



**KAIMANN**  
foam technology of tomorrow



## Pricelist Catalogue 2011- Ireland

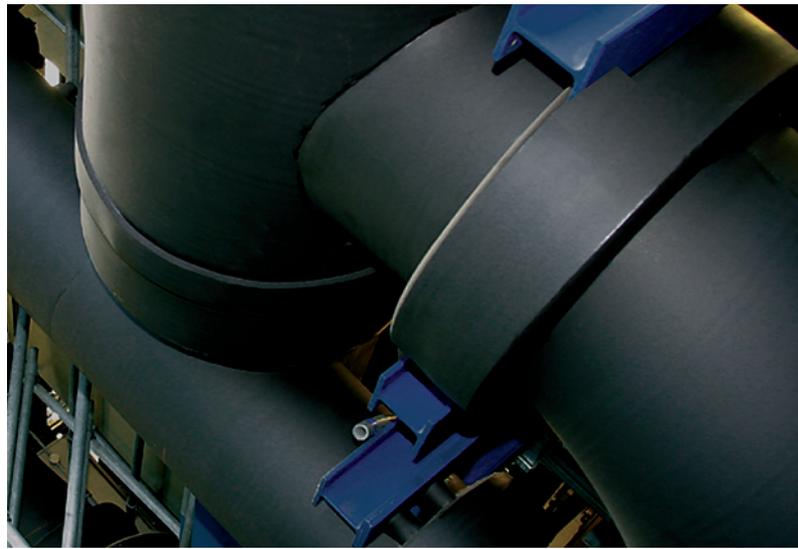
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## Kaimann: Foam technology of tomorrow

For over 50 years Kaimann has looked to build for the future without ever forgetting the lessons of the past. The success of our company has always been based on a reputation for quality and a commitment to establishing fair, long-term business partnerships with all of our customers.

Since Kaimann was founded in 1959 the company has constantly sought to improve the quality of products and services we are able to offer to the market. This long and continuous programme of development has led to our manufacturing plant in Hövelhof being recognised as the worlds lead-

ing centre for the production and development of flexible elastomeric and polyethylene insulation.

Kaiflex, our leading insulation brand, has grown to become known Europe's most reliable and trusted brand of flexible insulation for air-conditioning, refrigeration, heating, hot water and solar hot water applications. Today Kaiflex continues to set the standard for elastomeric foam insulation with a series of sophisticated product innovations.

Following recent investment, expansion and optimisation, Kaimann is now able to offer a Kaiflex product range tailored to the needs of the UK & Ireland.

■ Knowledge  
Successful insulation requires an appreciation of the challenges faced of the relative solutions available. Over 50 years

Kaimann has assembled a team of technical insulation experts with a deep and wide ranging understanding of the insulation industry which is harnessed to give customers an advantage.

■ Assurance

Confidence and trust form the core of any partnership. Kaimann understands this expresses a dedication to quality management by meeting a commitment to ISO 9001, by reliably meeting customer expectations and by providing an unparalleled level of service.

■ Innovation

Achieving even greater energy savings and further reductions in Carbon Dioxide emissions requires product innovation and technical expertise. Kaimann employs an experienced team of expert research and development chemists who work closely with industry stakeholders to determine and realise the insulation solutions of tomorrow.





## Kaimann: Manufacturing technology of tomorrow

The Kaimann manufacturing plant in Hövelhof, Germany, is the largest and most technologically advanced elastomeric and Polyethylene manufacturing facility in Europe with unrivalled production capabilities. Through sustained and focused investment Kaimann has optimised production techniques and developed its headquarters

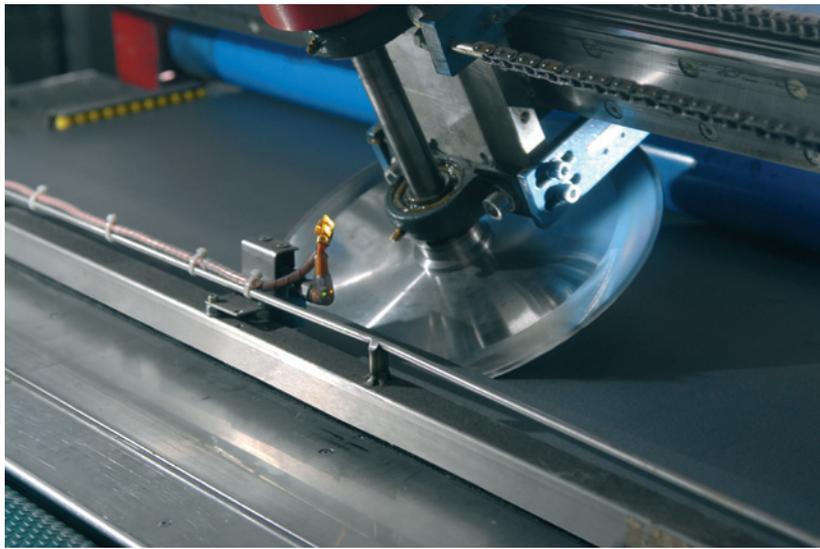
into a global centre of insulation manufacturing excellence with every Kaiflex product highly engineered to achieve superior technical values.

Successful manufacturing requires a balanced approach in which every stage of the process must work in combination to achieve quality pro-

duction objectives. Kaimann understands this which is why quality engineering is emphasised at every stage of production.

Kaimann also understands that the most important person in the production process is always the customer which is why Kaimann customers are





## Kaimann: Process technology of tomorrow

routinely invited to inspect our manufacturing facilities for themselves.

### ■ Research & Development

Employing expert chemists specialising exclusively in the development of flexible elastomeric insulation, Kaimann operates an advanced research & development laboratory at Hövelhof. Equipped with a scale production line, any innovations trialled in the laboratory can be later incorporated into full scale manufacturing with complete confidence.

### ■ Raw Materials Selection

All physical and chemical properties are carefully assessed by a rigorous testing regime and only the best raw materials make it into Kaiflex insulation.

### ■ Controlled Mixing Process

Combining raw materials to create consistent production batches is a key stage of the manufacturing process.

Kaimann operates the most modern, state of the art, mixing plant available with automated processes producing consistent results.

### ■ Elastomeric Production

Kaimann operates a pellet based manufacturing technique that offers an unparalleled level of production control and accuracy.

Raw materials are fed through high specification extrusion dies into an especially large and modern manufacturing oven. With precise control over temperature and line speed, Kaimann is able to consistently manufacture Kaiflex to exact production tolerances and specifications.



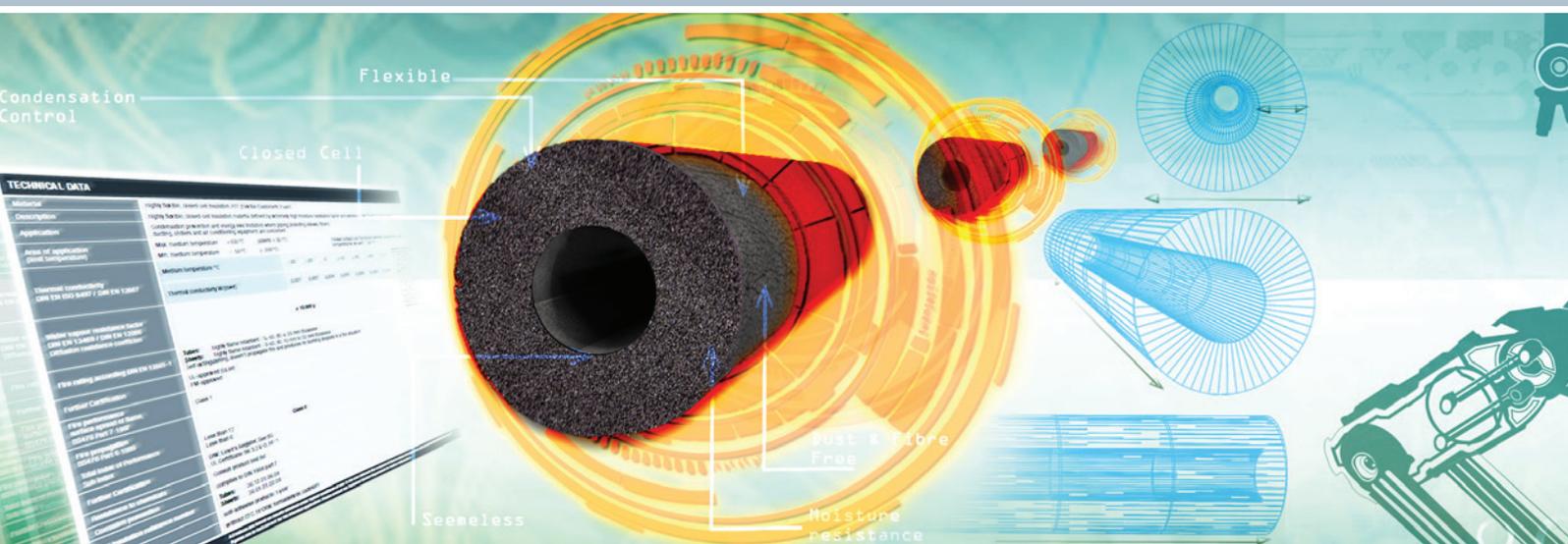
Optimisation of production techniques is an ongoing process. Kaimann continues to invest in additional equipment, training and resources to ensure the highest quality production quality.

### ■ PE Production

Kaimann manufacturing expertise is not limited to elastomeric foams and Polyethylene foam insulation is also manufactured on site at Hövelhof through an especially efficient and reliable production process.

### ■ Quality Control

A comprehensive quality management system in accordance with ISO 9001 covers all aspects of manufacturing, production and supply. Hövelhof is equipped with the highest precision measuring and monitoring equipment to ensure quality control objectives are met at every stage.



## Kaimann UK: Dedicated to local customers and requirements

Business culture varies from region to region, even within the UK & Ireland. Kaimann is a company that appreciates and embraces local differences which is why Kaimann employs a UK based team of local representatives and technical experts.

Kaimann literature presents advice and information drawn from the accumulated knowledge of technical insulation experts with vast experience in the UK insulation industry. Driven by a philosophy to make this knowledge available to all, Kaimann welcomes any and all technical calls from the UK & Ireland.

A locally based UK team that understands the needs of UK & Irish insulation wholesalers also provides sales support. With a large warehouse at the very heart of the British motorway network in Leicester, Kaimann is able to respond quickly to all customer requests.

The dedication of Kaimann to the lo-

cal market extends beyond literature, sales and customer support. Traditional insulation practice in the UK and Ireland is subtly different from that in Continental Europe and energy saving legislation has unique insulation thickness's. With this in mind the Kaiflex range of flexible insulation has been specifically tailored to the needs of the UK & Irish contractors and wholesalers with sheets, tubes and thickness's sized to meet local demand.

### ■ System Solutions

Dedicated to meeting the insulation challenges facing the UK & Ireland, Kaimann is constantly looking to introduce innovative new thermal and acoustic products and solutions.

### ■ Local Availability

Kaimann operates a large warehouse in Leicester stocking only Kaiflex products and with regular and reliable deliveries to all parts of the UK & Ireland.

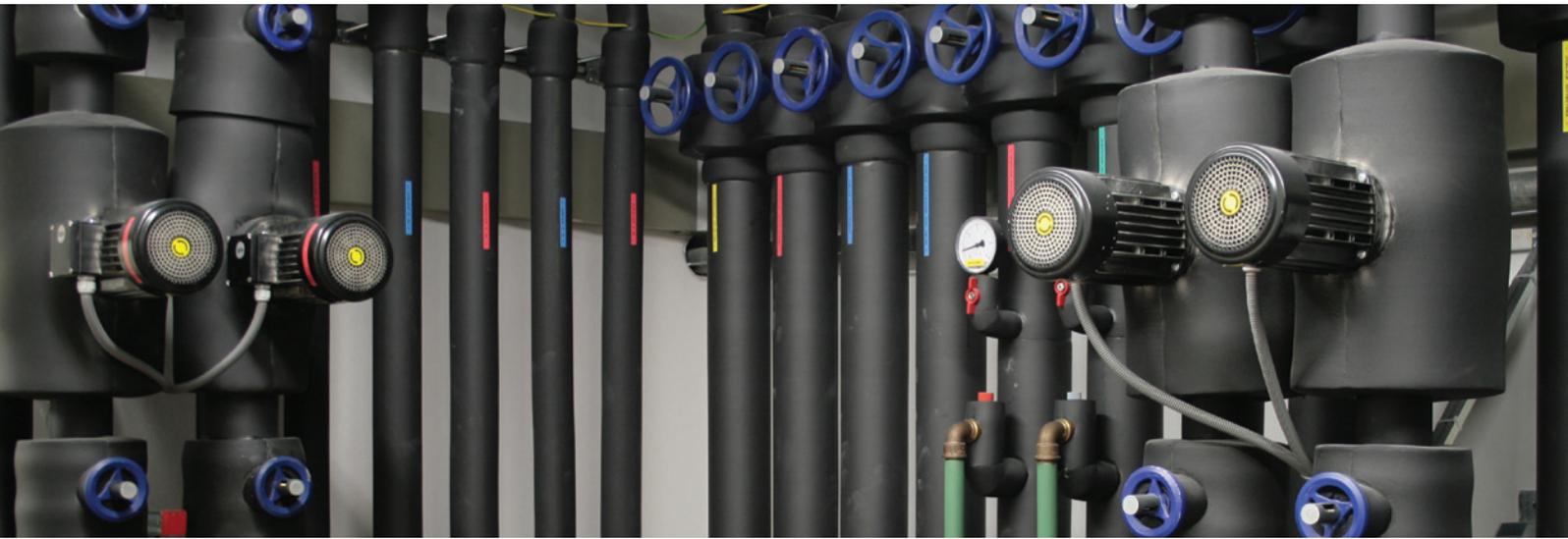
### ■ Technical Services

As a highly technical product, selecting the correct mechanical service insulation is about more than just single technical values. Kaimann's experienced UK technical service team is able to provide all of the expert advice needed to make the right decisions free of charge.

### ■ Marketing Partnership

Working closely together with customers to identify new business opportunities and to deliver the services and tools necessary for success, Kaimann is an ideal partner to help you develop in the mechanical insulation marketplace.

# APPLICATION AREAS



## Kaiflex insulation - expert systems for mechanical services

	Page	Refrigeration	Cold Water Applications	Split-Air-Conditioning	HVAC	Domestic Heating & Plumbing	Commercial Heating	Solar Hot Water	Ground Source Heat Pumps	Food Industries	Chemical & Pharmaceutical Industries	Heavy Industries	Shipbuilding	Acoustic Applications	Packaging & Protection
<b>Kaiflex ST Class 0</b>	23	■	■	■	■	■	■		■	■	■	■	■	■	
<b>Kaiflex ST Selfseal</b>	29		■		■	■	■		■						
<b>Kaiflex ST Coils</b>	33	■		■											
<b>Kaiflex EPDMplus</b>	37	■		■	■			■		■	■	■	■	■	
<b>Kaiflex BluEco</b>	41			■						■	■	■	■	■	
<b>Kaiflex PE</b>	45		■			■									
<b>Kaiflex TC</b>	49	■		■	■				■	■	■				
<b>Kaiflex Protect F-Black</b>	53									■	■	■	■		
<b>Kaiflex Protect ALU-NET</b>	53				■		■				■				
<b>Kaiflex Solar EPDM</b>	59							■							
<b>Kaiflex PyroStar</b>	63				■		■			■	■				
<b>Kaiflex RT-ST (PipeSupport)</b>	65	■	■	■			■			■	■	■	■		
<b>Kaiflex Accessories</b>	69	■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>Kaiflex Pack</b>	73														■

# REFRIGERATION



## Kaiflex insulation prevents condensation and corrosion

**Refrigeration pipework operates at cold temperatures, enabling the formation of condensation which accelerates pipe corrosion and mould growth whilst diminishing insulation performance.**

In a refrigeration system two sets of heat transfer coils are connected by pipework along which a liquid or gaseous refrigerant flow. Mechanical processes make it possible to cool the refrigerant and in this way heat can be carried away from the refrigeration unit.

Water condenses and instantly freezes on surfaces on pipes operating at temperatures below freezing. Ice formation makes a chiller work harder and can dramatically reduce the system performance and life expectancy so correctly applied insulation is essential for refrigeration pipework.

As condensation and ice forms most

readily at the weakest points, including valves and fittings, insulation must be present along the entire pipe length and should demonstrate the following:

- Resistant to moisture ingress

As a water resistant rubber material, Kaiflex is highly resistant to moisture ingress and will not allow water to easily compromise the material properties and performance.

- Anti-microbial protection

Resisting moisture and incorporating anti-microbial additives, Kaiflex offers protection against mould and bacterial growth.

- In-built water vapour barrier

The cumulative moisture resistance of the many layers of watertight closed cells is so great that Kaiflex has no need for an externally applied water vapour barrier – the vapour barrier is built in and cannot be easily compro-

mised or pierced.

- Reduces thermal bridges

Where small details such as pipe hangers, valves, flanges and bends are left uninsulated the heat loss at these points is disproportionately high. Kaiflex materials allow for difficult items to be more easily insulated, thereby reducing the number of thermal bridges.



## Kaiflex insulation reduces the risk of pipe freezing

**The scale of damage and financial cost of water pipes burst by freezing can be devastating. Insulation offsets pipe freezing and is highly recommended.**

Domestic cold water in the UK is piped directly into homes from a central supply. As water pipes enter a building they create weak points, known as thermal bridges, in the building fabric through which heat is lost. Condensation can also form on the cold surface of the pipe inside the building.

Cold water pipe insulation plays an important role in preventing these problems but the prevention of pipe freezing is by far the single greatest reason for insulating cold water pipe-work.

Water left stationary and exposed to sub-zero temperatures will eventually freeze. As pipes freeze water

expands and the pressure exerted is enough to either burst pipes along the length or to break pipe connections apart.

By greatly slowing the rate of freezing insulation makes pipe freezing much less likely. Insulation should be present along the entire pipe length and should demonstrate the following:

- Closed cell structure

Foams formed from thousands of tiny closed cells are known as closed cell foams. When the cell walls are impermeable, as is the case with Kaiflex, moisture cannot “wick” through the material.

- Resistant to moisture ingress

As a water resistant rubber material, Kaiflex is highly resistant to moisture ingress and will not allow water to easily compromise the material properties and performance.

- Long term thermal performance

Preventing moisture ingress into the material structure prevents an increase in the thermal conductivity. Kaiflex has a highly moisture resistant closed cell structure and keeps insulation effective for long periods of time.

- Ease of application

Only when insulation is well installed can energy savings be realised. Kaiflex is dust and fibre free and available in a self-adhesive format. It requires no special installation equipment and creates no health hazard to installers.

# AIR-CONDITIONING



## Kaiflex insulation protects air-conditioning pipes

**Split air-conditioning systems are indispensable for maintaining comfortable temperatures in shops and offices throughout the summer.**

Air-conditioning works by using a refrigerant liquid or gas to transport heat from one set of heat transfer coils indoors to a second outdoors connected by small bore copper pipe. Mechanical processes cause the refrigerant to drop in temperature allowing the fluid to carry heat outside the building.

As an energy intensive process it is important to ensure that an air-conditioning system achieves the maximum possible efficiency. By limiting the heat gain to pipework insulation plays a role in this but pipe insulation on air-conditioning systems performs another, more important, role.

Moisture condensing from the air can

rapidly accelerate the corrosion of Copper air-conditioning pipes. Corrosion diminishes the life of pipework and can be expensive to fix. As such it is essential to prevent condensation occurring on the pipework.

Insulation should be present along the entire length that, in order to prevent condensation, is able to demonstrate the following attributes:

- In-built water vapour barrier

The cumulative moisture resistance of the many layers of watertight closed cells is so great that Kaiflex has no need for an externally applied water vapour barrier – the vapour barrier is built in and cannot be easily compromised or pierced.

- Non-wicking

Open cell foams absorb water like a sponge through the wicking process. Kaiflex is non-wicking and moisture cannot move through the closed cell

structure.

- Flexible & seamless application

Most energy loss, ice formation, condensation and corrosion on insulated pipework occurs where slight gaps form in the insulation. Kaiflex is flexible and the full contact adhesive bonds on a cellular level preventing open joints.

# HVAC APPLICATIONS



Clean and healthy IAQ by using **Kaiflex** insulation systems

**In large commercial buildings ductwork allows for the distribution of heated air and the extraction and replacement of unhealthy stale air.**

Insulation is an essential part of a ducted air-conditioning system. Large surface areas create significant heat losses/gains and this energy loss can be minimised using insulation which also has the effect of preventing the formation of condensation.

Alongside heated or cooled air, ductwork also carries noise and contaminants associated with “sick building syndrome” that is thought to cause or aggravate illness, fatigue and a wider loss of productivity.

Insulation can be associated with dust, fibres and mould growth and so selection is vitally important.

Flexible closed cell insulations are dust and fibre free and as moisture

resistant foams naturally restrict mould growth. In addition flexible closed cell foams have excellent acoustic properties and can be used as combined thermal and acoustic insulation.

