

# INSTALLATION MANUAL: Thermo-teK PS Cld SYSTEM



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Premium insulation for cold pipes and  
building services systems

# THERMO-TEK PS CLD SYSTEM



The new Knauf Insulation **Thermo-teK PS Cld SYSTEM** was developed for the insulation of cold pipes (means the service temperature is below ambient temperature) in building service systems. It is suited for use on drinking and cooling water lines, regardless whether made from stainless steel, steel, copper or plastic. The system is also suitable for systems with intermittent temperatures.

Being non-combustible, the **Thermo-teK PS Cld SYSTEM** is designed to reduce energy losses and protect the pipes from condensation and fire.

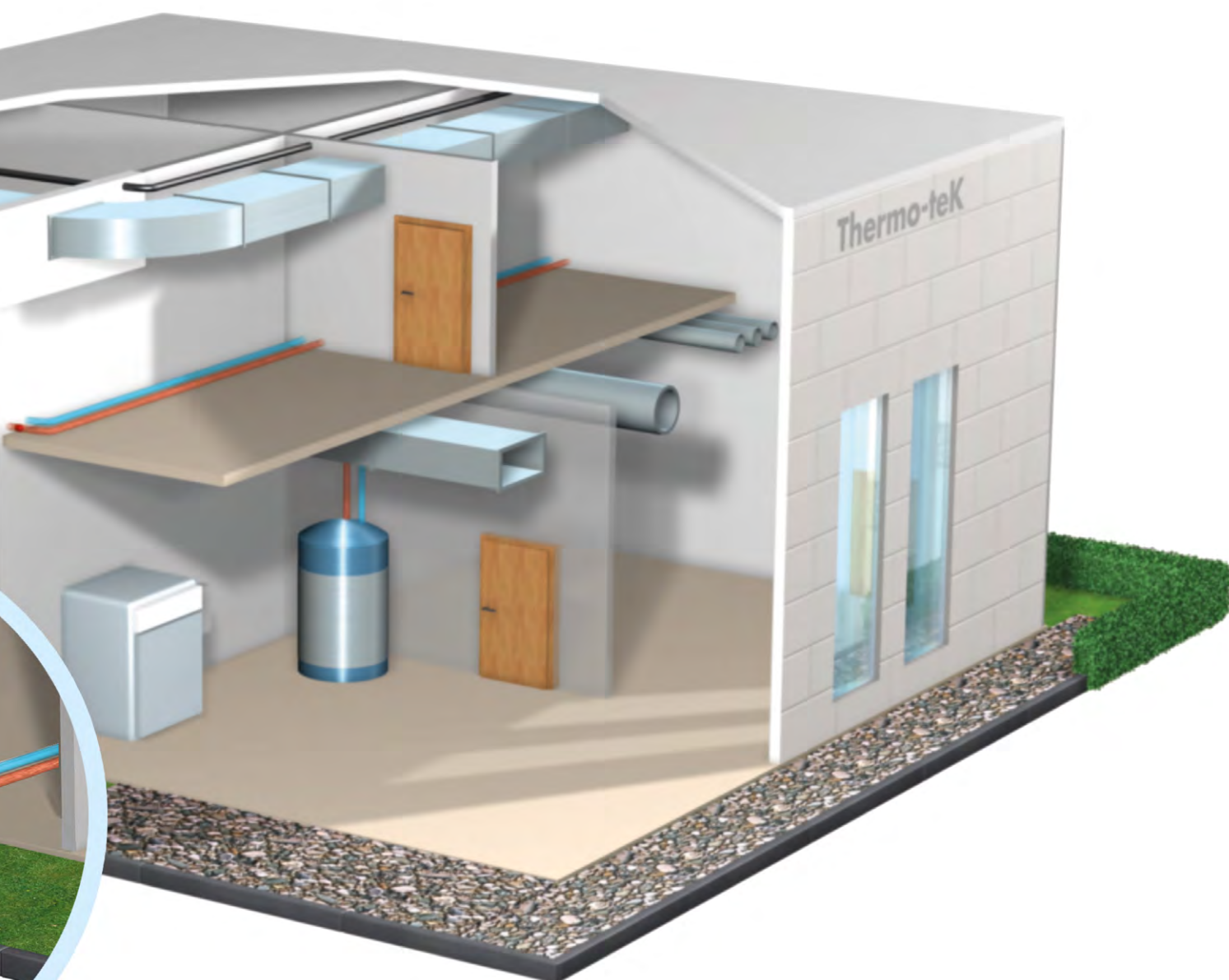
Knauf Insulation Thermo-teK PS Cld ALS pipe sections are the main components of the Thermo-teK PS Cld SYSTEM, produced with **ECOSE® Technology**.





## MULTIPLE BENEFITS

- ✓ Fire safe due to non-combustible Rock Mineral Wool A2<sub>s</sub>-s1, d0
- ✓ Extra tough and water vapour tight aluminium facing with glass scrim reinforcing and therefore highly protective regarding possible damage
- ✓ Specially designed closure tape for professional vapour tight sealing.
- ✓ Application range from 0 °C to + 250 °C
- ✓ Simple and fast processing for cold and warm applications
- ✓ Tested system with all necessary system components
- ✓ Low embedded CO<sub>2</sub>
- ✓ ECOSE® Technology



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# THERMO-TEK PS CLD SYSTEM COMPONENTS

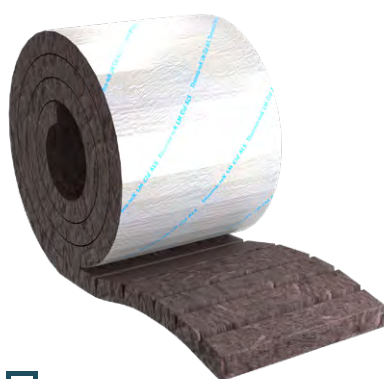
## Pipe section Thermo-teK PS Cld ALS



Thermo-teK PS Cld ALS is a circular-wound Rock Mineral Wool pipe section **with premium thermal conductivity, high compressive strength, excellent fire resistance and minimum product tolerances** of the inner and outer diameters thanks to the use of innovative production technologies. The 1200 mm long pipe section is **slit on one side** for easier installation **and laminated with extra strong** fibre glass reinforced, tear-resistant aluminium **foil, which acts as a water vapour barrier** and provides extra mechanical protection. A self-adhesive seal along the longitudinal slit eases the mounting process before a final sealing must to be applied with our extra strong **Thermo-teK Tape Cld**.

Due to the product's technical properties, **installation of additional cladding** on indoor pipes is not needed. The Knauf Insulation Thermo-teK PS Cld ALS pipe sections are suitable for insulation of steel, stainless steel, copper and plastic pipes in building services systems. Using reinforcing extra tough and water vapour tight aluminium facing with glass scrim, the Thermo-teK PS Cld ALS is particularly suitable for cold insulation as part of the Thermo-teK Cld SYSTEM.

## Lamella mat Thermo-teK LM Cld ALS



The lamella mat Thermo-teK LM Cld ALS is a Rock Mineral Wool mat, consisting of individual mineral wool strips (lamellas) that are bonded on one side to an **extra strong** fibre glass reinforced, tear-resistant aluminium **foil, which acts as a water vapour barrier** and provides extra mechanical protection. The Thermo-teK LM Cld ALS lamella mat is flexible and robust and is therefore very easy to use and can be perfectly adapted for installations such as valves, pumps, flanges and complex joints. Joints and seams must be securely closed with Thermo-teK Tape Cld.



