

**ISOVER**  
SAINT-GOBAIN



# HVAC INSULATION

PROVIDE A  
COMFORTABLE AND SAFE  
INDOOR ENVIRONMENT,  
IN A SUSTAINABLE WAY!



A

B

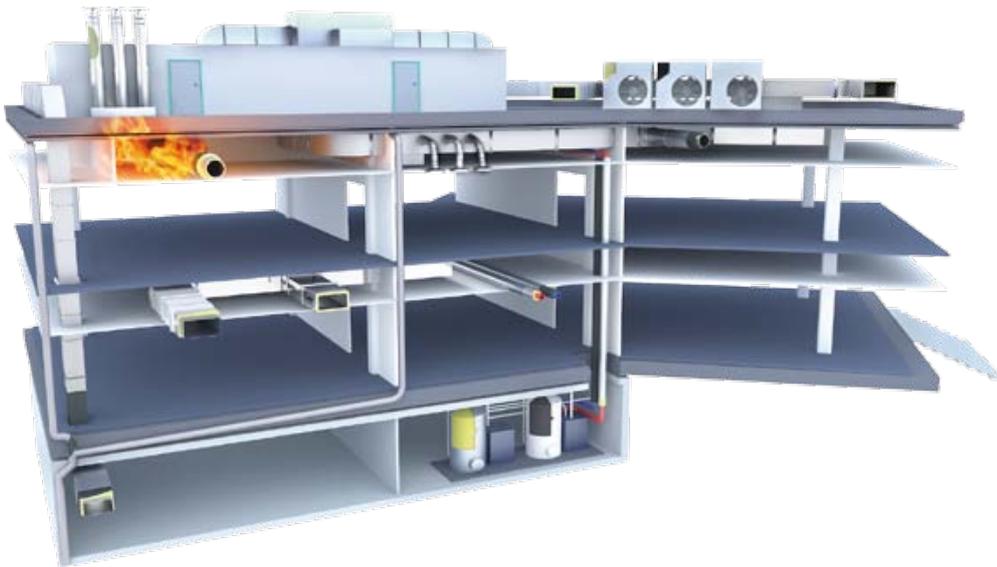
C

D

E

F

G



## **ENSURE YOUR BUILDINGS' THERMAL AND ACOUSTIC COMFORT, GENERATE ENERGY SAVINGS, PREVENT CONDENSATION AND PROVIDE FIRE SAFETY.**

Beyond heating or cooling a space and providing domestic water, Heating, Ventilation & Air-Conditioning (HVAC) systems aim to provide **comfort** and appropriate **indoor environmental quality** to everyone inside a building.

Used in all types of buildings, from education, healthcare, to commercial or residential, HVAC systems are often referred to as the lungs and the veins of a building: depending on the outdoor conditions, the fresh outdoor air is drawn into the buildings and heated or cooled before being distributed in the occupied spaces, then it is exhausted into the ambient air or reused in the system. Plumbing system convey fluids for a wide range of applications. Heating and cooling (HVAC), waste removal, and domestic water supply are the most common uses for plumbing.

HVAC systems typically consist of a thermostat, heat exchanger, furnace, compressor, fan motor, and evaporator coil. Plumbing systems use boilers, valves, plumbing fixtures, tanks, and other devices to convey fluids. Other parts that play a crucial role in the efficiency of an HVAC system include different types of **pipe and ductwork**.

As a building owner or project designer, you will choose your HVAC system based on the climate, usage and structural conditions of the building, as well as your individual preferences. But whatever your choices, all HVAC systems require **adequate insulation** to **keep the air or water at the desired temperature and avoid unnecessary heat loss and emissions**.



# 6 GOOD REASONS TO INSULATE YOUR HVAC SYSTEM

- 
- 1 - Reduce the environmental footprint of your buildings
  - 2 - Save on energy bills
  - 3 - Offer the greatest thermal comfort
  - 4 - Create a pleasant acoustic environment
  - 5 - Ensure fire safety
  - 6 - Prevent condensation damage

# 1

# REDUCE THE ENVIRONMENTAL FOOTPRINT OF YOUR BUILDINGS

**As the world's population continues to grow and natural resources become scarce, climate change has become a daily reality and an unprecedented challenge. Energy efficiency and carbon neutrality have therefore become prerequisites for today's sustainable buildings.**

At every stage of its life cycle, a building designed, built or renovated in a sustainable way should help improve people's comfort, safety and well-being while minimising the consumption of energy and natural resources, reducing the environmental footprint and resulting in lower running costs and increased property values.

## HVAC INSULATION

## A MAJOR FACTOR FOR SUSTAINABLE BUILDINGS

While buildings account for 33% of global energy consumption and 39% of greenhouse gas emissions, HVAC accounts for a lot: up to 80% of the energy used in buildings is consumed by HVAC (source: ec.europa.eu).

It goes without saying that everything must be done to optimize HVAC systems to minimize the environmental impact of buildings. Our insulation solutions help reduce energy consumption and energy-related emissions over the life of your projects, while having minimal (ideally zero) environmental impact during manufacturing and all their life cycle.

We strive to continuously increase the amount of recycled content in our products, and some of our glass wool solutions are made of up to 80% recycled glass.