The following attributes should be considered when selecting insulation for use on ductwork:

- Closed cell structure

Foams formed from thousands of tiny closed cells are known as closed cell foams. When the cell walls are impermeable, as is the case with Kaiflex, moisture cannot “wick” through the material.

- Anti-microbial protection

Resisting moisture and incorporating anti-microbial additives, Kaiflex offers protection against mould and bacterial growth.

- Excellent acoustic performance

Noise is contained and dissipated by visco-elastic materials which absorb sound and decouple vibration. Kaiflex is visco-elastic and provides excellent acoustic performance.

- Dust & Fibre free

Dust & fibres can aggravate respiratory conditions and contribute towards “sick building syndrome”. Kaiflex is dust & fibre free and will not release particles during either installation or if disturbed when in use.

- Formaldehyde free

Formaldehyde is a hazardous gas classified as a human carcinogen and tight occupational exposure limits are set. Being free of Formaldehyde, Kaiflex does not contribute toward the overall levels of Formaldehyde experienced.

# DOMESTIC HEATING



## Kaiflex insulation saves energy

**In today's world the idea of living in a home without reliable central heating and hot water on tap is almost unthinkable. Warm houses are healthy homes whilst hot water makes bathing easier and more comfortable. Central heating is so important that virtually all modern homes are designed with central heating firmly in mind.**

In older, less well insulated, buildings heating systems can prove expensive to run and the cost of inefficiencies must be borne by the building occupants themselves. Measures to reduce heat loss are therefore widely popular.

How the system is set up determines how effective energy saving measures can be. Domestic heating systems are most commonly set up with a boiler heating water to a modest 60°C.

It is possible to derive the energy needed from renewable sources using heat pumps or solar panels but the vast majority of homes operate boilers powered by burning gas or oil or by using an electrical heating element.

An easily implemented and cost effective way to improve the overall system performance is to insulate the heating distribution pipework. This is particularly true for pipes connected directly to the boiler and the hot water cylinder since only a small initial investment is necessary and the pay back period is very short.

Insulation should be present wherever heating pipe runs outside the building, in loft spaces, garages or other unheated areas and for at least 2 metres along pipe that is directly connected to the boiler or cylinder. Wherever present insulation should demonstrate the following attributes:

- Excellent thermal performance  
With low conductivity and high resistance values that do not noticeably diminish over time, Kaiflex is highly effective insulation for a wide range of purposes and applications.

- Reduces thermal bridges  
Where small details such as pipe hangers, valves, flanges and bends are left uninsulated the heat loss at these points is disproportionately high. Kaiflex materials allow for difficult items to be more easily insulated, thereby reducing the number of thermal bridges.

- Ease of application  
Only when insulation is well installed can energy savings be realised. Kaiflex is dust and fibre free and available in a self-adhesive format. It requires no special installation equipment and creates no health hazard to installers.

# COMMERCIAL HEATING



## Kaiflex insulation reduces heating pipe energy loss

**Insulating heating pipework in commercial offices and large public buildings helps to minimise energy waste, reducing the significant financial cost without compromising the experienced temperatures.**

Commercial heating systems are varied but the most common set-up remains a series of radiators connected to a distant central boiler. Mid-sized steel pipe is often used to connect radiators throughout the building, rising up a central service shaft before branching off into smaller bore pipe on each floor. Temperatures of 75°C-100°C are typical but some systems operating at up to 150°C are not unknown.

Operating for long hours at high temperatures and connected to long pipe runs the cumulative heat loss from pipework is high.

Some heat loss can be considered “useful” but insulation of heating pipes allows control to be maximised. In particular the loss of heat to unoccupied rooms through which the pipe passes can be minimised.

Insulation should be present along the entire length of heating pipe in order to prevent energy loss and should demonstrate the following attributes:

- Long term thermal performance  
Preventing moisture ingress into the material structure prevents an increase in the thermal conductivity. Kaiflex has a highly moisture resistant closed cell structure and keeps insulation effective for long periods of time.
- Excellent thermal performance  
With low conductivity and high resistance values that do not noticeably diminish over time, Kaiflex is highly effective insulation for a wide range

of purposes and applications.

- Reduces thermal bridges  
Where small details such as pipe hangers, valves, flanges and bends are left uninsulated the heat loss at these points is disproportionately high. Kaiflex materials allow for difficult items to be more easily insulated, thereby reducing the number of thermal bridges.

- Class 0 Fire Performance  
Large public buildings in the UK typically require pipe insulation to achieve a Class 0 fire rating in accordance with BS 476 Parts 6 and 7. Kaiflex is able to meet this performance, making it appropriate for use in offices, high rise apartments, schools and hospitals.

# SOLAR HOT WATER



## Kaiflex insulation improves solar hot water efficiency

**Heat loss from the pipework connecting a solar panel to a hot water cylinder can reduce the effectiveness of a system, greatly reducing the expected payback.**

Insulation of solar pipework reduces energy loss making the system more efficient throughout the year. This is especially important during Autumn, Winter and Spring months as the energy saved directly offsets the need to revert to conventional boilers.

Solar hot water pipework is, however, more challenging to insulate than conventional domestic hot water systems.

Panels are always located outdoors, often long distances from the hot water cylinders and insulation on the connecting pipework is prone to attack by rats, birds & other vermin. Damage of this type exposes the bare pipe, creating thermal bridges which

reduce insulating performance and increases energy loss.

In order to prevent energy loss from solar hot water pipework the following attributes should be displayed:

- **Moisture Resistance**

Exposed to rain, sleet and snow, insulation must resist the ingress of moisture to retain its thermal performance over time.

- **High Temperature Resistance**

During the summer solar hot water pipework can exceed 100°C. Insulation must withstand these temperatures.

- **UV-Resistance**

Penetrating UV-light can break some insulation down from within. Solar hot water insulation should be inherently resistant to UV-degradation.

- **Vermin Resistance**

Birds and rodents aggressively target insulation as a source of nesting material. Resilient coverings protect insulation, maintaining effectiveness over many years.

- **Flexibility**

Solar pipework is bent tightly to connect from solar panels to the hot water cylinder. Flexible materials match the bend and can insulate all of the pipework without the need for thermally wasteful seams.

# GROUND SOURCE HEAT PUMPS



## Kaiflex insulation protects ground source heat pipes

**Modern ground source heat pump (GSHP) technology can heat homes without the need for a conventional boiler by simply moving existing heat indoors. Even in the middle of Winter heat pumps can compress energy from the environment up to useful temperatures.**

Ground source heat pumps, increasingly used in combination with under-floor heating, pass a frost resistant refrigerant around a pipe loop buried outdoors. As the refrigerant passes through the loop it absorbs heat from the surrounding soil. Although the temperature change is tiny the GSHP unit is able to extract it by manipulating the refrigerant mechanically to trap and release latent heat.

Outdoors the buried heat loop pipe needs to absorb heat and should remain uninsulated but where the flow and return are close and where

the pipe is above ground insulation should be applied to maximise system efficiency. Buried insulation must be able to resist moisture ingress and provide a resilient protective surface.

Complex GSHP systems, such as those in schools and hospitals, have more associated pipework in the plant room. Although heated by the ground the flow temperatures here are still below ambient and without insulation condensation can occur.

Insulation should be present in order that, in order to prevent condensation and maximise efficiency, is able to demonstrate the following attributes:

- Protective surface

Insulation can occasionally be subject to mechanical impact, rips and tears. Whether accidental or intentional these look unsightly and reduce the insulation performance. Kaiflex is available with highly resilient cover-

ings that protect insulation against the most common causes of damage.

- In-built water vapour barrier

The cumulative moisture resistance of the many layers of watertight closed cells is so great that Kaiflex has no need for an externally applied water vapour barrier – the vapour barrier is built in and cannot be easily compromised or pierced.

- Resistant to moisture ingress

As a water resistant rubber material, Kaiflex is highly resistant to moisture ingress and will not allow water to easily compromise the material properties and performance.

- Insulates complex shapes

Available in highly flexible tubes and sheets, Kaiflex is easily cut to size and wrapped around even the most complex shapes without the need for specially produced bespoke items.

# FOOD INDUSTRIES



## Kaiflex insulation is clean for food production locations

**Food production is highly sensitive and it is important to ensure that hazardous contaminants, including dust, fibres, mould and volatile organic chemicals, are not able to migrate into food during production.**

Preventing the growth of dangerous mould and bacteria is especially important and all surfaces in food production locations, including the exposed surface of insulation, must be easy to clean and maintain. Since specialist cleaning detergents are used in addition to water any insulation used cannot absorb or react with these chemicals

Closed cell foams have a natural advantage over sponge like open cell foams but in food preparation locations even closed cell foams should be covered with an additional cleanable surface.

In addition to the risk of mould is fibre contamination. Artificial industrial fibres not intended for human consumption can settle on food during production, ultimately contributing towards various long term health problems. This is not possible with fibre free closed cell foams and no specific precautions are necessary.

Insulation should be present on pipework in food production locations that is able to demonstrate the following attributes:

- **Resistant to moisture ingress**  
As a water resistant rubber material, Kaiflex is highly resistant to moisture ingress and will not allow water to easily compromise the material properties and performance.
- **Anti-microbial protection**  
Resisting moisture and incorporating anti-microbial additives, Kaiflex offers protection against mould and

bacterial growth.

- **Dust & Fibre free**

Dust & fibres can aggravate respiratory conditions and contribute towards “sick building syndrome”. Kaiflex is dust & fibre free and will not release particles during either installation or if disturbed when in use.

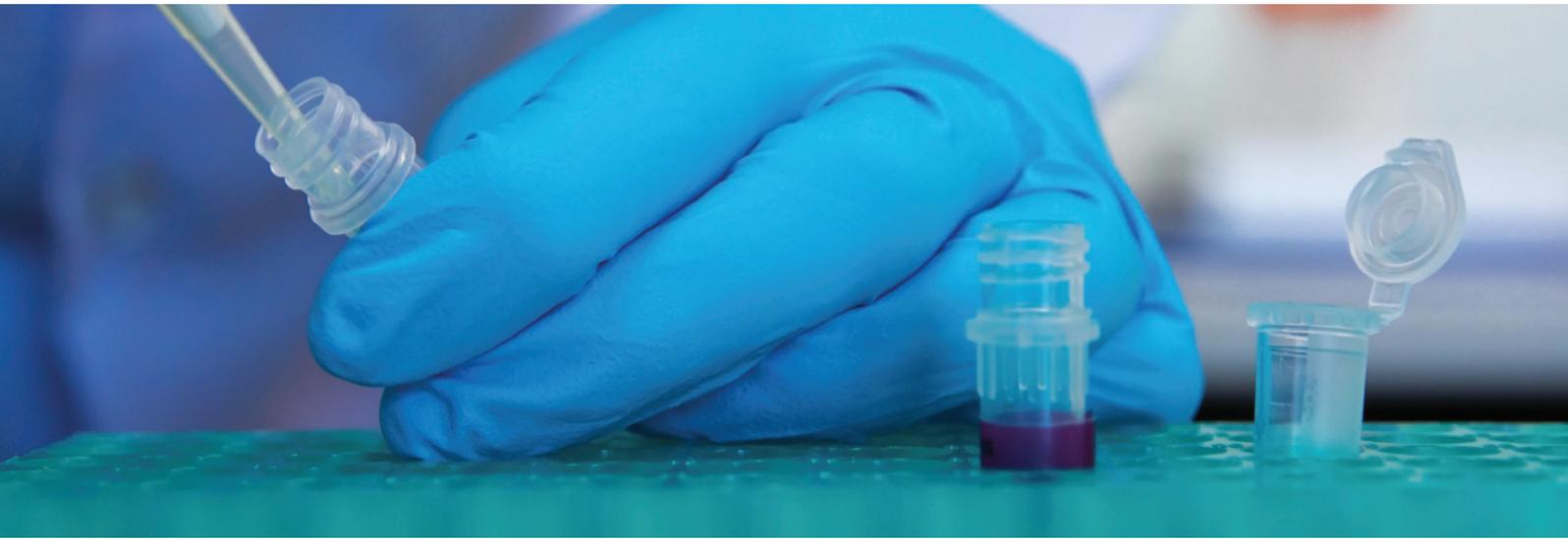
- **Protective surface**

Insulation can occasionally be subject to mechanical impact, rips and tears . Whether accidental or intentional these look unsightly and reduce the insulation performance. Kaiflex is available with highly resilient coverings that protect insulation against the most common causes of damage.

- **Chemical resistance**

When in contact with insulation, chemicals and oils can potentially react with insulation or soak into the structure. Pre-covered Kaiflex products are inherently resistant to the most commonly used chemicals.

# CHEMICAL & PHARMACEUTICAL INDUSTRIES



## Kaiflex insulation maintains process temperatures

### **Chemical & pharmaceutical process plants are highly engineered production environments requiring tightly monitored conditions.**

Refrigeration works by transporting heat from one set of heat transfer coils to another. The heat transfer coils are connected by pipework along which flows a liquid or gaseous refrigerant. Mechanical processes acting upon this refrigerant cause it to be at temperatures well below the ambient and as a result the fluid is able to carry heat away from the refrigeration unit.

Since the pipework is operating at temperatures well below freezing water can condense on the pipe surface and instantly freeze. Without correctly applied insulation refrigeration pipework quickly becomes encased in thick ice. Ice formation rapidly accelerates pipe corrosion and increases

the heat load on the chiller making the system far less efficient.

Condensation and the resultant ice formation must be prevented along the entire length of pipework, including all valves and fittings. In order to achieve this the insulation must demonstrate the following attributes:

#### ■ Anti-microbial protection

Resisting moisture and incorporating anti-microbial additives, Kaiflex offers protection against mould and bacterial growth.

#### ■ Dust & Fibre free

Dust & fibres can aggravate respiratory conditions and contribute towards "sick building syndrome". Kaiflex is dust & fibre free and will not release particles during either installation or if disturbed when in use.

#### ■ Protective surface

Insulation can occasionally be subject to mechanical impact, rips and tears. Whether accidental or intentional these look unsightly and reduce the insulation performance. Kaiflex is available with highly resilient coverings that protect insulation against the most common causes of damage.

#### ■ Chemical resistance

When in contact with insulation, chemicals and oils can potentially react with insulation or soak into the structure. Pre-covered Kaiflex and Kaiflex Protect materials are inherently resistant to the most commonly encountered chemicals.

# HEAVY INDUSTRIES



## Kaiflex insulation prevents corrosion under insulation

**Even a slight flaw or defect in pipework can result in a major financial and ecological disaster on large scale industrial sites. Long term pipe maintenance begins with preventing corrosion from occurring.**

Pipework on heavy industrial sites is insulated for a variety of reasons. Ensuring processes remain within tight temperature tolerances is a high priority. Controlling surface temperatures to prevent accidental injury is also important, as is ensuring personnel do not experience long term hearing damage from very loud pipework.

One priority however remains consistent. With the cost of maintenance so high and the consequences of pipe corrosion so dangerous, potentially even fatal, insulated pipe must not corrode.

With prolonged exposure to an aggressive, often saline, atmosphere

only highly moisture resistant insulation is likely to keep the pipe dry for a long period of time.

Insulation should therefore be present that is able to demonstrate the following attributes:

- Corrosion under insulation

As a non-wicking and waterproof insulation, Kaiflex keeps pipes dry and prevents corrosion under insulation from occurring.

- In-built water vapour barrier

The cumulative moisture resistance of the many layers of watertight closed cells is so great that Kaiflex has no need for an externally applied water vapour barrier – the vapour barrier is built in and cannot be easily compromised or pierced.

- Resistant to moisture ingress

As a water resistant rubber material, Kaiflex is highly resistant to moisture

ingress and will not allow water to easily compromise the material properties and performance.

- Protective surface

Insulation can occasionally be subject to mechanical impact, rips and tears. Whether accidental or intentional these look unsightly and reduce the insulation performance. Kaiflex is available with highly resilient coverings that protect insulation against the most common causes of damage.

- Excellent acoustic performance

Noise is contained and dissipated by visco-elastic materials which absorb sound and decouple vibration. Kaiflex is visco-elastic and provides excellent acoustic performance.



## Kaiflex insulation prevents pipe corrosion on board of ships and vessels

**Serviced by every kind of mechanical system, modern ships, including super cruise liners and oil and gas FPSO vessels, are more advanced than almost any land based hotel or factory.**

The complete range of services are present, from space heating through air-conditioning all the way to full scale refrigeration plants for food storage and even for on-board ice rinks! Mechanical services offshore present the same challenges for technical insulation as those onshore with several additional considerations.

Fire and smoke are more important issues at sea and the International Maritime Organisation (IMO) recognises this by setting its own fire tests. These tests are recognised worldwide and incorporate measures to determine smoke density and toxicity. Before an insulation can be used

offshore it must first pass all relevant IMO tests.

Offshore insurance underwriters, notably Lloyds Register, the American Bureau of Shipping (ABS) and Bureau Veritas, use the results given by IMO tests to then issue material approvals allowing the use of insulation on-board large ships and vessels.

Insulation should be present on mechanical services offshore that, in order to prevent condensation, energy loss and pipe corrosion, is able to demonstrate the following attributes:

- In-built water vapour barrier

The cumulative moisture resistance of the many layers of watertight closed cells is so great that Kaiflex has no need for an externally applied water vapour barrier – the vapour barrier is built in and cannot be easily compromised or pierced.

- Resistant to moisture ingress

As a water resistant rubber material, Kaiflex is highly resistant to moisture ingress and will not allow water to easily compromise the material properties and performance.

- Lloyds Register approved

Tested to international maritime standards, Kaiflex is Lloyds Register approved for use on marine and offshore installations.

- Corrosion under insulation

As a non-wicking and waterproof insulation, Kaiflex keeps pipes dry and prevents corrosion under insulation from occurring.

- Acoustic absorption

As noise enters a foam the energy of the sound wave is dissipated. Lining a duct or enclosure with absorbing material reduces the overall noise level.

# ACOUSTIC APPLICATIONS



## Kaiflex insulation makes for a quieter environment

**Every modern building utilises mechanical services to heat, cool and ventilate, to supply fresh water and remove waste water and to generally make buildings comfortable spaces in which to live. Noise generated by the essential mechanical services can however reduce occupant health and well being and noise control measures should always be an important consideration.**

In practice solving all noise problems requires a combination of techniques from the following four categories:

### ■ Acoustic absorption

When airborne noise passes into an acoustically absorbing foam the sound wave is dissipated. By selecting the absorption profile of the noise with that inside an enclosed space the noise level can be significantly reduced. In many cases the absorbing

lining must be free of dust and fibres or actively resist mould growth.

### ■ Barrier to sound

Dense barrier materials prevent the passage of noise by reflecting sound waves back. In this way barrier materials can encapsulate noise and are best deployed in combination with absorbing linings to trap and then dissipate the sound wave. Traditional barriers include lead and bitumen but modern flexible polymeric barriers are safer without compromising performance.

### ■ Vibration decoupling

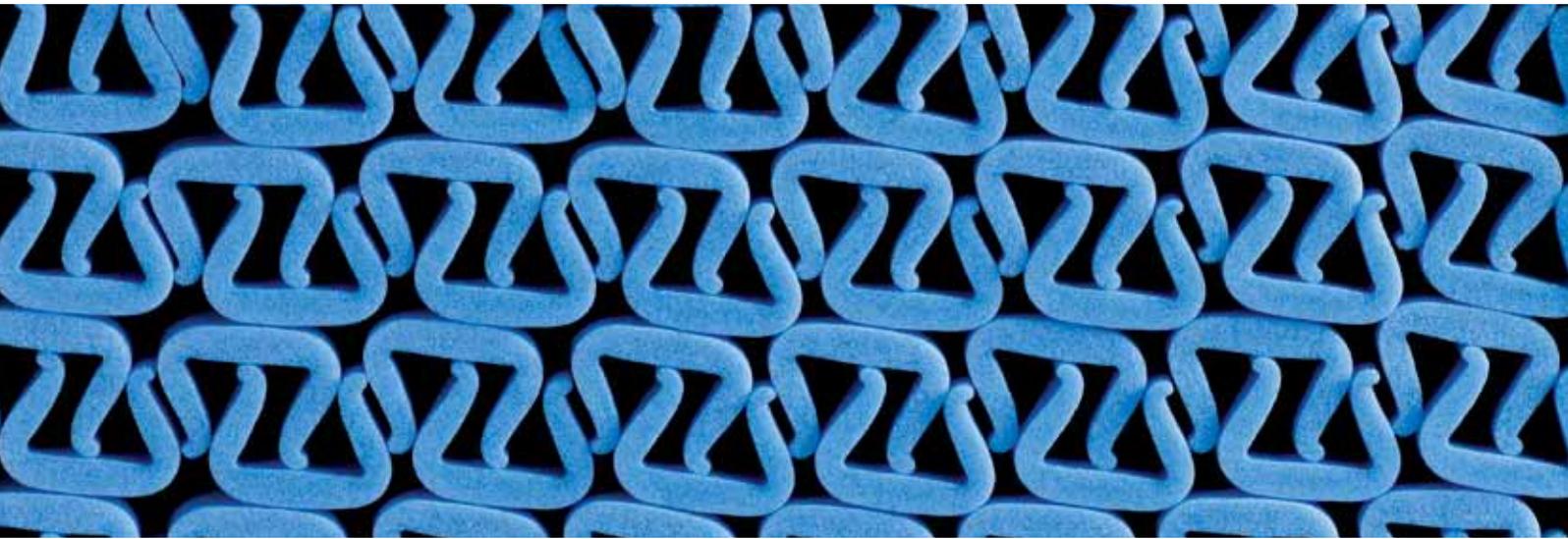
Noise travels through solid materials in the form of vibration and can move from one surface to another wherever there is direct physical contact – such as between a pipe and a pipe hanger – with vibration in one surface exciting vibration in the other. Acoustic bridges of this type account for a high

proportion of noise breakout. Flexible visco-elastic materials break the direct physical contact and prevent break out through vibration.

