

## 3. Installation instructions

### 3.1 Transport and storage of Microflex

Microflex pipelines are supplied in coils with a maximum length of 100 metres. Pipe ends are sealed with protective end caps as to prevent the entry of pollutants.

In storage, care must be taken to ensure that the PE-Xa carrier pipe is protected from sunlight and that no undesirable deformation of the coil is occurring.

Pipes must be transported and stored in such a way that sharp objects, like stones and tree roots cannot damage them. Pipes must not be dragged along the ground. Only nylon or textile straps should be used for fastening the coils during transport.

### 3.2 Utility trench profile

Up to a trench depth of 120 cm, we recommend digging a vertical trench; deeper than 120 cm we recommend a V-shaped trench.

Excavation works must be carried out in the approved manner, according to the rules and regulations of local authorities. A prior permission is very often required.

The depth of the trench must be in accordance with the guidelines relating to the laying of Microflex pipes.

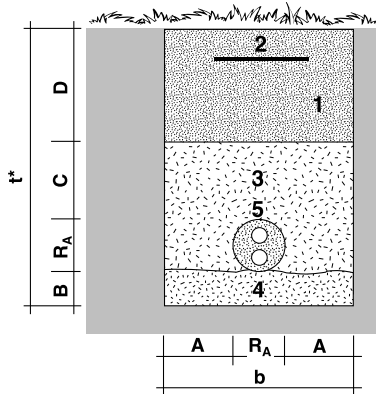
A land register plan might be useful to eliminate possible conflicts with existing or future utilities and structures.

After completion of the pipe-laying process, the route can be marked with a warning tape. Entry in the land register plan is recommended.

#### **ATTENTION:**

**Minimum laying temperature for Microflex pipes: - 5°C.**

- 1 Backfill
- 2 Route warning tape
- 3 Sand fill
- 4 Sandbed
- 5 Microflex pipe



### Profiles of utility trenches

Dimensioning chart in mm.

Particular attention must be paid to ground frost depth.

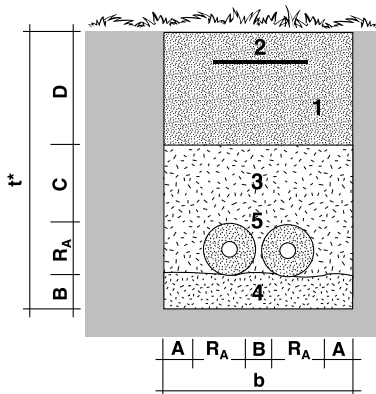
D-values between brackets refer to an authorized axle load of 5T.

Profile of trench for Microflex twin pipe (DUO)

| $R_A$<br>mm<br>jacket $\emptyset$ | A<br>mm | B<br>mm | C<br>mm | D<br>mm      | b<br>mm<br>width | $t^*$<br>mm<br>depth | Excavation<br>$m^3/m$<br>approx | Sandfill<br>$m^3/m$<br>approx |
|-----------------------------------|---------|---------|---------|--------------|------------------|----------------------|---------------------------------|-------------------------------|
| 125                               | 150     | 100     | 150     | 250<br>(650) | 425              | 625<br>(1025)        | 0,27                            | 0,17                          |
| 160                               | 180     | 100     | 150     | 250<br>(650) | 520              | 660<br>(1060)        | 0,34                            | 0,22                          |
| 200                               | 180     | 100     | 150     | 250<br>(650) | 560              | 700<br>(1100)        | 0,39                            | 0,25                          |

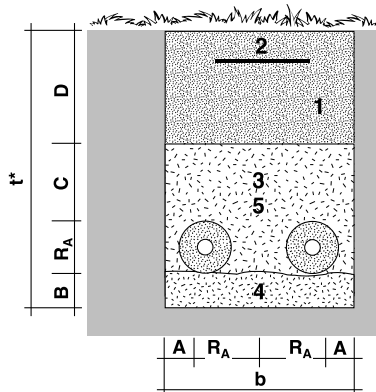
Profile of trench for 2 Microflex single pipes (2x UNO)  
**without** underground connection