## SCENARIO

Reduce greenhouse gas emissions by insulating better



A school building of **5,000 m<sup>2</sup>** using an electric AC system

- **3,200 m<sup>2</sup>** of rectangular ductwork
- Average temperature inside the duct: **15 °C**
- Maximum airflow velocity: **3 m/s**
- **4,000** operating hours per year
- CO<sub>2</sub> emissions per kWh: **0.623**

	CO <sub>2</sub> emissions
CLIMCOVER 25 mm	-98,860 kg p.a.
<b>CLIMCOVER 50 mm</b>	<b>-63,400 kg p.a.</b>

**AVOIDED  
CO<sub>2</sub> EMISSIONS**

**35,460 kg p.a.**



## DID YOU KNOW?

During the UN Climate Action Summit held on September 23, 2019, Saint-Gobain signed the Global Compact promise “Business ambition for 1.5 °C”, committing to achieve net zero emissions by 2050 at the latest in line with the objective of limiting the rise in global temperature to 1.5 °C.

## AT THE HEART OF ENVIRONMENTAL CERTIFICATIONS

The most recent versions of environmental certifications (LEED, BREEAM, WELL, HQE International etc.) have placed even more emphasis on energy efficiency. HVAC is an integral part of those certifications as it affects several of the scoring categories.

These scoring categories basically decide how “green” a building is: all aspects of a building’s design, construction, operation and maintenance - including HVAC - are taken into account and are certified at different levels.

High efficient HVAC systems will help you certify your sustainable building projects, not only saving energy and reducing CO<sub>2</sub> emissions, but also because they require less

maintenance, which helps to waste less of resources. HVAC also has a huge impact on the building user experience by providing acoustic and thermal comfort.

To provide detailed information on the environmental footprint of our solutions, we perform Life Cycle Assessments (LCAs) of our products and have issued Environmental Product Declarations (EPDs) for many of our solutions. They give a complete but summarised picture of the environmental impacts of a product, from the extraction of raw materials to the end of life, including production. EPDs also allow you to earn valuable points for green building certifications.

# 2

# SAVE ON ENERGY BILLS

**When heating and cooling represent up to 80% of the energy used in buildings, it goes without saying that every effort must be made to reduce the amount of energy required.**

Reducing heat loss from HVAC systems with proper insulation is a powerful way to reduce energy costs.

## HVAC INSULATION TO SAVE EVEN MORE

Efficient thermal insulation ensures that the medium (air or liquid) stays at the right temperature in the right place, reducing energy loss throughout the system.

Thermal conductivity ( $\lambda$ ) is a key factor in the energy efficiency of insulation products. The lower it is, the better a product's ability to prevent heat flow, i.e. to reduce heat loss (or heat gain in cold systems). With low thermal conductivity values, our HVAC insulation solutions offer excellent thermal efficiency over a wide temperature range. They also reduce the internal thermal load and the risk of overheating or -cooling in your building.

To help you define the most effective thermal insulation solution for your pipes and ducts, we can assist you in the design of your projects.

### SCENARIO

Save thousands on heating bills by insulating better



A three-storey block of flats in Northern Europe heated by gas

- 1,700 m of pipework with a diameter of 35 mm
- Average fluid temperature inside the pipes: 55 °C
- 4,800 operating hours per year
- Energy price 0.18 €/kWh

	Operational cost
KAIFLEX 13 mm	-18,500 € p.a.
<b>KAIFLEX 25 mm</b>	<b>-12,000 € p.a.</b>

ENERGY SAVINGS	PAYBACK*
<b>-6,500 € p.a.</b>	<b>-1 year</b>

*\*material cost/operational cost*

# 3

## OFFER THE GREATEST THERMAL COMFORT

**A balanced thermal environment is essential to feeling comfortable. Concentration, manual dexterity and the occurrence of accidents are all influenced by temperatures that are too high or too low.**

The operating temperature and relative humidity in a space determine the overall comfort conditions, depending on what we wear and what we do. Our bodies are also sensitive to small variations in factors such as air speed and temperature gradient. The impact of local discomfort elements must be minimized so that we can take full advantage of the space and function comfortably, whatever we do.

### HVAC INSULATION TO FEEL COMFORTABLE

Heating, Cooling, Ventilation and Air Conditioning (HVAC) systems help maintain the ideal indoor temperature all year round, provided they are properly insulated. Our insulation products with low thermal conductivity guarantee a reduction in heat loss to a minimum and optimal comfort offered to building occupants.

In addition, effective thermal insulation not only ensures that the medium stays at the right comfort temperature, but at the same time it prevents microbial contamination and the health risks that can go with it.

#### SCENARIO

Keep hot water hot for longer with insulation



How long will it take for stagnant hot water with a temperature of 55°C to go down to 21 °C, when the ambient temperature is 20 °C?

	Time to go down to 21 °C	GAIN OF TIME <b>+ 12 HOURS</b>
Uninsulated	2h20 min	
<b>U PROTECT® PIPE SECTION 20 mm</b>	<b>14h25 min</b>	

#### DID YOU KNOW?

Good insulation provides convenient water use, as water stays hot when needed to stay hot and cold when needed cold. This means less running of taps for a cold drink or a hot shower.