### ■ Noise damping

Where a surface cannot be acoustically decoupled the level of noise radiated can be greatly reduced by applying a visco-elastic noise dampener directly to the vibrating surface.

# PACKAGING & PROTECTION



**Kaiflex** profiles shaped to protect

**Damage, scratches, chips and scrapes to individual products can tarnish entire brands. In this age of rising standards and increasing customer expectations packaging must be more than just an after-thought.**

Customers will rightly complain about damaged products and may even be moved to reject entire batches. Utilising the correct packaging protects products during transport, preventing both minor blemishes and major cracks or breaks.

Foam padding cushions impact and covers the sharp edges that both cause and suffer from chips and scrapes. This is especially important for fragile glass and stone products which are easily broken during handling but almost all products can benefit from packaging in some way.

Packaging can even come to be seen

as part of the product itself, integral to its presentation and delivery.

When selecting packaging foams it is important to consider the following:

- Range of size & shapes

As products come in different sizes and shapes so too must packaging foams. Kaimann manufactures a full range of shapes and sizes and is able to manufacture unique bespoke items on request.

- Lightweight

Delivery costs increase with weight and heavier products are harder to handle. Kaimann packaging foams are lightweight and offer equivalent performance without adding significant additional weight.

- Cushioning foam structure

A closed cell foam structure traps air and creates a cushioning effect on impact. Kaimann packaging foams

are chosen for their high closed cell content which retains the foam shape whilst maximising the cushioning effect.

- Chemically inert

Products are packaged and padded for protection. Chemically inert Kaimann packaging foams provide protection and will not react with or degrade the products to which they are applied.

# *APPLICATION AREAS*



# *kaiflex*<sup>®</sup> ST Class 0



## Designed to prevent condensation and energy losses

Flexible closed cell rubber insulation, Kaiflex ST Class 0 reliably prevents condensation and reduces energy loss. By incorporating a water vapour barrier into the insulation cell structure Kaiflex ST Class 0 can effectively eliminate water vapour migration and retain outstanding performance over the entire system life.

By combining anti-microbial resistance into a Class 0 fire rated, closed cell, rubber that is completely dust and fibre free, Kaiflex ST Class 0 can be used in any kind of public, commercial or industrial building without impacting on health or the quality of air.

Available in tube, coils and sheets for use on air-conditioning, refrigeration, chilled water, heating and hot water pipes and air-distribution ductwork, Kaiflex ST Class 0 is versatile insulation with consistent and reliable technical values.

- Closed cell structure with in-built water vapour barrier
- Inherent moisture resistance with long lasting protection against corrosion
- Excellent thermal values minimise energy loss
- Flexible, dust and fibre free, nature allows for ease of installation
- In-built anti-microbial resistance

Designed to prevent condensation and energy losses

## Kaiflex ST Class 0 Technical Specification

<b>Polymer</b>		NBR blend	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Black	
<b>Upper Temperature Limit</b>	pipe flat surface	+105°C +85°C	
<b>Lower Temperature Limit</b>		-200°C	see remark (1)
<b>Thermal Conductivity</b>	at -30°C at -20°C at -0°C at +10°C at +20°C at +40°C at +70°C	0.031 W/(m·K) 0.032 W/(m·K) 0.034 W/(m·K) 0.035 W/(m·K) 0.036 W/(m·K) 0.038 W/(m·K) 0.041 W/(m·K)	Test acc. to - EN ISO 13469 - EN ISO 12086
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 10\ 000$	Test acc. to - EN ISO 13469 - EN ISO 12086
<b>Surface Spread of Flame</b>		Class 1	Test acc. to BS 476 Part 7 1997
<b>Fire Propagation</b>	Total index of performance	less than 12	Test acc. to BS 476 Part 6 1989
	Sub index	less than 6	
<b>Fire Performance</b> acc. to Building Regulations		<b>Class 0</b>	see remark (2)
<b>EuroClass</b>	tubes ( $\leq 25$ mm)	B <sub>L</sub> -s3, d0	Test acc. to DIN EN 13501-1
	sheet / rolls (10 mm to 32 mm)	B-s3, d0	
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		ODP zero GWP zero Cadmium free	
<b>Health Aspects</b>		Dust & Fibre free Formaldehyde free	
<b>Resistance to ...</b>	Mould	Excellent	
<b>Other attributes</b>	PH-value	neutral	
<b>Other Certificates / Approvals</b>		UL-approved (UL94)	Test in acc. with UL94
		FM approved	
		DNV, Lloyd's Register, See BG	
<b>Outdoor applications</b>		needs protection against UV- radiation	see remark (3)

Remark (1) For temperatures between -50°C and -200°C please contact our Technical Support Team for advice.

Remark (2) Test results for surface spread of flame and fire propagation meets Class 0 fire performance as defined in UK building regulations

Remark (3) Kaiflex ST Class 0 needs protection against UV-radiation. Please paint with Kaiflex KaiFinish to the recommended thickness within 3 days.

## Kaiflex ST Class 0 tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

Designed to prevent condensation and energy losses

## Kaiflex ST Class 0 tubes

Colour: black; Length: 2 m

Copper Pipe Cu			Iron & Steel pipe Fe			6 mm Insulation Thickness			9 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	1/4	6			7.0	ST-06x006	600	2.54	ST-09x006	360	2.99
	3/8	10			11.0	ST-06x010	430	3.09	ST-09x010	320	3.21
3/8	1/2	12			13.0	ST-06x012	350	3.11	ST-09x012	280	3.23
1/2	5/8	15			16.0	ST-06x015	300	3.14	ST-09x015	240	3.28
	5/8	3/4			21.0	ST-06x020	250	3.46	ST-09x020	160	4.17
	3/4	7/8	1/2	21.3	23.0	ST-06x022	216	3.72	ST-09x022	156	4.24
1	1 1/8	28	3/4	26.9	29.0	ST-06x028 ◊	150	4.71	ST-09x028	124	4.58
1 1/4	1 3/8	35	1	33.7	36.0				ST-09x035	92	5.17
1 1/2	1 5/8	42	1 1/4	42.4	43.5				ST-09x042	70	5.97
			1 1/2	48.3	49.5				ST-09x048	60	7.53
2	2 1/8	54			55.0				ST-09x054	60	8.62
			2	60.3	61.5				ST-09x060	60	9.84

Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness			19 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	1/4	6			7.0	ST-13x006	240	4.03			
	3/8	10			11.0	ST-13x010	190	4.21	ST-19x010	106	6.78
3/8	1/2	12			13.0	ST-13x012	172	4.28	ST-19x012	100	6.92
1/2	5/8	15			16.0	ST-13x015	154	4.32	ST-19x015	86	7.20
	5/8	3/4			21.0	ST-13x020	120	4.90	ST-19x020	76	8.10
	3/4	7/8	1/2	21.3	23.0	ST-13x022	110	5.37	ST-19x022	74	8.82
1	1 1/8	28	3/4	26.9	29.0	ST-13x028	86	6.42	ST-19x028	58	12.09
1 1/4	1 3/8	35	1	33.7	36.0	ST-13x035	76	6.93	ST-19x035	48	14.05
1 1/2	1 5/8	42	1 1/4	42.4	43.5	ST-13x042	56	8.25	ST-19x042	40	16.59
			1 1/2	48.3	49.5	ST-13x048	48	10.24	ST-19x048	30	18.99
2	2 1/8	54			55.0	ST-13x054	46	11.60	ST-19x054	30	21.15
			2	60.3	61.5	ST-13x060	40	13.10	ST-19x060	28	23.35
2 1/2	2 5/8	67			68.5	ST-13x067	40	17.24	ST-19x067	28	25.39
2 13/16	3	76.1	2 1/2	76.1	77.0	ST-13x076	34	20.33	ST-19x076	28	29.29
3	3 1/8	80			81.0	ST-13x080 ◊	30	21.31	ST-19x080 ◊	26	31.86
			3	88.9	90.5	ST-13x089 ◊	30	24.75	ST-19x089 ◊	22	35.25
3 1/2	3 2/3	93			94.5			25.29			37.74
4	4 1/4	108			109.5	ST-13x108 ◊	28	27.53	ST-19x108 ◊	20	40.11
			4	114.3	116.0	ST-13x114 ◊	28	31.99	ST-19x114 ◊	18	45.77

- 9 mm tubes are available upon request for the pipe dimensions: 9x64; 9x70; 9x76; 9x80; 9x89; 9x102; 9x108; 9x114; 9x125; 9x133; 9x140; 9x160.
- 13 mm tubes are available upon request for the pipe dimensions: 13x125; 13x133; 13x140; 13x160.
- 19 mm tubes are available upon request for the pipe dimensions: 19x125; 19x133; 19x140; 19x160.
- All Kaiflex ST Class 0 tubes are available as slit items. Additional 5 p/m net after discount has been applied. For ordering slit items add -SLIT to the codes above. (example: ST-13x076-SLIT)
- Items marked with ◊ delivery quoted on request.

Designed to prevent condensation and energy losses

## Kaiflex ST Class 0 tubes

Colour: black; Length: 2 m											
Copper Pipe Cu			Iron & Steel pipe Fe			25 mm Insulation Thickness			32 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	1/4	6			7.0						
	3/8	10			11.0						
3/8	1/2	12			13.0	ST-25x012	60	12.87			
1/2	5/8	15			16.0	ST-25x015	60	14.42	ST-32x015	32	18.13
5/8	3/4				21.0	ST-25x020	50	15.50			
3/4	7/8	22	1/2	21.3	23.0	ST-25x022	42	15.79	ST-32x022	32	19.88
1	1 1/8	28	3/4	26.9	29.0	ST-25x028	40	17.92	ST-32x028	24	23.09
1 1/4	1 3/8	35	1	33.7	36.0	ST-25x035	32	19.88	ST-32x035	24	23.90
1 1/2	1 5/8	42	1 1/4	42.4	43.5	ST-25x042	24	21.18	ST-32x042	24	27.84
			1 1/2	48.3	49.5	ST-25x048	24	24.44	ST-32x048	18	30.89
2	2 1/8	54			55.0	ST-25x054	22	25.02	ST-32x054	18	34.30
			2	60.3	61.5	ST-25x060	22	26.77	ST-32x060	16	42.60
2 1/2	2 5/8	67			68.5			33.78			49.80
2 13/16	3	76.1	2 1/2	76.1	77.0	ST-25x076	18	38.06	ST-32x076	12	57.78
	3	80			81.0			40.41			
			3	88.9	90.5	ST-25x089 ◊	14	41.98	ST-32x089	10	61.93
3 1/2	3 2/3	93			94.5			43.04			
4	4 1/4	108			109.5	ST-25x108 ◊	10	45.34			
			4	114.3	116.0	ST-25x114 ◊	10	46.92	ST-32x114	8	65.51

## Kaiflex ST Class 0 tubes - DHCG compliant

Meets Building Regulation Part L (England & Wales) domestic compliance requirements; Colour: black; Length: 2 m						
Copper Pipe Cu		Maximum permissible heat loss W/m	Insulation thickness mm	Reference	m / carton	€ / m*
Nom OD inch	Nom OD mm					
	8	7.06	13	ST-13x010	190	4.21
3/8	10	7.23	13	ST-13x010	190	4.21
1/2	12	7.35	19	ST-19x012	100	6.92
5/8	15	7.89	19	ST-19x015	86	7.20
7/8	22	9.12	25	ST-25x022	42	15.79
1 1/8	28	10.07	25	ST-25x028	40	17.92
1 3/8	35	11.08	25	ST-25x035	32	19.88
1 5/8	42	12.19	42	ST-25x042	24	21.18
2 1/8	54	14.12	54	ST-32x054	18	34.30

- 25 mm tubes are available upon request for the pipe dimensions: 25x140.
- 32 mm tubes are available upon request for the pipe dimensions: 32x133; 32x140; 32x160.
- All Kaiflex ST Class 0 tubes are available as slit items. Additional 5 p/m net after discount has been applied. For ordering slit items add -SLIT to the codes above. (example: ST-13x076-SLIT)
- Items marked with ◊ delivery quoted on request.

## Kaiflex ST Class 0 continuous sheet

Colour: black; Width: 1m;								
Insulation Thickness mm	Width m	Length m	Continuous Sheet			Continuous Sheet with self-adhesive backing		
			Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *
3	1	20	ST-03-E	30	41.64	ST-03-A-E	30	tba
6	1	20	ST-06-E	30	47.30	ST-06-A-E	30	86.24
10	1	15	ST-10-E	20	54.98	ST-10-A-E	20	93.93
13	1	11	ST-13-E	14	60.34	ST-13-A-E	14	99.27
19	1	8	ST-19-E	10	87.86	ST-19-A-E	10	126.77
25	1	6	ST-25-E	8	118.24	ST-25-A-E	8	157.17
32	1	4	ST-32-E	6	159.81	ST-32-A-E	6	198.75

## Kaiflex ST Class 0 flat sheet wide (2m x 1m)

Colour: black; Length: 2m; Width: 1m;								
Insulation Thickness mm	Width m	Length m	Flat Sheet Wide			Flat Sheet Wide with self-adhesive backing		
			Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *
6	0.5	2	ST-06-1.0	48	47.30	ST-06-1.0-A	48	86.24
10	0.5	2	ST-10-1.0	32	54.98	ST-10-1.0-A	32	93.93
13	0.5	2	ST-13-1.0	24	60.34	ST-13-1.0-A	24	99.27
19	0.5	2	ST-19-1.0	16	87.86	ST-19-1.0-A	16	126.77
25	0.5	2	ST-25-1.0	12	118.24	ST-25-1.0-A	12	157.17
32	0.5	2	ST-32-1.0	10	159.81	ST-32-1.0-A	10	198.75

## Kaiflex ST Class 0 flat sheet (2m x 0.5m)

Colour: black; Length: 2m; Width: 0.5m;								
Insulation Thickness mm	Width m	Length m	Flat Sheet 2m x 0.5m			Flat Sheet 2m x 0.5m with self-adhesive backing		
			Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *
6	0.5	2	ST-06-0.5	24	47.30	ST-06-0.5-A	24	86.24
10	0.5	2	ST-10-0.5	16	54.98	ST-10-0.5-A	16	93.93
13	0.5	2	ST-13-0.5	12	60.34	ST-13-0.5-A	12	99.27
19	0.5	2	ST-19-0.5	8	87.86	ST-19-0.5-A	8	126.77
25	0.5	2	ST-25-0.5	6	118.24	ST-25-0.5-A	6	157.17
32	0.5	2	ST-32-0.5	5	159.81	ST-32-0.5-A	5	198.75

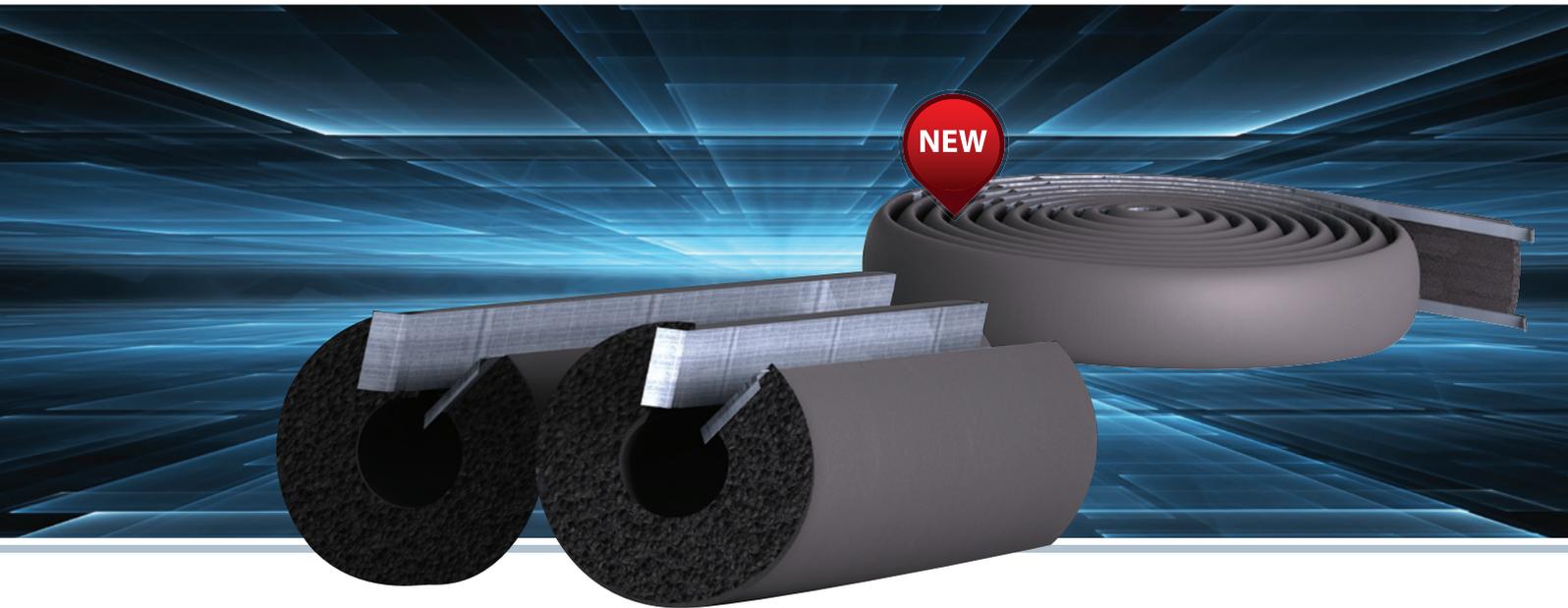
Designed to prevent condensation and energy losses

## Kaiflex ST Class 0 self-adhesive tape

Colour: black;

Insulation Thickness mm	Width mm	Length m	Reference	rolls / carton	€ / roll *
3	50	15	ST-TAPE	12	50.82

# Kaiflex<sup>®</sup> ST Selfseal



## Designed for quick and easy installation

Insulation with self-adhesive strips pre-applied, Kaiflex ST Selfseal is able to combine outstanding technical values with a streamlined application process that is as easy as peeling a self-adhesive release tape.

**Kaiflex ST Selfseal** can be installed in a fraction of the time whilst still maintaining the same energy saving performance and inherent resistance to microbial growth as standard Kaiflex ST. With a greatly simplified application procedure Kaiflex ST Selfseal can be installed even in extremely tight areas.

Self-adhesive pipe insulation coiled for the fastest possible application speeds, **Kaiflex ST Turbo Coils** retain the same energy saving performance as all standard Kaiflex ST insulation.

**Kaiflex ST Turbo Coils** are uniquely coiled pre-slit and open, ready to be sealed along a pipe by removing the self-adhesive release tape.

- Fast application
- Self-adhesive strips minimise the need for adhesive
- Closed cell structure with in-built water vapour barrier
- Inherent moisture resistance with long lasting protection against corrosion
- In-built anti-microbial resistance

Designed for quick and easy installation

## Kaiflex ST Class 0 Technical Specification

<b>Polymer</b>		NBR blend	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Black	
<b>Upper Temperature Limit</b>	pipe flat surface	+105°C +85°C	
<b>Lower Temperature Limit</b>		-200°C	see remark (1)
<b>Thermal Conductivity</b>	at -30°C at -20°C at -0°C at +10°C at +20°C at +40°C at +70°C	0.031 W/(m·K) 0.032 W/(m·K) 0.034 W/(m·K) 0.035 W/(m·K) 0.036 W/(m·K) 0.038 W/(m·K) 0.041 W/(m·K)	Test acc. to - EN ISO 13469 - EN ISO 12086
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 10\ 000$	Test acc. to - EN ISO 13469 - EN ISO 12086
<b>Surface Spread of Flame</b>		Class 1	Test acc. to BS 476 Part 7 1997
<b>Fire Propagation</b>	Total index of performance Sub index	less than 12 less than 6	Test acc. to BS 476 Part 6 1989
<b>Fire Performance</b> acc. to Building Regulations		<b>Class 0</b>	see remark (2)
<b>EuroClass</b>	tubes ( $\leq 25$ mm) sheet / rolls (10 mm to 32 mm)	B <sub>L</sub> -s3, d0 B-s3, d0	Test acc. to DIN EN 13501-1
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		ODP zero GWP zero Cadmium free	
<b>Health Aspects</b>		Dust & Fibre free Formaldehyde free	
<b>Resistance to ...</b>	Mould	Excellent	
<b>Other attributes</b>	PH-value	neutral	
<b>Other Certificates / Approvals</b>		UL-approved (UL94) FM approved DNV, Lloyd's Register, See BG	Test in acc. with UL94
<b>Outdoor applications</b>		needs protection against UV- radiation	see remark (3)

Remark (1) For temperatures between -50°C and -200°C please contact our Technical Support Team for advice.