## Pipe support Thermo-teK PH / PH INS

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Thermo-teK PH pipe support is a **pipe bracket to avoid thermal bridges**. It consists of the metal hanger and of a robust, pressure resistant Rock Mineral Wool core serving as load transfer. The Thermo-teK PH INS core is laminated with an extra strong, multi-layer, tear resistant fibre glass aluminium foil and a self adhesive overlapping seal to close the radial opening.

## Aluminium tape Thermo-teK Tape Cld

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Thermo-teK Tape Cld is a **highly tear-resistant, glass fiber mesh-reinforced aluminum adhesive tape** that securely seals all joints and connections in the Thermo-teK PS Cld SYSTEM. It comes with a high performance pressure sensitive adhesive which is designed for perfect sealing of the joints. Proper use of the Thermo-teK Tape Cld requires a press-on-process with a spatula tool after application.

## Flexible tape Thermo-teK Seal Cld

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The flexible sealant tape Thermo-teK Seal Cld is used at penetration points of the aluminium sheathing such as pipe suspensions, control- or measuring equipment. It is water-tight and meant to preserve the system's adhesive strength even at low temperatures.

## Spatula - tool

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Spatula, indispensable tool needed for proper closing and sealing of joints and seams.



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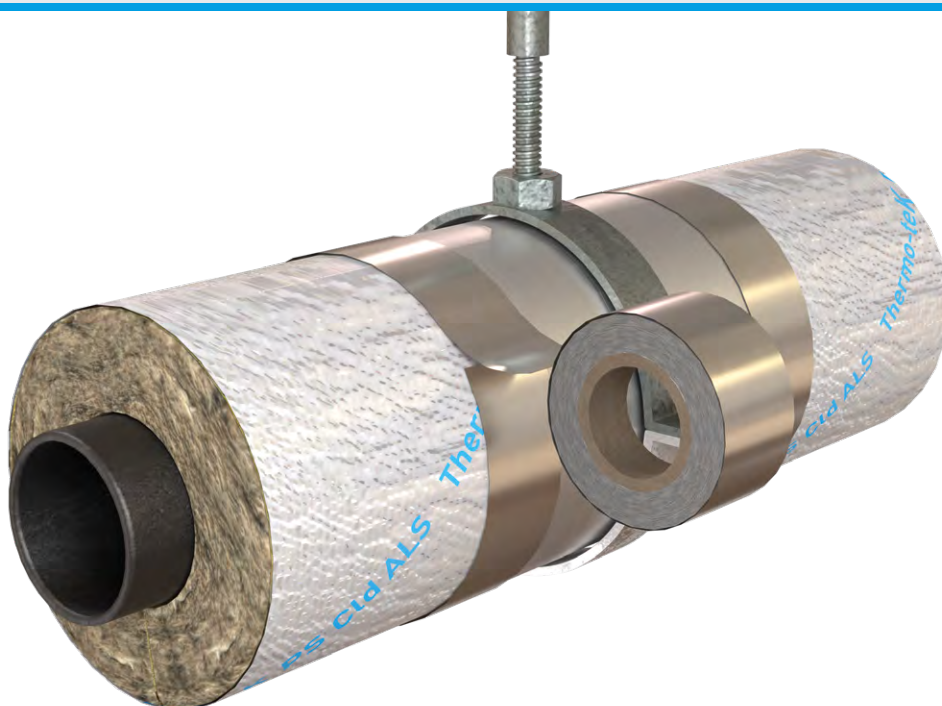
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The system **Thermo-teK PS Cld SYSTEM** is easy to install, using basic simple installation procedures of the Knauf Insulation Rock Mineral Wool products while considering the details referring to the cold insulation. Accurate and professional implementation is crucial for a perfectly performing pipeline system.



**Please consider the following requirements for a proper and safe installation of the Thermo-teK PS Cld SYSTEM:**

- ✓ All components of the pipeline system must be tightly connected and without any leakage
- ✓ The system may not be in operation while mounting
- ✓ All components must be clean and free from dust, oil or rust
- ✓ Before installation of the Thermo-teK PS Cld SYSTEM apply corrosion protection to the non-combustible pipe systems
- ✓ Protect also the fastening technology against corrosion
- ✓ Check the dimensions, diameter and available space of the pipeline, including the planned thickness of the insulation before installation
- ✓ Do not use any tape or sealant other than components of the Knauf Insulation PS Cld SYSTEM.



# APPLICATION & DIMENSIONING

## APPLICATION-SPECIFIC SELECTION OF PIPE SECTIONS & PIPE SUPPORTS

A prerequisite for the safe use of the PS Cld ALS system on cold-going lines is correct dimensioning depending on the given environmental parameters.

In particular, the temperature of the line (minimum value) as well as the ratios of humidity (maximum value) and outdoor temperature (maximum value) are of importance.

To simplify matters, a few typical applications are listed below, each of which is further divided into the the areas of 'moderate' and 'complex' climatic conditions.

After defining the respective application, the table can then be used for the actual pipe type used (metal or plastic).

The required insulation thickness can be finally read off as a function of the pipe diameter.

The insulation thickness of the Thermo-teK PH pipe support results analogously to the pipe section.

### POSSIBLE ENVIRONMENTAL PARAMETERS

Moderate climate conditions			
	line temp.	ambient temp.	rel. humidity
Standard cold line	$\geq 0^{\circ}\text{C}$	$\leq 25^{\circ}\text{C}$	$\leq 60\%$
Installation shaft or channel, dry	$\geq 6^{\circ}\text{C}$	$\leq 24^{\circ}\text{C}$	$\leq 65\%$
Corridors - dry	$\geq 6^{\circ}\text{C}$	$\leq 22^{\circ}\text{C}$	$\leq 65\%$
False ceilings	$\geq 6^{\circ}\text{C}$	$\leq 24^{\circ}\text{C}$	$\leq 65\%$
Potable water, cold	$\geq 8^{\circ}\text{C}$	$\leq 25^{\circ}\text{C}$	$\leq 65\%$

Complex climate conditions			
	line temp.	ambient temp.	rel. humidity
Standard cold line	$\geq 0^{\circ}\text{C}$	$\leq 25^{\circ}\text{C}$	$\leq 80\%$
Technical centre	$\geq 6^{\circ}\text{C}$	$\leq 32^{\circ}\text{C}$	$\leq 75\%$
Installation shaft or channel, humid	$\geq 6^{\circ}\text{C}$	$\leq 22^{\circ}\text{C}$	$\leq 85\%$
Office buildings, schools, hospitals	$\geq 6^{\circ}\text{C}$	$\leq 28^{\circ}\text{C}$	$\leq 70\%$
Underground garages - poorly ventilated	$\geq 6^{\circ}\text{C}$	$\leq 22^{\circ}\text{C}$	$\leq 85\%$
Potable water, cold	$\geq 8^{\circ}\text{C}$	$\leq 25^{\circ}\text{C}$	$\leq 80\%$