# 4

## CREATE A PLEASANT ACOUSTIC ENVIRONMENT

**Designing comfortable buildings also means taking the acoustic environment into consideration. This is because a well-balanced acoustic environment blocks unwanted and harmful noise and enhances the sounds we want, and in fact need, to hear.**

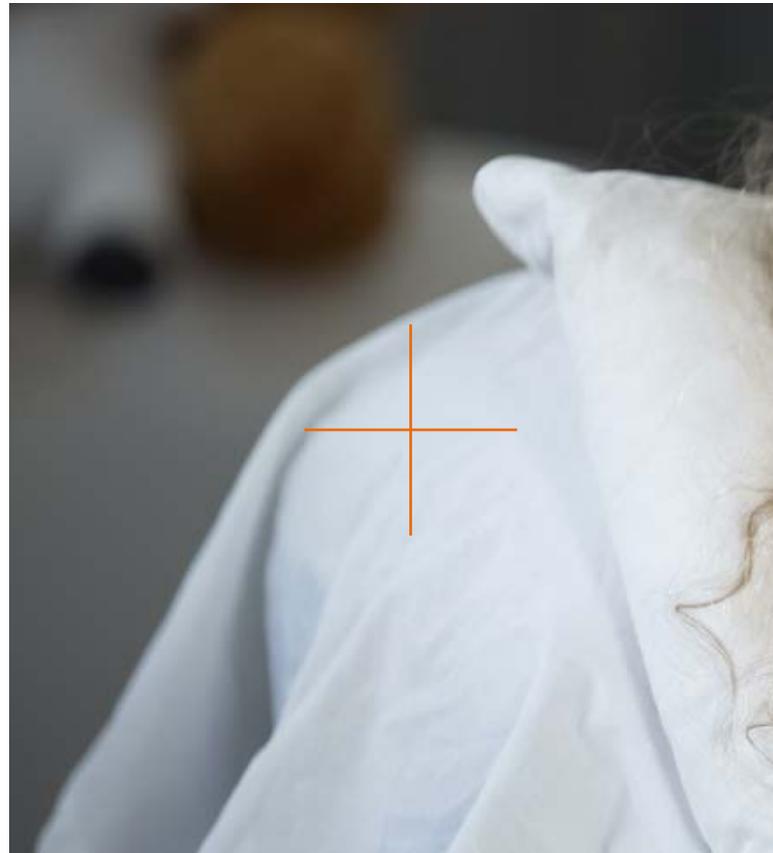
Research has shown that well-designed sound environments in offices or schools help improve concentration and enable better communication. Learning is more efficient and less tiring when students can easily hear and understand their teacher. In hospitals, reducing the stress and insomnia created by high noise levels helps patients recover faster and makes the job easier for staff. In our own homes, noise protection contributes to a feeling of security and privacy. In short, when we are acoustically comfortable - when unwanted noise is blocked out and we

can clearly hear beneficial sounds - we are more productive, happier, and have fewer health issues.

Noise emitted by HVAC systems can be one of the main sources of noise inside buildings. Pipes and ducts produce sounds in many different frequencies from very low to very high and these issues need to be addressed in a different way. For example, their geometry - which can be rectangular or circular - has a significant impact on the sound level.

### DID YOU KNOW?

Sound insulation is about reducing the noise transmitted to adjacent spaces, while sound absorption improves sound quality in the same space of the sound source.



## HVAC INSULATION

## TO KEEP NOISE OUT

With the right insulation, noise disturbance generated by HVAC systems can be greatly reduced and comfort improved. Our sound absorbing materials break sound waves, which helps eliminate sound reverberation and prevent propagation, especially in rectangular ducts.

Whether the noise is air-borne (transmissions from duct or pipe systems) or structure-borne (operation of HVAC machines or pipe & duct systems), we offer effective noise control solutions for duct systems, machinery, sewage, wastewater and rainwater pipes, including penetration seals. Our wide range of solutions that prevent the transmission of vibrations through structures and also attenuate airborne noise, include pipe insulation, duct wraps, duct liners and self-supporting ducts.



### DID YOU KNOW?

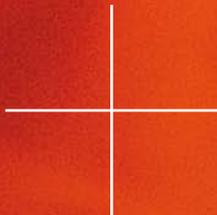
By using CLIMAVER® as an air duct, the sound pressure can be reduced by more than

**20 dB** per metre of duct.

**The consequences of fire breaking out and spreading are of serious concern for building occupants everywhere. Fires cause up to 10,000 victims each year in Europe.**

The choice of materials can significantly affect the spread of fire, smoke and its rate of development, even though the materials themselves are unlikely to be the first things that catch fire. Materials can be classified in terms of their reaction to fire, i.e. their potential contribution to flashover. Flashover is the spontaneous ignition of hot smoke and gases, which can lead to a fire spreading uncontrollably.

In the event of a fire, every second counts. The rapid spread of heat, fire and smoke must be avoided to allow people to evacuate the building and the fire brigade to respond and reduce the likelihood of fires getting out of hand.



## **HVAC INSULATION**

## **TO PROTECT LIVES**

Care should be taken to ensure that HVAC components remain stable, prevent the passage of flames and smoke, and control the temperature for as long as possible.

First of all, the insulating materials should at least be flame retardant and must not in any way contribute to the spread of the fire or create toxic fumes or burning droplets.

