

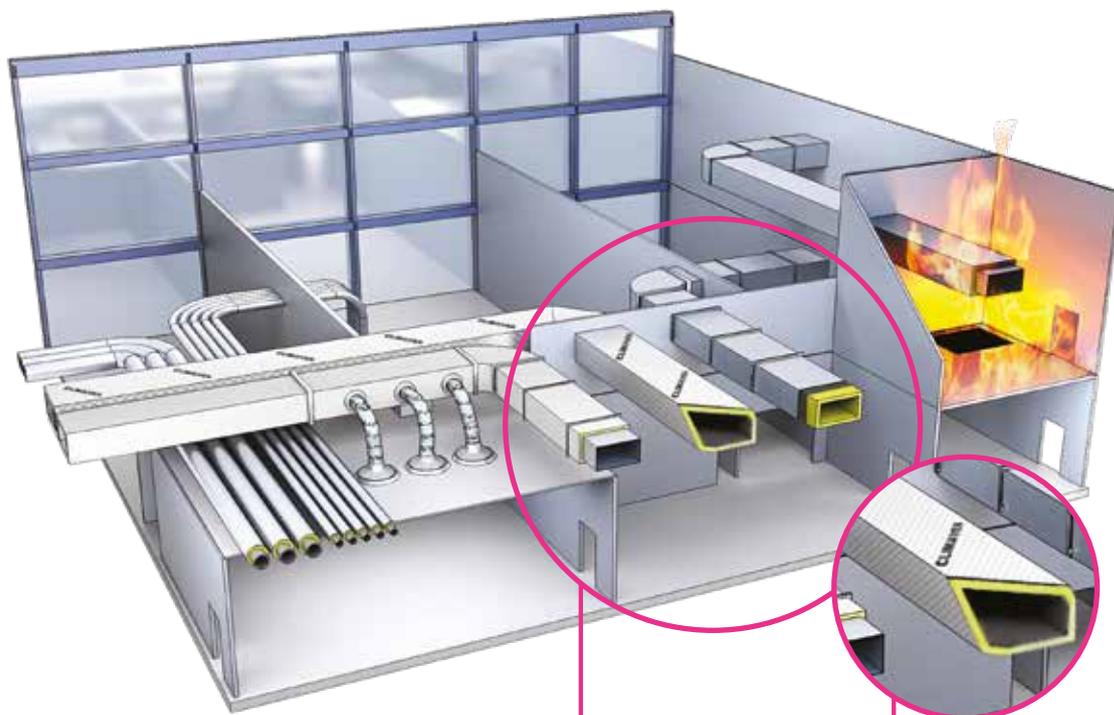


CLIMAVER® DUCT SYSTEM

More than a duct.
Much more than insulation.



Inside your HVAC SYSTEM



Ventilation/
air-conditioning
system

Self-supporting
duct system
CLIMAVER®

Optimizing VENTILATION & AIR-CONDITIONING SYSTEMS

Do you want to optimise your projects by offering your customers the most efficient solutions for their ventilation and air conditioning systems?

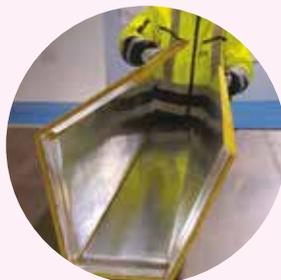
- › **Increase the energy efficiency** of buildings by offering best in class duct systems
- › **Reduce** installation, operating and maintenance **costs**
- › **Provide** the right amount of fresh air and ensure thermal and acoustic **comfort** for the occupants.

CHOOSE CLIMAVER[®], YOUR ALL-INCLUSIVE DUCT SYSTEM

Made from dense and rigid glass wool boards, **CLIMAVER[®]** self-supporting air ducts are a cost-effective, easy-to-install alternative to traditional insulated metal ducts:



An all-in-one metal-free system, delivered flat on a pallet, and assembled in a single operation.



Duct sections are assembled easily, without the need for expensive machinery usually used on-site.



A shiplap on the edges ensures tight closure of the duct.

A unique product to replace metal ducts, providing state-of-the-art insulation and comfort.

Read more to find out how **CLIMAVER[®]** ductwork can make your buildings more cost-efficient, greener and safer...

Add value at EVERY STEP OF THE PROJECT

Invest in this exceptional ducting solution to add value across the entire life of the project.



AS A BUILDING OWNER

- › Do your bit for the environment
- › Improve the safety, comfort and wellbeing of the occupants of your property
- › Earn points towards Green Building certifications (LEED, BREEAM...)
- › Significantly reduce operational and maintenance costs



AS A SPECIFIER

- › Design high-performance ventilation & air-conditioning systems for your customers
- › Bring key benefits to your customers
- › Demonstrate your capacity to innovate
- › Address the most stringent building regulations (thermal, acoustic & fire performance)
- › Work with Building Information Modelling (BIM)



AS A CONTRACTOR

- › Install duct and insulation in a single operation
- › Reduce installation time and labour costs
- › Install more easily

8 GOOD REASONS TO CHOOSE CLIMAVER®

- › Reduce your energy bill
- › Get greener
- › Engage for safer and healthier materials
- › Keep the noise down
- › Ensure fire safety
- › Ensure reliable, long-term performance
- › Minimise maintenance
- › Increase your site productivity