Remark (2) Test results for surface spread of flame and fire propagation meets Class 0 fire performance as defined in UK building regulations

Remark (3) Kaiflex ST Class 0 needs protection against UV-radiation. Please paint with Kaiflex KaiFinish to the recommended thickness within 3 days.

## Kaiflex ST Class 0 tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

## Kaiflex ST Selfseal tubes



Colour: black; Length: 2 m; tube with self-adhesive strips

Copper Pipe Cu			Iron & Steel pipe Fe			9 mm Insulation Thickness			13 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
1/2	5/8	15			16.0	ST-09x015-A	240	4.36	ST-13x015-A	154	5.76
5/8	3/4				21.0	ST-09x020-A	160	5.57	ST-13x020-A	120	7.06
3/4	7/8	22	1/2	21.3	23.0	ST-09x022-A	156	5.62	ST-13x022-A	110	7.13
1	1 1/8	28	3/4	26.9	29.0	ST-09x028-A	124	6.06	ST-13x028-A	86	8.52
1 1/4	1 3/8	35	1	33.7	36.0	ST-09x035-A	92	6.88	ST-13x035-A	76	9.19
1 1/2	1 5/8	42	1 1/4	42.4	43.5	ST-09x042-A	70	7.94	ST-13x042-A	56	10.95
			1 1/2	48.3	49.5	ST-09x048-A	60	9.99	ST-13x048-A	48	13.59
2	2 1/8	54			55.0	ST-09x054-A	60	11.45	ST-13x054-A	46	15.41
			2	60.3	61.5	ST-09x060-A	60	13.06	ST-13x060-A	40	17.36
2 1/2	2 5/8	67			68.5						
2 13/16	3	76.1	2 1/2	76.1	77.0				ST-13x076-A	34	26.97
3	3 1/8	80			81.0						
			3	88.9	90.5				ST-13x089-A	30	32.81

Copper Pipe Cu			Iron & Steel pipe Fe			19 mm Insulation Thickness			25 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
1/2	5/8	15			16.0	ST-19x015-A	86	9.57	ST-25x015-A ◊	60	16.70
5/8	3/4				21.0	ST-19x020-A	76	11.62	ST-25x020-A ◊	50	18.09
3/4	7/8	22	1/2	21.3	23.0	ST-19x022-A	74	11.67	ST-25x022-A ◊	42	18.44
1	1 1/8	28	3/4	26.9	29.0	ST-19x028-A	58	15.99	ST-25x028-A ◊	40	20.91
1 1/4	1 3/8	35	1	33.7	36.0	ST-19x035-A	48	18.64	ST-25x035-A ◊	32	23.25
1 1/2	1 5/8	42	1 1/4	42.4	43.5	ST-19x042-A	40	22.01	ST-25x042-A ◊	24	24.73
			1 1/2	48.3	49.5	ST-19x048-A	30	25.21	ST-25x048-A ◊	24	28.54
2	2 1/8	54			55.0	ST-19x054-A	30	28.04	ST-25x054-A ◊	22	29.22
			2	60.3	61.5	ST-19x060-A	28	30.99	ST-25x060-A ◊	22	31.27
2 1/2	2 5/8	67			68.5						
2 13/16	3	76.1	2 1/2	76.1	77.0	ST-19x076-A	28	38.84	ST-25x076-A ◊	18	41.43
3	3 1/8	80			81.0						
			3	88.9	90.5	ST-19x089-A	22	46.80	ST-25x089-A ◊	14	48.89

- Items marked with ◊ delivery quoted on request.

Designed for quick and easy installation

## Kaiflex ST Turbo Tube selfseal tubes on coil



Colour: black; coil of selfseal tubes;

Copper Pipe Cu			Iron & Steel pipe Fe		9 mm Insulation Thickness				13 mm Insulation Thickness			
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Reference	m / coil	coils / carton	€ / m *	Reference	m / coil	coils / carton	€ / m *
1/2	5/8	15			ST-09x015/E-A ◊	13	10	5.54	ST-13x015/E-A ◊	13	10	7.20
5/8	3/4				ST-09x020/E-A ◊	13	9	7.08	ST-13x020/E-A ◊	13	9	8.83
3/4	7/8	22	1/2	21.3	ST-09x022/E-A ◊	13	8	7.13	ST-13x022/E-A ◊	13	8	8.91
1	1 1/8	28	3/4	26.9	ST-09x028/E-A ◊	13	7	7.69	ST-13x028/E-A ◊	13	7	10.65
1 1/4	1 3/8	35	1	33.7	ST-09x035/E-A ◊	13	6	8.74	ST-13x035/E-A ◊	13	6	11.49
1 1/2	1 5/8	42	1 1/4	42.4	ST-09x042/E-A ◊	13	5	10.08	ST-13x042/E-A ◊	13	5	13.69

Copper Pipe Cu			Iron & Steel pipe Fe		19 mm Insulation Thickness							
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Reference	m / coil	coils / carton	€ / m *				
1/2	5/8	15			ST-19x015/E-A ◊	13	10	11.48				
5/8	3/4				ST-19x020/E-A ◊	13	9	13.94				
3/4	7/8	22	1/2	21.3	ST-19x022/E-A ◊	13	8	14.01				
1	1 1/8	28	3/4	26.9	ST-19x028/E-A ◊	13	7	19.19				
1 1/4	1 3/8	35	1	33.7	ST-19x035/E-A ◊	13	6	22.37				
1 1/2	1 5/8	42	1 1/4	42.4	ST-19x042/E-A ◊	13	5	26.41				

## Kaiflex ST Class 0 self-adhesive tape

Colour: black;

Insulation Thickness mm	Width mm	Length m	Reference	rolls / carton	€ / roll *
3	50	15	ST-TAPE	12	50.82

- Items marked with ◊ delivery quoted on request.

# Kaiflex<sup>®</sup> ST Coils



## The efficient solution for refrigeration pipework

Long continuous insulation coils, Kaiflex ST Coils provide outstanding technical performance in long continuous lengths.

Kaiflex ST Coils incorporate an in-built closed cell water vapour barrier that prevents condensation. Longer coil lengths mean fewer seams creating an even more secure and reliable system.

Conveniently packaged with 15 m long coils in plastic bags and longer coils in square cardboard boxes, Kaiflex ST Coils are easily sleeved over long pipe runs

- Easily sleeved onto pipe coils
- Long length minimises butt joints
- Closed cell structure with in-built water vapour barrier
- Inherent moisture resistance with long lasting protection against corrosion
- In-built anti-microbial resistance

### Kaiflex ST Class 0 Technical Specification

<b>Polymer</b>		NBR blend	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Black	
<b>Upper Temperature Limit</b>	pipe flat surface	+105°C +85°C	
<b>Lower Temperature Limit</b>		-200°C	see remark (1)
<b>Thermal Conductivity</b>	at -30°C at -20°C at -0°C at +10°C at +20°C at +40°C at +70°C	0.031 W/(m·K) 0.032 W/(m·K) 0.034 W/(m·K) 0.035 W/(m·K) 0.036 W/(m·K) 0.038 W/(m·K) 0.041 W/(m·K)	Test acc. to - EN ISO 13469 - EN ISO 12086
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 10\ 000$	Test acc. to - EN ISO 13469 - EN ISO 12086
<b>Surface Spread of Flame</b>		Class 1	Test acc. to BS 476 Part 7 1997
<b>Fire Propagation</b>	Total index of performance Sub index	less than 12 less than 6	Test acc. to BS 476 Part 6 1989
<b>Fire Performance</b> acc. to Building Regulations		<b>Class 0</b>	see remark (2)
<b>EuroClass</b>	tubes ( $\leq 25$ mm) sheet / rolls (10 mm to 32 mm)	B <sub>1</sub> -s3, d0 B-s3, d0	Test acc. to DIN EN 13501-1
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		ODP zero GWP zero Cadmium free	
<b>Health Aspects</b>		Dust & Fibre free Formaldehyde free	
<b>Resistance to ...</b>	Mould	Excellent	
<b>Other attributes</b>	PH-value	neutral	
<b>Other Certificates / Approvals</b>		UL-approved (UL94) FM approved DNV, Lloyd's Register, See BG	Test in acc. with UL94
<b>Outdoor applications</b>		needs protection against UV- radiation	see remark (3)

Remark (1) For temperatures between -50°C and -200°C please contact our Technical Support Team for advice.

Remark (2) Test results for surface spread of flame and fire propagation meets Class 0 fire performance as defined in UK building regulations

Remark (3) Kaiflex ST Class 0 needs protection against UV-radiation. Please paint with Kaiflex KaiFinish to the recommended thickness within 3 days.

### Kaiflex ST Class 0 tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

### Kaiflex ST Coils 15m coils

Colour: black; Length: 15 m; coiled, pre-chalked tube, individually packaged in plastic bags

Copper Pipe Cu			Iron & Steel pipe Fe			9 mm Insulation Thickness				13 mm Insulation Thickness			
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	coils / carton	m / carton	€ / m*	Reference	coils / carton	m / carton	€ / m*
	1/4	6			7.0	ST-09x006/E-15	20	300	2.99	ST-13x006/E-15	13	195	4.03
	3/8	10			11	ST-09x010/E-15	15	225	3.21	ST-13x010/E-15	10	150	4.21
3/8	1/2	12			13	ST-09x012/E-15	14	210	3.23	ST-13x012/E-15	9	135	4.28
1/2	5/8	15			16.0	ST-09x015/E-15	13	195	3.28	ST-13x015/E-15	8	120	4.32
5/8	3/4				21.0	ST-09x020/E-15	12	180	4.17	ST-13x020/E-15	7	105	4.90
3/4	7/8	22	1/2	21.3	23.0	ST-09x022/E-15	9	135	4.24	ST-13x022/E-15	6	90	5.37
1	1 1/8	28	3/4	26.9	29.0	ST-09x028/E-15	8	120	4.58	ST-13x028/E-15	6	90	6.42

### Kaiflex ST Coils coils in square box

Colour: black; coiled tube;

Copper Pipe Cu			Iron & Steel pipe Fe			9 mm Insulation Thickness			13 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	1/4	6			7.0	ST-09x006/E	40	3.16	ST-13x006/E	26	4.24
	3/8	10			11	ST-09x010/E	34	3.39	ST-13x010/E	23	4.46
3/8	1/2	12			13	ST-09x012/E	31	3.42	ST-13x012/E	18	4.61
1/2	5/8	15			16.0	ST-09x015/E	27	3.47	ST-13x015/E	17	4.92
5/8	3/4				21.0	ST-09x020/E	23	3.50	ST-13x020/E	15	6.12
3/4	7/8	22	1/2	21.3	23.0	ST-09x022/E	19	4.48	ST-13x022/E	14	5.53
1	1 1/8	28	3/4	26.9	29.0	ST-09x028/E	14	4.84	ST-13x028/E	10	6.84

### Kaiflex ST Class 0 self-adhesive tape

Colour: black;

Insulation Thickness mm	Width mm	Length m	Reference	rolls / carton	€ / roll *
3	50	15	ST-TAPE	12	50.82

- Items marked with ∅ delivery quoted on request.



# *kaiflex*® EPDM<sub>plus</sub>



## Designed to resist high temperatures and UV radiation

UV resistant rubber insulation for higher temperatures, Kaiflex EPDM is closed cell with highly moisture resistant properties that reliably prevent condensation and pipe corrosion.

EPDM rubber is durable, high temperature and UV resistant, making Kaiflex EPDM appropriate for use on outdoor split air-conditioning and solar hot water pipes which operate at temperatures that melt conventional domestic pipe insulation.

Kaiflex EPDM, in addition to resisting temperatures of up to 150°C, is naturally resistant moisture ingress and chemical inflicted degradation. Together these properties make Kaiflex EPDM ideally suited for use in demanding industrial process environments where salt water, chemical vapours and high temperatures combine to accelerate corrosion.

- Suitable for use at temperatures up to 150°C
- UV resistant for external use
- Closed cell structure with in-built water vapour barrier
- Inherent moisture resistance with long lasting protection against corrosion

Designed to resist high temperatures and UV radiation

## Kaiflex EPDMplus Technical Specification

<b>Polymer</b>		EPDM	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Black	
<b>Upper Temperature Limit</b>	tube & sheet	+150°C	
	self-adhesive tape	+85°C	
<b>Lower Temperature Limit</b>		-200°C	see remark (1)
<b>Thermal Conductivity</b>	at -0°C	0.038 W/(m·K)	Test acc. to - EN 12667 - EN ISO 8497
	at +40°C	0.042 W/(m·K)	
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 4\ 500$	Test acc. to EN ISO 12086
<b>EuroClass</b>		E	Test acc. to EN 13501-1
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		ODP zero GWP zero Cadmium free	
<b>Health Aspects</b>		Dust & Fibre free Formaldehyde free	
<b>Resistance to ...</b>	Mould	Excellent	
	UV radiation	Excellent	
<b>Other attributes</b>	PH-value	neutral	
<b>Outdoor applications</b>		<b>No</b> additional protection against UV radiation required	

Remark (1) For temperatures between -50°C and -200°C please ask our Technical Support Team for advice.

## Kaiflex EPDMplus tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

## Kaiflex EPDMplus tubes

Colour: black; Length: 2 m

Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness			19 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m *	Reference	m / carton	€ / m *
	3/8	10		10.2	11.0	EPDM-13x010	152	2.80			
3/8	1/2	12		12	13.0	EPDM-13x012	136	2.83	EPDM-19x012	78	6.16
1/2	5/8	15		13.5	16.0	EPDM-13x015	120	3.21	EPDM-19x015	72	6.71
		18		17.2	19.0	EPDM-13x018	106	3.82	EPDM-19x018	60	7.01
3/4	7/8	22	1/2	21.3	23.0	EPDM-13x022	84	4.10	EPDM-19x022	56	7.69
1	1 1/8	28	3/4	26.9	29.0	EPDM-13x028	72	4.85	EPDM-19x028	40	9.67
1 1/4	1 3/8	35	1	33.7	36.0	EPDM-13x035	50	5.68	EPDM-19x035	36	10.90
1 1/2	1 5/8	42	1 1/4	42.4	43.5	EPDM-13x042	40	6.22	EPDM-19x042	32	12.13
			1 1/2	48.3	49.5	EPDM-13x048	36	8.02	EPDM-19x048	24	15.45
2	2 1/8	54			55.0	EPDM-13x054	32	8.31	EPDM-19x054	22	15.84
			2	60.3	61.5	EPDM-13x060	24	9.30	EPDM-19x060	18	16.63
2 13/16	3	76.1	2 1/2	76.1	77.0	EPDM-13x076	18	13.90	EPDM-19x076	16	21.57
			3	88.9	90.5	EPDM-13x089	16	17.49	EPDM-19x089	12	23.73

Copper Pipe Cu			Iron & Steel pipe Fe			25 mm Insulation Thickness					
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m *			
	3/8	10			11.0						
3/8	1/2	12			13.0	EPDM-25x012	50	10.37			
1/2	5/8	15			16.0	EPDM-25x015	50	11.00			
		18		17.2	19.0	EPDM-25x018	40	11.87			
3/4	7/8	22	1/2	21.3	23.0	EPDM-25x022	36	12.47			
1	1 1/8	28	3/4	26.9	29.0	EPDM-25x028	32	13.58			
1 1/4	1 3/8	35	1	33.7	36.0	EPDM-25x035	24	14.37			
1 1/2	1 5/8	42	1 1/4	42.4	43.5	EPDM-25x042	22	16.72			
			1 1/2	48.3	49.5	EPDM-25x048	18	18.68			
2	2 1/8	54			55.0	EPDM-25x054	18	20.14			
			2	60.3	61.5	EPDM-25x060	16	21.77			
2 13/16	3	76.1	2 1/2	76.1	77.0	EPDM-25x076	12	27.39			
			3	88.9	90.5	EPDM-25x089	12	32.94			

- Delivery time for all Kaiflex EPDMplus products: 10 working days
- 10 mm and 32 mm tubes are available upon request



Note that due to the severe ongoing volatility of raw EPDM prices, the listed prices for Kaiflex EPDM products are guide prices only. Actual prices will be determined by the market price for raw EPDM at the beginning of each quarter. For more details and to confirm the prices applicable for the current quarter please contact our customer service.

Designed to resist high temperatures and UV radiation

## Kaiflex EPDMplus continuous sheet

Colour: black;

Insulation Thickness mm	Width m	Length m	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *
10	1	10	EPDM-10-E	10	35.21
13	1	8	EPDM-13-E	8	39.38
19	1	6	EPDM-19-E	6	61.94
25	1	4	EPDM-25-E	4	89.81

## Kaiflex EPDMplus self-adhesive tape

Colour: black;

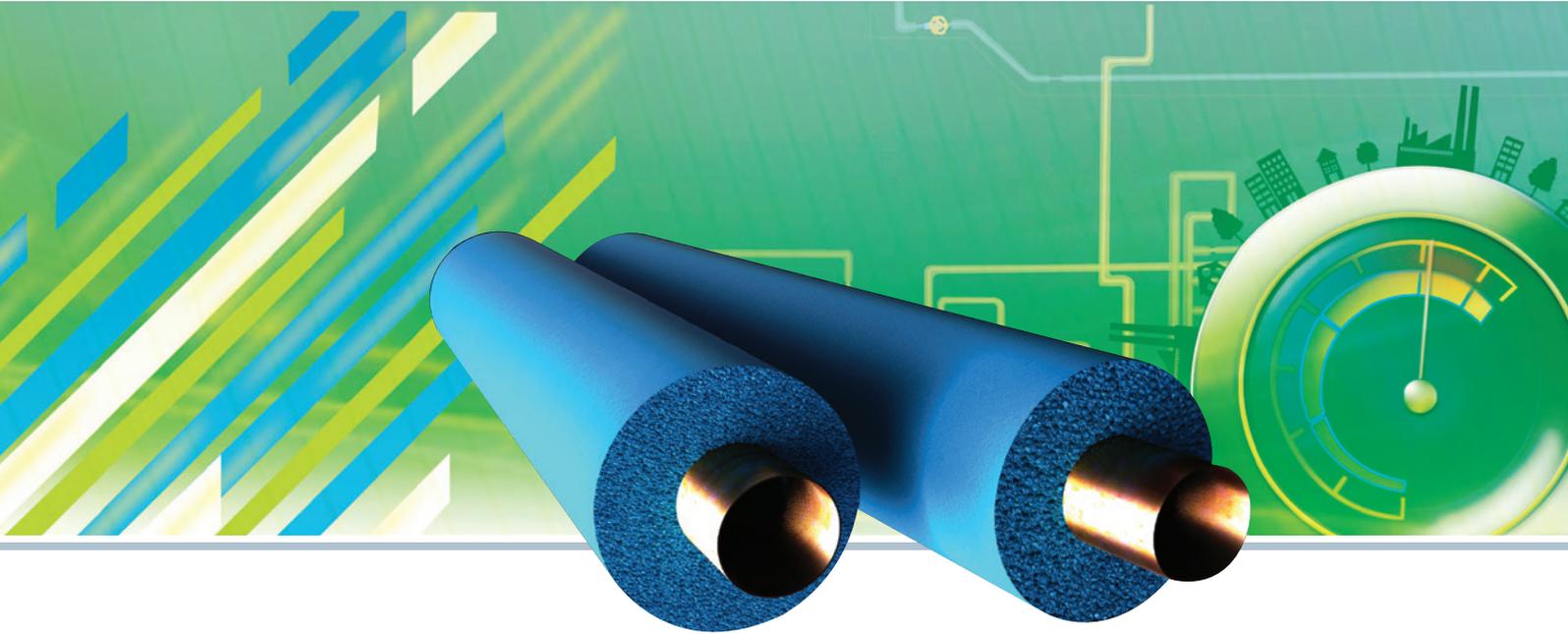
Insulation Thickness mm	Width mm	Length m	Reference	rolls / carton	€ / roll *
3	50	15	EPDM-TAPE	12	38.91

- Delivery time for all Kaiflex EPDMplus products: 10 working days
- 6 mm and 32 mm continuous sheet are available upon request



Note that due to the severe ongoing volatility of raw EPDM prices, the listed prices for Kaiflex EPDM products are guide prices only. Actual prices will be determined by the market price for raw EPDM at the beginning of each quarter. For more details and to confirm the prices applicable for the current quarter please contact our customer service.

# *kaiflex*<sup>®</sup> BluEco



## Designed to be free of halogens

Kaiflex BluEco, free from halogens, Chlorines, Bromines and Deca Bromine, combines excellent thermal energy saving properties with technically superior fire and smoke performance.

As a flexible closed cell Nitrile rubber foam insulation with a low thermal conductivity, Kaiflex BluEco not only minimises energy loss but also prevents condensation and protects against pipe corrosion.

Fully tested according to all relevant international standards, Kaiflex BluEco delivers the fire and smoke performance essential for sensitive transport, computing and offshore locations. Kaiflex BluEco also excels when tested against the new Scandinavian test procedure NT Fire 036, achieving the highest possible categorisation of PI.

