed and sanitised**, it is the ideal and **economical** solution.



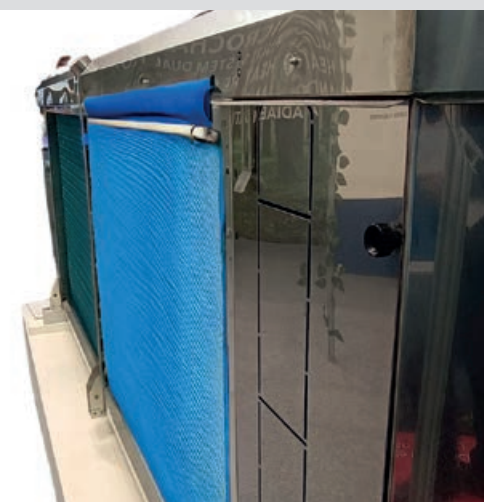
THE ADVANTAGES AT A GLANCE

- Energy saving thanks to reduced defrosting times.
- Prevents the formation of ice on cold room surfaces.
- Easily washed and sanitised.

FROST BLOCKER

Our new product, the **Frost Blocker**, represents a significant advancement in improving the operational efficiency of industrial evaporators. This automated curtain, made with special polyester fabric, offers an innovative approach to the defrosting process.

THE FROST BLOCKER IS THE IDEAL SOLUTION FOR INDUSTRIES REQUIRING PRECISE CONTROL OVER THE DEFROSTING PROCESS. INVEST IN FUTURE TECHNOLOGY WITH OUR FROST BLOCKER, WHERE INNOVATION MEETS FUNCTIONALITY.



Main features

- ADVANCED MATERIALS**
We utilize a high-quality porous polyester fabric, specially designed to withstand the most demanding industrial conditions.
- DEFROST CYCLE OPTIMIZATION**
The Frost Blocker serves as a crucial ally, protecting remote evaporators from atmospheric moisture. This contributes to enhancing the efficiency of the machine's defrosting process.

- SMART AUTOMATION**
The rigid automation of the curtain ensures it lowers automatically when the machine is turned off, protecting the evaporators and facilitating an efficient start to the next operating cycle.
- ENERGY SAVING**
By optimizing the defrosting process, the Frost Blocker contributes to overall energy savings of industrial machines, improving efficiency, and reducing operational costs.
- USER-FRIENDLINESS**
Thanks to its design, the curtain automatically rises before the machine starts, allowing safe access to the evaporators.

SYSTEM COMPLEMENTS

Download the KLIN-AIR university report



Sanitisation system for KLIN-AIR air conditioning ducts

KLIN-AIR is the only **duct sanitisation** system that reduces the microbial load in the air using the tried and tested Bioxigen® technology.

The Bioxigen® technology used in the Klimagiel **KLIN-AIR** drastically **reduces** the **microbial load** in the air, reduces fine dust and maintains the correct ionic balance thanks to the special **quartz condenser**.

Klimagiel **KLIN-AIR** products are applicable in both **new and existing constructions** and must be sized according to the air flow rate of the ducts and the project purpose.

KLIN-AIR is available for all flow rate ranges from 200 m³/h to 20,000 m³/h and more for Klimagiel circular ducting.

The Bioxigen® technology used by **KLIN-AIR** consists of a glass cylinder with appropriate metal meshes that are electrically powered.

This allows an alternating electric field to be generated outside the cylinder whose lines of force change in intensity and direction continuously over time, increasing the vibration of the air molecules.



MAIN STRENGTHS



Microbial abatement



Improved INDOOR air quality



Reduced periodic cleaning of air ducts



Easy installation in new or existing air ducts



Reduced electrical consumption



Equipped with sanitisation monitoring system



Equipped with an electronic system that alerts the user in case of malfunctions or reduced effectiveness of the product



Permitted for use in the presence of people, thanks to the bipolar ionisation principle



University research and certifications confirming the effectiveness and efficiency of KLIN-AIR

SYSTEM COMPLEMENTS

KLIN-AIR TRIS

Purify the air in your home or office with the elegant design of Klimagiel **TRIS**. The ideal solution against asthma, allergies, and to improve breathing.

Recommended for bedrooms as well, **TRIS** utilizes the Bioxigen® system to sanitize air and surfaces without filters or chemical additives.

It neutralizes odors, allergens, bacteria, and mold, providing a healthier environment. Carefully designed, CE marked, and without costly frequent maintenance. Ideal for spaces of 20-40 m³.



| FEATURES | VALUE |
|-------------------------|---------------------|
| Dimensions (LxWxH) | 126x117x202 mm |
| Weight | 0,4 kg |
| Power Supply | 230 V / 1 N / 50 Hz |
| Power Consumption | 3 W |
| Type | Static |
| Recommended Room Volume | 20-40 m³ |

SYSTEM COMPLEMENTS

AIR SCENTING SYSTEM FOR K-EMOTION AERAULIC DUCTS

K-EMOTION is a fragrance diffuser with Venturi system designed for perfect diffusion in medium to large rooms.

