

Handling & laying instruction coils

Handling and laying of flexible pre-insulated Flexalen[®] pipes



Application Instruction

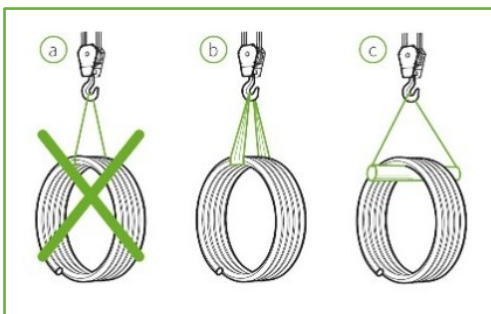
Application conditions and preparation

- Ambient temperature: +5 to +40°C
- Ensure a "clean" area (free of dirt, stones and sharp objects that could damage the products) at the place where the pipe will be stored and the installation work is carried out
- In windy areas choose a location protected from the wind so that coils cannot move
- When lifting rolls, only use approved lifting straps
- Wear the correct work clothes, safety shoes and helmet while carrying out work

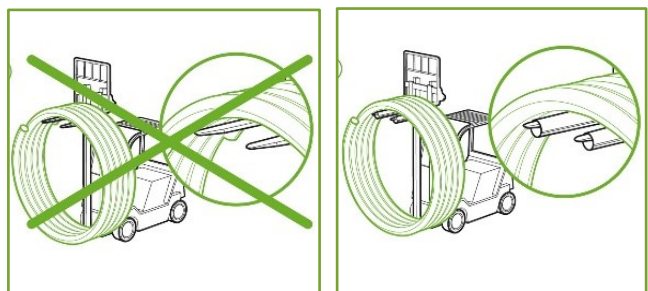
Unloading pipes

Unloading of pipes must be done carefully to avoid damage to the casing pipe.

For unloading, it is necessary to use soft synthetic slings with a minimum width of 50 mm. Steel cables, chains, wires and round ropes must not be used.



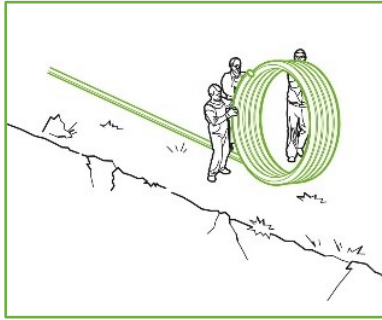
When unloading and handling, make sure that the pipe coils are lifted and must not be dragged under any circumstances.



If using a forklift truck, the forks must be suitably covered with a soft material (such as PE) to prevent damage to the pipe's outer casing. Also ensure that these protective pipes cannot slide off the forks.



When unloading, pipe coils must be lifted securely and must not be dropped or dragged under any circumstances.



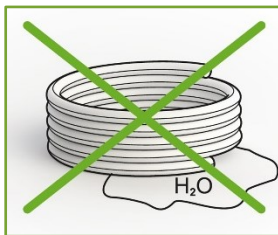
Pipe coils may be rolled, but only where the surface is level and free of sharp objects that could damage the outer jacket of the pipe. When handling by hand, care should be taken to allow for the weight of the pipe coil and to use sufficient manpower to ensure safety on the site.

Storage conditions of pipes



For long-term storage, pipe coils must be placed on their side – on a generally level surface to ensure uniform support of the pipe. If the coils are stored on an incline, they must be secured to prevent movement.

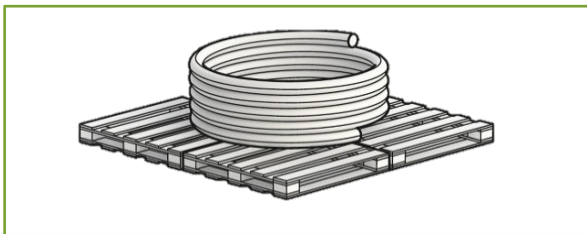
If stored outside, it is recommended to cover the pipe coils with a suitable UV-resistant material – ensuring that adequate ventilation is provided to prevent overheating of the coil.



Pipe coils must not be stored in standing water or areas prone to flooding.

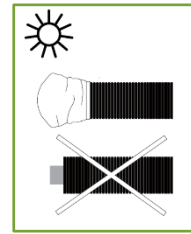


Ensure that the pipes are stored on a flat surface, free from sharp objects that can damage the pipe's outer casing.



Where available, timber, pallets, or sandbags can be used to store the pipe coils.