- Free of Halogens
- Free of Chlorines, Bromines and Deca Bromine
- Low smoke toxicity
- Flexible, dust and fibre free, nature allows for ease of installation
- Moisture and corrosion resistant closed cell structure

## Kaiflex BluEco Technical Specification

<b>Polymer</b>		NBR blend	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Black	
<b>Upper Temperature Limit</b>	pipe flat surface	+105°C +85°C	
<b>Lower Temperature Limit</b>		-40°C	see remark (1)
<b>Thermal Conductivity</b>	at 0°C at +40°C	0.040 W/(m·K) 0.045 W/(m·K)	Test acc. to EN 12667 & ISO 8497
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 2\ 000$	Test acc. to EN 12086 & EN 13469
<b>Fire Performance</b>	Euroclass	E	Test acc. to EN 13501
	Material class	PI	acc. NT Fire 036
	Flame spread	0 mm/min.	acc. FMVSS 302
	Smoke/Toxicity test	passed	acc. IMO (FTP Code part 2/ISO 5659-2)
	Surface Flammability test	passed	acc. IMO (FTP Code part 5)
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		ODP zero GWP zero Cadmium free	
<b>Health Aspects</b>		Dust & Fibre free Formaldehyde free	
<b>Resistance to ...</b>	Mould	Excellent	
<b>Other attributes</b>	PH-value Chlorine content Bromide content Halogen content	neutral free free free	
<b>Outdoor applications</b>		<b>Needs</b> protection against UV- radiation	see remark (2)

Remark (1) For temperatures below -40°C please ask our Technical Support Team for advice.

Remark (2) Kaiflex BluEco needs protection against UV-radiation. Please paint with Kaiflex KaiFinish to the recommended thickness within 3 days.

## Kaiflex BluEco tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

## Kaiflex BluEco tubes

Colour: blue; Length: 2 m

Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness			19 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	3/8	10		10.2	11.0	BE-13x010	152	4.40			
3/8	1/2	12		12	13.0	BE-13x012	136	4.70	BE-19x012	78	9.01
1/2	5/8	15		13.5	16.0	BE-13x015	120	5.14	BE-19x015	72	9.92
		18		17.2	19.0	BE-13x018	106	5.66	BE-19x018	60	10.68
3/4	7/8	22	1/2	21.3	23.0	BE-13x022	84	6.50	BE-19x022	56	11.81
1	1 1/8	28	3/4	26.9	29.0	BE-13x028	72	7.64	BE-19x028	40	14.33
1 1/4	1 3/8	35	1	33.7	36.0	BE-13x035	50	9.63	BE-19x035	36	16.96
1 1/2	1 5/8	42	1 1/4	42.4	43.5	BE-13x042	40	11.30	BE-19x042	32	20.33
			1 1/2	48.3	49.5	BE-13x048	36	13.29	BE-19x048	24	24.18
2	2 1/8	54			55.0	BE-13x054	32	15.08	BE-19x054	22	27.21
			2	60.3	61.5	BE-13x060	24	16.63	BE-19x060	18	30.04
2 13/16	3	76.1	2 1/2	76.1	77.0	BE-13x076	18	26.37	BE-19x076	16	40.60
			3	88.9	90.5	BE-13x089	16	30.04	BE-19x089	12	45.86

Copper Pipe Cu			Iron & Steel pipe Fe			25 mm Insulation Thickness			
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	
	3/8	10			11.0				
3/8	1/2	12			13.0				
1/2	5/8	15			16.0	BE-25x015	50	18.99	
		18		17.2	19.0	BE-25x018	40	20.38	
3/4	7/8	22	1/2	21.3	23.0	BE-25x022	36	22.41	
1	1 1/8	28	3/4	26.9	29.0	BE-25x028	32	27.12	
1 1/4	1 3/8	35	1	33.7	36.0	BE-25x035	24	32.87	
1 1/2	1 5/8	42	1 1/4	42.4	43.5	BE-25x042	22	37.99	
			1 1/2	48.3	49.5	BE-25x048	18	39.87	
2	2 1/8	54			55.0	BE-25x054	18	44.35	
			2	60.3	61.5	BE-25x060	16	47.62	
2 13/16	3	76.1	2 1/2	76.1	77.0	BE-25x076	12	62.17	
			3	88.9	90.5	BE-25x089	12	69.48	

- Delivery time for all Kaiflex BluEco products: 10 working days
- 9 mm tubes are available upon request

## Kaiflex BluEco continuous sheet

Colour: blue;

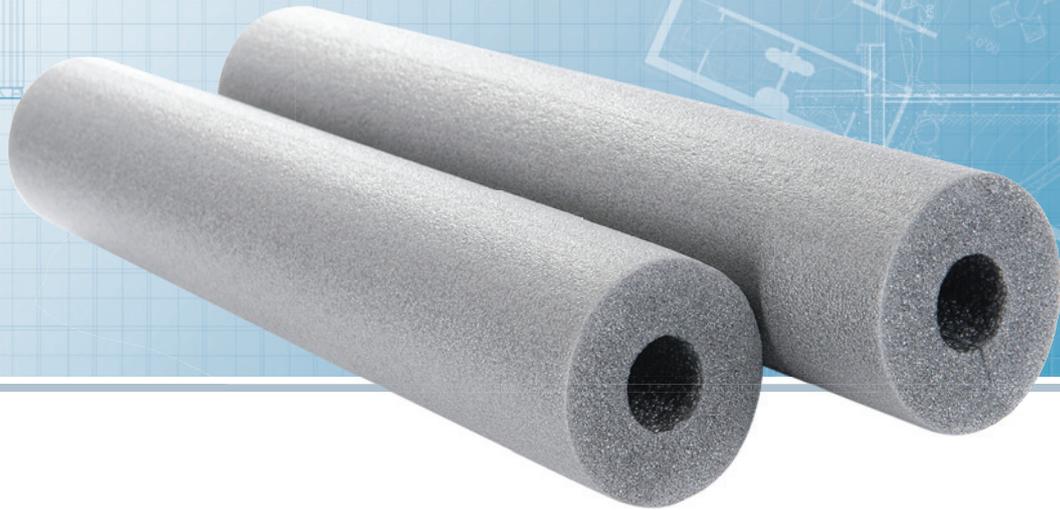
Continuous Sheet								
Insulation Thickness mm	Width m	Length m	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *			
6	1	18	BE-PL06-R	18	49.51			
10	1	10	BE-PL10-R	10	54.88			
13	1	8	BE-PL13-R	8	59.50			
19	1	6	BE-PL19-R	6	84.52			
25	1	4	BE-PL25-R	4	115.41			

## Kaiflex BluEco self-adhesive tape

Colour: blue;

Insulation Thickness mm	Width mm	Length m	Reference	rolls / carton	€ / roll *
3	50	15	BE-TAPE	12	53.97

- Delivery time for all Kaiflex BluEco products: 10 working days
- 3 mm continuous sheet available upon request



## Saves energy and offsets pipe freezing in domestic applications

Silver-grey polyethylene pipe insulation for domestic heating, hot and cold water systems, Kaiflex PE exhibits stable thermal properties which save energy and offset pipe freezing over the entire life of a domestic heating system.

Kaiflex PE is easily applied with the semi-flexible tubes supplied pre-slit and simply pushed around the pipe. The closed cell polyethylene structure of Kaiflex PE is dust and fibre free, highly stable, non-brittle and non-reactive making it suitable for use on all domestic pipework.

- Energy saving for domestic heating pipework
- Easily installed without adhesive or tape
- Short payback period realises economic savings quickly

## Saves energy and offsets pipe freezing in domestic applications

### Kaiflex PE Technical Specification

<b>Polymer</b>		Polyethylene	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Silver grey	
<b>Upper Temperature Limit</b>	pipe	+102°C	
<b>Lower Temperature Limit</b>	pipe	+5°C	see remark (1)
<b>Thermal Conductivity</b>	at +40°C	0.040 W/(m·K)	
<b>Ignition Resistance</b>		No Ignition	
<b>Density</b>		25 kg/m³	
<b>Dimensional Stability</b>		2%	
<b>Environmental Aspects</b>		ODP zero GWP three	
<b>Health Aspects</b>		Dust & Fibre free	
<b>Resistance to ...</b>	Ozone	Good	
	Oil & Grease	Good	
<b>Outdoor applications</b>		<b>Needs</b> protection against UV- radiation	see remark (2)

### Kaiflex PE Insulation Thickness to Control Pipe Freezing - see remark (3)

Copper Pipe Cu			Insulation Thickness in mm - see remark (3)			
NB inch	Nom OD inch	Nom OD mm	8 hours -6°C 50% ice formation	12 hours -6°C 50% ice formation	12 hours -10°C 50% ice formation	12 hours -20°C 50% ice formation
3/8	1/2	12	25 ◊	25 ◊	25 ◊	25 ◊
1/2	5/8	15	25 ◊	25 ◊	25 ◊	25 ◊
3/4	7/8	22	9	19	25 ◊	25 ◊
1	1 1/8	28	9	9	25	25 ◊
1 1/4	1 3/8	35	9	9	13	25 ◊
1 1/2	1 5/8	42	9	9	9	25
2	2 1/8	54	9	9	9	19

Thickness's marked ◊ are not sufficient to prevent pipe freezing for 12 hours or greater but are the greatest commercially available thickness. For these sizes it is suggested that insulation is used in combination with trace heating and other anti-freezing measures.

Remark (1) For temperatures below +5°C please contact our Technical Support Team.

Remark (2) Kaiflex PE is not designed to withstand UV-radiation. When installed in outdoor locations a UV-resistant covering should be applied within 3 days.

Remark (3) Thickness's in this table control pipe freezing by offsetting the freezing time by 8-12 hours at the temperatures specified. Where temperatures are expected to remain below freezing for longer than 12 hours specialist advice should be sought and our Technical Support Team should be contacted on +44 (0) 161 408 1806.

Saves energy and offsets pipe freezing in domestic applications

## Kaiflex PE tubes

Colour: silver grey; Length: 2 m

Copper Pipe Cu			Iron & Steel pipe Fe		9 mm Insulation Thickness			13 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	3/8	10			PE-09x10 ◊	tba	2.40	PE-13x10 ◊	tba	2.63
1/2	5/8	15			PE-09x15	300	2.42	PE-13x15	220	2.83
3/4	7/8	22	1/2	21.3	PE-09x22	220	3.19	PE-13x22	160	3.70
1	1 1/8	28	3/4	26.9	PE-09x28	170	3.80	PE-13x28	130	4.39
1 1/4	1 3/8	35	1	33.7	PE-09x35	140	4.59	PE-13x35	110	5.29
1 1/2	1 5/8	42	1 1/4	42.4	PE-09x42	100	5.16	PE-13x42	90	5.97
			1 1/2	48.3	PE-09x48	86	7.16	PE-13x48	80	8.31
2	2 1/8	54						PE-13x54	68	8.65
			2	60.3				PE-13x60	60	9.56
2 13/16	3	76.1	2 1/2	76.1				PE-13x76	40	16.23

Copper Pipe Cu			Iron & Steel pipe Fe		20 mm Insulation Thickness			25 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
3/8	1/2	12			PE-20x12 ◊	tba	6.21			
1/2	5/8	15			PE-20x15	114	6.30	PE-25x15	80	10.91
3/4	7/8	22	1/2	21.3	PE-20x22	100	7.40	PE-25x22	70	11.97
1	1 1/8	28	3/4	26.9	PE-20x28	90	8.58	PE-25x28	64	13.74
1 1/4	1 3/8	35	1	33.7	PE-20x35	70	9.73	PE-25x35	54	14.90
1 1/2	1 5/8	42	1 1/4	42.4	PE-20x42	60	10.63	PE-25x42	50	16.58

- all 9 mm and 13 mm tubes are semi-slit
- all 20 mm, 25 mm and 30 mm tubes are slit
- Tubes in 1m length are available upon request
- Items marked with ◊ delivery quoted on request.

Saves energy and offsets pipe freezing in domestic applications

## Kaiflex PE tubes DHCG compliant

Meets Building Regulation Part L (England & Wales) domestic compliance requirements; Colour: silver-grey; Length: 2 m						
Copper Pipe Cu		Maximum permissible heat loss W/m	Insulation thickness mm	Reference	m / carton	€ / m*
Nom OD inch	Nom OD mm					
	8	7.06	13	PE-13x10 ◊	tba	2.63
3/8	10	7.23	13	PE-13x10 ◊	tba	2.63
1/2	12	7.35	19	PE-20x12 ◊	tba	6.21
5/8	15	7.89	19	PE-20x15	114	6.30
7/8	22	9.12	25	PE-25x22	70	11.97
1 1/8	28	10.07	25	PE-25x28	64	13.74
1 3/8	35	11.08	30	PE-30x35 ◊	tba	19.69
1 5/8	42	12.19	30	PE-30x42 ◊	tba	21.88
2 1/8	54	14.12	30	PE-30x54 ◊	tba	28.86

## Kaiflex PE accessories

	Description	Reference	carton content	€ *
Self-adhesive tape	Thickness: 3mm - Width: 50mm - Length: 10m - Colour: Grey	PE-TAPE-50	10 rolls	18.70 per roll
Clips	Colour: Grey	PE-CLIPS	25 bags = 2,500 clips	4.95 per bag

- all 9 mm and 13 mm tubes are semi-slit
- all 20 mm, 25 mm and 30 mm tubes are slit
- Items marked with ◊ delivery quoted on request.



## Designed to be tough and durable

Nitrile rubber tubes and sheet with a tough PVC coating pre-applied, Kaiflex TC prevents energy loss and condensation whilst providing the waterproof rubber foam insulation with protection against the weather, impact, vandalism and UV damage.

Kaiflex TC is durable and visually attractive. The finish resists dirt and makes Kaiflex TC ideal for use in food production and clean room locations. With inherent UV resistance, Kaiflex TC can be used outdoors without the need for additional paint or cladding. Kaiflex TC can even be used on pipework buried in shallow soil, on pipe connecting mains cold water to houses and on sections of ground source heat loops which require insulation.

Available in pure white or black films, on rolls or pre-bonded to Kaiflex tubes and sheet, Kaiflex TC is particularly easy to install with application times minimised.

- Weather & UV-resistant for outdoor use
- Smooth and durable protective film
- Clean surface for food production locations
- In-built anti-microbial resistance
- Closed cell structure with in-built water vapour barrier

Designed to be tough and durable

## Kaiflex TC Technical Specification

<b>Polymer</b>		NBR blend	
<b>Covering</b>		Polymeric (PVC)	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>	Covering	White or Black	
<b>Upper Temperature Limit</b>	pipe	+80°C	see remark (1)
<b>Lower Temperature Limit</b>		-10°C	see remark (1)
<b>Thermal Conductivity</b>	at -30°C	0.031 W/(m·K)	Test acc. to - EN ISO 13469 - EN ISO 12086
	at -20°C	0.032 W/(m·K)	
	at -0°C	0.034 W/(m·K)	
	at +20°C	0.036 W/(m·K)	
	at +40°C	0.038 W/(m·K)	
	at +70°C	0.041 W/(m·K)	
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 10\ 000$	Test acc. to EN 12086 & EN 13469
<b>Surface Spread of Flame</b>		Class 1	Test acc. to BS 476 Part 7: 1997
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		OPD zero	
		GWP zero	
<b>Health Aspects</b>		Dust & Fibre free	
		Formaldehyde free	
<b>Resistance to ...</b>	UV	Excellent	
	Building Materials	Very Good	
<b>Outdoor applications</b>		<b>No</b> additional protection against UV radiation required	

## Kaiflex TC tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

Remark (1) For temperatures between below -10°C and above +80°C please contact our Technical Support Team for advice.

## Kaiflex TC pre-covered tubes - black

Colour: black; Length: 2 m											
Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness			19 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	3/8	10			11.0	TC-13x010-BK	84	13.69			
3/8	1/2	12			13.0	TC-13x012-BK	76	14.12	TC-19x012-BK	44	21.88
1/2	5/8	15			16.0	TC-13x015-BK	66	14.53	TC-19x015-BK	36	22.52
5/8	3/4				21.0	TC-13x020-BK	52	15.92	TC-19x020-BK	30	23.22
3/4	7/8	22	1/2	21.3	23.0	TC-13x022-BK	48	16.75	TC-19x022-BK	30	23.67
1	1 1/8	28	3/4	26.9	29.0	TC-13x028-BK	36	17.79	TC-19x028-BK	22	24.53
1 1/4	1 3/8	35	1	33.7	36.0	TC-13x035-BK	28	19.50	TC-19x035-BK	16	27.07
1 1/2	1 5/8	42	1 1/4	42.4	43.5	TC-13x042-BK	22	21.56	TC-19x042-BK	14	30.38
			1 1/2	48.3	49.5	TC-13x048-BK	16	23.21	TC-19x048-BK	12	32.91
2	2 1/8	54			55.0	TC-13x054-BK	16	26.59	TC-19x054-BK	12	36.65
			2	60.3	61.5	TC-13x060-BK	14	28.44	TC-19x060-BK	12	39.68
2 1/2	2 5/8	67			68.5	TC-13x067-BK	12	30.88			

## Kaiflex TC pre-covered tubes - white

Colour: white; Length: 2 m											
Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness			19 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
	3/8	10			11.0	TC-13x010-WH	84	13.69			
3/8	1/2	12			13.0	TC-13x012-WH	76	14.12	TC-19x012-WH	44	21.88
1/2	5/8	15			16.0	TC-13x015-WH	66	14.53	TC-19x015-WH	36	22.52
5/8	3/4				21.0	TC-13x020-WH	52	15.92	TC-19x020-WH	30	23.22
3/4	7/8	22	1/2	21.3	23.0	TC-13x022-WH	48	16.75	TC-19x022-WH	30	23.67
1	1 1/8	28	3/4	26.9	29.0	TC-13x028-WH	36	17.79	TC-19x028-WH	22	24.53
1 1/4	1 3/8	35	1	33.7	36.0	TC-13x035-WH	28	19.50	TC-19x035-WH	16	27.07
1 1/2	1 5/8	42	1 1/4	42.4	43.5	TC-13x042-WH	22	21.56	TC-19x042-WH	14	30.38
			1 1/2	48.3	49.5	TC-13x048-WH	16	23.21	TC-19x048-WH	12	32.91
2	2 1/8	54			55.0	TC-13x054-WH	16	26.59	TC-19x054-WH	12	36.65
			2	60.3	61.5	TC-13x060-WH	14	28.44	TC-19x060-WH	12	39.68
2 1/2	2 5/8	67			68.5	TC-13x067-WH	12	30.88			

- For all Kaiflex TC products delivery is quoted on request

Designed to be tough and durable

## Kaiflex TC pre-covered flat sheet

Colour Covering: black or white; Colour insulation: black; Length: 2m; Width: 0.5m								
Insulation Thickness mm	Width m	Length m	with black covering			with white covering		
			Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *
13	0.5	2	TC-13-BK	9	58.29	TC-13-WH	9	58.29
19	0.5	2	TC-19-BK	7	61.61	TC-19-WH	7	61.61

## Kaiflex TC covering on rolls

Colour: black or white							
Width mm	Length m	black			white		
		Reference	m <sup>2</sup> / roll	€ / roll *	Reference	m <sup>2</sup> / roll	€ / roll *
500	50	TC-COVER-50-BK	25	401.98	TC-COVER-50-WH	25	401.98

## Kaiflex TC self-adhesive tape

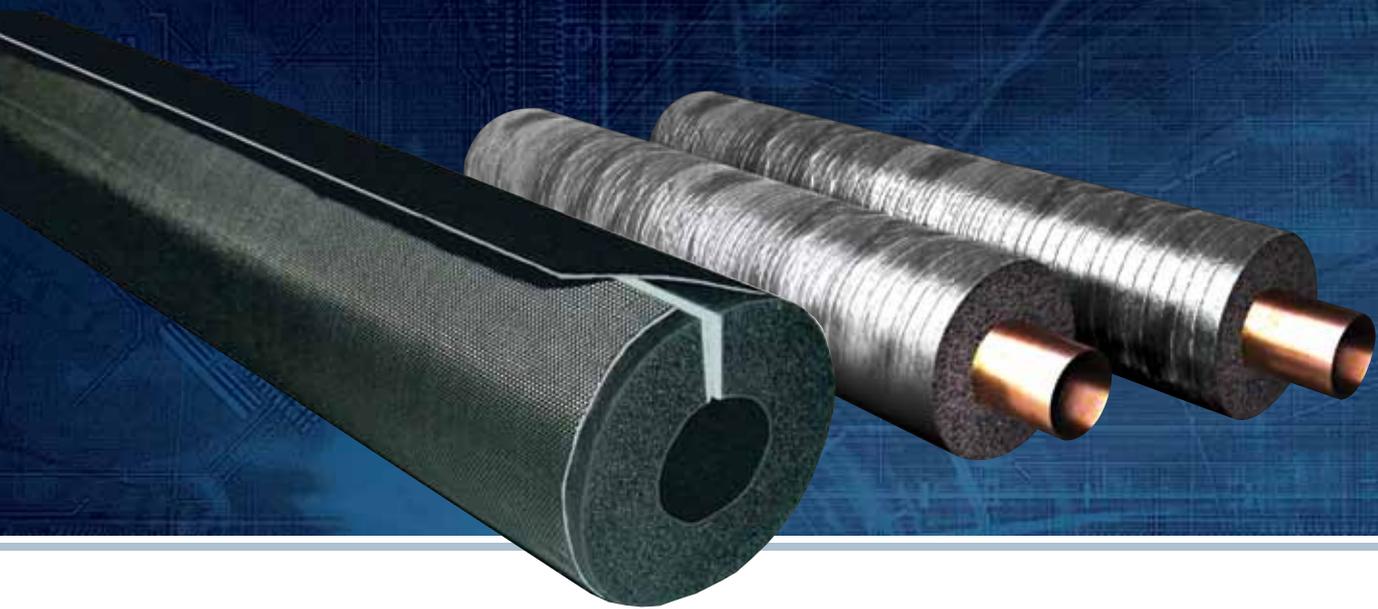
Colour: black or white							
Width mm	Length m	black			white		
		Reference	rolls / carton	€ / m *	Reference	rolls / carton	€ / m *
25	50	TC-TAPE-25-BK	8	54.82	TC-TAPE-25-WH	8	54.82
50	50	TC-TAPE-50-BK	4	110.22	TC-TAPE-50-WH	4	110.22

## Kaiflex Mastic sealing compound

Reference	Colour	Cartridge content / ml	Cartridge / carton	€ / cartridge *
MASTIC-BK	Black	290	12	37.26
MASTIC-TR	Translucent	290	12	37.26

- For all Kaiflex TC products delivery is quoted on request
- Black and white Kaiflex TC covering also available in 1 m wide on request

# *Kaiflex*<sup>®</sup> PROTECT



## Resistant to mechanical impact

Tough black woven glass fibre fabric covering for Kaiflex insulation, **Kaiflex Protect F Black** protects insulation against mechanical damage and can be supplied either separately as rolls of thin sheet or pre-applied to Kaiflex tube or sheet.