The escalation of a fire within a building can be restricted by sub-dividing the building into fire compartments, separated from one another by fire-resistant walls and/or floors. Where pipes or ducts pass through a fire-rated wall or floor, the spread of fire and smoke through these openings must be prevented. These openings, known as penetrations, represent potential channels through which fire and smoke could spread and must be protected to guarantee the overall fire resistance of the construction. For these applications, we offer solutions with superior material stability and thermal resistance at high temperatures. Fire resistant pipes and ducts or smoke extraction ducts will retain their integrity and insulating properties for a given period of time.

Our HVAC fire insulation solutions can provide up to 2 hours of fire resistance for pipes, rectangular and circular duct systems and penetrations, and are always tested in trusted third party laboratories.

# PREVENT CONDENSATION DAMAGE

**The surfaces of air-conditioning, refrigeration and cold-water pipework are generally at a lower temperature than the surrounding air. When the air is cooled to the point of being saturated with water vapour, it reaches the dew point. When cooled further, the water vapour suspended in the air will condense to form liquid water. On contact with the surfaces of cold pipes, ducts or conduits, there may therefore be condensation.**

The damage of the building structure, cost of corrosion under insulation (CUI), water piping that freezes, and the associated potential operational disruption can be significant. Corrosion processes under thermal or sound insulation are among the hidden and therefore particularly critical damage processes.

## HVAC INSULATION

## FOR LONG-LASTING SYSTEMS

While cold pipe and duct insulation is primarily used for energy efficiency in HVAC systems, it is also an effective way – if properly chosen – to prevent condensation. Good insulation reliably prevents the surfaces of the pipes or ducts from falling below the dew point, so that condensation does not occur, and that there is no risk of corrosion or damaging surrounding structures by moisture.

Applying insulation around a cold pipe or duct helps keep the cold inside. Even if the outer surface of the pipe or duct itself is cold, the temperature of the outer surface of the insulation will be high enough to prevent condensation. This reduces the risk of corrosion and damage to pipes, ducts and surrounding structures as well as the overall HVAC equipment and ensures the stability of the system throughout its lifetime. This obviously means significant savings in operating and maintenance costs.

## DID YOU KNOW?

**As long as the surface temperature of the insulation is above the dew point, no condensation will form, even if the temperature inside the pipe or duct is below the dew point.**



# MAIN HVAC APPLICATIONS AND INSULATION SOLUTIONS

- 
- 1** - HVAC main equipment
  - 2** - Ductwork
  - 3** - Pipework
  - 4** - Passive fire protection

# HVAC INSULATION OFFER



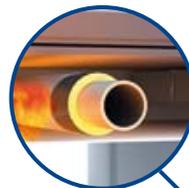
**SELF-SUPPORTING DUCTS**  
CLIMAVER®



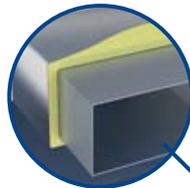
**CHIMNEYS**  
U PROTECT®



**FIRE RATED DUCTS**  
U PROTECT®



**VENTILATION DUCTS**  
CLIMCOVER



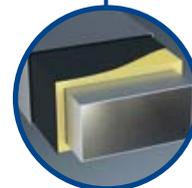
**DUCT PENETRATIONS**  
U PROTECT®



**SEWAGE & RAIN WATER PIPES**  
KAIVENIENCE



**SMOKE EXTRACTION DUCTS**  
U PROTECT®



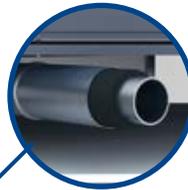
**BOILERS / TANKS**  
CLIMCOVER



**AIR HANDLING UNIT**  
KAISOUND



**DUCTS OUTSIDE THE BUILDING**  
CLIMAVER® STAR



**A/C DUCTS**  
KAIFLEX



**FLEXIBLE DUCTS**  
FLEXIVER



**COLD WATER PIPES**  
KAIFLEX



**HOT WATER PIPES**  
U PROTECT® PIPE SECTION ALU2



**PIPE PENETRATIONS**  
U PROTECT® PIPE SECTION ALU2  
KAIFLEX

# HVAC MAIN EQUIPMENT

The main equipment of heating systems includes furnaces, hot water and steam boilers, heat pumps and space heating systems.

The main equipment of cooling systems includes cold water tanks, chillers and compressors, cooling towers, air handling units and fan coils.



AIR HANDLING UNIT  
MECHANICAL ROOM  
BOILERS / TANKS



## AIR HANDLING UNIT

An air handling unit (often called AHU) is used to regulate the temperature and humidity of the air and to circulate the air inside the building. It can be connected to a network of ducts and / or pipes.

### INSULATION WHY AND HOW?

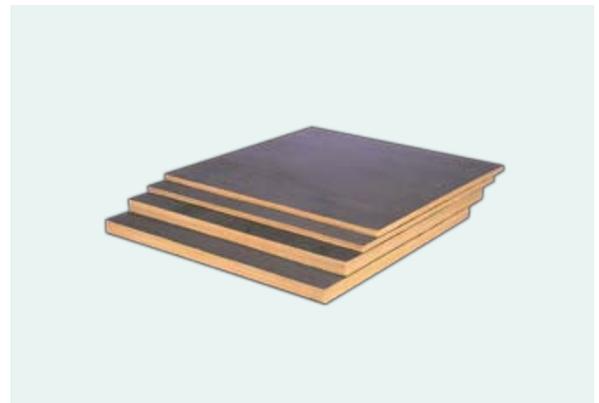
Provide thermal stability and energy savings, prevent condensation, improve acoustic comfort and ensure fire safety.