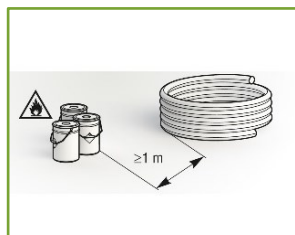
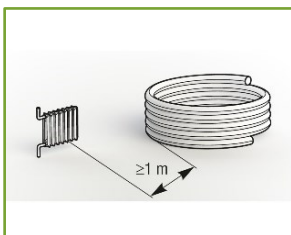
All fixing straps holding the pipe coil together must not be cut during transportation or storage to ensure safe handling.



The exposed ends of the pipe must be protected by factory-fitted protective caps. If not available, the ends of the pipe can be protected with two layers of polyethylene foil (with a minimum thickness of 100 microns) or PE end caps, fixed in place with duct tape.

Pipe end protection must remain in place until the pipe connections are made.

The pipe ends are protected at the factory with PE foil (FLEXALEN 600) or with PE end caps (FLEXALEN PU). Pipes, fittings and accessories must be kept at least one meter away from sources of heat, accelerants, explosive materials and any chemicals that can cause damage.



Fittings and accessories must be stored in their original packaging, ensuring that the clearly marked individual storage instructions are followed – such as keeping them clean and dry. Especially the PB fittings must be stored in a carton - UV protected.

Eventually transport of coils on the site



Pipe coils can be transported vertically or horizontally. Care must be taken to avoid violent vibrations when driving over rough terrain. To avoid damage, contact areas need to be protected with carton or similar.



Pipe coils can be transported in a pipe coil trailer, which can hold one pipe. This simplifies the uncoiling process as pipes can be directly fed into the pre-prepared trench.

Trench preparation

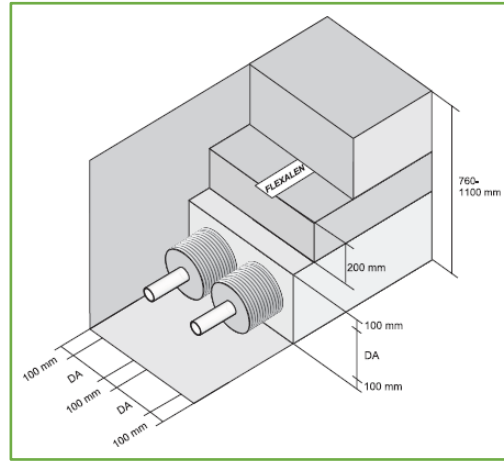
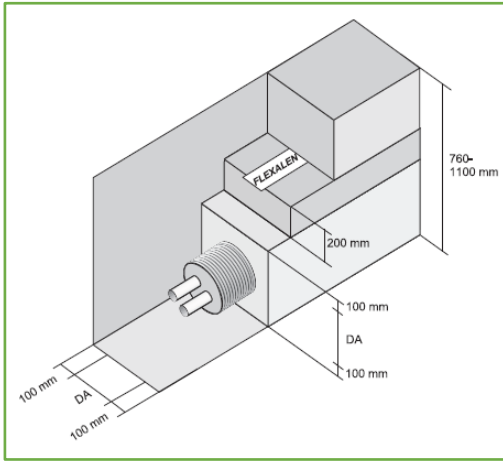
Application conditions and preparation

- Ambient temperature: +5 to +40°C
- Protruding stones and rocks in the trench must be removed.
- Minimum covering 0.5 m in areas without live load.
- Minimum covering 0.8 m in areas with live load (SLW60 = 600 kN total load as per DIN 1072).
- Max. laying depth: 2.6 m, a greater depth requires the approval of Thermaflex!
- From a laying depth of 1.2 m, a V-trench should preferably be excavated.
- Additional space must be provided to comply with the installation conditions according to DIN 4124 - especially for underground pipe connections (branches, sockets).
- When digging the trench, the bending radius (0.4 m – 1.25 m) of the Flexalen pipe to be used must be considered (see Technical Data Sheets FLEXALEN 600 & FLEXALEN PU).
- Ensure that no water is in the trench during laying (and the installation) of the pre-insulated pipes (ground water needs to be removed with pumps etc.).

Trench widths (the table below assumes a stable soil structure, without crumbling of the trench walls)

Casing pipe OD [mm]	Width for one pipe [m]	Width for two pipes [m]
90/91	0.29	0.48
111	0.31	0.52
125/126	0.33	0.55
142	0.34	0.58
160/162	0.36	0.62
182	0.38	0.66
200/202	0.40	0.70

Excavation work must be carried out in accordance with the approved procedure, rules and regulations of local authorities.