**Kaiflex Protect F Black** is attractive, unobtrusive, easy to clean and ideal for covering pipe and duct insulation publicly exposed to view. The covering is also UV resistant and waterproof making it suitable for outdoor use.

Glass fibre reinforced aluminium foil covering for Kaiflex insulation, **Kaiflex Protect Alu-NET** protects insulation against mechanical damage and can be supplied either separately as rolls of thin sheet or pre-applied to Kaiflex tube or sheet.

**Kaiflex Protect Alu-NET** is particularly attractive with a superior aluminium finish that provides an alternative to metal cladding on a range of applications.

Resistant to mechanical impact

## Kaiflex Protect F-Black & ALU-NET Technical Specification

<b>Insulation: Polymer</b>		NBR blend	
<b>Insulation: Cell Structure</b>		Closed Cell	
<b>Insulation: Colour</b>		Black	
<b>Covering: Material</b>	Kaiflex Protect F-Black	Woven glass fibre cloth	
	Kaiflex Protect ALU-NET	Glass fibre re-enforced Aluminium foil	
<b>Covering: Colour</b>	Kaiflex Protect F-Black	Black	
	Kaiflex Protect ALU-NET	Silver	
<b>Upper Temperature Limit</b>	pipe (coating)	+80°C	
	flat surface (coating)	+80°C	
<b>Lower Temperature Limit</b>	(coating)	-30°C	see remark (1)
<b>Thermal Conductivity of pre-covered tubes &amp; sheets</b>	at -30°C	0.031 W/(m·K)	Test acc. to - EN ISO 13469 - EN ISO 12086
	at -20°C	0.032 W/(m·K)	
	at -0°C	0.034 W/(m·K)	
	at +20°C	0.036 W/(m·K)	
	at +40°C	0.038 W/(m·K)	
	at +70°C	0.041 W/(m·K)	
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 10\ 000$	Test acc. to EN 12086 & EN 13469
<b>Environmental Aspects</b>		ODP zero	
		GWP zero	
<b>Health Aspects</b>		Dust & Fibre free	
		Formaldehyde free	
<b>Resistance to ...</b>	UV radiation	Excellent	
	Ozone	Good	
<b>Outdoor applications</b>	Kaiflex Protect F-Black	<b>No</b> additional protection against UV radiation required	
	Kaiflex Protect ALU-NET	Application <b>indoors only</b>	

## Kaiflex Protect F-Black & ALU-NET tolerances: thickness & length

Insulation thickness mm	6	9	10	13	19	25	$\geq 32$	Length all thicknesses	Width all thicknesses
<b>Tubes</b>	$\pm 1.0$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.5$ mm	$\pm 2.5$ mm	$\pm 3.0$ mm	$\pm 1.5\%$	
<b>Sheet</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	$\pm 1.5\%$	$\pm 2.0\%$
<b>Rolls</b>	$\pm 1.0$ mm	-	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 1.5$ mm	$\pm 2.0$	$\pm 2.0$	+ 5.0% / - 1.5%	$\pm 2.0\%$

Remark (1) For temperatures below -30°C please contact our Technical Support Team for advice.

### Kaiflex Protect F-Black & ALU-NET pre-covered selfseal tubes

Colour Insulation: black; Colour Covering: black or silver; Length: 1 m											
Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness					
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	pre-covered with Kaiflex Protect F-Black			pre-covered with Kaiflex Protect ALU-NET		
						Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
1/2	5/8	15			16.0	STFB-13x015	77	7.50	ALUNET-13x015	77	6.25
5/8	3/4				21.0	STFB-13x018	65	7.65	ALUNET-13x018	65	6.40
3/4	7/8	22	1/2	21.3	23.0	STFB-13x022	56	7.90	ALUNET-13x022	56	6.60
1	1 1/8	28	3/4	26.9	29.0	STFB-13x028	43	8.50	ALUNET-13x028	43	7.10
1 1/4	1 3/8	35	1	33.7	36.0	STFB-13x035	38	9.15	ALUNET-13x035	38	7.60
1 1/2	1 5/8	42	1 1/4	42.4	43.5	STFB-13x042	28	10.00	ALUNET-13x042	28	8.35
			1 1/2	48.3	49.5	STFB-13x048	24	10.60	ALUNET-13x048	24	8.85
2	2 1/8	54			55.0	STFB-13x054	23	11.90	ALUNET-13x054	23	9.95
			2	60.3	61.5	STFB-13x060	20	13.20	ALUNET-13x060	20	11.00
2 1/2	2 5/8	67			68.5						
2 13/16	3	76.1	2 1/2	76.1	77.0	STFB-13x076	17	15.15	ALUNET-13x076	17	12.60
3	3 1/8	80			81.0						
			3	88.9	90.5	STFB-13x089	15	16.30	ALUNET-13x089	15	13.60

Copper Pipe Cu			Iron & Steel pipe Fe			19 mm Insulation Thickness					
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	pre-covered with Kaiflex Protect F-Black			pre-covered with Kaiflex Protect ALU-NET		
						Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
1/2	5/8	15			16.0	STFB-19x015	43	9.65	ALUNET-19x015	43	8.05
5/8	3/4				21.0	STFB-19x018	39	9.90	ALUNET-19x018	39	8.25
3/4	7/8	22	1/2	21.3	23.0	STFB-19x022	37	10.20	ALUNET-19x022	37	8.50
1	1 1/8	28	3/4	26.9	29.0	STFB-19x028	29	11.00	ALUNET-19x028	29	9.20
1 1/4	1 3/8	35	1	33.7	36.0	STFB-19x035	24	12.10	ALUNET-19x035	24	10.05
1 1/2	1 5/8	42	1 1/4	42.4	43.5	STFB-19x042	20	12.90	ALUNET-19x042	20	10.75
			1 1/2	48.3	49.5	STFB-19x048	15	14.15	ALUNET-19x048	15	11.80
2	2 1/8	54			55.0	STFB-19x054	15	16.30	ALUNET-19x054	15	13.60
			2	60.3	61.5	STFB-19x060	14	17.20	ALUNET-19x060	14	14.35
2 1/2	2 5/8	67			68.5						
2 13/16	3	76.1	2 1/2	76.1	77.0	STFB-19x076	14	19.30	ALUNET-19x076	14	16.05
3	3 1/8	80			81.0						
			3	88.9	90.5	STFB-19x089	11	21.40	ALUNET-19x089	11	17.80

- Kaiflex Protect F-Black & ALU-NET are based on Kaiflex ST Class 0 substrate as standard
- Kaiflex Protect F-Black & ALU-NET products: 10 working days
- Kaiflex Protect F-Black & ALU-NET are also available based on Kaiflex EPDMplus and Kaiflex HF substrates; price and delivery quoted on request
- All Kaiflex Protect F-Black & ALU-NET pre-covered sheets are also available with self-adhesive backing; delivery quoted on request

### Kaiflex Protect F-Black & ALU-NET pre-covered selfseal tubes

Colour Insulation: black; Length: 1 m											
Copper Pipe Cu			Iron & Steel pipe Fe			25 mm Insulation Thickness					
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	pre-covered with Kaiflex Protect F-Black			pre-covered with Kaiflex Protect ALU-NET		
						Reference	m / carton	€ / m*	Reference	m / carton	€ / m*
1/2	5/8	15			16.0						
5/8	3/4				21.0	STFB-25x018	25	11.85	ALUNET-25x018	25	9.90
3/4	7/8	22	1/2	21.3	23.0	STFB-25x022	21	13.10	ALUNET-25x022	21	10.90
1	1 1/8	28	3/4	26.9	29.0	STFB-25x028	20	13.90	ALUNET-25x028	20	11.60
1 1/4	1 3/8	35	1	33.7	36.0	STFB-25x035	16	14.75	ALUNET-25x035	16	12.30
1 1/2	1 5/8	42	1 1/4	42.4	43.5	STFB-25x042	12	16.10	ALUNET-25x042	12	13.40
			1 1/2	48.3	49.5	STFB-25x048	12	17.15	ALUNET-25x048	12	14.30
2	2 1/8	54			55.0	STFB-25x054	11	18.40	ALUNET-25x054	11	15.35
			2	60.3	61.5	STFB-25x060	11	21.00	ALUNET-25x060	11	17.50
2 1/2	2 5/8	67			68.5						
2 13/16	3	76.1	2 1/2	76.1	77.0	STFB-25x076	9	23.90	ALUNET-25x076	9	19.90
3	3 1/8	80			81.0						
			3	88.9	90.5	STFB-25x089	7	26.15	ALUNET-25x089	7	21.80

### Kaiflex Protect F-Black & ALU-NET pre-covered continuous sheet

Insulation Thickness mm	Width m	Length m	pre-covered with Kaiflex Protect F-Black			pre-covered with Kaiflex Protect ALU-NET		
			Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *	Reference	m <sup>2</sup> / carton	€ / m <sup>2</sup> *
13	1	11	STFB-13	14	35.05	ALUNET-13	14	26.85
19	1	8	STFB-19	10	37.45	ALUNET-19	10	28.65
25	1	6	STFB-25	8	47.30	ALUNET-25	8	36.20

- Kaiflex Protect F-Black & ALU-NET are based on Kaiflex ST Class 0 substrate as standard
- Kaiflex Protect F-Black & ALU-NET products: 10 working days
- Kaiflex Protect F-Black & ALU-NET are also available based on Kaiflex EPDMplus and Kaiflex HF substrates; price and delivery quoted on request
- All Kaiflex Protect F-Black & ALU-NET pre-covered sheets are also available with self-adhesive backing; delivery quoted on request

## Kaiflex Protect F-Black & ALU-NET covering

Width m	Length m	m <sup>2</sup> / roll	Kaiflex Protect F-Black					
			Reference	roll / carton	€ / m <sup>2</sup> *			
1	25	26	STFB-25	1	14.95			

## Kaiflex Protect F-Black butyl tape

Colour: black;				
Width mm	Length m	Reference	rolls / carton	€ / roll *
20	20	FB-TAPE20	30	14.75
50	20	FB-TAPE50	12	28.85
100	20	FB-TAPE100	6	57.70

## Kaiflex Mastic sealing compound

Reference	Colour	Cartridge content / ml	cartridges / carton	€ / cartridge *
MASTIC-GY	Grey	290	12	37.26
MASTIC-BK	Black	290	12	37.26
MASTIC-TR	Translucent	290	12	37.26

- Kaiflex Protect F-Black & ALU-NET are based on Kaiflex ST Class 0 substrate as standard
- Kaiflex Protect F-Black & ALU-NET products: 10 working days
- Kaiflex Protect F-Black & ALU-NET are also available based on Kaiflex EPDMplus and Kaiflex HF substrates; price and delivery quoted on request
- All Kaiflex Protect F-Black & ALU-NET pre-covered sheets are also available with self-adhesive backing; delivery quoted on request

# *kaiflex*<sup>®</sup> **PROTECT**

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Resistant to mechanical impact

# Kaiflex<sup>®</sup> SOLAR EPDM



## Designed to improve solar hot water efficiency

Twin coils of corrugated stainless steel pipe pre-insulated with solar grade EPDM insulation, **Kaiflex EPDM Solar VA** connects solar panels to storage cylinders while minimising energy loss, keeping solar water hot long into the colder months.

Kaiflex EPDM Solar VA is based on naturally UV-resistant EPDM rubber and comes with an additional co-extruded foil pre-applied that deters accidental and deliberate damage and vandalism over long periods of time.

The corrugated pipe is specifically designed for to withstand high solar temperatures and pressures. By incorporating a corrugated structure the pipe can be effortlessly bent around the tightest bends and Kaiflex EPDM Solar is fully compatible with all standard solar panels, cylinders, pumps and fittings.

**Kaiflex Solar EPDM-CO** is based on naturally UV-resistant EPDM rubber and comes with an additional co-extruded foil pre-applied that deters accidental and deliberate damage and vandalism over long periods of time.

Highly flexible and temperature resistant up to 150°C, Kaiflex Solar EPDM-CO will not experience degradation at solar hot water temperatures..

- Reduces solar energy loss, improving efficiency
- Pre-insulated coils for quicker and easier installation
- Unique protective woven polyester fibre covering
- Integrated electrical sensor cable
- Compatible with standard solar fittings

Designed to improve solar hot water efficiency

## Kaiflex Solar Technical Specification

<b>Description</b>		win coils of corrugated stainless steel pipe pre-insulated with high temperature Kaiflex EPDM insulation with a tough co-extruded foil covering.	
<b>Corrugated Stainless Steel Pipe</b>	Material	1.4404 / AISI 316L	
<b>Cell Structure</b>		Closed Cell	
<b>Colour</b>		Black	
<b>Upper Temperature Limit</b>		+150°C (+175°C)	
<b>Lower Temperature Limit</b>		-50°C	see remark (1)
<b>Thermal Conductivity</b>	at -0°C at +40°C	0.038 W/(m·K) 0.042 W/(m·K)	Test acc. to EN ISO 8497
<b>Water Vapour Barrier</b>		In-built	
<b>Water Vapour Resistance</b>	Moisture Resistance Factor $\mu$	$\geq 4\ 500$	Test acc. to EN 12086 & EN 13469
<b>EuroClass</b>		E	Test acc. to EN 13501-1
<b>Reaction to Fire</b>		Self-extinguishing, does not drip	
<b>Environmental Aspects</b>		ODP zero GWP zero Cadmium free	
<b>Health Aspects</b>		Dust & Fibre free Formaldehyde free	
<b>Resistance to ...</b>	Mould UV radiation	Excellent Excellent	
<b>Other Attributes</b>	PH-value	Neutral	
<b>Outdoor Applications</b>		NO additional protection against UV impact is required.	

## Corrugated Steel Pipe

Nom ID mm	Inner Diameter mm	Outer Diameter mm	Pipe Thickness mm	Min. Bending Radius mm	Max. System Pressure bar	Volume l/m
16	16.3	21.4	0.2	25	16	0.273
20	20.5	26.7	0.2	30	10	0.430
25	25.4	31.8	0.2	35	10	0.633

Remark (1) For temperatures below -50°C please ask our Technical Support Team for advice. Tel. +44 (0)161 408 1806, Email knowhow@kaimann.com

## Kaiflex Solar EPDM 2in2 VA pre-insulated twin tubes

Twin corrugated stainless steel pipes pre-insulated using Kaiflex EPDM plus with foil coverings pre-applied.

Nom ID mm	Insulation thickness mm	Description	Reference	carton / pallet	m / carton	€ / m *
16	14	Pre-Covered Kaiflex Solar twin tube DN 16 with 14 mm insulation	SOLAR-VA-14x16/10	10	10	33.83
16	14	Pre-Covered Kaiflex Solar twin tube DN 16 with 14 mm insulation	SOLAR-VA-14x16/15	10	15	32.44
16	14	Pre-Covered Kaiflex Solar twin tube DN 16 with 14 mm insulation	SOLAR-VA-14x16/20	6	20	31.78
16	14	Pre-Covered Kaiflex Solar twin tube DN 16 with 14 mm insulation	SOLAR-VA-14x16/25	6	25	31.39
20	14	Pre-Covered Kaiflex Solar twin tube DN 20 with 14 mm insulation	SOLAR-VA-14x20/10	10	10	40.08
20	14	Pre-Covered Kaiflex Solar twin tube DN 20 with 14 mm insulation	SOLAR-VA-14x20/15	8	15	38.24
20	14	Pre-Covered Kaiflex Solar twin tube DN 20 with 14 mm insulation	SOLAR-VA-14x20/20	6	20	37.34
20	14	Pre-Covered Kaiflex Solar twin tube DN 20 with 14 mm insulation	SOLAR-VA-14x20/25	4	25	36.81
25	14	Pre-Covered Kaiflex Solar twin tube DN 25 with 14 mm insulation	SOLAR-VA-14x25/10	8	10	49.62
25	14	Pre-Covered Kaiflex Solar twin tube DN 25 with 14 mm insulation	SOLAR-VA-14x25/15	6	15	47.60
25	14	Pre-Covered Kaiflex Solar twin tube DN 25 with 14 mm insulation	SOLAR-VA-14x25/20	4	20	46.12
25	14	Pre-Covered Kaiflex Solar twin tube DN 25 with 14 mm insulation	SOLAR-VA-14x25/25	4	25	46.05
16	19	Pre-Covered Kaiflex Solar twin tube DN 16 with 19 mm insulation	SOLAR-VA-19x16/15	-	15	49.97
16	19	Pre-Covered Kaiflex Solar twin tube DN 16 with 19 mm insulation	SOLAR-VA-19x16/25	-	25	48.37
20	19	Pre-Covered Kaiflex Solar twin tube DN 20 with 19 mm insulation	SOLAR-VA-19x20/15	-	15	57.91
20	19	Pre-Covered Kaiflex Solar twin tube DN 20 with 19 mm insulation	SOLAR-VA-19x20/25	-	25	56.11

- 50 m long coils are available upon request. Note no expansion fittings are included.

## Kaiflex Solar EPDM-CO co-extruded tubes



Colour: black; co-extruded PE-foil covering; Length: 2 m

Copper Pipe Cu			Iron & Steel pipe Fe			13 mm Insulation Thickness			19 mm Insulation Thickness		
NB inch	Nom OD inch	Nom OD mm	NB inch	Nom OD mm	Min ID mm	Reference	m / carton	€ / m *	Reference	m / carton	€ / m *
1/2	5/8	15			16.0	EPDM-CO-13x015 ◊	120	4.17	EPDM-CO-19x015 ◊	72	7.70
		18		17.2	19.0	EPDM-CO-13x018 ◊	106	4.53	EPDM-CO-19x018 ◊	60	7.92
3/4	7/8	22	1/2	21.3	23.0	EPDM-CO-13x022 ◊	84	4.90	EPDM-CO-19x022 ◊	56	9.05
1	1 1/8	28	3/4	26.9	29.0	EPDM-CO-13x028 ◊	72	5.32	EPDM-CO-19x028 ◊	40	10.83

- Delivery time for Kaiflex Solar EPDM 2in2 VA & Kaiflex Solar EPDM-CO products: 10 working days
- Items marked with ◊ delivery quoted on request.

Designed to improve solar hot water efficiency

## Kaiflex Solar accessories

Colour: black;

Reference	Description	carton content	€ *
<b>ADH-SOLAR-0220</b>	Solar EPDM adhesive, Content: 0.26 litre (paintbrush tin)	24 cans	20.51 can
<b>ADH-SOLAR-0660</b>	Solar EPDM adhesive, 0.79 litre	20 cans	35.35 can
<b>WOVENCOVER-1.2 ◊</b>	Kaiflex Fiberguard, woven covering suitable for tube with Nom ID 16, 20 and 25 Set consists of 2 rolls (each 1.2 m long) and PVC tape	1 set	27.29 set

- Delivery time for Kaiflex Solar EPDM 2in2 VA & Kaiflex Solar EPDM-CO products: 10 working days
- Items marked with ◊ delivery quoted on request.

# Kaiflex<sup>®</sup> PyroStar



## Designed to stop fire spread

**Kaiflex Pyrostar** is thin and flexible with a strong intumescent effect that tightly seals fire wall penetrations and prevents fire spread. Kaiflex Pyrostar is fibre free and features a closed cell structure to prevent any moisture ingress that could impact on performance.