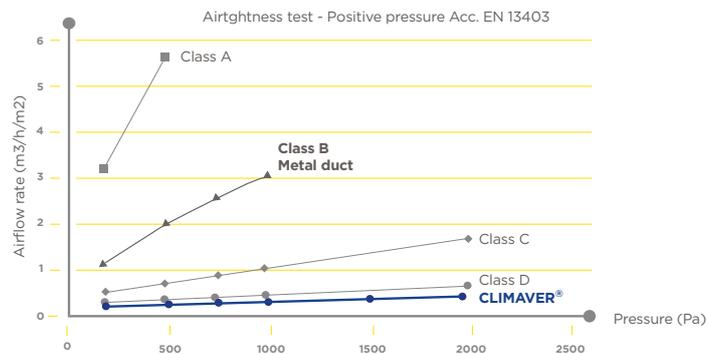
Reduce your ENERGY BILL



To make your duct system as energy efficient as possible, you must take into consideration the thermal performance of your insulation material, potential thermal bridges and the airtightness of the duct system.

THE ALL-INCLUSIVE CLIMAVER® SOLUTION

HIGHEST CLASSIFICATION OF AIRTIGHTNESS (EXCEEDING THE MOST STRINGENT AIRTIGHTNESS CLASSIFICATION)



EXCELLENT THERMAL RESISTANCE

Thermal conductivity at 10°C (W/m.K): $\lambda = 0,032$
 Thermal resistance (m².K/W): R = 25mm = 0.78
 R = 40mm = 1.25

REDUCED THERMAL BRIDGES



Reduced thickness of insulation at the edges

↓
Thermal bridges + risk of condensation



Constant thickness of insulation all around the duct

↓
No thermal bridges



Are you aware of the untapped potential of airtight ducts to improve energy efficiency?

Most people are unaware of this “out-of-sight” problem around the seams and joints of duct take-offs and fittings, often due to a poor workmanship. In fact, duct leakage is not only detrimental to indoor air quality and comfort, but also to the energy efficiency of the whole system.

Reducing leakage means:

- › **Less heat loss.**
- › **Less power for air handling unit (AHU) or ventilation machine needed** to compensate for the effect of the leaks.
- › **Lower total airflow** rates to and from unconditioned spaces.
- › **Optimised energy efficiency measures**, including demand-control and heat recovery.
- › **The air** needed to maintain the indoor environment at the desired temperature **flows exactly where it is needed.**
- › The whole system can be **precisely dimensioned.**



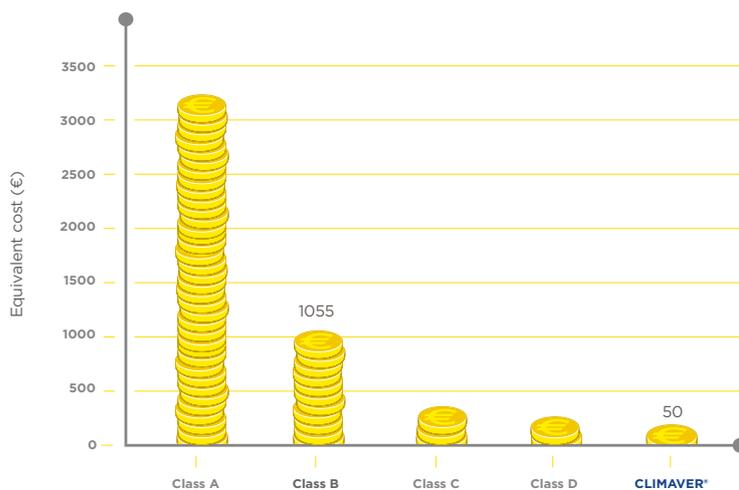
Energy used for heating & cooling is reduced by ~15%.

SCENARIO

- › A duct system of 200m², with a static pressure of 300 Pa, and a flow of 5400 m³/h.
- › The airflow temperature is 16 °C and the room temperature is 25°C.
- › Energy cost assumed is 0.15 EUR per kWh.

Airtightness class EN 13403	Leaks permitted (l/(sm ²))	% Leaks / total flow	Energy loss / year (kWh)	Cost / year (EUR)
A	1.1	14.8	21283	3192
B	0.370	5.0	7030	1055
C	0.120	1.6	2343	351
D	0.040	0.5	780	117
CLIMAVER®	0.017	0.2	330	50

Cost per year due to duct leakage



Class B system (metal duct + insulation)

- › Up to 5% leaks / total flow
- › Up to 7030 kWh lost per year
- › **Cost of duct leakage = 1055 €**

VS.

CLIMAVER®

- › Max 0.2% leaks / total flow
- › Only 330 kWh lost per year
- › **Cost of duct leakage = 50 €**

Get GREENER



Are you looking for more sustainable solutions?

CLIMAVER® provides various benefits to the environment across its entire lifecycle, lessening the impact from sourcing to manufacture, from distribution to end-of-life:

› **CLIMAVER® helps save materials & resources:**

Manufactured from up to 80% recycled glass wool, it reduces the need for sand extracted from quarries and helps protect biodiversity. But that is not all! Compared to metal ducts requiring the use of screws and welding, **CLIMAVER®** also reduces the consumption of additional tools and equipment.