With its compact, linear shape, it is an excellent room **scenting solution** for KLIMAGIEL aeraulic ducts.

TECHNICAL FEATURES

| | K-EMOTION | K-EMOTION PRO |
|--------------------|-------------------------|--------------------------|
| COVER | 800-1200 m ³ | 2500-4000 m ³ |
| VOLTAGE | 12 V | 12 V |
| POWER | 7.5 W | 16 W |
| NOISE | <40 dB | <45 dB |
| WEIGHT | 3.0 kg | 4.2 kg |
| DIMENSIONS (LxDxH) | 230x110x260 mm | 280x120x279.5 mm |
| PERFUME CAPACITY | 500 ml | 800 ml |
| COLOUR | WHITE | |



K-EMOTION is designed for large ducted environments, expansive public areas, hotel lobbies, office common spaces, hospitality facilities, spas, fitness centers, bars, and retail stores.

KLIMAGIEL's high-quality fragrances are crafted with premium ingredients. The bases of these fragrances are made with fire-resistant solvents, ensuring they are safe for use with electronic equipment. The main notes of the fragrances are divided among citrusy, fresh, spicy, floral, fruity, and even green scents.

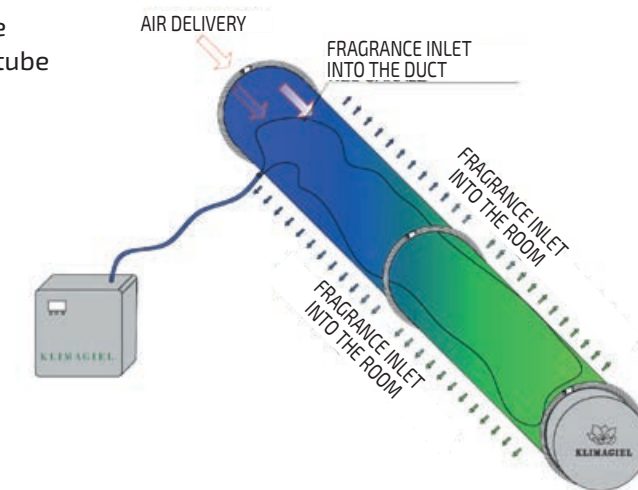
KLIMAGIEL fragrances are meticulously crafted by fragrance experts, offering a unique and luxurious aroma.

K-EMOTION PERFUMES

| | | | | | |
|--|---|---|---|--|---|
| PALERMO Saffron & Vanilla 22000-11 | NAPOLI Citrus & Spices 22000-17 | BOLOGNA Coffee Cinnamon 22000-8 | PORTO Lavender 22000-19 | LISBONA Woody Spicy 22000-16 | FIRENZE Magnolia 22000-15 |
| MADRID Rose 22000-18 | MILANO Aquatic Mint 22000-21 | FORLI Spring 22000-24 | BARI Vanilla Bread 22000-20 | VERONA Peach 22000-22 | PERUGIA Rose and Jasmine 22000-13 |
| ROMA Green Tea 22000-10 | BORDEAUX Red Fruits 22000-17 | PARIGI Vetiver and Vanilla 22000-15 | SALERNO Zagora Nardol 22000-6 | LONDRA Fruit 22000-12 | BOLZANO Nectar Peach 22000-10 |

Citrus
 Fresh
 Spicy
 Floral
 Fruity
 Green

K-EMOTION is connected to the ventilation system via a single tube kit with a diameter of 8mm.



K-EMOTION is programmable directly from the display and can be controlled from the app via Wi-Fi or Bluetooth, to ensure constant and efficient fragrance diffusion even in larger rooms.



The olfactory process is very much influenced by emotional factors. Odours have an important signalling function between individuals and long-term memory, allowing a person to remember them even years later. university studies by the **Ludwig Boltzmann Institute for Functional Topography of the Brain in Vienna** verified that, thanks to specific fragrances, the increase in sales of shops which participated in the scientific research was up to 60% higher than those which did not use fragrances. In addition, the productivity of the staff increased by 25% compared to periods when the perfumes were not used.

PEOPLE ARE 100 TIMES MORE LIKELY TO REMEMBER A SMELL IN RELATION TO SOMETHING THAT THEY HEAR, SEE OR TOUCH.



A STUDY SHOWED THAT CUSTOMERS WERE 84% MORE LIKELY TO BUY PRODUCTS IN A FRAGRANT ENVIRONMENT COMPARED TO AN ENVIRONMENT THAT IS NOT FRAGRANT. IN ADDITION, THEY WERE WILLING TO PAY 10% TO 20% MORE IN THE SCENTED ENVIRONMENTS FOR PRODUCTS THEY DESIRED.

KLIMAGIEL accessories

KLIMAGIEL offers a rich selection of accessories to help you find an ideal solution to complete every realisation. All KLIMAGIEL textile and metal diffusers are supplied complete with installation accessories.

METAL DUCT ACCESSORIES



METAL INSTALLATION KIT

KLIMAGIEL bracket system supplied as standard with the ducts. Formed by a special slot and M8 nut that allows the vertical position of the duct to be adjusted by screwing or unscrewing the nut.