Compatible with flexible and rigid insulation and extensively tested in real fire situations on combustible and non-combustible pipes passing through both light and solid wall constructions, Kaiflex Pyrostar fully maintains the fire wall integrity up to 120 minutes.

As a flexible solution which is easily cut to size, Kaiflex Pyrostar eliminates the need to order and retain a wide range of uniquely sized cuffs for each combination of pipe size and insulation thickness. One roll of Kaiflex Pyrostar can be adapted on site to seal almost any pipe penetration against fire spread.

- Maintains fire wall integrity for up to 120 minutes
- Compatible with combustible and non-combustible pipe
- Flexible - one roll fits all pipe sizes
- Dust and fibre free
- Resistant to moisture ingress

Designed to stop fire spread

## Kaiflex PyroStar Technical Specification

<b>Polymer</b>		Fiberglass finished with a graphite-based intumescent material	
<b>Colour</b>		Dark Grey	
<b>Fire Resistance Class</b>		R90 / R120	Test acc. to DIN 4102 Part 11
<b>Thickness</b>		1 mm	
<b>Applications</b>	Insulation products	Nitrile rubber, Glass wool, Rock wool, Polyurethane and Cellular Glass	
	Material of pipe	Steel, stainless steel and cast iron pipes up to Ø 326 mm Insulation thicknesses from 6 to 100 mm Copper pipes up to Ø 88.9 mm insulation thicknesses from 9 to 50 mm Solid wall and ceiling, thicknesses ≥ 150 mm Partition wall ≥ 100 mm	

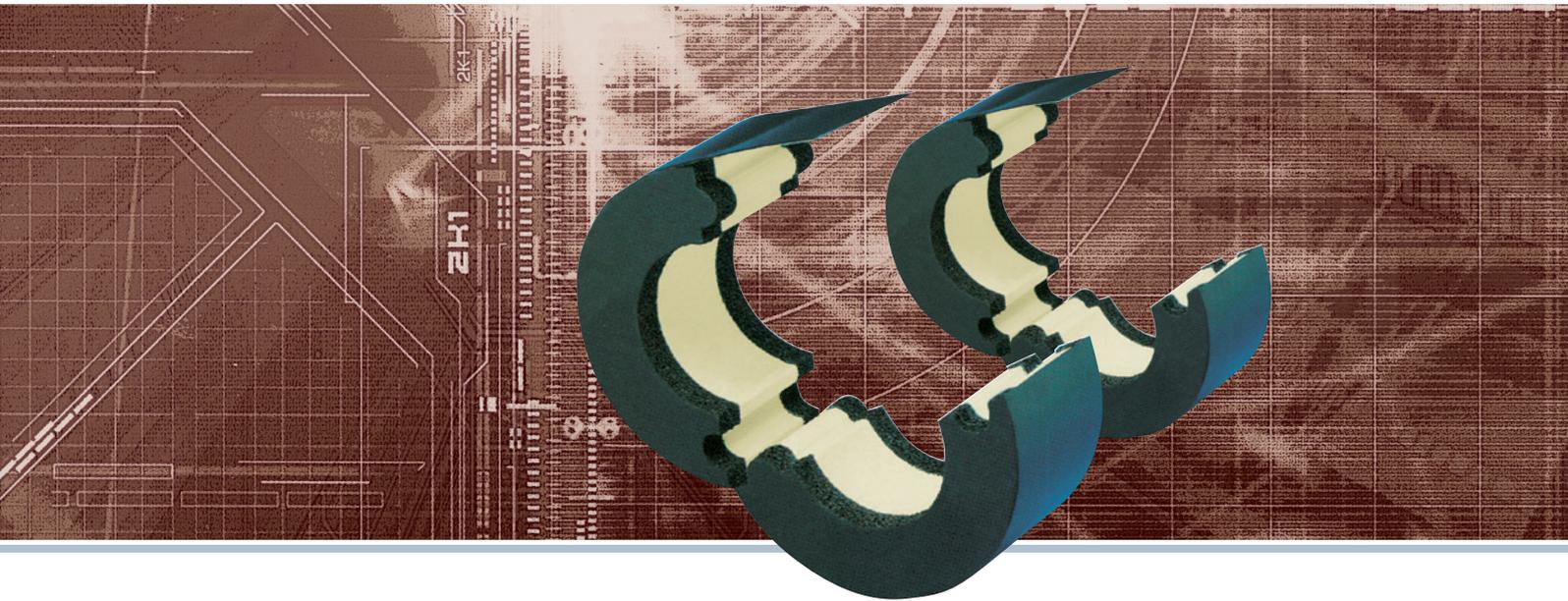
Remark For advice regarding application please contact our Technical Support Team.

## Kaiflex PyroStar fire wrap



Reference	Width mm	Length m	rolls / carton	€ / roll*
PYROSTAR-125/05	125	5	1	257.25
PYROSTAR-125/10	125	10	1	514.50

# *kaiflex*® RT ST



## Load bearing protection against thermal bridging and corrosion

Insulated load bearing pipe sections that are vapour sealed and resistant to compression, Kaiflex RT-ST prevents condensation, corrosion and energy loss at critical points.

Kaiflex RT-ST consists of high density, compression resistant, PIR foam sections combined with water vapour resistant Kaiflex ST Class 0 insulation and a protective outer shell covering. Load bearing pipe clamps that would tear or compress standard insulation tubes can be applied directly around Kaiflex RT-ST sections.

Fully compatible with all other Kaiflex products, Kaiflex RT-ST sections feature an interlocking design and represent a durable, reliable and visually attractive solution that prevents avoidable energy loss and helps to keep pipework free of corrosion.

- Prevents condensation and corrosion at pipe supports
- Restricts thermal bridging
- Load bearing without compression

### Kaiflex RT-ST Technical Specification

Polymer		CFC-free PUR/PIR bearing segments, embedded in Kaiflex ST	
Cell Structure		Closed Cell	
Colour		Black	
Upper Temperature Limit	pipe flat surface	+105°C +85°C	
Lower Temperature Limit		-50°C	see remark (1)
Thermal Conductivity	at -30°C	0.031 W/(m·K)	Test acc. to - EN ISO 13469 - EN ISO 12086
	at -20°C	0.032 W/(m·K)	
	at -0°C	0.034 W/(m·K)	
	at +20°C	0.036 W/(m·K)	
	at +40°C	0.038 W/(m·K)	
	at +60°C	0.040 W/(m·K)	
		In-built	
Water Vapour Resistance	Moisture Resistance Factor $\mu$	$\geq 10\ 000$	Test acc. to EN 12086 & EN 13469
Density Bearing Inserts		620 kPa	acc. to EN 826
Reaction to Fire		Self-extinguishing, does not drip	
Environmental Aspects		ODP zero GWP zero	
Outdoor applications		<b>Needs</b> protection against UV- radiation	see remark (2)

Remark (1) For temperatures between -50°C and -200°C please ask our Technical Support Team for advice.

Remark (2) Kaiflex ST Class 0 needs protection against UV-radiation. Please paint with Kaiflex KaiFinish to the recommended thickness within 3 days.

## Load bearing protection against thermal bridging and corrosion

### Kaiflex RT-ST insulated pipe support

with self-adhesive closure; CFC-free PUR/PIR load bearing inserts; embedded in Kaiflex ST Class 0

Copper Cu	Iron & Steel pipe Fe		Max. support interval m	13 mm Insulation Thickness				19 mm Insulation Thickness				
	Nom OD mm	NB inch		Nom OD mm	O.D. mm	Reference	piece / carton	€ / piece *	O.D. mm	Reference	piece / carton	€ / piece *
	10	1/8	10.2	2.00	36	RT-ST-13x010	430	3.72	48	RT-ST-19x010	250	4.00
	12		12.5	2.00	38	RT-ST-13x012	385	3.76	50	RT-ST-19x012	215	4.09
	15	1/4	13.5	2.00	41	RT-ST-13x015	315	3.80	53	RT-ST-19x015	185	4.20
	18	3/8	17.2	2.25	44	RT-ST-13x018	300	3.85	56	RT-ST-19x018	175	4.34
	20			2.75					56	RT-ST-19x020	165	4.65
	22	1/2	21.3	2.75	48	RT-ST-13x022	240	4.39	60	RT-ST-19x022	140	4.79
	28	3/4	26.9	3.00	54	RT-ST-13x028	175	4.89	66	RT-ST-19x028	120	5.61
	35	1	33.7	3.50	61	RT-ST-13x035	140	5.29	73	RT-ST-19x035	95	6.16
	42	1 1/4	42.4	3.75	68	RT-ST-13x042	100	5.39	80	RT-ST-19x042	75	6.29
		1 1/2	48.3	4.25	74	RT-ST-13x048	95	5.61	86	RT-ST-19x048	60	6.56
	54		54.0	4.25	80	RT-ST-13x054	80	5.80	92	RT-ST-19x054	60	6.87
	57		57.0	4.25	83	RT-ST-13x057	75	5.80	95	RT-ST-19x057	60	6.87
		2	60.3	4.75	86	RT-ST-13x060	60	7.20	98	RT-ST-19x060	50	8.47
	64		63.5	4.75	92	RT-ST-13x064	60	7.20	104	RT-ST-19x064	45	8.47
	70		70.0	4.75	98	RT-ST-13x070	50	7.26	110	RT-ST-19x070	40	8.66
	76.1	2 1/2	76.1	5.50	104	RT-ST-13x076	45	7.92	116	RT-ST-19x076	35	9.90
	88.9	3	88.9	6.00	117	RT-ST-13x089	30	9.14	129	RT-ST-19x089	30	11.77
		3 1/2	101.6	6.00	136	RT-ST-13x102	25	9.68	142	RT-ST-19x102	23	12.79
	108		108.0	6.00	136	RT-ST-13x108	25	9.69	148	RT-ST-19x108	22	12.77
	114	4	114.3	6.00	144	RT-ST-13x114	20	11.27	156	RT-ST-19x114	50	14.43
	133		133.0	6.00	163	RT-ST-13x133	20	13.08	175	RT-ST-19x133	20	16.97
		5	139.7	6.00	170	RT-ST-13x140	20	13.08	182	RT-ST-19x140	20	17.20
	159		160.0	6.00	190	RT-ST-13x160	20	14.39	202	RT-ST-19x160	12	18.75
	168		168.3	6.00	196	RT-ST-13x168	12	14.75	208	RT-ST-19x168	12	18.94
			219.1	6.00	247	RT-ST-13x219	9	21.17	259	RT-ST-19x219	9	28.28
			273.0	6.00	301	RT-ST-13x273	5	25.71	313	RT-ST-19x273	5	33.59

- Delivery time for all Kaiflex RT-ST pipe supports: 10 working days.

### Kaiflex RT-ST insulated pipe support

with self-adhesive closure; CFC-free PUR/PIR load bearing inserts; embedded in Kaiflex ST Class O;

Copper Cu	Iron & Steel pipe Fe		Max. support interval m	25 mm Insulation Thickness				32 mm Insulation Thickness				
	Nom OD mm	NB inch		Nom OD mm	O.D. mm	Reference	piece / carton	€ / piece *	O.D. mm	Reference	piece / carton	€ / piece *
	10	1/8	10.2	2.00	60	RT-ST-25x010	tba	5.22	74	RT-ST-32x010	tba	5.57
	12		12.5	2.00	62	RT-ST-25x012	tba	5.26	76	RT-ST-32x012	95	5.71
	15	1/4	13.5	2.00	65	RT-ST-25x015	tba	5.33	79	RT-ST-32x015	80	5.81
	18	3/8	17.2	2.25	68	RT-ST-25x018	115	5.39	82	RT-ST-32x018	75	5.84
	20			2.75								
	22	1/2	21.3	2.75	72	RT-ST-25x022	100	5.91	86	RT-ST-32x022	60	6.33
	28	3/4	26.9	3.00	78	RT-ST-25x028	95	6.81	92	RT-ST-32x028	60	7.20
	35	1	33.7	3.50	85	RT-ST-25x035	75	7.67	99	RT-ST-32x035	50	8.24
	42	1 1/4	42.4	3.75	92	RT-ST-25x042	60	7.95	106	RT-ST-32x042	45	8.69
		1 1/2	48.3	4.25	98	RT-ST-25x048	50	8.49	112	RT-ST-32x048	40	9.36
	54		54.0	4.25	104	RT-ST-25x054	45	9.19	118	RT-ST-32x054	35	9.86
	57		57.0	4.25	107	RT-ST-25x057	tba	9.19	121	RT-ST-32x057	tba	9.86
		2	60.3	4.75	110	RT-ST-25x060	40	10.95	124	RT-ST-32x060	30	12.13
	64		63.5	4.75	116	RT-ST-25x064	30	10.95	130	RT-ST-32x064	30	12.16
	70		70.0	4.75	122	RT-ST-25x070	30	11.23	136	RT-ST-32x070	25	12.48
	76.1	2 1/2	76.1	5.50	128	RT-ST-25x076	30	12.87	142	RT-ST-32x076	25	14.25
	88.9	3	88.9	6.00	141	RT-ST-25x089	25	15.29	155	RT-ST-32x089	17	16.93
		3 1/2	101.6	6.00	154	RT-ST-25x102	tba	16.70	168	RT-ST-32x102	40	18.62
	108		108.0	6.00	160	RT-ST-25x108	15	16.70	174	RT-ST-32x108	40	18.62
	114	4	114.3	6.00	168	RT-ST-25x114	40	19.45	182	RT-ST-32x114	28	22.04
	133		133.0	6.00	187	RT-ST-25x133	tba	23.23	201	RT-ST-32x133	14	26.88
		5	139.7	6.00	194	RT-ST-25x140	20	23.23	208	RT-ST-32x140	12	27.04
	159		160.0	6.00	214	RT-ST-25x160	10	25.34	228	RT-ST-32x160	9	29.51
	168		168.3	6.00	220	RT-ST-25x168	10	28.47	234	RT-ST-32x168	9	35.29
			219.1	6.00	271	RT-ST-25x219	9	43.27	285	RT-ST-32x219	6	54.14
			273.0	6.00	325	RT-ST-25x273	5	51.47	339	RT-ST-32x273	5	64.42

### Kaiflex RT-ST flexible load bearing strips

with self-adhesive closure; CFC-free PUR/PIR load bearing inserts (120kg/m<sup>3</sup>); embedded in Kaiflex ST Class O;

Insulation Thickness mm	Width mm	Length m	Reference	piece / carton	€ / piece *
13	75	2	RT-ST-13	12	64.96
19	100	2	RT-ST-19	10	79.72
32	100	2	RT-ST-32	6	98.25

- Delivery time for all Kaiflex RT-ST pipe supports: 10 working days.

# *kaiflex*® ACCESSORIES



## Designed for reliable application

Designed to work in conjunction with Kaiflex insulation, Kaiflex accessories ease application and provide the most professional finish possible. Accessories include:

**Kaiflex Adhesive** – adhesive designed to cure quickly and create a water vapour tight bond between Kaiflex surfaces, pipe and ductwork. Kaiflex adhesive is designed for use with Kaiflex ST Class 0 and Kaiflex Blueco.

**Kaiflex Adhesive EPDM** – adhesive designed to cure quickly and create a water vapour tight bond between Kaiflex EPDM surfaces, pipe and ductwork. Kaiflex adhesive is designed for use with Kaiflex EPDM and Kaiflex EPDM Solar.

**Kaiflex Cleaner** – solvent based liquid that prepares steel, copper and Kaiflex surfaces for maximum adhesive strength prior to application by removing dirt, grease, and excess adhesive. Kaiflex Cleaner is also recommended for cleaning adhesive from brushes.

Designed for reliable application

## Kaiflex adhesive 414

Designed for the products: Kaiflex ST Class 0, Kaiflex ST Selfseal, Kaiflex ST Coils, Kaiflex BluEco, Kaiflex TC, Kaiflex Protect F-Black & ALU-NET, Kaiflex RT-ST

Reference	Description	Cans / carton	€ / can *
ADH414-0220	Kaiflex Adhesive 414; Can Content: 220 g (paintbrush tin)	24	10.21
ADH414-0450	Kaiflex Adhesive 414; Can Content: 450 g	20	13.17
ADH414-0660	Kaiflex Adhesive 414; Can Content: 660 g	20	20.05
ADH414-2200	Kaiflex Adhesive 414; Can Content: 2,200 g	6	54.83

## Kaiflex adhesive 494



Low VOC, LEED compliant adhesive; Designed for the products: Kaiflex ST Class 0, Kaiflex ST Selfseal, Kaiflex ST Coils, Kaiflex RT-ST

Reference	Description	Cans / carton	€ / can *
ADH494-2300	Kaiflex Adhesive 494; Can Content: 2,300 g	6	90.63

## Kaiflex adhesive Solar EPDM

Designed for Kaiflex EPDMplus and Kaiflex Solar EPDM

Reference	Description	cans / carton	€ / can *
ADH-SOLAR-0220	Kaiflex Adhesive Solar; for use with Kaiflex EPDMplus; Can Content: 220 g	24	20.51
ADH-SOLAR-0660	Kaiflex Adhesive Solar; for use with Kaiflex EPDMplus; Can Content: 660 g	20	35.35

## Kaiflex tape self-adhesive

Insulation Material	Insulation Thickness mm	Width mm	Length m	Reference	rolls / carton	€ / roll *
Kaiflex ST Class 0	3	50	15	ST-TAPE	12	50.82
Kaiflex EPDMplus	3	50	15	EPDM-TAPE	12	38.91
Kaiflex BluEco	3	50	15	BE-TAPE	12	53.97

## Kaiflex KaiFinish paint for Kaiflex products

Protective coat resistant to UV-radiation. Designed for the products: Kaiflex ST Class 0, Kaiflex ST Selfseal, Kaiflex ST Coils, Kaiflex BluEco, Kaiflex RT-ST			
Reference	Description	cans / carton	€ / can *
FINISH-750-WH	Protective coat for Kaiflex ST Class 0; Colour: white; Can content: 0.75 litre	12	41.70
FINISH-750-GY	Protective coat for Kaiflex ST Class 0; grey; Can content: 0.75 litre	12	41.70

## Kaiflex Cleaner

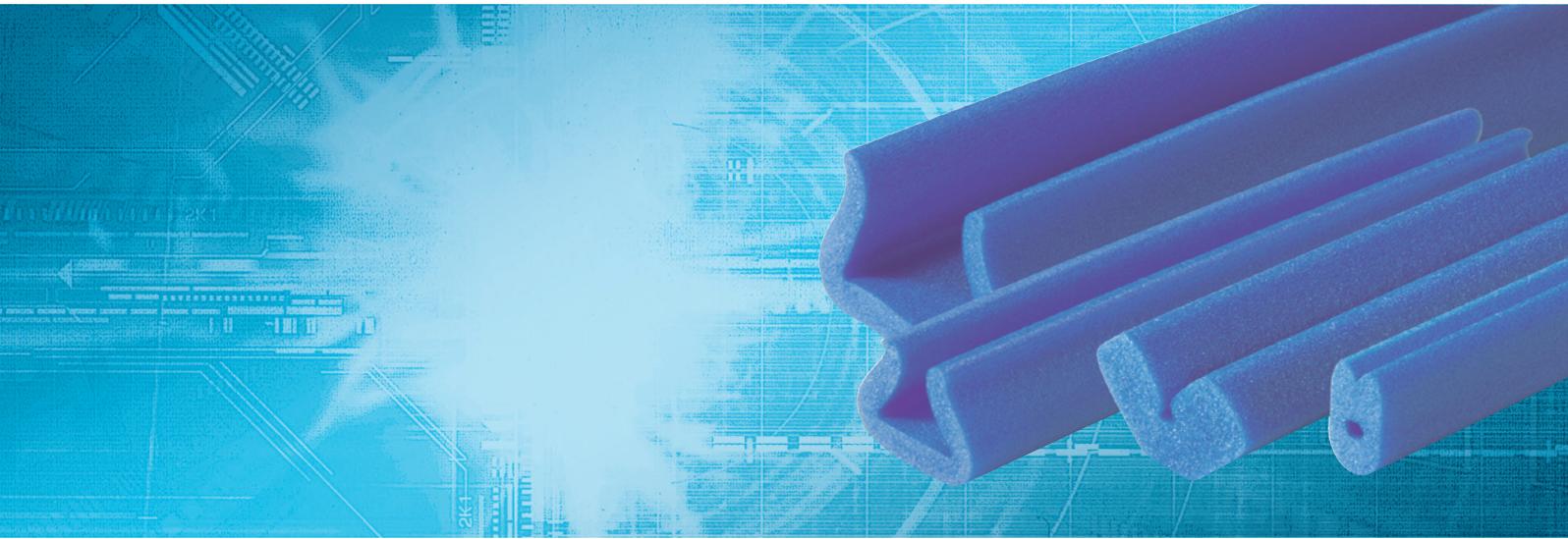
Designed for Kaiflex adhesive and Kaiflex insulation products			
Reference	Description	cans / carton	€ / can *
CLEANER-1000	Special Cleaner for Kaiflex Adhesive 313; Can Content: 1.0 litre	12	12.05

# *kaiflex*<sup>®</sup> ACCESSORIES

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Designed for reliable application

# *kaiflex*® **PACK**



## Shaped for reliable protection

Kaimann Polyethylene packaging profiles protect products and components from damage, chips, scratches and scrapes.