## Knauf Insulation Technical Solution Thermo-teK PS Cld ALS pipe section for non-combustible pipes

Pipe material / outer diameter				Moderate climate conditions	Complex climate conditions
Steel pipes according to EN 10220 and EN 10255	Copper pipes according to EN 1057	Stainless steel pipes according to EN ISO 1127	DN	Thermo-teK PS Cld ALS	Thermo-teK PS Cld ALS
oD [mm]	oD [mm]	oD [mm]		Standard cold line	Standard cold line
Inner diameter x thickness (mm)					
13,5			8,0	15 x 20	15 x 30
17,2			10	18 x 20	18 x 40
	15	15	12	15 x 20	15 x 40
	18,0	18,0	15,0	18 x 20	18 x 40
21,3			15,0	22 x 20	22 x 40
	22	22	20	22 x 20	22 x 40
26,9			20	28 x 20	28 x 40
	28	29	25	28 x 20	28 x 40
33,7			25,0	35 x 20	35 x 40
	35,0	35,0	32,0	35 x 20	35 x 40
42,4			32	42 x 20	42 x 50
	42	42	40	42 x 20	42 x 50
48,3			40	48 x 20	48 x 50
	54		50	54 x 30	54 x 50
		54	50	54 x 30	54 x 50
60,3			50	60 x 30	60 x 60
	64			64 x 30	64 x 60
	64				
	76,1	76,1	65	76 x 30	76 x 60
	76,1	76,1			
76,1			65	76 x 30	76 x 60
76,1					
88,9	88,9	88,9	80	89 x 30	89 x 60
	88,9	88,9			
	108	108	100	108 x 30	108 x 60
	108	108			
114,3			100	114 x 30	114 x 60
114,3					
139,7			125	140 x 30	140 x 70
139,7					
159			150	159 x 30	159 x 70
159					
168,3			150	169 x 40	169 x 70
168,3					
219,1			200	219 x 40	219 x 70
219,1					
273			250	273 x 40	273 x 80
323,9			300	324 x 40	324 x 80

Recommended sizes of insulation according to this table will ensure proper condensation control in case of correct reading referring to the standard cases described before.

Additionally, country-specific legal requirements that go beyond these calculations can be in place. Please always make sure to do proper calculations based on all valid building codes.



## Knauf Insulation Technical Solution Thermo-teK PS Cld ALS pipe section for combustible pipes

Pipe material / outer diameter			Moderate climate conditions	Complex climate conditions
Plastic pipes PE-HD, PE-X, PE-soft, PP, PP-R, PVC-U, PVC-C, PVC-H, ABS/ASA, PB	Plastic composite pipes with an aluminum layer up to 1.5 mm thickness	Fiber composite pipes PP, PB	Thermo-teK PS Cld ALS	Thermo-teK PS Cld ALS
oD [mm]	oD [mm]	oD [mm]	Standard cold line	Standard cold line
			Inner diameter x thickness (mm)	
14	14	14	15 x 20	15 x 40
16	16	16	18 x 20	18 x 40
			16 x 20 <sup>1)</sup>	16 x 40 <sup>1)</sup>
17	17		18 x 20	18 x 40
18	18	18	18 x 20	18 x 40
20	20	20	22 x 20	22 x 49
			20 x 20 <sup>1)</sup>	20 x 40 <sup>1)</sup>
	22		22 x 20	22 x 40
25	25	25	28 x 20	28 x 40
			25 x 20	25 x 40 <sup>1)</sup>
	27		28 x 20	28 x 40
32	32	32	35 x 20	35 x 40
			32 x 30	32 x 40
	34		35 x 20	35 x 40
40	40	40	42 x 20	42 x 40
			40 x 20 <sup>1)</sup>	40 x 40 <sup>1)</sup>
	42		42 x 20	42 x 50
50	50	50	54 x 30	54 x 50
			50 x 30 <sup>1)</sup>	50 x 50 <sup>1)</sup>
63	63	63	64 x 30	64 x 60
			63 x 30 <sup>1)</sup>	63 x 60 <sup>1)</sup>
75	75	75	76 x 30	76 x 60
			75 x 30 <sup>1)</sup>	75 x 60 <sup>1)</sup>
90	90	90	102 x 30	102 x 60
			90 x 30 <sup>1)</sup>	90 x 60 <sup>1)</sup>
110	110	110	114 x 30	114 x 60
			110 x 30 <sup>1)</sup>	110 x 60 <sup>1)</sup>
	113		114 x 60	114 x 60

1) Thermo-teK PH

Recommended sizes of insulation according to this table will ensure proper condensation control in case of correct reading referring to the standard cases described before.

Additionally, country-specific legal requirements that go beyond these calculations can be in place. Please always make sure to do proper calculations based on all valid building codes.



### IMPORTANT

Further information on load bearing of pipe hanger inserts Thermo-teK PH INS:

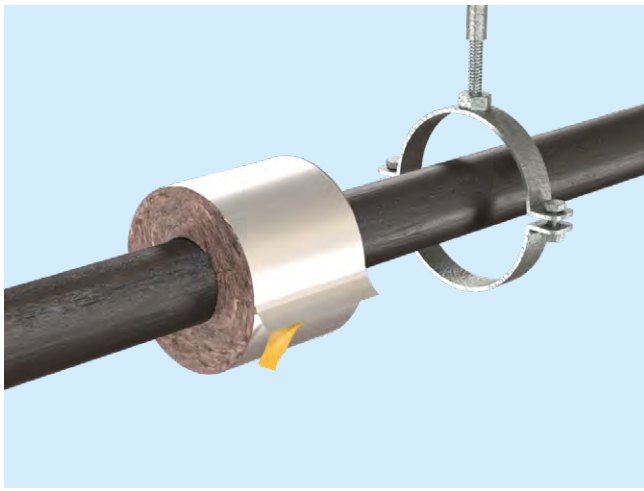


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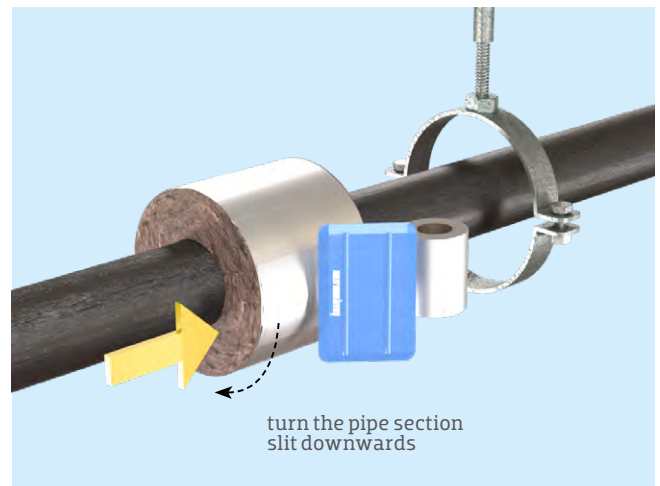
# INSTALLATION STEPS

## PIPE SECTION THERMO-TEK PS CLD ALS IN COMBINATION WITH PIPE HANGER INSTALLATION (PH OR PH INS)

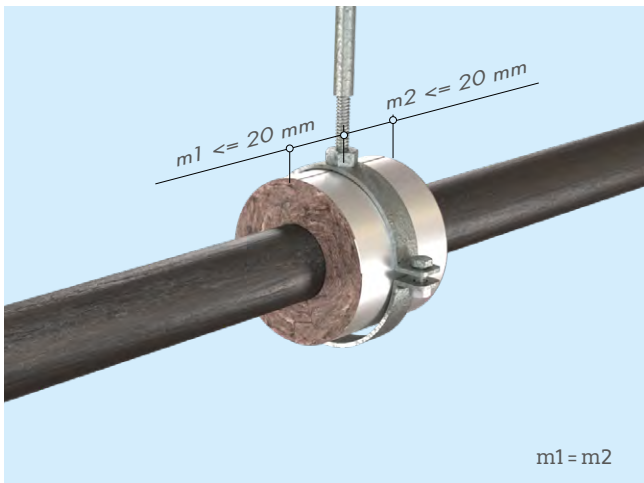
**1** Clean the surface of the pipeline, place the Thermo-teK PH around the pipe and do not tighten the screws. Place the cut part of the Rock Mineral Wool Core Thermo-teK PH INS on the pipe next to the hanger, close it tightly around the pipe and seal the longitudinal joint with the self-adhesive seal.