METAL COLLAR - CONNECTING CLAMPS

Supplied with metal ducts as standard. Needed to connect the metal modules that make up the duct.



INTERNAL STABILISATION FRAME (PATENT APPLICATION FILED)

Available for metal ducts from Ø 1050 mm. It facilitates assembly and increases duct rigidity with large diameters, avoiding ovalisation.



STEEL PROFILE WITH ITS SLIDE

(See duct installation instructions with its sliding steel profile).



METAL COLLAR FOR OVAL DUCTS

Supplied with oval metal ducts as standard. Needed to connect the metal modules that make up the oval duct.

FABRIC DUCT ACCESSORIES



KLIMAGIEL BRACKET

Available in green, white and black. KLIMAGIEL standard solution for fixing to the Ø 3 mm cable. Can also be used for installation with H or C-profile.



SNAP HOOK

Available in black and white. Alternative solution for situations where a different diameter cable is required to the one supplied by KLIMAGIEL (up to 10 mm diameter).



SLIDING

Available in white. Alternative bracket for clamping with H or C-profile (also not supplied by KLIMAGIEL).



ADJUSTABLE BRACKET BUCKLE

Available in black and white. For use where variable adjustment of the bracket length is required.

TYPES OF FABRIC DUCT PROFILE



PROFILE SUSPENSION SYSTEM

Made of aluminium. Solution to be used when there is a need to install the profile (H or C) in suspension and not directly on the ceiling.



H-PROFILE

Made of aluminium.



PLASTIC RAIL WITH PROFILED JOINT

Made of durable plastic, this profile is the perfect solution for sectors such as the food industry or environments that require regular chemical cleaning.

TYPES OF FABRIC DUCT PROFILE



C-PROFILE

Made of aluminium and AISI 304 stainless steel.



P-PROFILE

Made of aluminium.
Can be used both as a clamping system and for fixing the duct/machine connection. Prepared for Ø 6-8 mm rod.



FASTENING SYSTEM FOR TEXTILE DUCTS

Made of stainless and galvanised steel.
Consisting of cable, tensioner and cable clamps.

VARIOUS ACCESSORIES



EARTHQUAKE KIT

Can be installed on both fabric and metal ducts.
Keeps the duct structure from oscillating in the event of seismic events and consequently reduces the possibility of the duct falling.

KLIMAGIEL provides earthquake-proof system designs on request.



ADJUSTABLE LOCKING SYSTEM

This allows you to adjust and lock fabric and metal ducts at a desired length without tools.



Extra services

TOUCH-UP KIT

Solution for maintaining the aesthetic appearance of painted metal ducts.
The kit consists of:

- Container with the required colour powder (RAL CLASSIC scale);
- Thinner with a handy brush, to be mixed with the powder to make it applicable.

The kit can be requested either when placing the order or at a later stage for already completed orders.



LOGO BY MICROPERFORATION

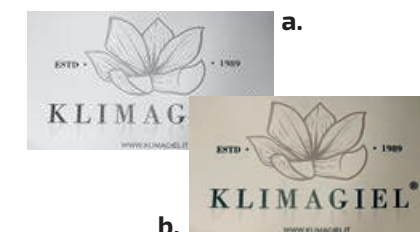
Implementation of customised logos on metal caps by microperforation (subject to feasibility assessment). The microperforation used for the logo does not affect operation of the duct.



CUSTOMISED LABELS

Production of customised labels for textile ducts in two versions:

- Black or green with a max. height of 11 cm (construction costs included);
- Colour screen-printed labels with customisable sizes (extra service).



ADJUSTABLE CONE

On request, KLIMAGIEL manufactures the cone with an adjustable closure in order to be able to create pressure drops within the diffusers and to be able to slightly correct the available pressure.