Lightweight, blue in colour and available in a range of shapes and sizes Kaimann Polyethylene profiles are an economic and visually pleasing packaging solution.

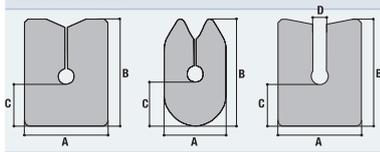
Based on chemically inert Polyethylene, Kaimann profiles retain their protective properties even when stored for many years.

- Lightweight packaging foam
- Wide range of shapes and sizes
- Chemically inert

Shaped for reliable protection

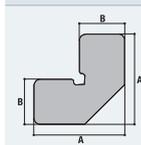
## Kaiflex Pack SG profile

Length: 2 m; Colour: blue;

Measurements	Type	Resource No.	A mm	B mm	C mm	D mm	Colour	Length m	m / box
	SG 33 / 26 <sup>(1)</sup>	3KPSG332	26	33	13	-	blue	2	400
	SG 34 / 20 <sup>(2)</sup>	3KPSG342	19	32	13	-	blue	2	500
	SG 33 / 26 <sup>(1)</sup>	3KPSG33C	26	33	13	-	blue	coil	365
	SG 40 / 28 <sup>(3)</sup>	3KPSG40C	28	40	13	8	blue	coil	325

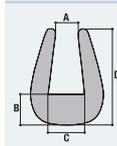
## Kaiflex Pack C profile

Length: 2 m; Colour: blue;

Measurements	Type	Resource No.	A mm	B mm	C mm	D mm	Colour	Length m	m / box
	C 52 / 24	3KPC5224	52	24	-	-	blue	2	160
	C 60 / 30	3KPC6030	60	30	-	-	blue	2	140
	C 80 / 40	3KPC8040	80	40	-	-	blue	2	84
	C 95 / 50	3KPC9550	95	50	-	-	blue	2	50

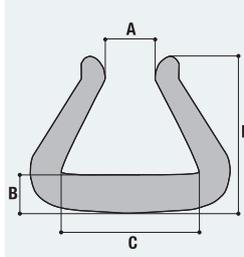
## Kaiflex Pack UGT profile

Length: 1 m; Colour: blue / grey;

Measurements	Type	Resource No.	A mm	B mm	C mm	D mm	Colour	Length m	m / box
	UGT / 23	3KPUGT23	10	30	21	80	blue	blue	65
	UGT / 30	3KPUGT30	25	27	30	80	blue	grey	66

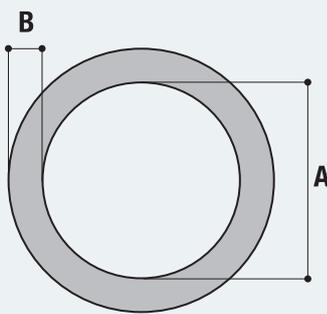
## Kaiflex Pack U profile

Length: 2 m; Colour: blue;

Measurements	Type	Resource No.	A mm	B mm	C mm	D mm	Colour	Length m	m / box
	U 08 / 18	3KPU0818	8	10	18	30	blue	2	400
	U 15 / 28	3KPU1528	15	10	28	30	blue	2	340
	U 20 / 35	3KPU2035	20	10	35	35	blue	2	260
	U 30 / 40	3KPU3040	30	15	40	80	blue	2	104
	U 25 / 42	3KPU2542	25	12	42	45	blue	2	190
	U 40 / 60	3KPU4060	40	13	60	50	blue	2	144
	U 60 / 80	3KPU6080	60	14	80	58	blue	2	90
	U 70 / 90	3KPU7090	70	14	90	60	blue	2	80
	U 90 / 110	3KPU9011	90	25	110	90	blue	2	36

## Kaiflex Pack O profile

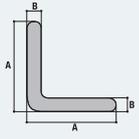
Length: 2 m; Colour: grey;

Measurements	Type	Resource No.	A mm	B mm	C mm	D mm	Colour	Length m	m / box
	9 x 12	37009012	12	9			grey	2	320
	9 x 15	37009015	15	9			grey	2	300
	9 x 18	37009018	18	9			grey	2	260
	9 x 22	37009022	22	9			grey	2	220
	9 x 28	37009028	28	9			grey	2	170
	9 x 35	37009035	35	9			grey	2	140
	9 x 42	37009042	42	9			grey	2	100
	9 x 48	37009048	48	9			grey	2	86
	9 x 54	37009054	54	9			grey	2	70
	9 x 60	37009060	60	9			grey	2	64
	9 x 76	37009076	76	9			grey	2	40
	13 x 15	37013015	15	13			grey	2	220
	13 x 18	37013018	18	13			grey	2	200
	13 x 22	37013022	22	13			grey	2	160
	13 x 28	37013028	28	13			grey	2	130
	13 x 35	37013035	35	13			grey	2	110
	13 x 42	37013042	42	13			grey	2	90
	13 x 48	37013048	48	13			grey	2	80
	13 x 54	37013054	54	13			grey	2	68
	13 x 60	37013060	60	13			grey	2	60
	13 x 76	37013076	76	13			grey	2	36
	13 x 89	37013089	89	13			grey	2	32
	13 x 114	37013114	114	13			grey	2	24
	20 x 15	37020015	15	20			grey	2	114
	20 x 18	37020018	18	20			grey	2	110
	20 x 22	37020022	22	20			grey	2	100
	20 x 28	37020028	28	20			grey	2	90
	20 x 35	37020035	35	20			grey	2	70
	20 x 42	37020042	42	20			grey	2	60
	20 x 48	37020048	48	20			grey	2	50
	20 x 54	37020054	54	20			grey	2	42
	20 x 60	37020060	60	20			grey	2	34
20 x 76	37020076	76	20			grey	2	26	
20 x 89	37020089	89	20			grey	2	22	
20 x 108	37020108	108	20			grey	2	16	
20 x 114	37020114	114	20			grey	2	16	
25 x 15	37025015	15	25			grey	2	300	
25 x 18	37025018	18	25			grey	2	260	
25 x 22	37025022	22	25			grey	2	220	
25 x 28	37025028	28	25			grey	2	170	
25 x 35	37025035	35	25			grey	2	140	
25 x 42	37025042	42	25			grey	2	100	
25 x 48	37025048	48	25			grey	2	86	

Shaped for reliable protection

## Kaiflex Pack L profile

Length: 2 m; Colour: blue;

Measurements	Type	Resource No.	A mm	B mm	C mm	D mm	Colour	Length m	m / box
	L 50 / 06	3KPL5006	50	6			blue	2	540
	L 75 / 10	3KPL7510	75	10			blue	2	210



# KAIMANN

foam technology of tomorrow

## I. General

1. All deliveries by KAIMANN GmbH ("KAIMANN") to the purchaser are based exclusively on the following General Terms and Conditions ("Conditions"). The purchaser recognises their binding application to the present contract and also, in their valid version, to all future transactions.

2. Any purchasing conditions of the purchaser, whether deviating, conflicting or supplementary in content, do not form part of the contract, also not through acceptance of the order. In particular, they also have no application if the purchaser refers to them in his business transactions, e.g. when placing an order, and KAIMANN does not expressly reject them.

## II. Conclusion of contract

1. Offers by KAIMANN are subject to confirmation.

2. The contract is formed on confirmation of order by KAIMANN. If, by way of exception, no confirmation of order is received, KAIMANN's conditions apply at the latest on acceptance of the delivery item.

3. The written confirmation of order by KAIMANN has exclusive authority with regard to the type and extent of the contractually owed delivery and the type of packaging and shipping method. The selection of the delivery item is carried out on the basis of the parameters provided by the purchaser. Sketches, illustrations, dimensions, weights or other performance data in brochures, circulars, price lists, other publications or in our offers and/or relevant documents do not represent a guarantee of properties or any other guarantee, but only serve as a product description.

4. KAIMANN is entitled to carry out reasonable, customary or negligible alterations to the delivery item at any time without prior notice, provided this does not impair its functioning or mode of operation.

## III. Delivery, delivery dates and delivery deadlines

1. The delivery dates and deadlines apply as confirmed in KAIMANN's written order confirmation, however, not before the purchaser has provided all the necessary documents, authorisations, clearances or any agreed down payment. If no delivery period has been agreed, delivery is to be made as soon as possible.

2. The delivery dates and deadlines are deemed observed if the delivery item leaves KAIMANN's work, or KAIMANN announces its readiness to deliver, at the latest 14 days after expiry of the delivery deadline.

3. The delivery period is extended appropriately without KAIMANN defaulting on delivery in case of unforeseeable obstacles for which KAIMANN is not responsible. These include industrial action, in particular strike and lawful lockout, accident, machine failure, fire, flood, riot, terrorist acts, war, enactment of new laws or official measures after conclusion of contract which impede delivery, lacking import and export licences needed, or the improper or untimely fulfilment of hedging transactions concluded by the suppliers / subcontractors, in so far as these circumstances influence the delivery of the object of purchase for their duration. This also applies when such circumstances affect suppliers / subcontractors. If the delivery is delayed as a result of such circumstances for which KAIMANN is not responsible for more than 30 days after the contractually specified delivery date, KAIMANN may withdraw from the purchase contract by informing the purchaser in writing. If, in cases pursuant to § 275 of the Civil Code (BGB), KAIMANN does not need to perform, the purchaser may withdraw from

the contract in accordance with § 326 para. 5 of the Civil Code (BGB).

4. If the delivery is delayed for reasons for which the purchaser is responsible, KAIMANN may demand compensation for the additional costs thus incurred.

5. If, after receiving the order confirmation from KAIMANN, the purchaser cancels or alters an order, KAIMANN may withdraw the order or accept return delivery out of goodwill. In this case, the purchaser is nevertheless obliged to pay KAIMANN a processing fee of 10 % of the invoice amount.

## IV. Transfer of risk, transport costs and shipping

1. If not agreed otherwise, all deliveries within Germany are free to the purchaser's address. I.e., KAIMANN delivers the objects itself or has them delivered by a forwarder, and pays the transport costs, provided nothing is agreed to the contrary in the order confirmation. KAIMANN bears the risk of accidental destruction, impairment, or delay from transfer to the forwarder.

2. KAIMANN decides at its own discretion on the type of shipment used.

3. Part deliveries are permissible.

## V. Acceptance and delivery on call

1. The delivery items are to be accepted by the purchaser even if they demonstrate more than negligible defects. Delivery items for which the written order confirmation stipulates particular quality specifications, or for which delivery ex works is specified, are to be checked and accepted immediately by the purchaser in KAIMANN's works or in KAIMANN's supplying warehouse once KAIMANN announces its readiness to deliver.

2. If the purchaser rejects delivery although it is due, the delivery items will be stored by KAIMANN at the purchaser's cost and risk from the day that KAIMANN announces its readiness to deliver. From this date on, KAIMANN is no longer liable for the accidental destruction, depreciation or damage, e.g. by fire, theft, weather influence or disasters.

3. If a contract has been concluded with the purchaser for a total quantity which can be called in certain parts, the call orders and the corresponding itemisations are to be carried out at the latest by the agreed delivery date. If these calls and itemisations are not carried within the time specified, KAIMANN is entitled to itemise and proffer the delivery items, or put them into storage at the purchaser's cost. On unsuccessful expiry of a subsequent deadline set by KAIMANN, KAIMANN is entitled to withdraw from the remaining part of the contract, or demand compensation for this due to default.

## VI. Prices

1. Provided nothing else is agreed between the parties, the prices in KAIMANN's valid price list apply. All prices are in Euros and do not include the statutory VAT. Additional costs (for example for packaging, postage, freight, insurance, customs or delivery charges) are only included where

delivery is owed free to the purchaser's address, or if the parties have agreed a cost transfer. The statutory VAT at the rate applicable on delivery, along with any applicable additional costs is shown separately on the invoice.

2. If, between conclusion and performance of the contract, customs, freight, charges or duties are raised or introduced, or if price increases are approved or fixed by the authoritative works or dealer association, KAIMANN is entitled to raise the price accordingly, and the purchaser is obliged to pay the corresponding surplus. The purchaser has no right of cancellation in this case.

3. The parties assume that carriage-free prices are subject to the condition of unimpeded access to water, land and air traffic. The purchaser is to pay any additional costs resulting from impeded access.

4. Costs for dead freight as a result of circumstances for which the purchaser is responsible, are charged to his account.

## VII. Payment terms

1. Unless agreed otherwise, payment is to be made within 10 days of the date of invoice and delivery by KAIMANN at 2 % discount, or within 30 days of the date of invoice in cash, without discount. Offsetting against payment claims by KAIMANN, and the assertion of rights of retention are only permissible in case of undisputed or legally established claims.

2. If the purchaser defaults on payment, KAIMANN is entitled to charge interest on arrears at 8 % per year above the valid base rate as defined by § 247 of the Civil Code (BGB). Costs incurred by KAIMANN through the collection of debts, including lawyer's costs, are to be borne by the purchaser. This does not exclude the assertion of further claims for damage.

3. Bills of exchange are only accepted in lieu of payment under the condition that discounting is possible at the Federal State Central Bank. There is no obligation to accept bills of exchange.

4. Credit entries for bills and cheques are always subject to receipt and without prejudice to an earlier due date of the purchase price in case of default by the purchaser. They are effective with the value date on which KAIMANN is able to dispose of the counter-value.

5. If the payment conditions are not fulfilled, or if, after conclusion of the contract, circumstances become known which are suitable to reduce the purchaser's creditworthiness, irrespective of KAIMANN's right to withdraw from the contract, all amounts become due immediately, regardless of the term of bills accepted. KAIMANN is furthermore entitled to demand securities, and only affect outstanding deliveries against advance payment or the provision of security. The duty to provide advance payment does not apply if the purchaser holds undisputed or legally established counter claims.

## VIII. Retention of title

1. KAIMANN reserves ownership of all delivery items delivered until the purchaser has paid all claims, including future claims arising from the business relationship. This also applies if the purchaser has paid the purchase price for certain deliveries. In case of open accounts, the retention of title serves as security for any balance claims held by KAIMANN. If bills or cheques are accepted by KAIMANN, or if bills issued by KAIMANN are made available to the purchaser, the retention of title also counts as security for claims on the part of KAIMANN arising from dishonoured bills. The retention of title does not lapse until all bills and cheques have been honoured.

2. Treatment and processing are carried out for KAIMANN as manufacturer within the meaning of § 950 of the Civil Code (BGB), without obligation for KAIMANN. The delivery items thus processed serve as security at the invoice value of the reserved goods.

3. In case of processing, bonding and blending of the reserved goods by the purchaser with other goods which do not belong to KAIMANN, KAIMANN is entitled to co-ownership of the new goods in the proportion of the invoice value of the reserved goods to the invoice value of the other goods including the cost of processing at the time of processing (bonding, blending). The coownership rights thus generated apply correspondingly as reserved goods in accordance with these conditions.

4. The purchaser is entitled to dispose of the delivery items delivered within the normal course of business. He now assigns the resulting claims against third parties to KAIMANN in advance as security - in total or at the level of the respective co-ownership share. KAIMANN accepts this assignment. The purchaser is to inform KAIMANN immediately in writing of any attachment or other impairment of KAIMANN's rights by third parties. The power of disposition lapses on suspension of payment by the purchaser and on application for the opening of composition or insolvency proceedings.

5. The claims arising from bills accepted by the purchaser in lieu of payment or on account of payment are now assigned to KAIMANN in advance. Instead of transferring the bills accepted, they are safeguarded by the purchaser for KAIMANN.

6. KAIMANN is obliged to release securities held by him at his choice to the extent that these exceed his claims by more than 10%.

7. In case of default of payment or breach of contract by the purchaser with regard to the retention of title, irrespective of its other rights, KAIMANN is entitled to withdraw from the contract in accordance with §§ 323, 324 of the Civil Code (BGB) and to take back the reserved goods at the cost of the purchaser. The same applies if composition or insolvency proceedings are opened on the purchaser's assets, or if the opening of such proceedings is rejected due to a lack of assets, or if another substantial deterioration in his financial situation occurs.

8. The claims assigned to KAIMANN serve as security for all his claims, including future claims against the purchaser arising from the business relationship - no. 1 applies accordingly. Subject to revocation by KAIMANN, which is permissible at any time, the purchaser is entitled to collect the assigned claims himself. In case of default on payment by the purchaser, KAIMANN is entitled, also without revoking the purchaser's authorisation to collect, to notify the purchaser's debtor of the assignment, and collect the debt himself. On request, the purchaser is obliged to inform the third party purchasers of the assignment and provide KAIMANN with the

information and documents he needs in order to assert his rights against third party purchasers.

## IX. Warranty, liability

1. KAIMANN provides warranty, in accordance with the following provisions, for defects to delivery items which exist on transfer of risk. Delivery items are defective if they do not correspond to the specifications on KAIMANN's technical data sheet or the test certificate. Warranty claims do not apply in case of only negligible deviation from the agreed quality or in case of only negligible impairment to the serviceability.

2. The delivery items are to be inspected by the purchaser immediately on arrival at the place of destination with regard to their external qualities, quantities and dimensions in the stack. If defects are detected, KAIMANN is to be notified of this in writing without delay. If the customer fails to give notification of a defect which is discernible on due inspection, guarantee claims are ruled out. The same applies if later, a defect is detected which was initially not discernible, and the purchaser fails to notify KAIMANN of this immediately, but at the latest within 8 days of detection of the error. KAIMANN is always to be given the opportunity to inspect rejected delivery items.

3. In case of defects, KAIMANN undertakes to fulfil its warranty obligation by means of replacement delivery. If this replacement delivery is unsuccessful twice, in accordance with the statutory regulations, the purchaser is entitled to reduction or cancellation. The purchaser can only assert claims for damages in accordance with the following numbers 6 and 7.

4. If KAIMANN inspects the delivery objects due to a claim for rectification of a defect, and it emerges that the claim for rectification was unjustified because no guarantee case exists, the purchaser is to bear the costs. The claim for rectification is unjustified if the purchaser has recognised, or neglectfully failed to recognise, that no defect exists, and that the cause for the symptom behind the presumed defect lies within his own area of responsibility.

5. If the purchaser buys reject or Ila material from KAIMANN, the parties agree that, compared with new goods, the quality of the delivery item is lower, and this forms no grounds for guarantee claims against KAIMANN.

6. All guarantee claims of the purchaser lapse within one year taken from the delivery of the delivery items. Repairs or replacement deliveries within the guarantee period do not result in its extension. Exceptions are here formed by cases of mandatory statutory longer periods of limitation in accordance with §§ 438 para. 1 no. 2, 438 para. 3 and 479 of the Civil Code (BGB) and claims which form exceptions to KAIMANN's limitation of liability in accordance with number 7 below (violation of fundamental contractual duties as well as life, limb or health, liability for guaranteed quantities and product liability).

7. Irrespective of the legal basis, KAIMANN is liable in case of intent and gross negligence. In case of slight negligence, KAIMANN is liable for the violation of fundamental contractual duties. This is limited however, to damage which is typical for this type of contract and foreseeable on conclusion of the contract. KAIMANN's liability in accordance with product liability law for the lack of guaranteed features (guaranteed features have to be individually designated as such expressly in writing by KAIMANN) and for damage arising through injury to life, limb or health is unaffected by this. On request, KAIMANN is to provide the purchaser with product information, based on which, the purchaser can make his product selection. In this case, KAIMANN is liable for the correctness of the information provided there, but not for the selection of the actual delivery items or their suitability for the intended purpose. IX. 7 sentence 2 remains unaffected.

## X. Product liability

1. The purchaser is to inform KAIMANN of all cases which come to his attention which could lead to liability in terms of product liability, in particular cases in which a delivery item from KAIMANN has caused material or personal damage. The duty to inform also applies with regard to all product liability claims made by third parties relating to delivery items from KAIMANN, as well as official notices or warnings sent to the purchaser, and other advice of danger.

2. On request by KAIMANN, the purchaser is to carry out or collaborate in all precautionary measures to prevent damage, as well as corrective measures (e.g. replacement of products which have not yet been sold on) at KAIMANN's expense. In this case, KAIMANN is responsible for taking the decision as to which measure is adequate and necessary.

3. Costs for measures carried out by the purchaser on his own authority are only to be paid by KAIMANN in cases of imminent danger and where the measure was necessary.

## XI. Place of jurisdiction and choice of law

1. The place of jurisdiction for all disputes arising from or in connection with the delivery is Paderborn. In addition, KAIMANN is entitled to sue the purchaser at his general place of jurisdiction or assert his claims at any eligible foreign courts.

2. For all deliveries, also abroad, German law applies exclusively, under exclusion of the CISG.

3. If individual provisions of these conditions are or become invalid, this does not affect the validity of the conditions as a whole, or the validity of the remaining provisions. The same applies to individual contracts. In this case, the invalid provision is to be replaced by a provision which comes as close as possible to the economic purpose of the invalid provision. The same applies in case of a gap in the provisions.

4. Amendments to these conditions require written form.



# KAIMANN

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