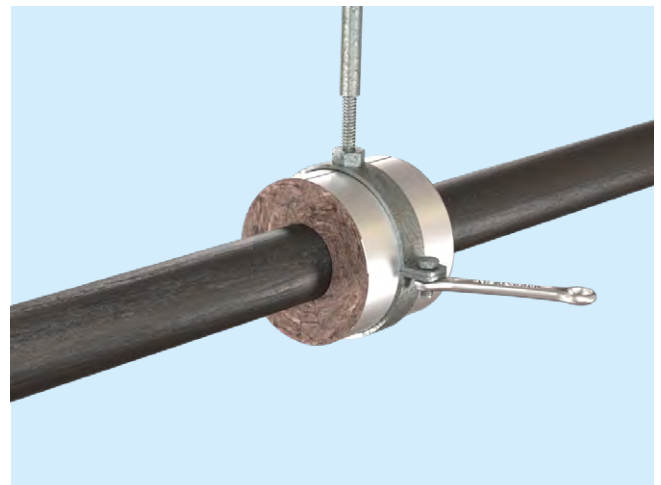
**2** Seal the longitudinal joint with a strip of Thermo-teK Tape Cld and press with spatula. The longitudinal joint of the Rock Mineral Wool Core Thermo-teK PH INS must be positioned horizontally to ensure an even distribution of pressure from the pipe hanger. Make sure the slit with the self-adhesive seal is facing downwards.



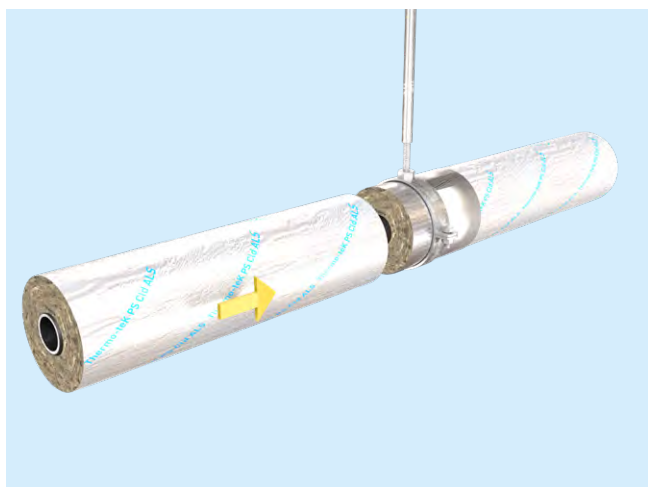
**3** Slide the Rock Mineral Wool Core Thermo-teK PH INS, into the metal clamp, without damaging the aluminium lamination. The core must be centered in the hanger.



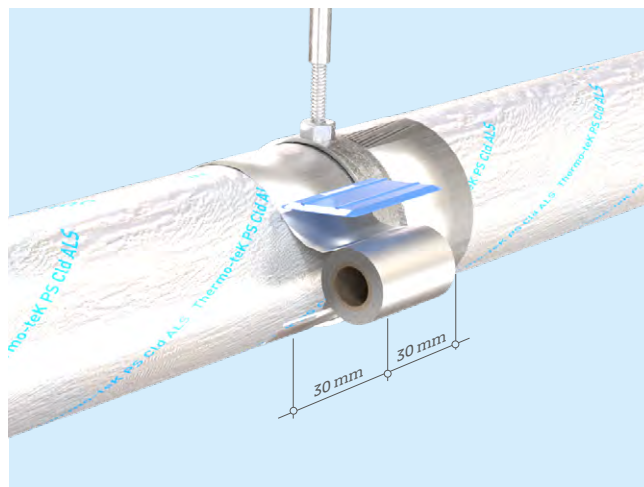
**4** Centered, close the hanger and carefully hand tighten the hanger screws with a wrench.



5 After fixing the Thermo-teK PH, install the Thermo-teK PS Cld ALS pipe section. Push the pipe section close to the Thermo-teK PH INS.

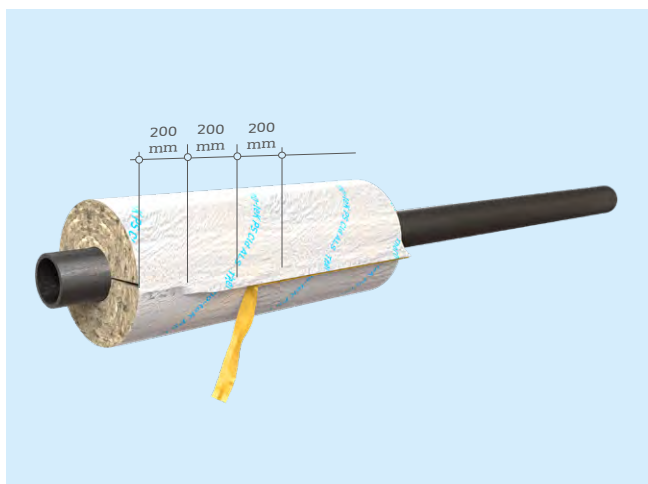


6 Tape the butt joints with Thermo-teK Tape Cld. To do this, wrap the Thermo-teK Tape Cld in one piece around the entire circumference at least once. Make sure that the adhesive surface is covering at least additional 30 mm on both sides of the joint. Use spatula as described above.

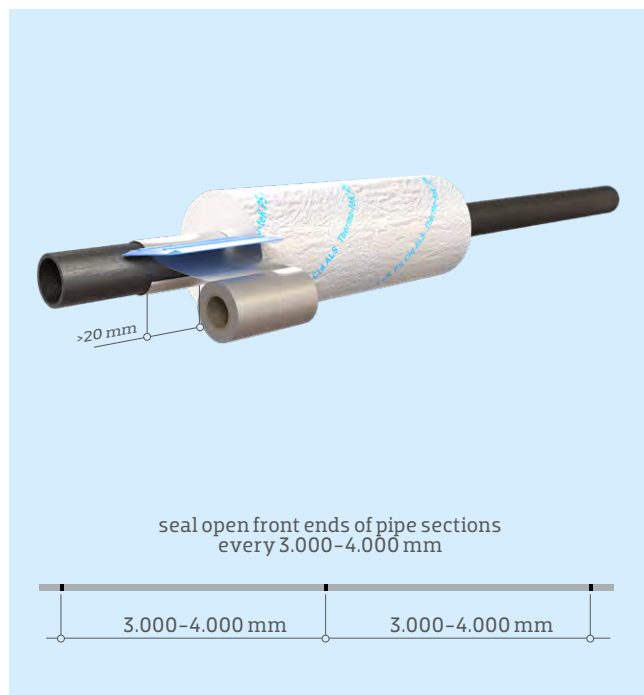


## INSTALLATION ON STRAIGHT PIPE LINES

1 Clean the surface of the pipeline if needed. Open the pipe section Thermo-teK PS Cld ALS and place it on the pipeline with good access to the longitudinal slit. Remove cover tape in 200 mm steps from one side to the other and close step by step the self adhesive seal. Press firmly and use spatula to smooth and fasten the longitudinal joint. Make sure that the pipe section is closed tightly.

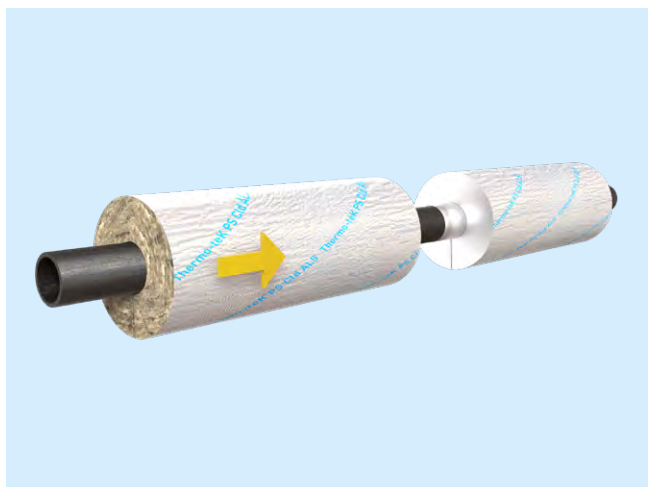


2 In case of a local damage a possible distribution of moisture within the system needs to be stopped. Therefore open front ends of mineral wool need to be sealed onto the piping material with Thermo-teK Tape Cld every three to four meters. Make sure to cover the pipe section surface at least 20 mm wide on both sides of the joint.

