

### "Combi-System" Press connection

Composition pipe "Copipe"

Press fittings programme "Cofit P"

#### 1 Application:

Due to the universal application of the Oventrop composition pipe "Copipe" and the press fittings "Cofit P", the Oventrop „Combi-System“ makes it possible to complete a whole installation with just one system.

For the radiator connection, Oventrop offers valves, pipes and fittings between boiler and radiators.

The Oventrop composition pipe "Copipe" prevents diffusion of oxygen. In underfloor heating systems it offers safety and is also easy to install. Here, an extensive range of controls and valves is also available.

All components are also suitable for sanitary installations and for rain water usage plants.

The system is tested according to DVGW work sheet W 534 and carries the registration number DW-8501AT2407 for all dimensions.

For reasons of technical coordination, composition pipes "Copipe" may only be installed together with the „Cofit“ connections and fittings.

#### 2 Composition pipe "Copipe" (DVGW AT2407):

Triple layered composition pipe allowing no oxygen diffusion

- inner pipe layer made of crosslinked polyethylene
- butt welded aluminium sleeve
- outer coating made of crosslinked polyethylene joined with a special bonding agent.

Marking of the pipe: PE-Xc/AL/PE-X

(AL = aluminium, PE-X = crosslinked polyethylene, Xc = electron-beam crosslinked)

Pipe dimensions for press connection system (outer diameter x wall thickness):

16 x 2 mm, 20 x 2.5 mm, 26 x 3 mm, 32 x 3 mm, 40 x 3.5 mm

Pressure and temperature limits: 10 bar, 95°C or 16 bar, 20°C

The pipes 16 x 2 mm and 20 x 2.5 mm are also available with insulation. They comply with the requirements of the DIN 1988 standard for the protection of potable water installations (cold) from warming up and condensation. The insulation layer has a thickness of 4 mm.

All dimensions are DVGW approved according to work sheet W 542.

#### 3 Press fittings programme "Cofit P" (DVGW AT2407):

For Oventrop composition pipe "Copipe".

Bodies of the fittings made of bronze, for dimension 40 x 3.5 mm the body is made of brass resistant to de-zincification or tin-plated brass.

- body of fitting reinforced on pipe side with grooves for triple radial pressing to absorb tensile forces
- knurl to absorb torsional forces
- double O-ring seal
- PTFE insulation ring for galvanic separation of aluminium and bronze.

Casing made of stainless steel. With viewers to check the insertion depth of the pipe. Captive connection between casing and body of fitting. The fixed casing protects the body from damages and simplifies installation.

Dimension 40 x 3.5 mm with loose casing.

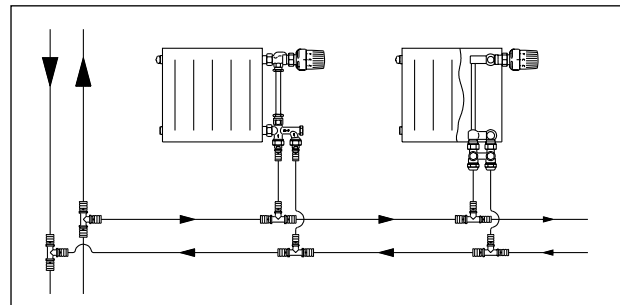
#### 4 Press fitting tools:

##### 4.1 Press machines:

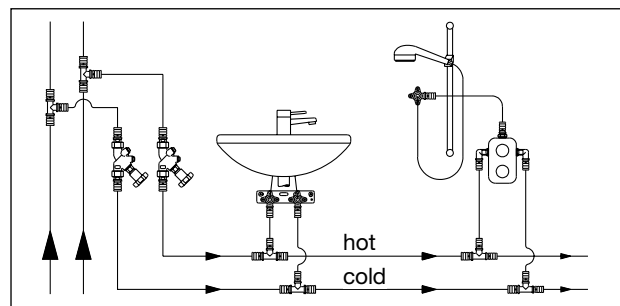
For pressing, Oventrop offers a battery operated (12 V) as well as a mains-operated (230 V) press machine.

The press machines have to be serviced at regular intervals by a service centre. Addresses for a fast maintenance and service can be taken from the enclosed documents.