01.
Fill the prepared pipe trench with 10 cm of sand (according EN 13941-2) as bedding before laying the pipe(s).

02.
Lay the pipe(s) on the sand bedding.

03.
Fill sand between the pipe(s) and the trench walls and 10 cm over the pipe soffit(s). After manual compacting a sand bed of at least 10 cm in any direction must surround the pipe(s).

04.
Further backfilling with spoil from the trench. Coarse-grain gravel or road metal with or without a small soil portion are not suitable for the filling.

Grain size 0-3 mm!

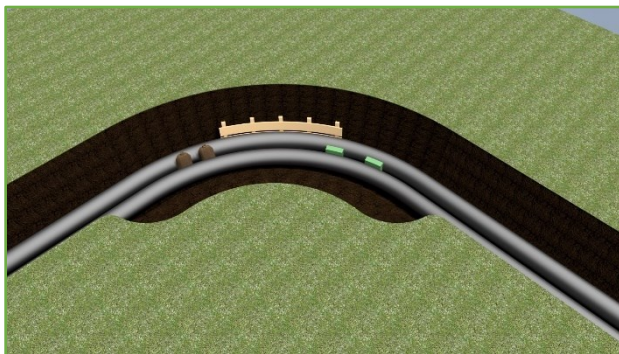
05.
Place a warning tape 300 mm above the laid Flexalen pipe to prevent excavation damage to the system in the future.

06.
Further backfilling with spoil from the trench. From a cover of 50 cm we recommend mechanically compaction with a vibratory tamper.

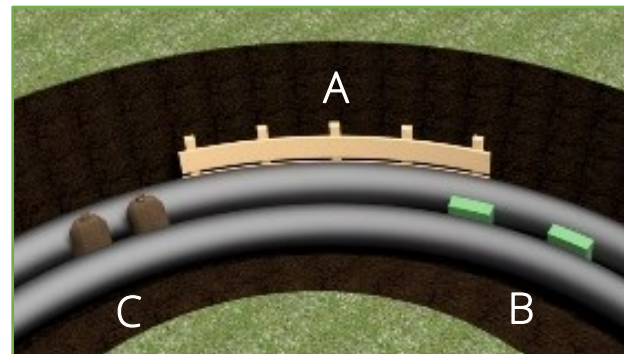
07.
For the final backfilling, we recommend to retain the original soil stratification. So in meadows and fields the last layer should be formed by a „humus layer“. The excavated material from the lower layers should never be used for the surface layer.

08.
Please additionally observe the corresponding national standards and regulations for the installation of district heating pipes.

Please note that proper trench filling has a great influence on heat loss. All specifications must therefore be strictly observed!



To guarantee the distance of 100 mm between pipes and between the pipes and trench walls at bends, we recommend solutions as shown in the picture.



- A) Fixing with hammered-in wooden slats in combination with a crossbar
- B) Keeping distance by rigid foam blocks
- C) Keeping distance by sand bags

Distances to other supply lines

Since the ground temperature in the immediate area of the district heating pipeline is higher than normal, the transmission performance of buried electrical lines may be affected. To avoid possible interactions with other line systems, Thermaflex recommends keeping the following minimum distances (see also VDE 0100, VDE 0101 and DVGW W400):

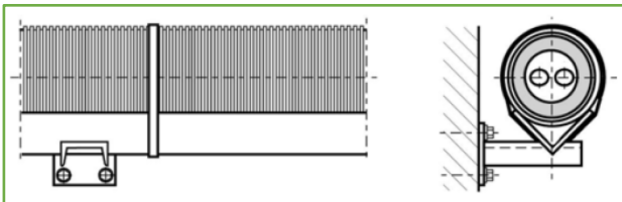
Minimum distances (could vary to your national standard)

Type of line	Crossing lines	Parallel lines	
	Minimum distance [m]	Minimum distance [m] < 5 m	Minimum distance [m] > 5 m
1 kV, signal or measuring cable	0.3	0.3	0.3
10 kV or 30 kV cable	0.6	0.6	0.7
Several 30 kV cables or cables over 60 kV	1.0	1.0	1.5
Gas and water pipes*	0.2	0.5	0.5

*) Drinking water pipelines must be protected against impermissible heat influence when approaching district heating pipelines. If this cannot be ensured by the distance, the drinking water pipes must be insulated.