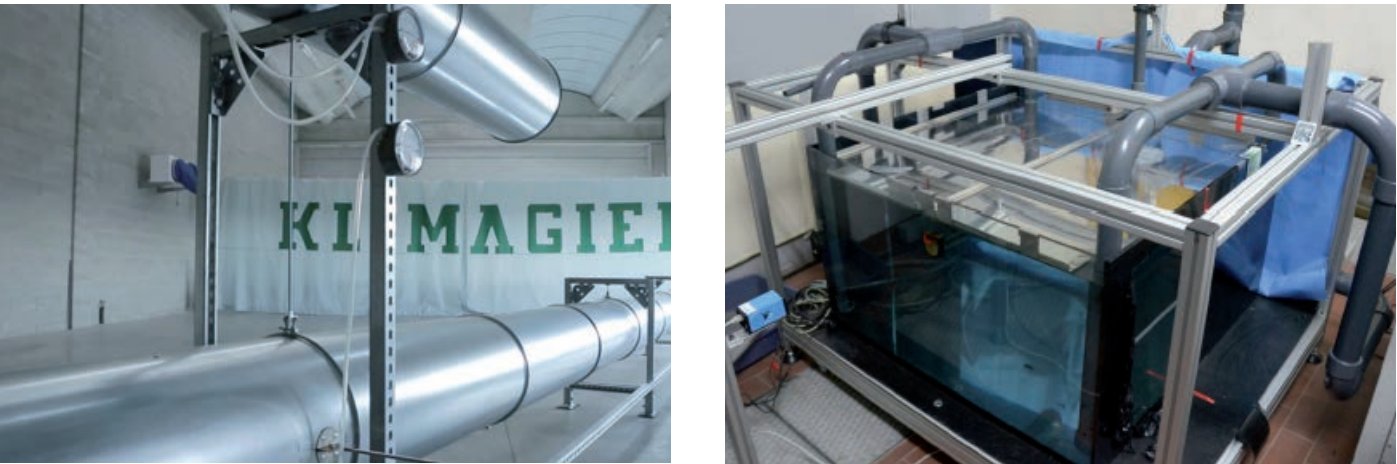
Research and Development

CONSTANTLY STRIVING TO IMPROVE PERFORMANCE

Collaboration with the POLITECNICO di MILANO and the use of two separate experimental apparatuses developed a process of analysis and verification of technical and production data that was able to profitably characterise KLIMAGIEL products.

With the BIG TUBE, it was possible to study the aerodynamics inside the ducts in detail, with a procedure that made it possible to refine the size and specific phorometry of each duct and its main operating characteristics, such as pressure drops, outflow coefficients and conducted and diffused flow rates.

With the AQUARIUM, a kinematically similar water circuit equipped with PIV - particle image velocimetry - visualisation techniques, the movement of water was characterised and velocity data collected at all points of a section illuminated by the laser blade. It was thus possible to study in detail the behaviour of the air released into the environment.



Design consulting Inspections Qualified staff

Integrated consultancy is the professional service that KLIMAGIEL established know-how in ducted air distribution offers its customers, assisting and guiding them in finding and using the best solution for their specific objective.

The evaluation of performance in terms of time, adherence to budget, agreed quality and return on investment, sharing responsibility for results are therefore indispensable.

A further, no less important service is inspections where the work is to be carried out and the surveys where the system is to be installed.

KLIMAGIEL also provides a comprehensive organisation capable of responding to all service requests.

Professionalism, competence and closeness to the Customer have always been distinctive elements guaranteeing quality service that is renewed year after year.



Our projects

KLIMAGIEL has a broad spectrum of experience in a wide variety of applications. The areas suitable for the exploitation of high induction technology are the most varied, both in the civil sector, particularly for commercial and service areas, and in the industrial, production and logistics sectors.