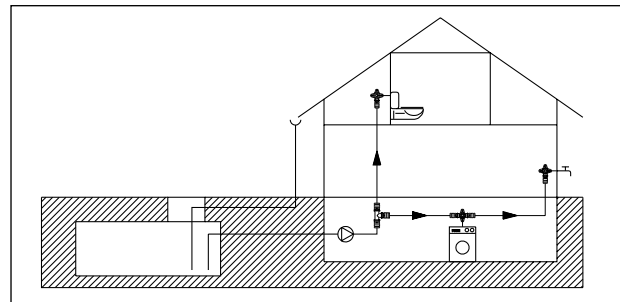
The corresponding installation instructions are to be observed.



Radiator connection



Sanitary installation



Rain water usage plant



Oventrop composition pipe "Copipe" and Oventrop press fittings system "Cofit P"

## 4.2 Press bits:

If handled properly, the Oventrop press bits for the pipe dimensions 16 to 32 mm guarantee an accurate pressing with lasting tightness.

The press bits have to be kept clean. If they are dirty, they can e.g. be cleaned by using a wire brush. Once a year or every 8.000 to 10.000 pressings or if the press contour or any other part of the press bits should have been damaged, the latter should be returned to the Rems Roller service centre.

Details regarding pressing can be taken from the opposite illustration and table.

## 4.3 Press clamp with auxiliary bits:

If handled properly, the Oventrop press clamp with auxiliary bits for the pipe dimension 40 mm guarantees an accurate pressing with lasting tightness.

The installation instructions also giving information regarding care and maintenance of the tools, are to be observed.

## 4.4 Information on products of other companies:

The Oventrop press bits may also be used with the press machines of the following companies:

Geberit type PWH75; Inno-P; Klauke types UAP1, UAP2, UP2EL; Mannesmann/Novopress types EFP1, EFP2, ECO1, ACO1; Polytherm; Rems; Roller; Rothenberger; Unicor; Velta; Viega type 2.

The press bits of the following companies may also be used to press the Oventrop press fittings:

Polytherm; Rems types H 16 A, H 20 A, H 26 A, H 32 A; Velta.

The press machines of the company Novopress types EFP3 and AFP3 together with the corresponding press bits marked "Cofit P" also guarantee an accurate pressing.

The Oventrop press clamp with auxiliary bits can be used with the Oventrop press machines 230 V and 12 V as well as the press machines of the following companies:

Gerberit type PWH75; Klauke type UAP2; Mannemmann/Novopress types EFP1, EFP2, ECO1, ACO1; Rems; Viega type 2.

## 5 Installation tools

### 1. Oventrop pipe cutter:

For cutting the Oventrop composition pipe „Copipe“ at right angles, one tool for all dimensions. Additional cutting wheel in the grip, further cutting wheels available as spare parts.

### 2. Oventrop universal tool for deburring and calibrating:

A universal tool for the pipe dimensions 14 to 32 mm. For deburring the pipe ends. Prevents damaging of the O-ring at the compression fitting.

Calibrating which is carried out at the same time, ensures that the O-ring will fit perfectly. Mandrels for replacement are available.

A separate universal tool for deburring and calibrating is available for the pipe dimension 40 mm.

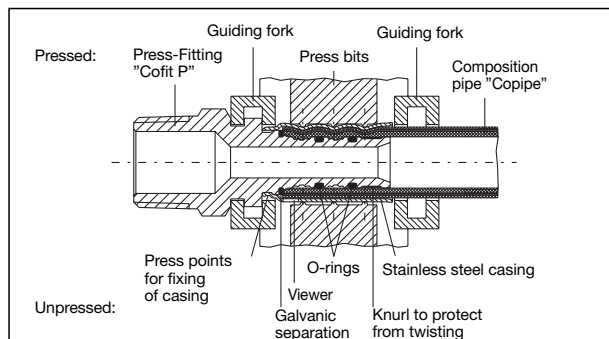
As alternative, a smoothing tool with handgrip can be used. By smoothing and chamfering the inner pipe layer, the pipe end offers best possible installation conditions for the introduction of the fittings.

### 3. Oventrop pipe bending spring:

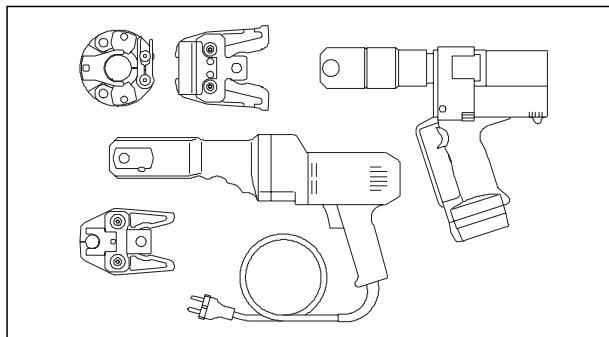
Prevents breaking and snapping off, especially with hand-made bends having a small radius. Available for the pipe dimensions 14 x 2 mm, 16 x 2 mm and 20 x 2.5 mm, length 600 mm.