› **CLIMAVER® drives energy efficiency:**

Very good thermal resistance, reduced thermal bridges and excellent airtightness help significantly reduce energy consumption and limit greenhouse gas emissions from your ventilation system. *Remember: The best energy is the energy we don't use.*

› **CLIMAVER® limits waste generation:**

The exclusive Straight Duct Method (cf. page 18) and unique guiding lines ensure the optimal use of material, reducing building site waste.

› **CLIMAVER® reduces transport emissions:**

The product is usually delivered flat on a pallet and assembled on-site. **CLIMAVER®**'s space-saving packaging reduces and optimises transport-related emissions.

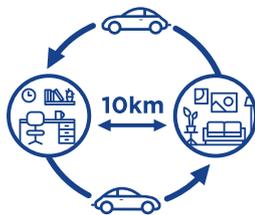


Do you expect your suppliers to be transparent about the impact of their products?



At ISOVER, we assess the environmental impacts of our products over their entire lifecycle (**LCA - Life Cycle Assessment**). We also offer transparent information on their environmental performance to our customers by providing third-party verified **Environmental Product Declarations**. EPDs for **CLIMAVER®** are available on our website.

For a typical office building, the use of 1000m² of CLIMAVER® instead of insulated metal duct would save the equivalent of:



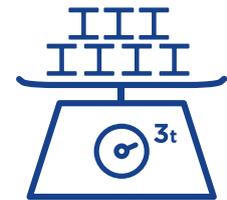
x 36 years

More than 36 years of driving 20km a day to work*
180,000 km travelled by car or 30 tons of CO₂ emissions



4000x

The electricity usage of 4,000 inhabitants for 24h**
215,000 MJ of electricity consumed over 25 years



More than 3 tons of steel to install, insulate and dismantle



CLIMAVER® contributes significantly to many aspects of LEED and other sustainability labels.

Engage for safer AND HEALTHIER MATERIALS



The health and safety of our customers is a top priority for us, not only for the building's occupants, but also during installation.

PROVIDING FRESH, CLEAN AIR

The indoor climate of the buildings is important for the wellbeing of its occupants. A constant supply of clean, fresh air helps people to be more productive, happier and to experience fewer health issues. The best way to improve indoor air quality is to reduce pollution at source while improving ventilation and purifying the air. With **CLIMAVER®**, you can effortlessly carry fresh air inside **without having to worry about mould or bacteria** (EN 13403 for non-metallic ducts). **CLIMAVER®** also fulfils low emission requirements for buildings (according to EN ISO 16000-10:2006).



WORKING WITH A SAFE MATERIAL

CLIMAVER® ensures safe and comfortable installation

All ISOVER glass wool fibres are bio-soluble and exonerated from any classifications on carcinogenic, mutagenic, or toxic for reproduction criteria. **CLIMAVER®** is certified according to EUCEB and therefore complies with all EU regulatory requirements.



CLIMAVER® is easy to handle thanks to its ergonomic product dimensions and **weight 50% lower** than a metal duct + insulation solution.

In addition to this, the aluminium foil with its unique guiding lines improves installation productivity.

More than 2500 scientific publications have demonstrated that mineral wool fibres are safe to manufacture, install and live with.

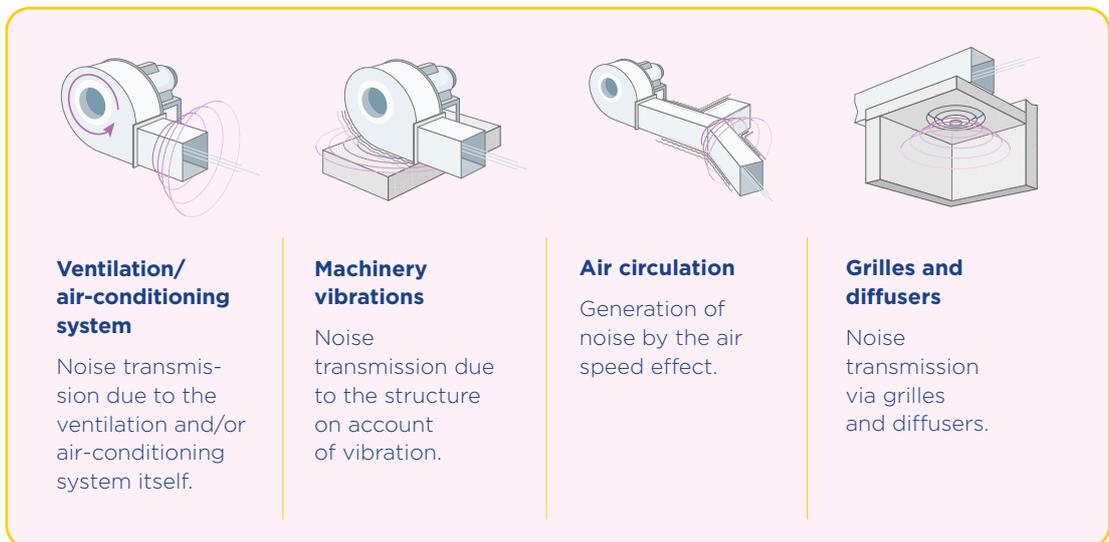
This has been recognised by health authorities at an international level e.g. REACH regulation.

Keep the noise DOWN



Noise is recognised as an environmental pollutant that has a significant impact on our health and wellbeing. Ventilation and air-conditioning systems can be a source of noise and vibrations, either from the equipment itself or from the air flow circulating through the system.