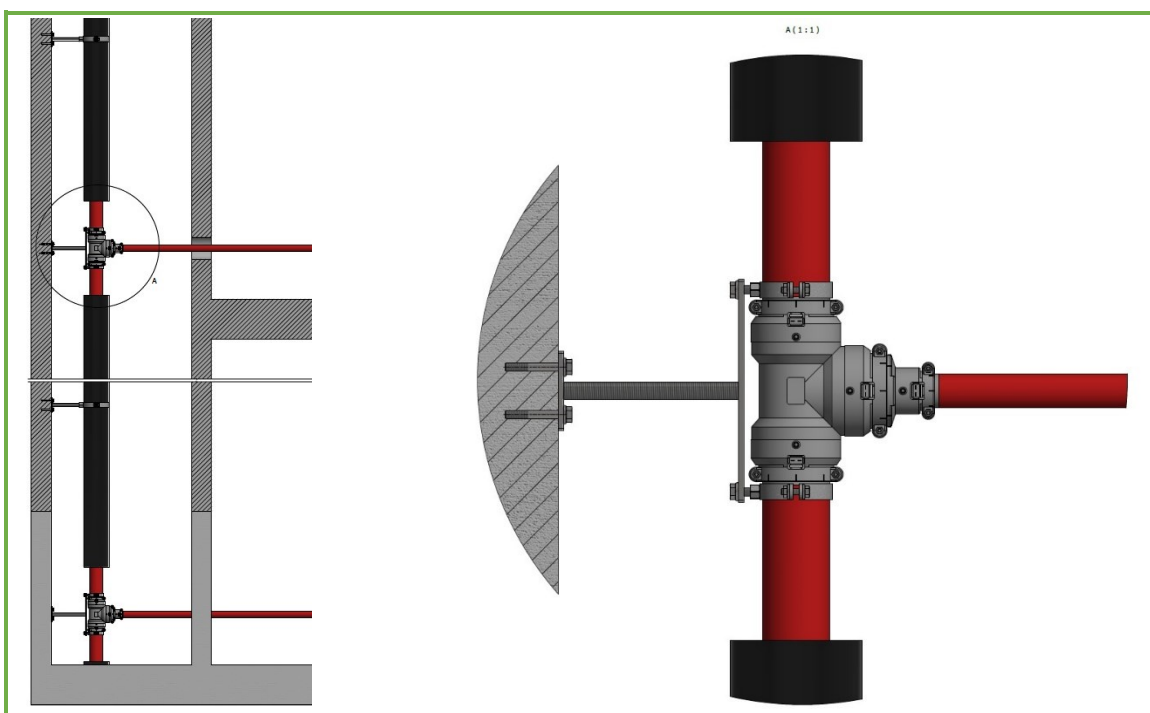
Wall and ceiling installation - horizontal

For above ground horizontal lines, we recommend that all coiled Flexalen pipelines are supported along their entire length by securing to an angle bar bed or adequate cable tray with strong clips or ties placed every meter.



Wall and ceiling installation – vertical

For vertical lines we recommend that the pipe is secured to the wall or cable tray with strong clips or ties at the casing pipe every meter. The Thermaflex PB pipe in the Flexalen pipe systems must be anchored every 4 to 5 meters (in most cases on each floor, see below drawing). Suitable restraining clamps must be used on both sides of the branch resp. socket.



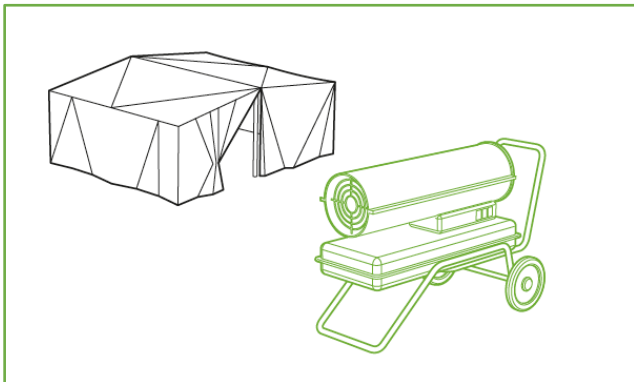
Exposed lines in the terrain

If the pipeline is laid in the terrain, we recommend providing fixing points to prevent sliding away.

Pipe preparation for uncoiling

Application conditions and preparation

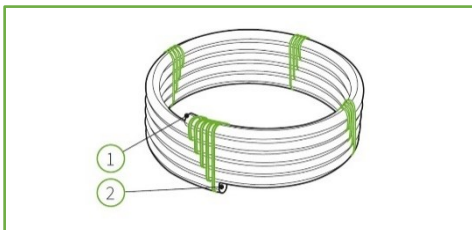
- Ambient temperature: +5 to +40°C
- At temperatures below 5°C the pipe coils must be heated to ensure the correct conditions for safe uncoiling. It is therefore recommended to store the pipe coils in a warm place with temperatures above 20°C for at least eight to ten hours (resp. above 10°C for 24 hours) before installation.
- If possible, uncoil the pipes 24 hours before installation so that they can straighten out.