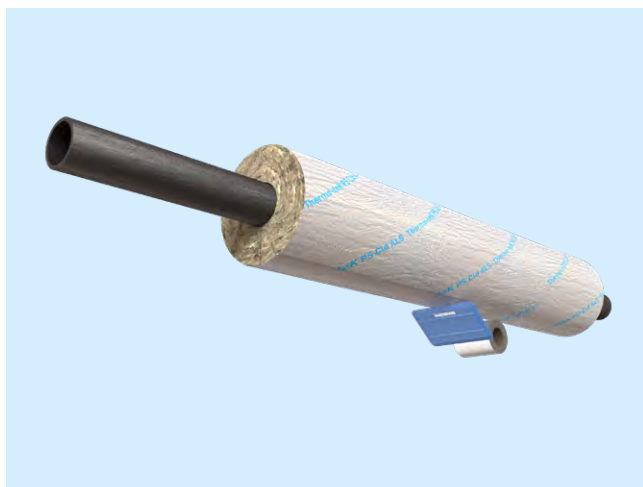


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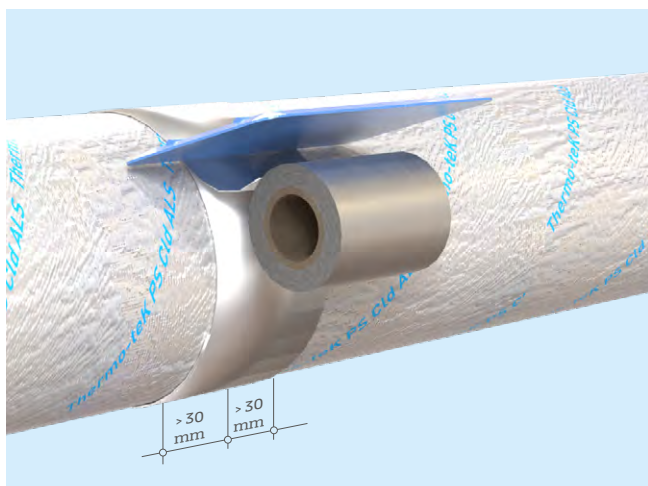
3 Push the next pipe section along the pipe and place it tight to the lateral side of the already installed pipe section.



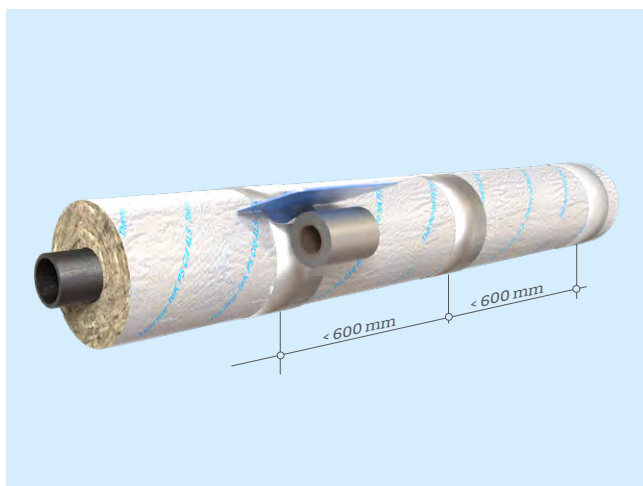
4 Seal the longitudinal slit of pipe section Thermo-teK PS Cld ALS with the sealing tape Thermo-teK Tape Cld. Use the spatula to smooth and fasten the joint.



5 Wrap the Thermo-teK Tape Cld in one piece around the entire pipe circumference at least one full loop to seal the vertical joints. Make sure to cover the pipe section surface at least additional 30 mm on both sides of the joint, ideally center the tape over the joint.



6 Use additional wraps of Thermo-teK Tape Cld to secure the pipe sections mechanically. The distance between individual wraps should be a maximum of 600 mm.



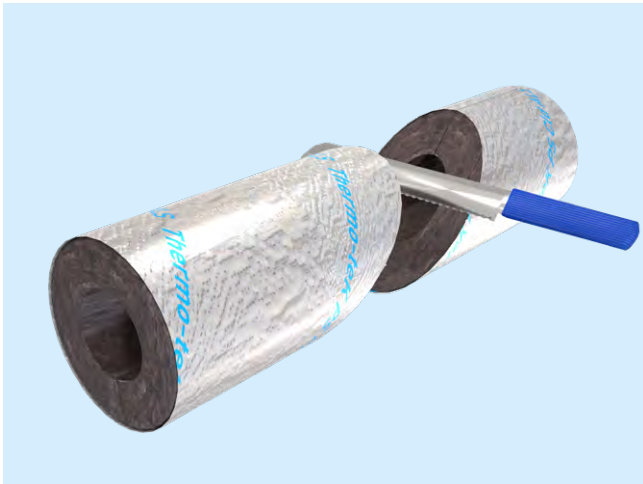
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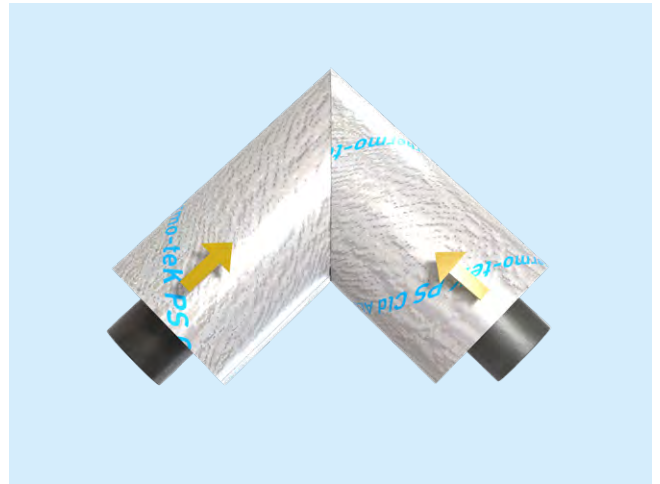
## PIPE SECTION THERMO-TEK PS CLD ALS - INSTALLATION ON PIPELINE ELBOWS

### Pipe elbow 90°

1 Place the pipe section on a flat surface for easier cutting. Cut it to the angle of 45° using a sharp knife.

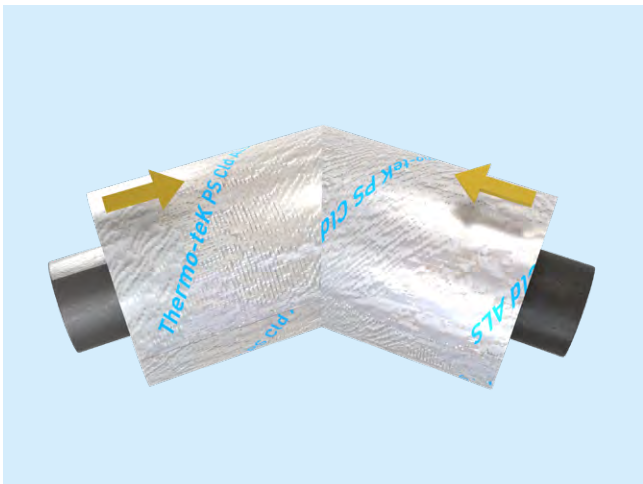


2 Place the pipe sections on both sides of the pipe elbow and close the longitudinal slits with the self-adhesive seal. Push the pipe sections tightly together and seal the joint with the Thermo-teK Tape Cld. All tapes to be smoothed and fastened with spatula (see earlier steps)