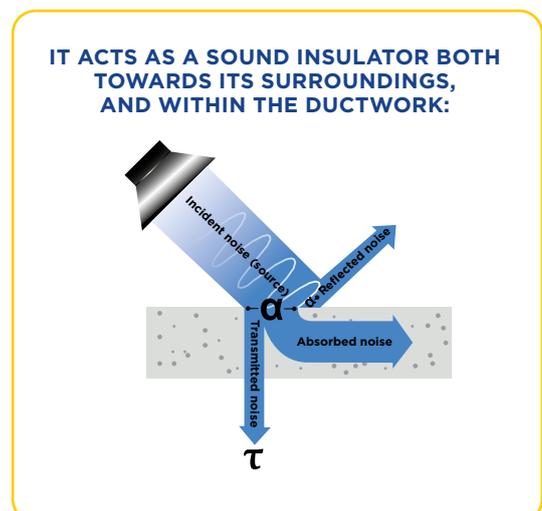
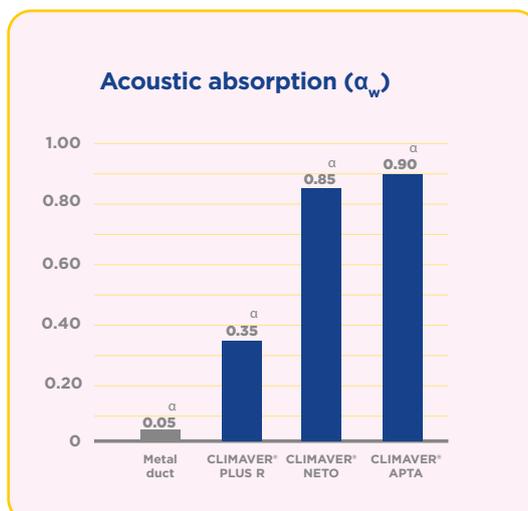
Main sources of noise in a ventilation and/or air-conditioning system:



This phenomenon is particularly noticeable if the internal surface of the ducts is made of a material that easily reflects sound, e.g. metal.

CREATE A WELL-BALANCED ACOUSTIC ENVIRONMENT WITH CLIMAVER®

CLIMAVER® offers best-in-class sound absorption with weighted absorption coefficients of up to α_w **0.85** for **CLIMAVER® Neto** and α_w **0.90** for **CLIMAVER® APTA**.



Product	Frequency (Hz)				
	125	250	500	1000	2000
Metal duct	2	2	7,5	7,5	3
CLIMAVER® Plus	8.5	8.5	8.5	38.5	30
CLIMAVER® Neto	18	43	52.5	62.54	68
CLIMAVER® Apta	22	43	53	68	68

Acoustic attenuation in dB for 5m of 400x200mm duct

CLIMAVER® is highly absorbent, including at low frequencies, where the problem of noise generated by the AHU or ventilation machine is greater.

- › **Increases the level of acoustic comfort** of your buildings
- › **No need for additional acoustic insulation** liners inside the ducts
- › **No need for silencers or sound attenuators***

**depending on system design*



Ensure FIRE SAFETY



The consequences of fire breaking out and spreading are of serious concern for property owners and occupants everywhere.

Today's buildings are full of highly inflammable materials which immediately catch fire. Within only a few minutes, a fire spreads, meaning the temperature goes up and the room begins to fill with toxic smoke. Smoke inhalation can cause serious respiratory complications, and is the primary cause of death for victims of fires, exceeding burns by a 3-to-1 ratio.

The choice of materials can significantly affect the spread of fire and its rate of travel, even though they are not likely to be the first things to ignite. They can be classified in terms of their reaction to fire, i.e. their potential contribution to flashover (the spontaneous ignition of hot smoke and gases which can lead to a fire spreading uncontrollably). To address other hazards found in real-life fires and for risk assessment, two additional classifications are also available: "s" and "d", providing information on smoke development. Class s1 to s3 refers to levels of smoke release, from insignificant (s1) to high (s3); and classes d0 to d2 refer to the emission of flaming droplets.

Product CLIMAVER®	Class	Reaction to fire	Flashover	Smoke and droplets
A1 APTA	A1	No contribution to a fire	No	None
A2 PLUS, A2 NETO, A2 DECO, A2 APTA	A2, s1-d0	No significant contribution to fire growth	No	Insignificant smoke release with no flaming droplets or particles expected
PLUS R, NETO, APTA, STAR	B, s1-d0	No significant contribution to fire growth	No	Insignificant smoke release with no flaming droplets or particles expected
-	c	Limited contribution to flashover	Flashover >10 min	Production of smoke & flaming droplets & particles
-	d	Contribution to flashover	Flashover 2<>10 min	Production of smoke & flaming droplets & particles
-	e	Significant contribution to flashover	Flashover <2 min	Production of smoke & flaming droplets & particles (smoke release is expected to be substantial)
-	f	Not tested or incapable of achieving Class E	NPD	NPD

CLIMAVER® is also classified 0 according BS 476 standard.



SAFETY FIRST:

CLIMAVER® is non-combustible. It does not contribute to the spread of fire. It will not emit smoke or help to propagate fire.

Ensure reliable, LONG-TERM PERFORMANCE



As CLIMAVER® is made of glass wool, it could be perceived as fragile. However, CLIMAVER® is both robust and flexible, which means that it can withstand all kinds of mechanical stress.