AIRPORTS



Our projects

CELLARS, MATURATION CELLS



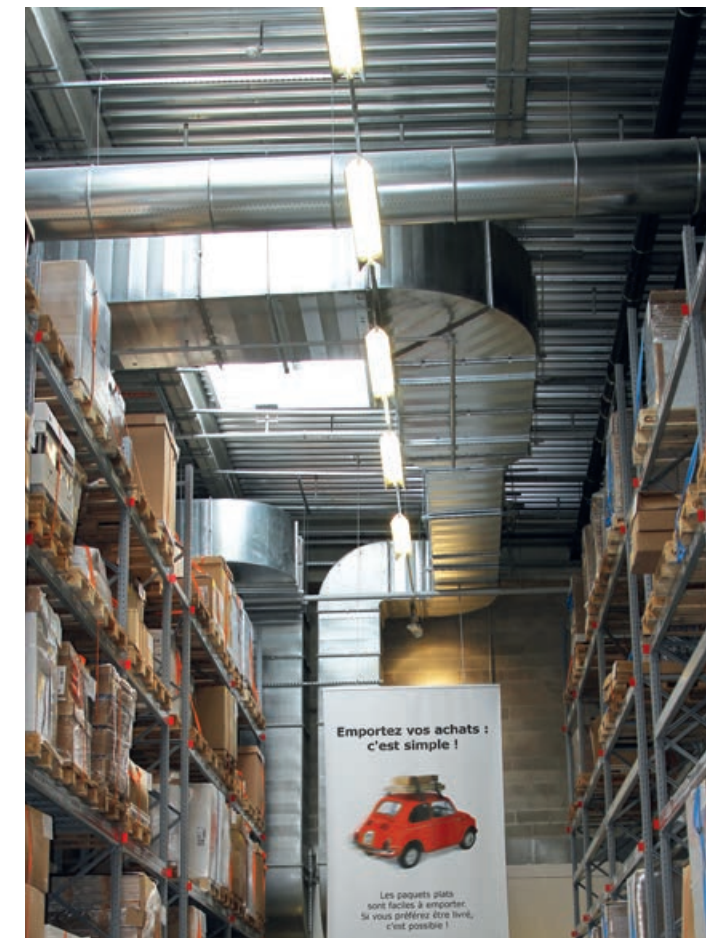
Our projects

FACTORIES



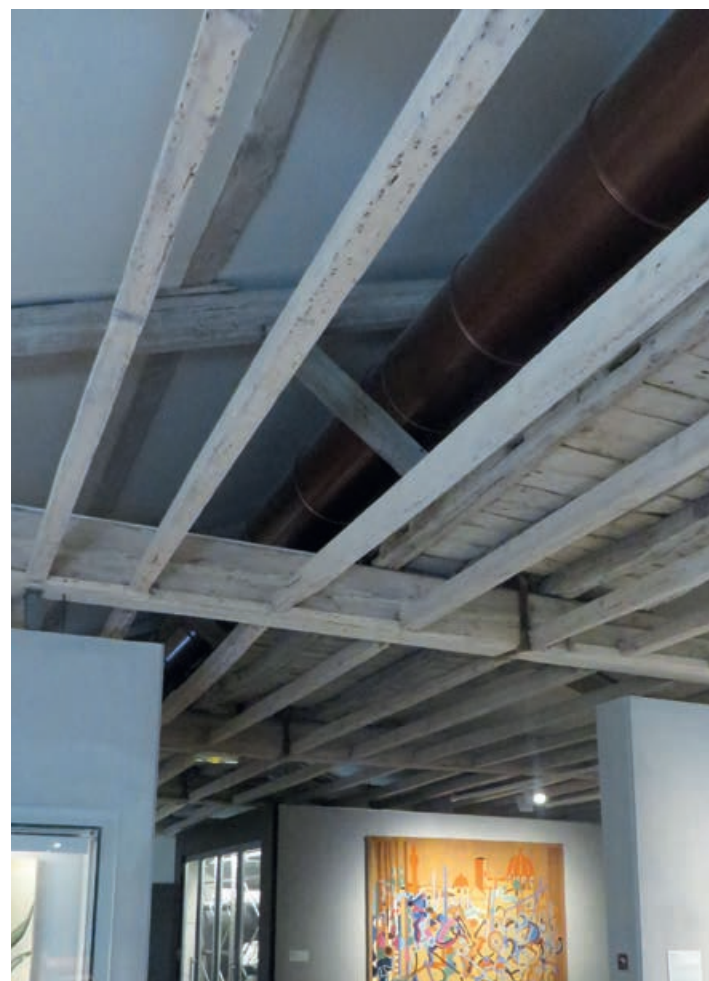