### YOUR SOLUTION

#### KAISOUND



KAISOUND is an open porosity, hydrophobic elastomeric foam made largely from recycled materials. It provides sound insulation, is highly flexible and easy to handle and fulfils high hygiene requirements.



#### CLIMLINER



CLIMLINER is a lightweight glass wool slab/roll with special facing designed for acoustic insulation needs in addition to thermal insulation.



## MECHANICAL ROOM

Spaces or zones containing equipment that produce or distribute heating, cooling, ventilation or plumbing capacities.

### INSULATION WHY AND HOW?

Provide thermal stability and energy savings, prevent condensation, improve acoustic comfort and ensure fire safety.

### YOUR SOLUTION

#### KAIFLEX



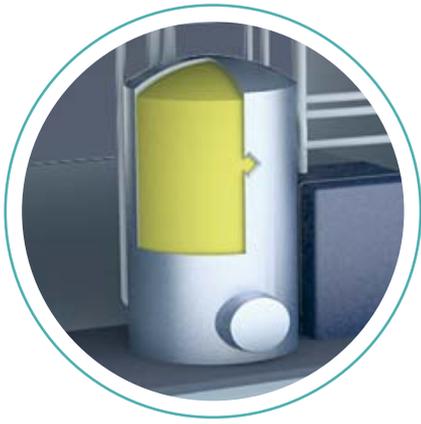
KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, while meeting high hygiene requirements.



#### U PROTECT® WIRED MAT / SLAB 4.0 ALU1



U PROTECT® Slabs and Wired net mats are made of aluminium faced ULTIMATE™ mineral wool and provide up to 2 hours fire resistance, as well as efficient thermal and acoustic insulation.



## BOILERS / TANKS

Boilers or tanks are closed containers for heating or cooling water to power heating / cooling systems or to provide hot / cold water.

### INSULATION WHY AND HOW?

Provide thermal stability and energy savings, prevent condensation, improve acoustic comfort and ensure fire safety.

### YOUR SOLUTION

#### KAIFLEX



KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, while meeting high hygiene requirements.



#### CLIMCOVER



CLIMCOVER provides thermal and acoustic insulation. It is faced on one side with a reinforced pure aluminium foil which acts as a vapour barrier. Due to its unique fibre structure, it is highly flexible and can be easily bent over different shapes and parts of HVAC systems.



## DUCTWORK

Ductwork refers to the system of ducts used to transport air from HVAC equipment throughout a building.

The airflows include supply air, return air, and exhaust air. Air ducts are important to ensure an acceptable indoor air quality as well as thermal comfort for the occupants. Air ducts come in different sizes, shapes, and materials - they can for instance be round (circular) or rectangular. The proper duct design is critical to maintain optimal air flow in the system and to avoid discomfort, high energy costs, bad air quality, and increased noise levels.

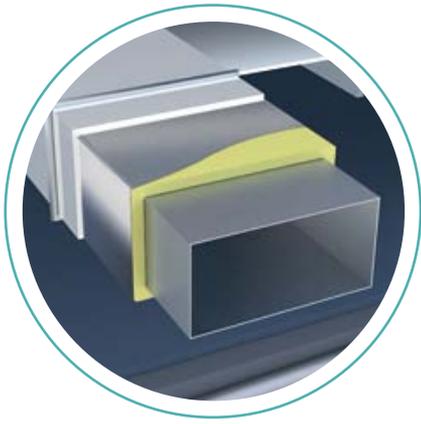
Ductwork has a major impact on the efficiency and comfort level of buildings. It is therefore important to insulate it properly to ensure that the air flowing silently through the system stays at the desired temperature and does not “leak”.

### DID YOU KNOW?

While ductwork is traditionally made of metal, CLIMAVER® is a unique product to replace metal ductwork, offering state-of-the-art insulation and comfort, with minimal environmental impact.



VENTILATION DUCTS  
CLIMAVER® SELF-SUPPORTING DUCT  
A/C DUCTS  
OUTDOOR DUCTS  
FLEXIBLE DUCTS



## VENTILATION DUCTS

Used to exchange air inside the building, they rely on different airflows including supply air, return air, and exhaust air.

### INSULATION WHY AND HOW?

Provide thermal stability and energy savings, prevent condensation and improve acoustic comfort.

## YOUR SOLUTION

### CLIMCOVER



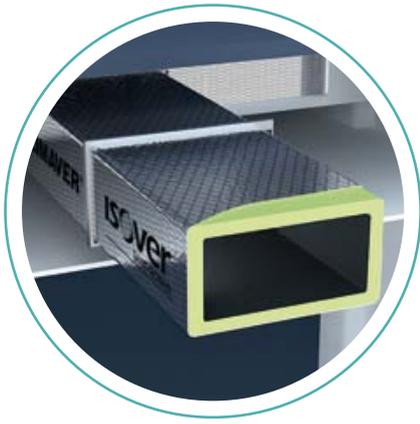
CLIMCOVER provides thermal and acoustic insulation. It is faced on one side with a reinforced pure aluminium foil which acts as a vapour barrier. Due to its unique fibre structure, it is highly flexible and can be easily bent over different shapes and parts of HVAC systems.