WITHSTANDING HIGH PRESSURE

To make sure your **CLIMAVER®** duct is not affected by the working pressure of your air conditioning system, we tested the entire range in accordance with EN 13403.

The Resistance Against Pressure test determines the fitness for purpose of ductwork assembled without reinforcements. The air ducts and connector sections with joints should withstand the test pressure without rupturing.

This standard requires the duct to be tested at a pressure of 2.5 times the pressure declared by the manufacturer. The **CLIMAVER®** range has therefore been tested at a pressure of 2000 Pa without generating any cracks or swelling, despite the test being performed on a joint between two ducts.

Be assured that your CLIMAVER® duct can withstand constant static pressure of up to 800 Pa and air-circulation up to 18m/s.

A ROBUST SYSTEM

CLIMAVER® has been tested for the minimum required rigidity according to the EN 13403 method. It attains board stiffness Class R2 (Flexural rigidity $Nmm^2 \geq 90,000$). Contrary to metal ducts, **CLIMAVER®** is not at risk of dents or damage on building sites.



Minimise **MAINTENANCE**

We know that it is important for your ventilation to work efficiently over time.

Our design teams have therefore worked hard to ensure all CLIMAVER® products are easy to clean without compromising their original properties.

The internal coatings of the **CLIMAVER®** range offer the mechanical resistance required to clean the air conditioning systems, including with nylon brushes, without causing any deterioration or requiring post-cleaning treatments (encapsulation). For the same reason, the resistance of the internal coating reduces the frequency of access required for cleaning. This has been certified by AELSA (the Spanish association of duct cleaning companies).



CLIMAVER® ducts retain all their acoustic, thermal and fire protection properties over the whole lifetime of the system.

Increase your SITE PRODUCTIVITY



Do you want to optimise your work, increase productivity and reduce installation times?

Choose **CLIMAVER®**, a single product that replaces the two traditional trades of metal ductwork and their insulation. Assembled in a single operation, it offers numerous installation benefits:

› **Improves site productivity:**

CLIMAVER® is up to 5 times faster to install than metal ducts + insulation. One worker can install 20 to 25 m² of **CLIMAVER®** per day, which can help optimize the use of manpower.

› **Greater flexibility:**

Installed on site, **CLIMAVER®** can easily be adapted to last-minute changes in ductwork or alternative routing.

› **Comfortable to install:**

Up to 50% weight reduction compared to metal ducts + insulation, and its ergonomic product dimensions make it easy to carry and lift. Installation also requires fewer duct supports.

› **Optimises logistics:**

Saves space during transport and storage, as **CLIMAVER®** is delivered flat on a pallet or box, and no special power tools or machines are needed for installation.

› **Limits waste generation**

› **Reduces noise disturbance on building sites.**

UNDERSTANDING THE SDM METHOD

As its name suggests, the Straight Duct Method (SDM) involves combining straight duct boards in different configurations and parts like elbows, branches and offsets etc.