| $R_A$<br>mm<br>jacket $\emptyset$ | A<br>mm | B<br>mm | C<br>mm | D<br>mm      | b<br>mm<br>width | $t^*$<br>mm<br>depth | Excavation<br>$m^3/m$<br>approx | Sandfill<br>$m^3/m$<br>approx |
|-----------------------------------|---------|---------|---------|--------------|------------------|----------------------|---------------------------------|-------------------------------|
| 75                                | 150     | 100     | 150     | 250<br>(650) | 550              | 575<br>(975)         | 0,32                            | 0,20                          |
| 90                                | 150     | 100     | 150     | 250<br>(650) | 580              | 590<br>(990)         | 0,34                            | 0,22                          |
| 125                               | 150     | 100     | 150     | 250<br>(650) | 650              | 625<br>(1025)        | 0,41                            | 0,26                          |
| 160                               | 180     | 100     | 150     | 250<br>(650) | 780              | 660<br>(1060)        | 0,51                            | 0,32                          |
| 200                               | 180     | 100     | 150     | 250<br>(650) | 860              | 700<br>(1100)        | 0,60                            | 0,38                          |



Profile of trench for 2 Microflex single pipes (2x UNO)  
**with** underground connection

| $R_A$<br>mm<br>jacket $\emptyset$ | A<br>mm | B<br>mm | C<br>mm | D<br>mm      | b<br>mm<br>width | $t^*$<br>mm<br>depth | Excavation<br>$m^3/m$<br>approx | Sandfill<br>$m^3/m$<br>approx |
|-----------------------------------|---------|---------|---------|--------------|------------------|----------------------|---------------------------------|-------------------------------|
| 300                               | 150     | 100     | 150     | 250<br>(650) | 900              | 800<br>(1200)        | 0,72                            | 0,45                          |

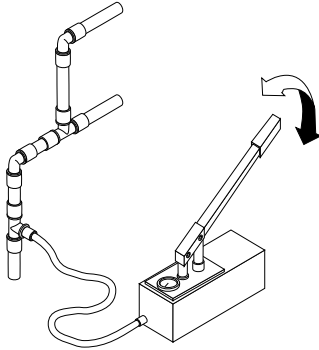


Loading up to SLW60 according to DIN 1072 when covered at minimum 500mm.  
The static calculations of buried pipes are according to ATV-DWK-A127.

### 3.3 Pressure test

#### Pressure test according to DIN 1988 Part 2

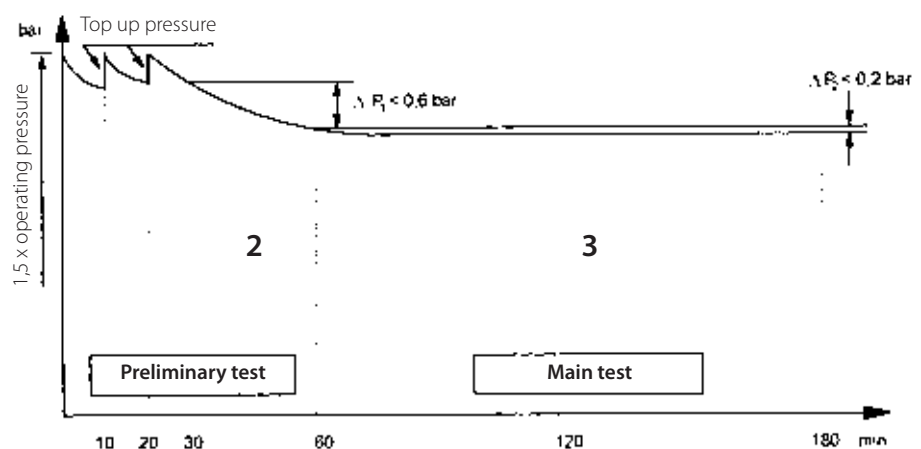
The pressure test procedure is obligatory before closing the trench!



1. **Pressure tests** constitute contractually agreed auxiliary work essential to the accomplishment of the contract and also form part of the contractor's performance without being stated in the performance specification. Prior to concealing, fill the finished pipework with water, taking care to avoid air locks. The pressure test must be conducted in two parts, starting with the preliminary test, followed by the main test.
2. **Preliminary test**  
The preliminary test involves applying a test pressure equal to 1.5 times the admissible operating pressure. This pressure must be regenerated twice within the space of 30 minutes at intervals of 10 minutes. Following a test period of another 30 minutes, the test pressure must not have fallen by more than 0.6 bar (0.1 bar per minute). Leakages must not occur.
3. **Main test**  
The main test has to be conducted immediately after the preliminary test. The test takes 2 hours. At the end of this period, the test pressure recorded after the preliminary test must not have fallen by more than 0.2 bar. Leakages must not occur at any point in the system being tested.