### KAIFLEX



KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, while meeting high hygiene requirements.



## CLIMAVER® SELF-SUPPORTING DUCT

CLIMAVER® is a self-supporting glass wool duct system for the distribution of air in ventilation and air-conditioning systems.

### INSULATION WHY AND HOW?

Provide an easy to install ductwork and insulation solution in one operation, for thermal and acoustic comfort and greatest energy efficiency.

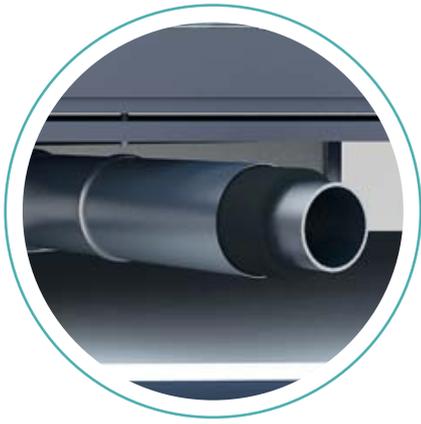
## YOUR SOLUTION



### CLIMAVER®



CLIMAVER® is a self-supporting duct for air-conditioning, ventilation, heating and cooling systems. CLIMAVER® offers superior thermal performance and a high level of airtightness to keep your air fresh and making the system energy efficient. CLIMAVER® also reduces noise levels generated by fans and air-conditioning units providing superior acoustic comfort to the building occupants.



## A/C DUCTS

Used to provide cooled or heated air, they rely on a supply air airflow.

### INSULATION WHY AND HOW?

Provide thermal stability and energy savings, prevent condensation and improve acoustic comfort.

## YOUR SOLUTION

### CLIMCOVER



CLIMCOVER provides thermal and acoustic insulation. It is faced on one side with a reinforced pure aluminium foil which acts as a vapour barrier. Due to its unique fibre structure, it is highly flexible and can be easily bent over different shapes and parts of HVAC systems.



### KAIFLEX



KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, while meeting high hygiene requirements.



## OUTDOOR DUCTS

Part of the ducts can be located outside the building. These ducts supply and exhaust the air supplied by the AHU. They convey air flows including supply air, return air, and exhaust air. Outdoor ducts must be resistant to UV rays and to rodents and birds.

### INSULATION WHY AND HOW?

Provide thermal stability, mechanical protection and energy savings, prevent condensation and improve acoustic comfort.

## YOUR SOLUTION

### CLIMAVER® STAR



CLIMAVER® STAR is a self-supporting duct for air-conditioning and ventilation systems outside buildings. It offers superior thermal performance and high levels of air tightness to keep your air fresh and make the system energy efficient. It also reduces noise levels generated by fans and air conditioning units providing superior acoustic comfort to building users. CLIMAVER® STAR has a special facing providing vapour barrier and UV protection for a long-lasting duct system.



### + KAIFLEX



KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, optional with already applied facing to protect against mechanical stress and UV rays.



## FLEXIBLE DUCTS

Flexible ducts are mainly used to attach supply air outlets (diffusers and grilles) to rigid ducts. In most cases, local regulations limit their length to a maximum of 2m due to their basic thermal and acoustic performance and high pressure drops.

### **INSULATION WHY AND HOW?**

Provide thermal stability and energy savings, prevent condensation and improve acoustic comfort.

## YOUR SOLUTION



### **FLEXIVER**



FLEXIVER is a circular flexible duct composed of three layers of an aluminium-polyester complex and insulated on the outside by a glass wool felt covered with a reinforced polyester and aluminium foil which provides mechanical resistance and acts as a vapour barrier.

## PIPEWORK

Pipework is part of any HVAC system in buildings where fluids must be conveyed. A heating system consists of a boiler, radiators and the pipework that connects them. Refrigeration systems are carrying lower than ambient temperature liquids through a system including condenser, evaporator and compressor. In these systems, the risk of condensation leading to corrosion is very high and it is crucial to use a suitable insulating material. Sanitary pipework is used to supply hot and cold water to toilets, sinks, baths, showers, dishwashers, washing machines, etc. and to carry waste water out of the building to the sewage system.

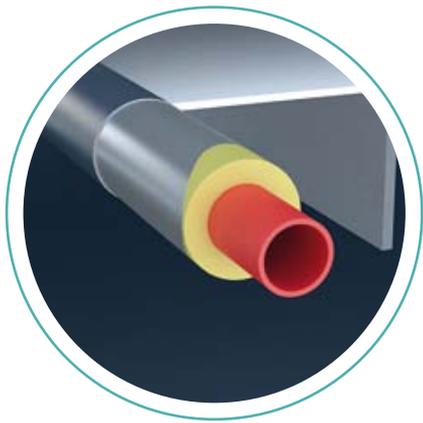
The pipe system comprises many different components, including pipes of different diameters, supports, gaskets, flanges, bolts, valves, strainers, connexions and expansion joints. Pipework has a major impact on the efficiency and comfort level of buildings, and pipe insulation will provide thermal stability and acoustic comfort, and will also help save water.

### DID YOU KNOW?

Keeping the medium inside the pipes at the correct temperature reduces the risk of contamination by legionella bacteria, which multiply at temperatures between 20 and 45 °C.