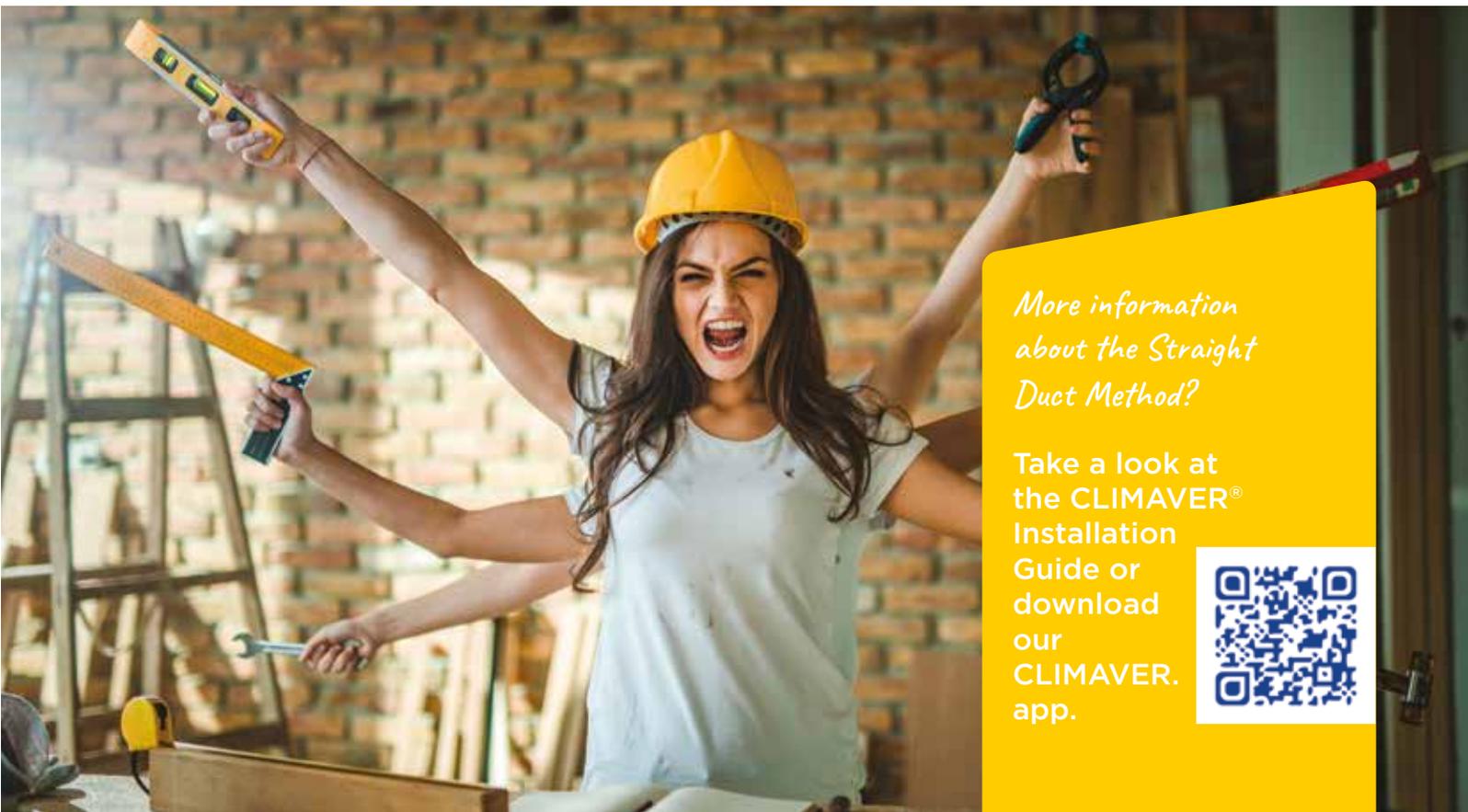
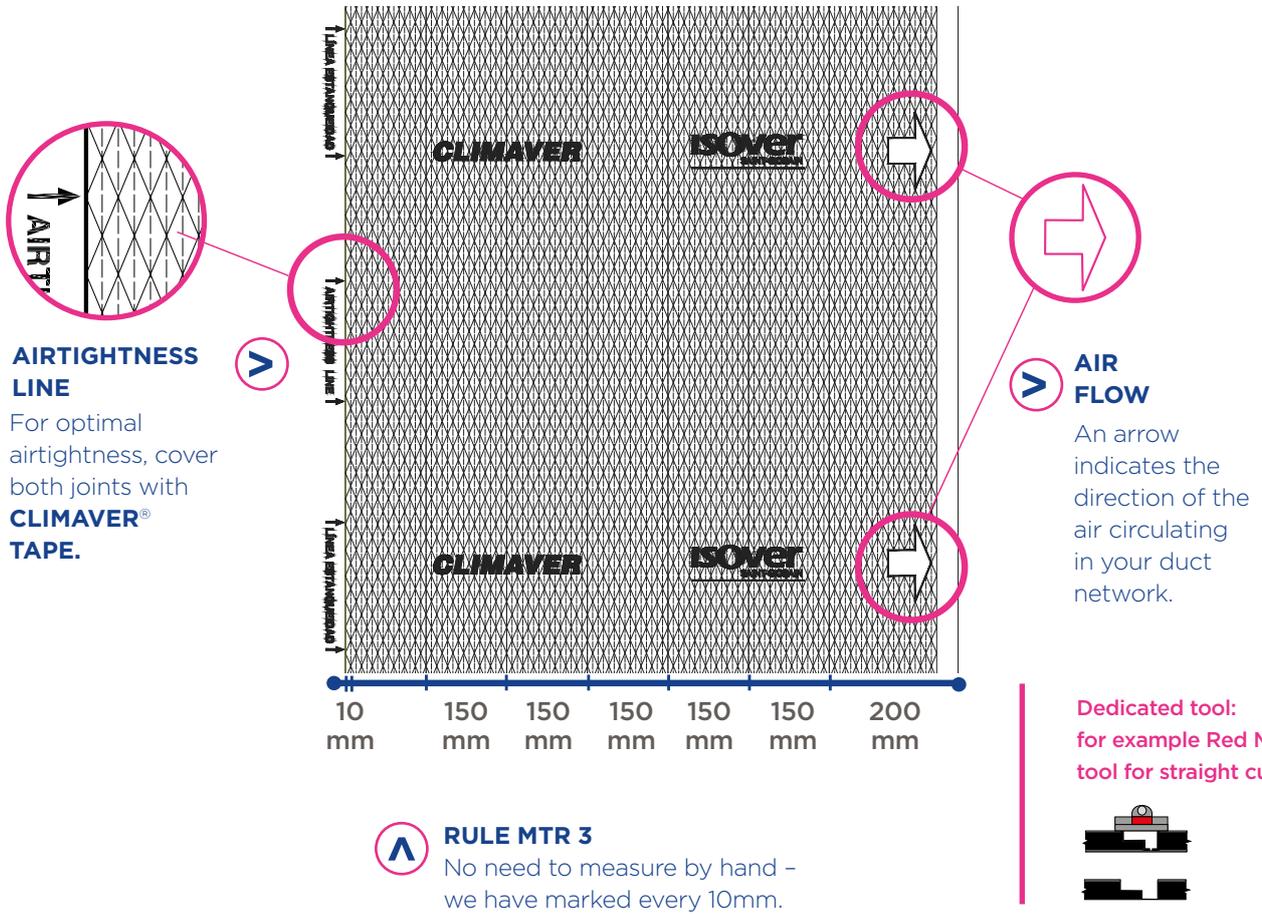
By constructing self-supporting ducts in this way, greater precision, resistance and quality can be achieved, with less load loss and waste.