Our projects

WAREHOUSES



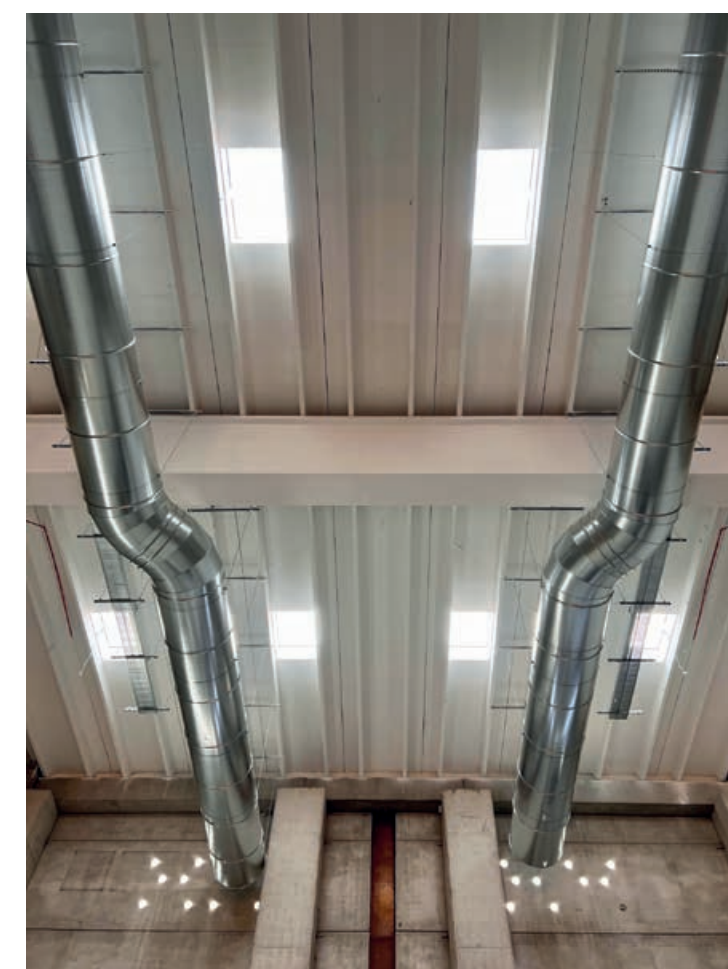
Our projects

MUSEUMS



Our projects

GYMS, SPORTS CENTRES



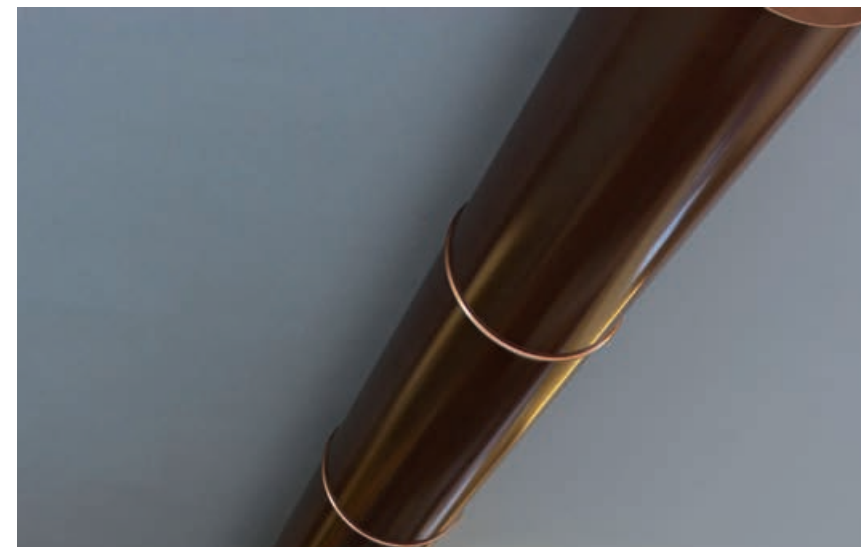