|   | bar / psi            |  | bar / psi            |
|---|----------------------|--|----------------------|
| <b>2 Preliminary test</b>                           | <input type="text"/> | <b>3 Main test</b>                             | <input type="text"/> |
| 2.1 Operating pressure x 1,5                        | <input type="text"/> | 3.1.1 Beginning                                | <input type="text"/> |
| 2.2 After 10 min (restore 2,1)                      | <input type="text"/> | 3.1.2 End                                      | <input type="text"/> |
| 2.3 After 20 min (restore 2,1)                      | <input type="text"/> | 3.2 Test pressure                              | <input type="text"/> |
| 2.4 After 30min                                     | <input type="text"/> | 3.3 After 120 min                              | <input type="text"/> |
| 2.5 After 60 min admissible pressure drop < 0,6 bar | <input type="text"/> | 3.4 Remarks admissible pressure drop < 0,2 bar | <input type="text"/> |

#### Leakage testing - DIN 1988



Test the finished pipe-work before concealing! The state-of-the-art execution and documentation of the pressure test for the entire piping system is a warranty requirement!



### 3.4 Instructions for laying Microflex pipes in earth

Microflex pipelines can be laid in earth without difficulties. The corrugated jacket provides the necessary protection for the insulating material and the medium pipe. Groundwater has no influence on the Microflex system. The pipes may be laid into the trench directly from the coil. This may only be done by pulling the carrier pipes (do never pull the jacket).

When uncoiling the pipe, please take care to ensure that the pipe is not dragged along the ground or is damaged by sharp objects and that outside pipe ends don't whip back when untying the textile straps.

The bending radii (see product data sheet) must not fall below the prescribed minimum neither during installation nor in the final position of the pipeline.

Pipes must be laid in a serpentine course and may be covered with sand at regular intervals. General guidelines for laying underground pipes must be followed meticulously.

When laying larger dimensions and lengths, pulling devices such as winches or tail-end rollers may be used. Always connect these devices to the carrier pipe.

The carrier pipe must be fitted with protective end caps preventing the entry of dirty particles.

### 3.5 Warning tape

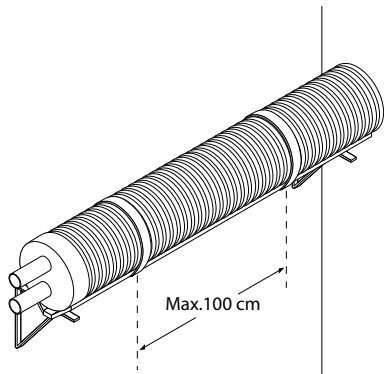
| Legend                                   | Length | Art. No. |
|--|--------|----------|
| ATTENTION: WATER PIPE                    | 250 m  | MTRW     |
| ATTENTION: WATER PIPE WITH HEATING CABLE | 250 m  | MTRB     |

### 3.6 Backfilling guidelines

Carefully place the Microflex pipeline on a compacted 10 cm bed of sand on the bottom of the trench. The quality of this sand bed providing uniform support for the pipe line has a decisive influence on the compressive stress of the system. Make sure that the pipes are fully covered with sand (granulometry of 0-3mm).

Backfilling should be in layers of about 20 cm and compacted by hand. Care should be taken to remove any sharp objects from the backfill material. When the backfill has been brought to about 50 cm above the top of the pipe, a vibrating tamper may be used to compact the remainder of the soil. There should also be a warning tape bearing the legend "water pipe" laid directly above the duct.





onto wall assembly

### 3.7 Installation instructions onto walls or ceilings

For this purpose, the pipe must be supported every 1 m along its entire length because of the flexibility. To avoid bending, the pipe must be tied with straps to a supporting structure.

### 3.8 Guidelines for pipes laying on the ground

If the pipeline is laid on the ground, points of support must be provided to prevent slipping away. On bumpy ground, the pipe should be tied at intervals of about 25 m, and care must be taken to ensure that the pipes are well supported. For this purpose a supporting structure can be set up.

### 3.9 Guidelines for the use of the MK heat shrinkable caps



**1**  
Slide the cap over the carrier pipe and the jacket.



**2**  
Use a heat gun or mini torch with soft yellow flame (do **NOT** use a blue flame!) to **gently** shrink the cap.



**3**  
Press the cap, wearing protective gloves.



**4**  
The tail end of the pipe is now sealed watertight.