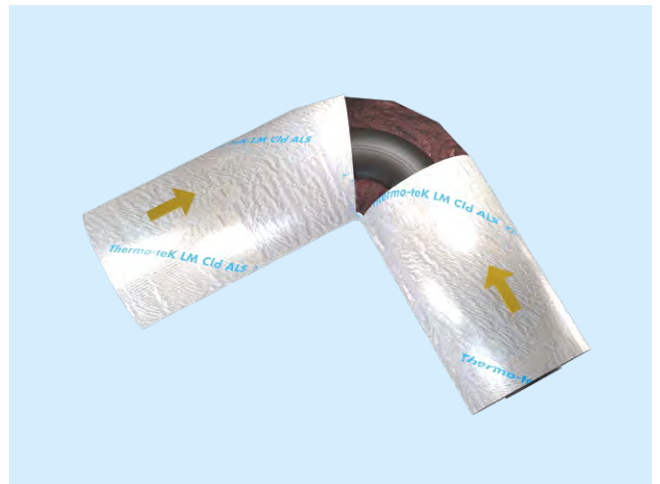


### Other options

#### Pipe elbow 135°



#### Extended curved pipes



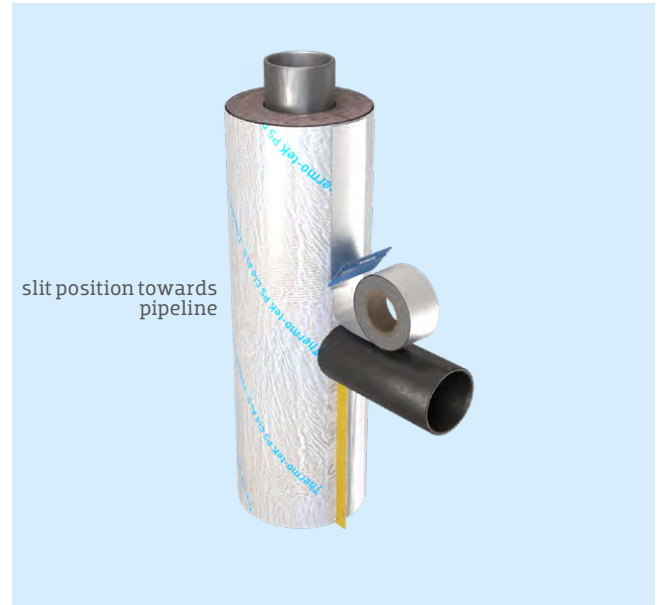
## PIPE SECTION THERMO-TEK PS CLD ALS - INSTALLATION ON PIPELINE INTERSECTION

### Intersection, option 1

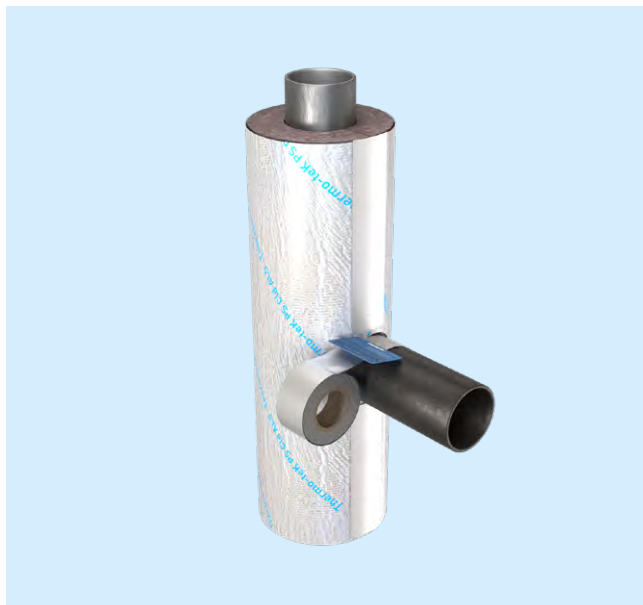
1 Cut a circular hole, in the needed diameter according to the intersection pipe, at the longitudinal joint of the pipe section. The diameter of the hole may not be larger than 2 mm of the T- pipe diameter. Larger gaps must be filled with loose wool, f.i. Power-teK LW STD/CRY.



2 Open the pipe section and place it on the pipeline with the longitudinal slit facing the intersection pipe. Make sure that the pipe section closes tightly at the longitudinal slit and close the slit with self-adhesive seal. Apply a strip of Thermo-teK Tape Cld onto the longitudinal strip and use spatula to smooth and fasten longitudinal joint.



3 Use Thermo-teK Tape Cld to seal the intersection pipe in order to create a vapour barrier.



4 In order to connect the insulation segments tightly at the intersection, adjust the front surface of the pipe section to the outer radius of the already insulated pipe. In case of gaps use Thermo-teK Seal Cld and finish the installation with Therm-teK Tape Cld; use spatula.



5 Push the cut surfaces close to the existing insulation and seal the joint with the Thermo-teK Tape Cld. All tapes have to be smoothend and fastened with spatula, as described.



### Intersection, option 2

1 Place the pipe section on a flat surface for easier cutting. Use a sharp insulation knife to cut out a symmetrical 90° piece out of the pipe section on the longitudinal slit. To make a tight connection, cut a 45° piece out of the pipe section on the lateral side.



2 Place the pipe sections on the pipe line and close the longitudinal slits. Push both pre-cut pipe sections tightly together and seal the joint with the Thermo-teK Tape Cld. All tapes have to be smoothend and fastened with spatula, as described.



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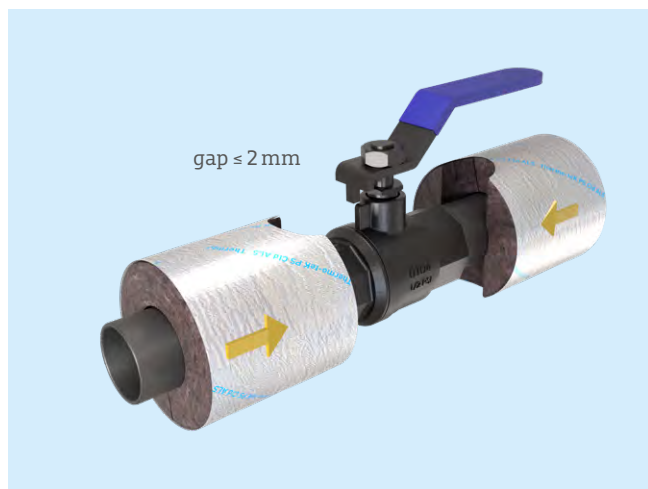
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## THERMO-TEK PS CLD SYSTEM – INSULATION OF FLANGES, PUMPS AND OTHER INSTALLATIONS AS WELL AS CONTAINERS

### Ball Valve

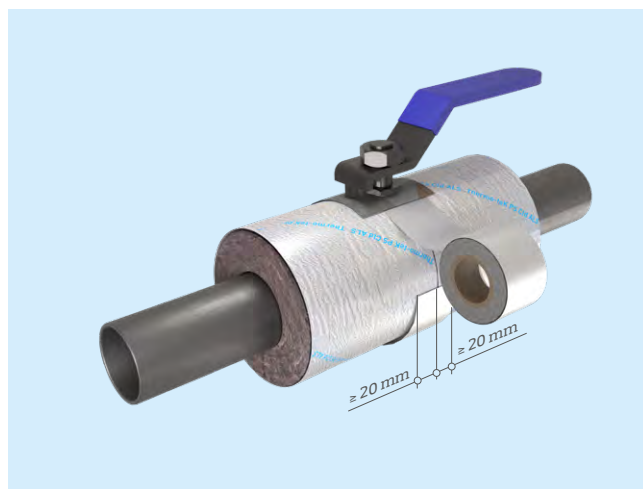
1 Cut a semi-circular hole on the lateral side of the pipe sections to fit the diameter of the spindle extension. Install the pipe section according to the instructions and push them tightly together on both sides of the spindle.