Our projects

HAIRDRESSERS AND SPAS



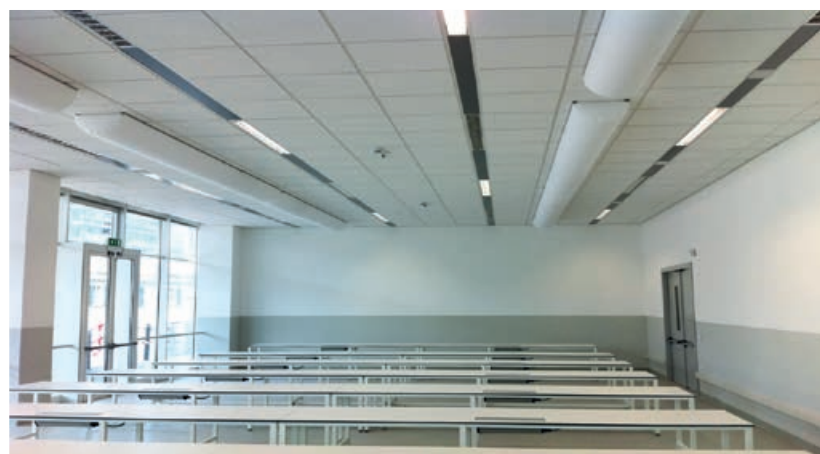
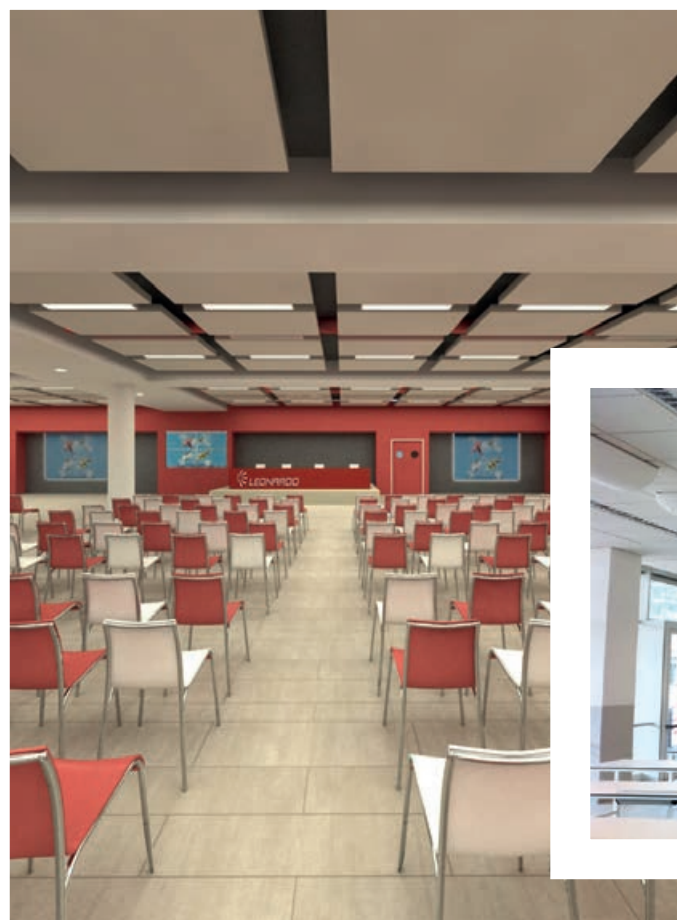
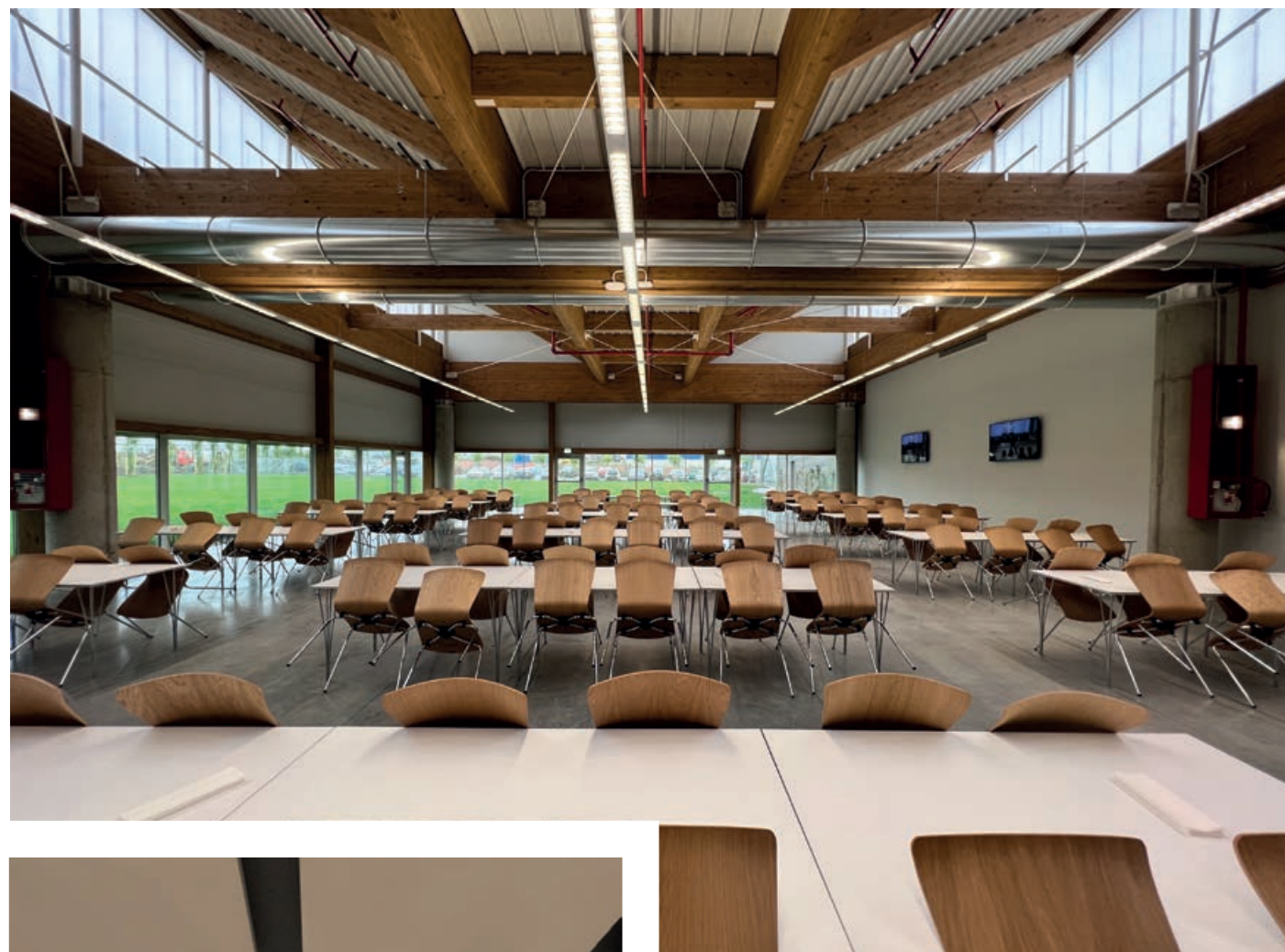
Our projects