What's more, you'll save time and money, as the boards are faster to install.

5 times faster than cutting from pieces.

We've added guiding lines on all **CLIMAVER®** boards, so the installer does not have to draw lines himself. This limits the risk of mistakes, while improving performance and optimising the quantity of material used.

New design



More information about the Straight Duct Method?

Take a look at the **CLIMAVER® Installation Guide** or download our **CLIMAVER. app.**



GET MORE FROM SDM

With our exclusive leaning shiplap, you can further optimise the performance of your ductwork:

- › **Improve airtightness & reduce pressure loss**
- › **Enhance aesthetics**
- › Obtain **stronger, more precise jointing**
- › **Choose your configuration**, including complex shapes
- › **Connect to any HVAC** standard equipment

0% waste with SDM

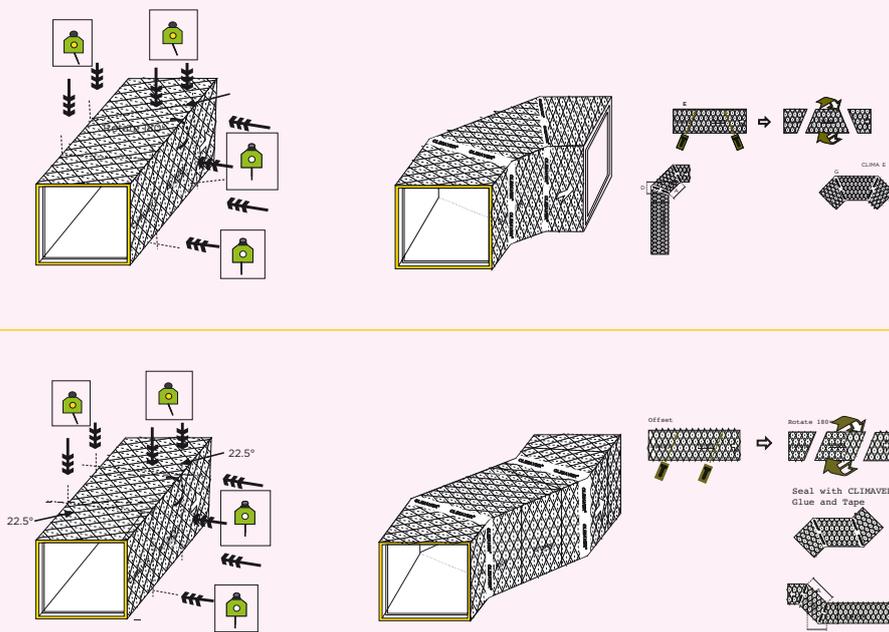


Example:
waste generated
creating two 90° elbows
of 300x350mm



1.5 m ²	Cut from 4 pieces
0 m ²	Straight Duct Method (SDM)

ALL COMPLEX SHAPES AND CONNECTIONS NEEDED WITH OTHER HVAC EQUIPMENT ARE EASY TO ACHIEVE WITH CLIMAVER®.



WHICH CLIMAVER[®] PRODUCT IS RIGHT FOR YOUR PROJECT?

Make your choice from
a comprehensive range
of solutions, trusted by
customers around the world.

A comprehensive range TO MEET ALL YOUR NEEDS

Whether you are looking for maximum energy efficiency, enhanced noise reduction or extra fire protection, you'll find a pre-insulated duct solution tailored to your project.

Product	Specifically designed for	Acoustic absorption	Thermal savings	Air-tightness	Thickness
CLIMAVER® PLUS R		*	**	***	25mm
CLIMAVER® NETO	Acoustics	**	**	***	25mm
CLIMAVER® A2 PLUS		*	**	***	25mm
CLIMAVER® A2 NETO	Acoustics	**	**	***	25mm
CLIMAVER® A2 DECO	Aesthetics + acoustics	**	**	***	25mm
CLIMAVER® APTA	Top class acoustics + energy savings	***	***	***	40/(50) mm
CLIMAVER® A2 APTA	Top class acoustics + energy savings	***	***	***	40mm
CLIMAVER® A1 APTA	Top class acoustics + energy savings	***	***	***	40mm
CLIMAVER® STAR	Outdoor use + acoustics	***	***	***	40mm

* good **better ***best



CLIMAVER® and BIM:

We provide BIM objects of different CLIMAVER® configurations, to facilitate the work of designers and specifiers on projects involving Building Information Modelling. The BIM objects are available for download in the "Documentation" section of our website.

Proven Across CONTINENTS AND BUILDING SECTORS

CLIMAVER® solutions have been chosen by customers across the globe looking to combine high performance and significant cost savings in a variety of sectors:

- › **Commercial buildings**
- › **Residential buildings**
- › **City complexes / malls**
- › **Airports**
- › **Hotels**
- › **Hospitals**
- › **High-rise buildings**
- › **Schools and educational institutions**

BE CONFIDENT:

*A system used widely
for more than 50 years*

More than
180 million m² of
CLIMAVER® duct
have already
been installed
worldwide.