Where warm storage facilities are not available on site, the pipe coils can be heated with hot air guns (air temperature up to 60°C). The pipe coils should be covered with insulating tents and hot air should be passed around the pipes, and also into the service pipe to achieve a uniform temperature in the insulating foam.

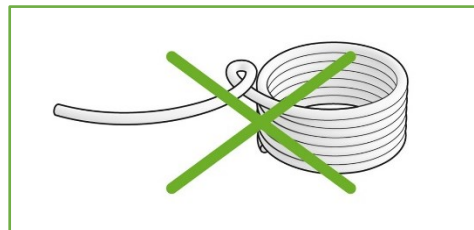
For FLEXALEN PU: If it is not ensured that the correct temperature has been reached, the insulating foam may crack during the uncoiling procedure.

Uncoiling and laying

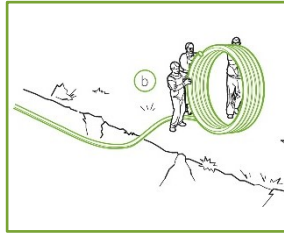
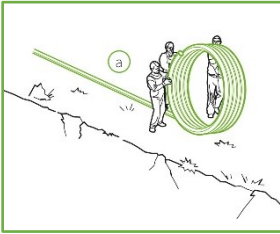


Pipe coils are held together with a series of fixing straps that are located at a minimum of four equally spaced positions around the circumference of the coil.

It is essential that the straps are cut in the correct sequence, as otherwise the coil could spontaneously unwind and cause, serious injuries and damage. Start uncoiling at the end of the pipe (2) by careful and controlled removal of the fixing straps.

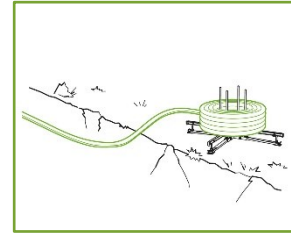
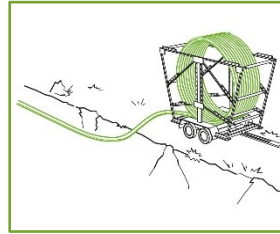


Never go below the minimum permissible bending radius or kink the pipe. The bending radius is depending on outer diameter of casing and medium pipe (0,4 m – 1,25 m). All bending radius you will find in our technical data sheets for FLEXALEN 600 & FLEXALEN PU.



Uncoiling of pipe can be done manually by rolling the coil. During the uncoiling process, the pipe is laid either alongside or directly into the pre-prepared trench. Fixing straps need to be cut carefully and in the correct sequence as the pipe is uncoiled.

Care must be taken to avoid rolling the pipe coil over any sharp objects that could damage the pipe's outer casing. The uncoiled length of pipe can be fixed by means of carefully placed sandbags or other suitable materials.



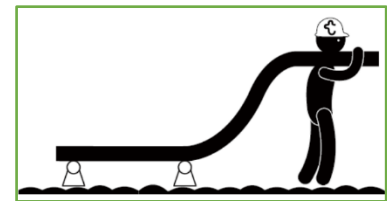
When uncoiling sizes of Flexalen® PU pre-insulated pipes with casing pipe dimension over 142 mm, it is strongly recommended to use uncoiling devices such as trailers or uncoiling platforms. Uncoiling devices can also be very helpful for any dimension of Flexalen® pipe in such cases, where access to the area of installation is limited or there are obstacles such as trees, lampposts and other street furniture, preventing the pipe coil being rolled alongside the trench.

When pulling the pipe along the trench during uncoiling, please ensure that the jacket pipe is not damaged by abrasion and punctured by sharp objects. Where possible, use pipe rollers, timber or sandbags to maintain the integrity of the casing.

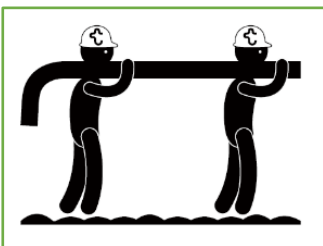
Attention: As the pipe is pulled from the coil trailer by manpower or machine, care must be taken to avoid damaging the pipe by stretching.



If you don't want to uncoil the pipe by rolling the pipe alongside or directly into the trench, stay inside the coil when removing straps and have a free space around the coil. This is only recommended for shorter pipe lengths.



Never drag the Flexalen pipes over the ground, always use cable/pipe rollers to prevent damage.



If no cable/pipe rollers are available then carry the pipe on the shoulders of several installers to transport it to the intended place.



Pipe roller