HOT WATER PIPES  
COLD WATER PIPES  
WASTE- / RAINWATER PIPES



## HOT WATER PIPES

Hot water pipes are supply pipes for domestic water or heating.

### INSULATION WHY AND HOW?

Maintain the desired fluid temperature, save energy, improve thermal comfort and prevent health problems.

## YOUR SOLUTION

### U PROTECT® PIPE SECTION ALU2



Manufactured from ULTIMATE™ mineral wool, U PROTECT® Pipe Section Alu2 is an efficient, lightweight and easy to install solution for thermal and acoustic insulation and fire resistance in HVAC piping systems.

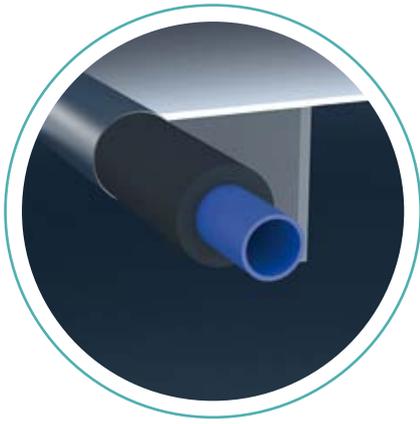


### KAIFLEX



KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, while meeting high hygiene requirements.





## COLD WATER PIPES

Cold water pipes are supply pipes for refrigeration or cold domestic water.

### INSULATION WHY AND HOW?

Maintain the desired fluid temperature, save energy, improve thermal comfort, prevent condensation, corrosion and health issues.

## YOUR SOLUTION

### KAIFLEX



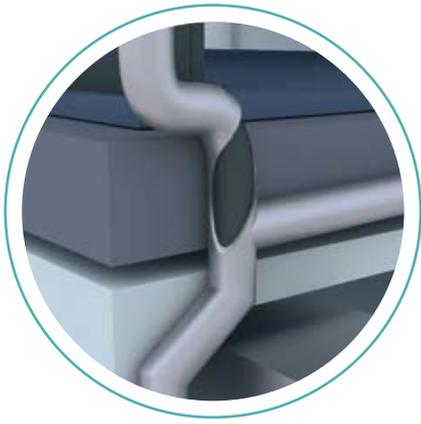
KAIFLEX is a flexible closed cell elastomeric foam insulation that prevents condensation and reduces energy loss, while meeting high hygiene requirements.



### U PROTECT® PIPE SECTION ALU2



Manufactured from ULTIMATE™ mineral wool, U PROTECT® Pipe Section Alu2 is an efficient, lightweight and easy to install solution for thermal and acoustic insulation and fire resistance in HVAC piping systems.



## WASTE- / RAINWATER PIPES

These pipes are used to evacuate waste- and rainwater and other liquids through the building.

### INSULATION WHY AND HOW?

Prevent condensation  
and improve  
acoustic comfort.

## YOUR SOLUTION

### KAIVENIENCE



KAIVENIENCE is a multilayer system based on sound insulation foam material in combination with various coatings, which is suitable for both interior and exterior applications. With a thickness of only 5 to 10 mm, this solution is suitable even for limited spaces. Thanks to its coatings, Kaivenience ensures effective condensation prevention and is not vulnerable to damage. It fits harmoniously into its environment even if it is installed where it is visible.



### U PROTECT® PIPE SECTION ALU2



Manufactured from ULTIMATE™ mineral wool, U PROTECT® Pipe Section Alu2 is an efficient, lightweight and easy to install solution for thermal and acoustic insulation and fire resistance in HVAC piping systems.

Passive fire protection is an important element of the building fire compartmentation. The objective is to protect building inhabitants against the rapid spread of smoke and fire inside the building. Fire compartmentation is reached by subdividing the building with fire rated floors and walls and protecting the building services that penetrate through them. The final target is to give enough time to building occupants to exit the building in case of fire.

By choosing a suitable insulation solution, the fire safety of air ducts and pipes is ensured.



- FIRE RATED DUCTS
- SMOKE EXTRACTION DUCTS
- DUCT PENETRATIONS
- PIPE PENETRATIONS
- CHIMNEYS



## FIRE RATED DUCTS

Fire rated ducts ensure the fire compartmentation of buildings.

### **INSULATION WHY AND HOW?**

Ensure stability, minimise temperature rise and prevent the passage of flames and smoke.

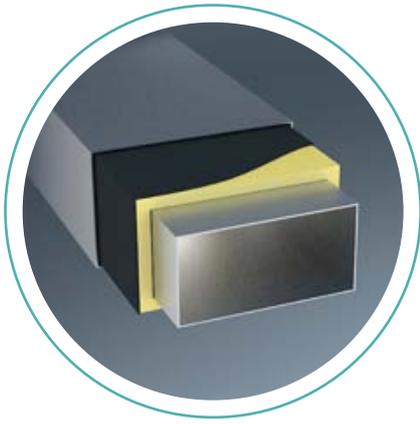
## YOUR SOLUTION



### **U PROTECT® WIRED MAT / SLAB 4.0 ALU1**



U PROTECT® Slabs and Wired net mats are made of aluminium faced ULTIMATE™ mineral wool and provide up to 2 hours fire resistance, as well as efficient thermal and acoustic insulation.