OFFICE BUILDINGS

Beijing,
Chaoyang Distric, China



HEALTHCARE

Hospital San Juan de Dios
Cordoba, Spain



SPORT

Arena Mineirão
Belo Horizonte
Minas Gerais,
Brazil

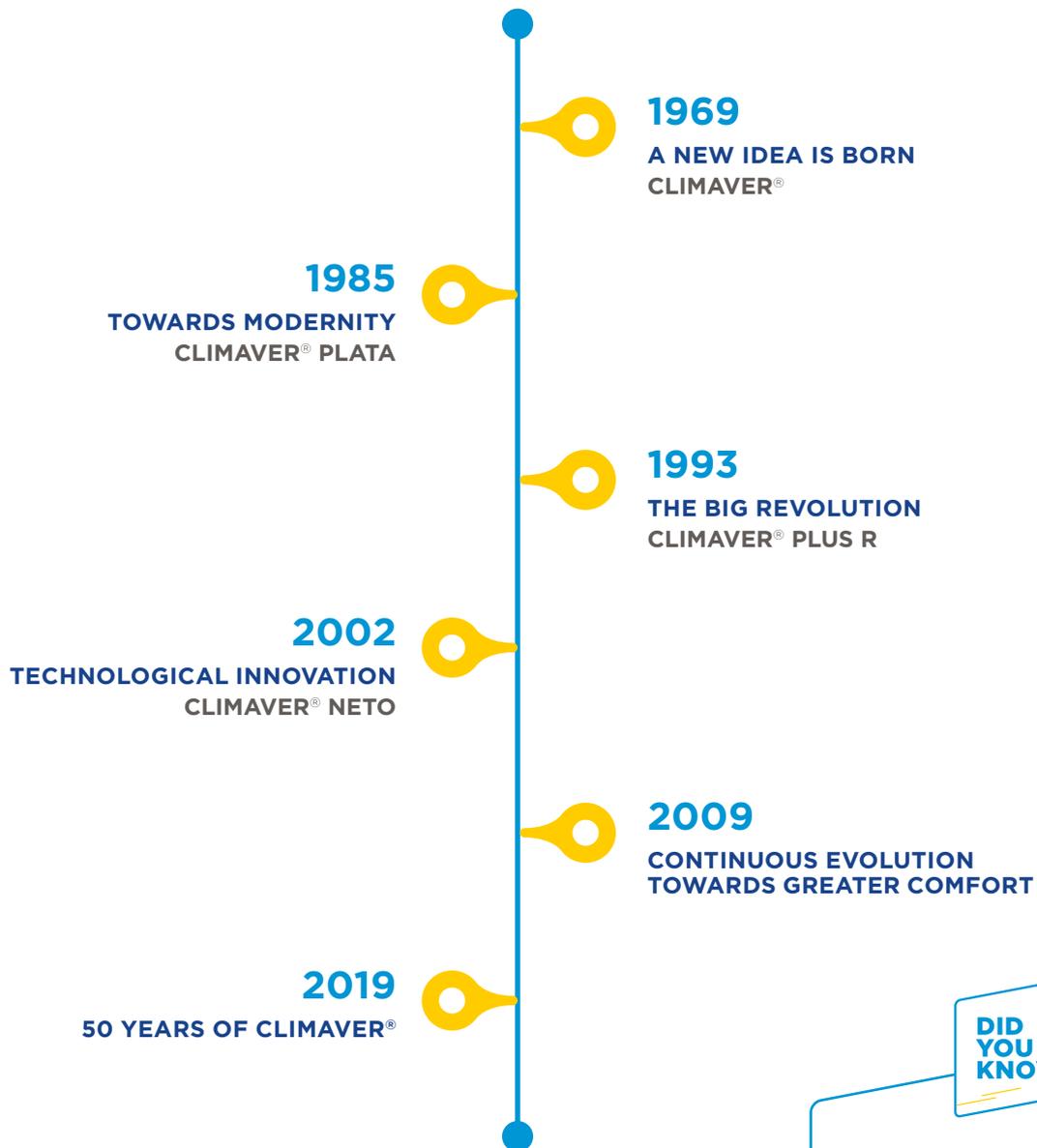


CULTURE

**Lithuanian National
Philharmonic Hall**
Vilnius, Lithuania

The CLIMAVER® STORY

For 50 years, we have constantly updated and improved the CLIMAVER® range to meet our customers' evolving needs. Based on this deep sector experience, we have constantly improved our manufacturing techniques to build a product optimised for both installers and end users.



**DID
YOU
KNOW**

*Many first-
generation
CLIMAVER®
installations are
still operational.*

ABOUT US

A photograph showing a person's hands holding a small green seedling with several leaves. The background is bright and hazy, suggesting an outdoor setting. The image is partially obscured by a yellow callout box in the lower right.

Discover the Saint-Gobain Group, and read more about Saint-Gobain Technical Insulation, the world leading supplier of sustainable insulation solutions.



MAKING THE WORLD A BETTER HOME



Saint-Gobain designs, manufactures and distributes solutions for the construction, mobility, healthcare and other industrial application markets. Developed through a continuous innovation process, they provide wellbeing, performance and safety while addressing the challenges of sustainable construction, resource efficiency and the fight against climate change.

This strategy of responsible growth is guided by the Saint-Gobain purpose, "MAKING THE WORLD A BETTER HOME", which responds to the shared ambition of the women and men in the Group to act every day to make the world a more beautiful and sustainable place to live in.





Saint-Gobain ISOVER

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