The circumferential gap to the spindle may not be more than 2 mm. Stuff larger gaps tightly with loose wool Power-teK LW STD/CRY.



2 Seal all insulation joints with Thermo-teK Tape Cld according to the instructions.

Use Thermo-teK Seal Cld to seal the insulating material joint to the fitting spindle. The flextape must cover surface of  $\geq 20$  mm width on the spindle and on the insulation. All tape to be smoothed and fastened with spatula (see above).

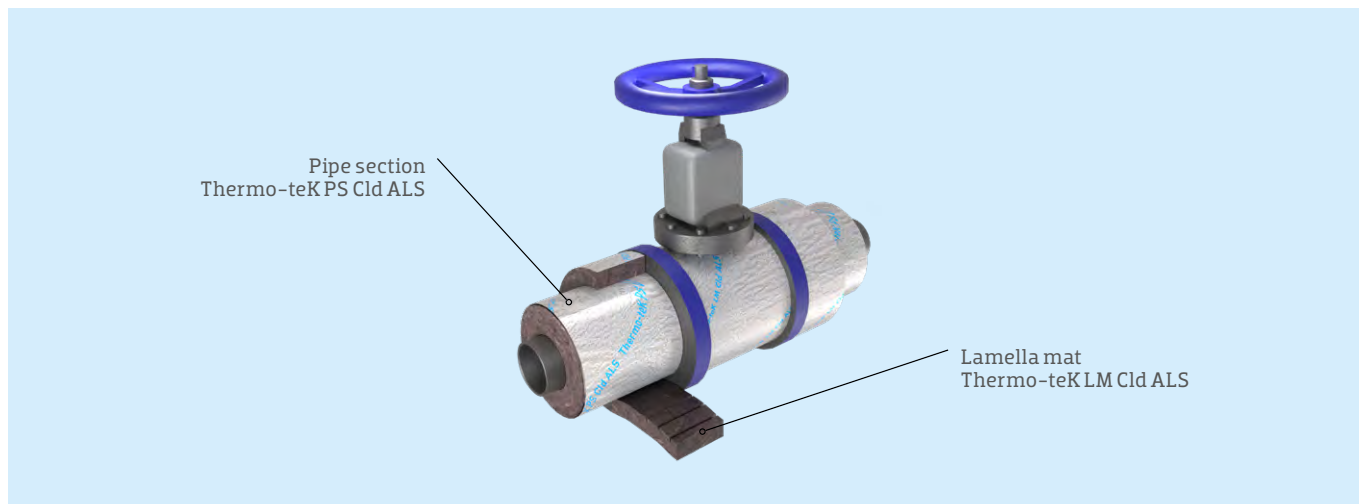


### STOP VALVE (SHUT-OFF VALVE)

1 Place the pipe section Thermo-teK PS Cld ALS tight to the flange on both sides of the fitting. For larger pipe dimensions and for insulating the valve body between the flanges use the lamella mat Thermo-teK LM Cld ALS. To insulate the valve, cut a circular hole corresponding to the diameter of the spindle housing at the longitudinal seal of the mat.

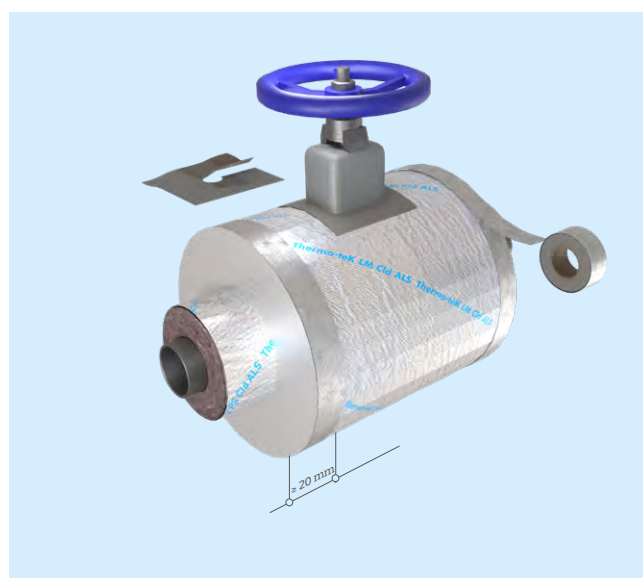
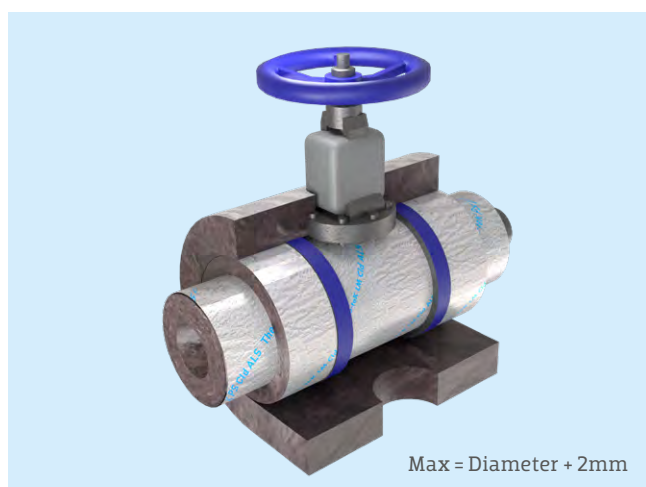
2 Several layers may be needed to completely insulate the fitting housing until the surface of the insulating material is flush with the circumference of the flange. Create a double layer on the pipe insulation on the other side of the flange in the same way. The doubling should have a width of 100 - 300 mm depending on the pipe dimension.





**3** To insulate the fitting housing including the flanges, another insulation layer is needed. Cut a circular hole corresponding to the diameter of the spindle housing at the longitudinal seal of the insulating mat. The circumferential gap to the spindle may not be more than 2 mm. Stuff larger gaps tightly with loose wool Power-teK LW STD/CRY.

**4** Use Thermo-teK Tape Cld to seal tightly all round longitudinal seals as well as the open end lateral sides of the Thermo-teK PS Cld ALS. Seal the insulating material tightly to the fitting spindle with flexible tape Thermo-teK SEAL Cld. The flextape must cover surface of  $\geq 20$  mm width on the spindle and on the insulation.