RESTAURANTS



Our projects

MEETING ROOMS



Our projects

TERMAL BATHS, POOLS



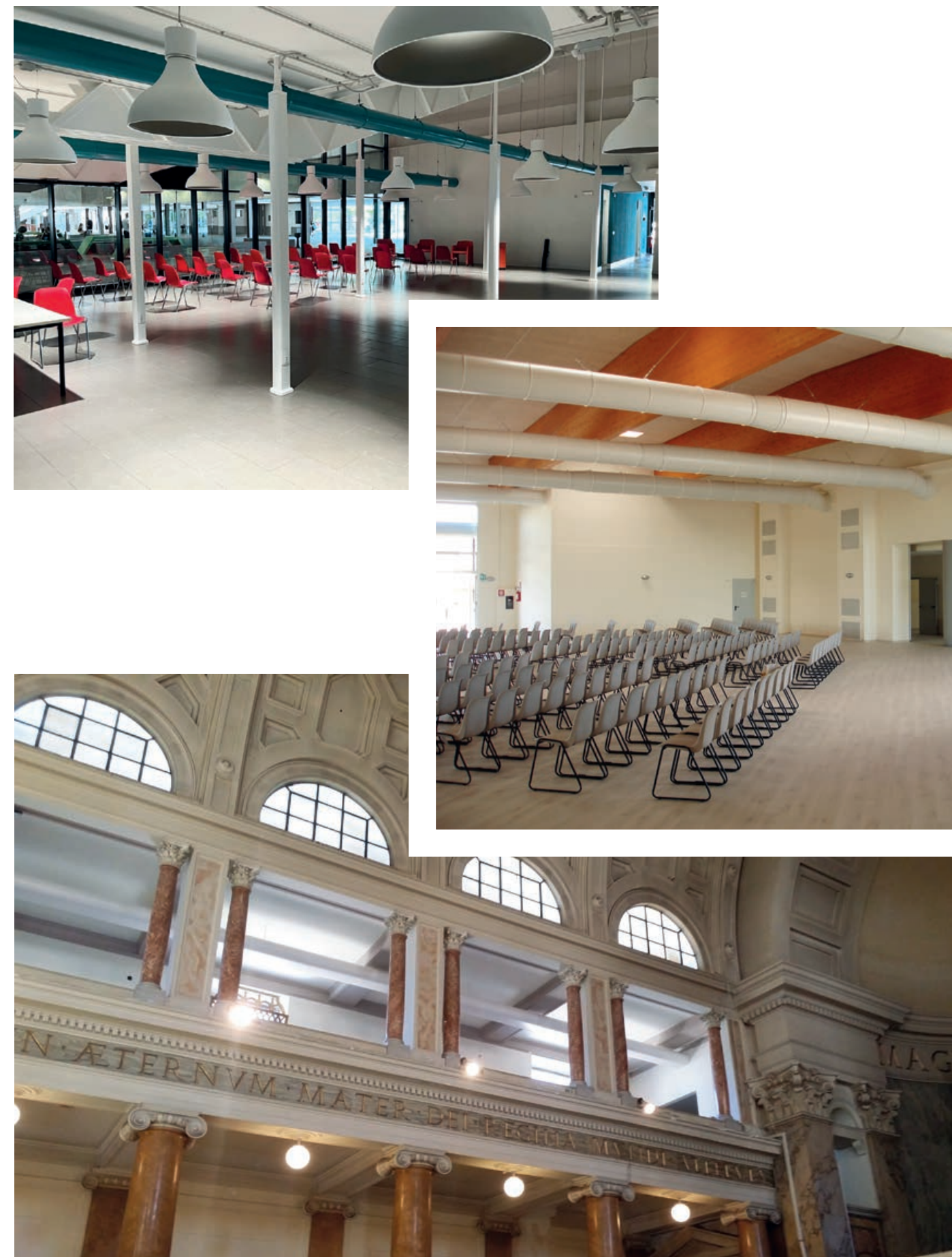
Our projects

OFFICES



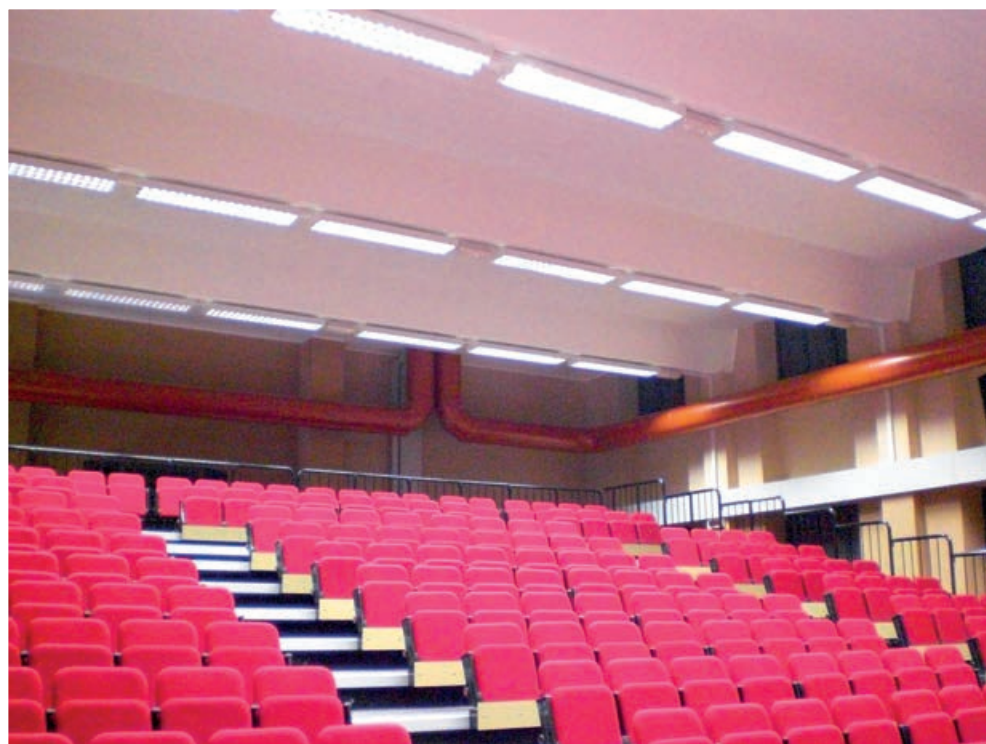
Our projects

UNIVERSITIES



Our projects

CINEMAS



Our projects

PRIVATE HOMES