## SMOKE EXTRACTION DUCTS

Smoke extraction ducts are used to remove smoke from buildings in the event of a fire, to allow emergency evacuation and to support fire compartmentation.

### **INSULATION WHY AND HOW?**

Ensure stability, minimise temperature rise and prevent the passage of flames and smoke.

## YOUR SOLUTION



### **U PROTECT® WIRED MAT / SLAB 4.0 ALU1**



U PROTECT® Slabs and Wired net mats are made of aluminium faced ULTIMATE™ mineral wool and provide up to 2 hours fire resistance, as well as efficient thermal and acoustic insulation.



## DUCT PENETRATIONS

A duct penetration is an opening in a wall or floor, for the purpose of accommodating the passage of a duct. It is part of the building's fire compartmentation.

### **INSULATION WHY AND HOW?**

Ensure stability, minimise temperature rise and prevent the passage of flames and smoke.

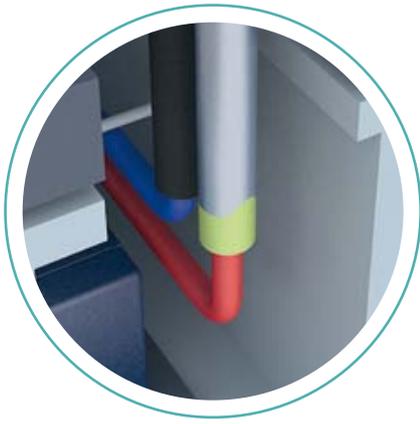
## YOUR SOLUTION



### **U PROTECT® WIRED MAT / SLAB 4.0 ALU1 + BSK**



U PROTECT® Slabs and Wired net mats are made of aluminium faced ULTIMATE™ mineral wool and provide up to 2 hours fire resistance, as well as efficient thermal and acoustic insulation. They have been tested according to EN1366-1 for fire resistant ductwork and EN1366-8 for multi-compartment smoke extraction ductwork. With the appropriate accessories for the system, they are perfectly suitable for penetration sealing.



## PIPE PENETRATIONS

A pipe penetration is an opening in a wall or floor, for the purpose of accommodating the passage of pipework. It participates in the building's fire compartmentation.

### INSULATION WHY AND HOW?

Ensure stability, minimise temperature rise and prevent the passage of flames and smoke.

## YOUR SOLUTION

### U PROTECT® PIPE SECTION ALU2



Manufactured from ULTIMATE™ mineral wool, U PROTECT® Pipe Section Alu2 is an efficient, lightweight and easy to install solution for thermal and acoustic insulation and fire resistance in HVAC piping systems (tested according to EN1366-3 up to 120 minutes).



### KAIFLEX



KAIFLEX is particularly well suited for pipe penetrations with 90/120 minutes' fire resistance according to DIN 4102-2. For larger pipe diameters, when the pipe passes through lightweight partitions or to insulate combustible pipe systems, the "Kaiflex Pyrostar" fire protection system can be used.



## CHIMNEYS

A chimney is a vertical channel that conducts smoke and combustion gases from a fire place or furnace through the roof or wall of a building.

### **INSULATION WHY AND HOW?**

Reduce condensation inside the chimney, minimise temperature rise, ensure stability and fire safety.

## YOUR SOLUTION



### **U PROTECT® WIRED MAT / SLAB 4.0 ALU1**



U PROTECT® Slabs and Wired net mats are made of aluminium faced ULTIMATE™ mineral wool and provide up to 2 hours fire resistance, as well as efficient thermal and acoustic insulation.





# ABOUT SAINT-GOBAIN

---

Find out more about the Group  
and the Saint-Gobain Technical  
Insulation business unit.



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.

# MAKING THE WORLD A BETTER HOME



Aligned with this commitment, Saint-Gobain Technical Insulation has been delivering sustainable insulation solutions to customers since 1937. Across all technical markets - from Marine to Industry, HVAC, automotive and household appliances - and with a worldwide presence deployed locally, we support our customers at every step of the project, from design to installation. This means customizing our approach based on specific needs. This means adding value through high levels of comfort, health, safety and performance. This also means helping limit environmental impact of each project, while managing costs.

With expertise in an array of insulation materials, we are constantly pushing the limits of our solutions. These unwavering R&D efforts also enable us to reduce the carbon footprint of each product, whether through high levels of recycled content, recyclability or lower energy consumption.

Drawing on a unique combination of global resources, local deployment and multi-material expertise, Saint-Gobain Technical Insulation strives to always be more efficient and responsible. Together with our customers, we are making this an everyday reality.

Saint-Gobain Technical Insulation  
**PUSHING THE LIMITS OF SUSTAINABILITY TOGETHER.**



Saint-Gobain Technical Insulation

**PUSHING THE LIMITS OF SUSTAINABILITY TOGETHER.**



**Saint-Gobain ISOVER**

Tour Saint-Gobain  
12 place de l'Iris  
92096 La Défense Cedex - France  
[www.isover-technical-insulation.com](http://www.isover-technical-insulation.com)

The information given in this brochure is based on our current knowledge and experience. If any information is incorrect this is not deliberate or grossly negligent. This document is not continually updated and we cannot be held responsible for any unintentional errors. For the most up-to-date information, please visit our websites: [www.isover-technical-insulation.com](http://www.isover-technical-insulation.com) & [www.kaimann.com](http://www.kaimann.com)