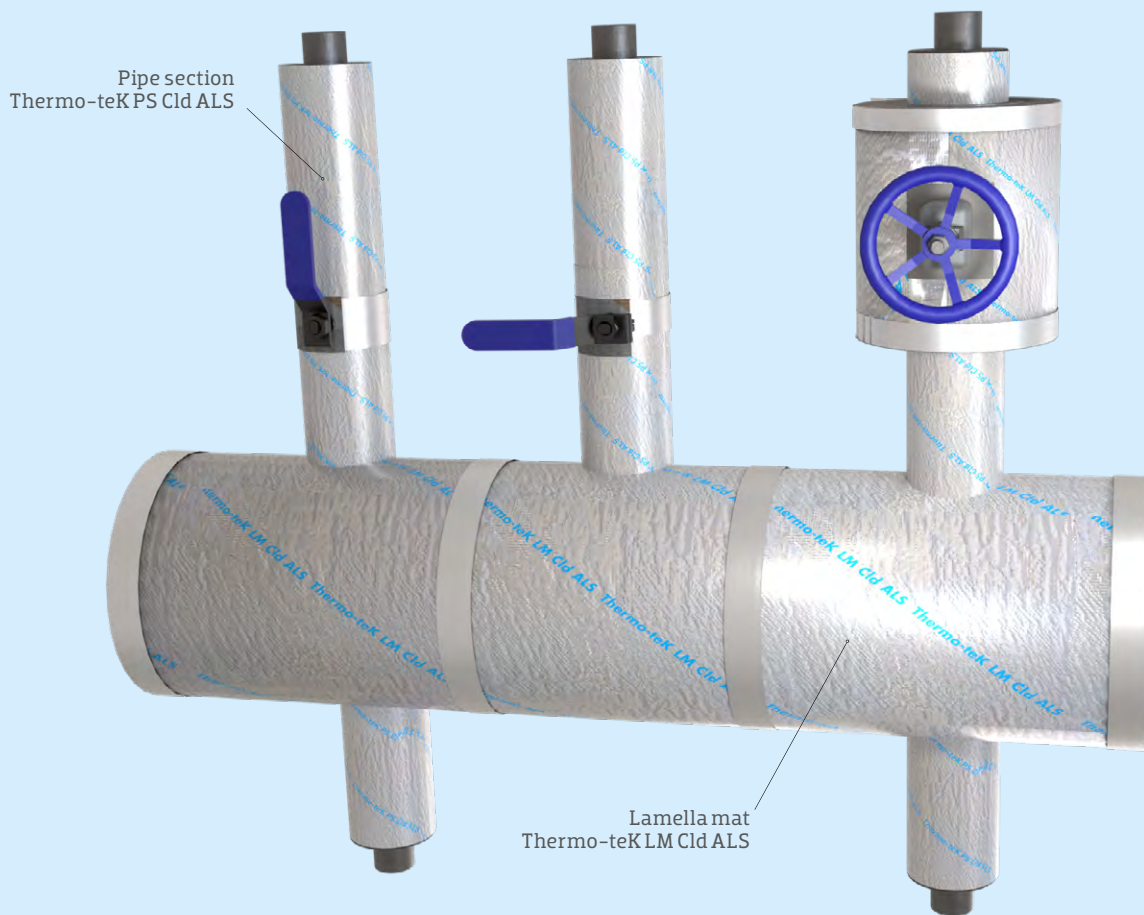
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## FURTHER APPLICATIONS COMBINING PS CLD ALS AND LM CLD ALS:

- ✓ pipeline network distributors
- ✓ back flow preventors with drainage plug
- ✓ ball valves
- ✓ balancing valves
- ✓ etc.

**THERMO-TEK PS CLD**  
SYSTEM PRODUCTS  
ARE AN **EXCELLENT**  
**CHOICE** FOR INSULATING  
VARIOUS FURTHER  
**COLD** APPLICATIONS



**SAFE IS COOL**



**Clear vision with focus on our customers. Service and quality excellence with in future oriented actions based on sustainability.**



#### **FIRE PROTECTION**

Regulations for the passive fire protection of buildings are intended to prevent the spread of fire, smoke and gases as much as possible in order to save lives and property. We developed a set of systems and products to cover this important challenge.

With our binder technology ECOSE® Technology without any added formaldehyde we also reduce energy consumption during manufacture and improve the energy balance of the finished product. Awarded the Eurofins Indoor Air Comfort Gold, our insulation materials ensure excellent quality of indoor air and are ideally suitable for sustainable use.



#### **SOUND INSULATION**

We are affected by noise throughout the day, and often this cannot be avoided. However, with the sound insulation products we provide, noise emissions will be reduced and the quality of life in living and work areas therefore considerably improved.



#### **ENERGY EFFICIENCY**

Extremely rising energy costs are becoming an increasing burden of companies and individuals, influencing negative financial effects in business or private budgets. First efficient step in energy saving should be reduction of heat losses by installation of additional insulation. Our Mineral Wool products provide the optimum solution for every application and are therefore ideally suited for energy and cost-conscious usage.



#### **SUSTAINABILITY**

It is our responsibility to protect and preserve nature and the environment. Because of this we use natural materials almost exclusively as the basis for our Mineral Wool products.

**Sustainable Mineral Wool insulation materials with ECOSE® Technology meet all of the relevant standards and ensure an excellent indoor air quality.**

with **ECOSE®** TECHNOLOGY

## **BIM FACTORY TS – OUR NEW PLANNING TOOL FOR YOU**



## **Our mission: To support you in your daily work.**

Building Information Modeling (BIM) is a digital, future-oriented process for planning, building and operating buildings that helps increase productivity in the construction industry. It bundles all information that can be accessed at every step of the life cycle of a building, from design to demolition. Parts lists can be created just as easily during planning, as can comprehensive, timely maintenance overviews during regular operation.



## FOR A BETTER WORLD

Our products save energy, cut emissions and are designed to make sure buildings and applications are good for the environment and keep people healthy, safe and well. Across our company, we have been working on sustainability for over a decade. We have focused on zero harm, reducing our energy use and emissions, recycling our production waste, incorporating circular economy principles and constantly campaigning for better and more sustainable buildings and applications. Over the past decade, we have achieved great things and we are proud of how we have changed our company, helped our colleagues, communities and customers and reduced our impact on the environment. But sustainability is a process of continuous improvement. We must do more for our people and our environment. That's why we've created our new sustainability strategy. We call the new strategy 'For A Better World' because it builds on the success of our mission statement: "Our vision is to lead the change in smarter insulation solutions for a better world."



### LIVING WITH A GREEN HEART

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The "Living with a Green Heart" initiative promotes a comprehensive approach to sustainable development with

**emphasis on societal and social sustainable development**, placing an informed individual at the forefront of sustainable transformation of society. "Living with a Green Heart" presents a unique story and approach that encourages companies, organisations, and individuals to:

- ✓ Create sustainable products and solutions which can transform grey cities into green oasis, build safe and comfortable homes and lead to a better world for all of us.
- ✓ Lead social sustainability actions, cocreating a more informed and kinder future for ourselves and those that come after us.
- ✓ Build a friendlier and more responsible environment for employees at all levels and in all aspects, appreciating the diversity and improving our relationships, as well as the way we work, collaborate, and coexist within our environments.

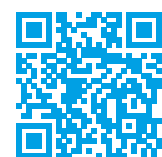
## CONTACTS

### Knauf Insulation d.o.o.

Varaždinska 140  
42220 Novi Marof  
ts@knaufinsulation.com

[www.knaufinsulation-ts.com/](http://www.knaufinsulation-ts.com/)

FOR FURTHER INFORMATION VISIT  
OUR WEBSITE [WWW.KNAUFINSULATION-TS.COM/](http://WWW.KNAUFINSULATION-TS.COM/)



Premium member of



### COMPANY PROFILE

Knauf Insulation is one of the most respected names in the insulation industry worldwide with over 40 years of experience and still growing fast. Over 6.000 employees in more than 40 countries and 29 manufacturing sites. Being part of the family-owned Knauf group, Knauf Insulation Technical Solutions provides solutions for customers' requirements in industry, marine applications, heating, ventilation and air conditioning. A profound market understanding and insulation know-how enables us to provide a broad range of products to meet your specific needs.

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challenge.  
create.  
care.