### 4. Oventrop pipe bending tool:

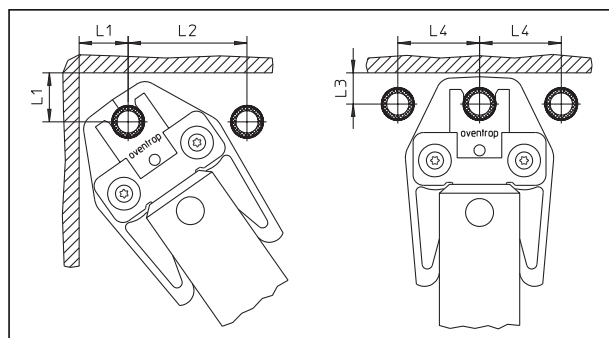
For easy and even bending of pipes, for outer pipe diameters of 14 to 26 mm, mechanical transmission. Pipe bending tools for larger pipe diameters are available from specialist stores, e.g. Tube Bender Maxi of the company Rothenberger.



Oventrop press fitting

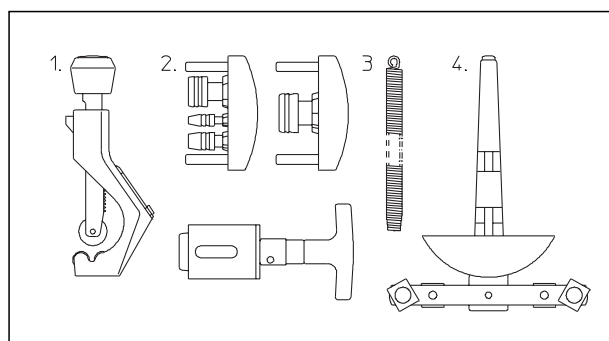


Oventrop press fitting tools

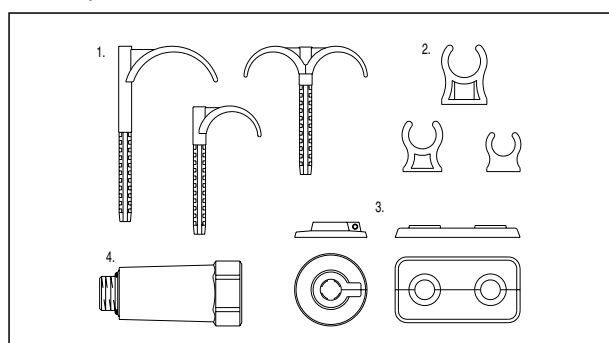


Press Bits	Dimension	Size	L1	L2	L3	L4
H 16 A	Ø 16 x 2,0 mm	DN 12	33 mm	80 mm	21 mm	50 mm
H 20 A	Ø 20 x 2,5 mm	DN 15	33 mm	80 mm	21 mm	55 mm
H 26 A	Ø 26 x 3 mm	DN 20	38 mm	80 mm	25 mm	62 mm
H 32 A	Ø 32 x 3 mm	DN 25	43 mm	90 mm	27 mm	72 mm

Oventrop press bits – required working area



Oventrop installation tools



Oventrop installation material

## 6 Installation material:

### 1. Oventrop dowel hooks:

To fix pipes onto concrete flooring or insulation- and sound absorbing layers.

- single dowel hook up to 32 mm outer diameter
- double dowel hook up to 32 mm outer diameter, advantageous for parallel pipes
- single dowel hook „Maxi“ up to 55 mm outer diameter, for fixing the insulation material

### 2. Oventrop pipe brackets:

For fixing pipes onto the wall, for outer pipe diameter 14, 16 and 20 mm.

### 3. Oventrop rosette covers:

To cover pipe entry into wall or floor.

### 4. Protection cap

To seal wall mounted connection pieces during the pressure test of the cold- and hot water installation according to DIN 1988 and for protection during plastering and tiling.

Cap may only be used once.

## 7 Installation instructions

### Press fittings system "Cofit P" 16 - 32 mm:

The press fittings "Cofit P" may be used for composition pipe "Copipe" and for standard plastic pipes 16 x 2.0 mm. Processing as described below for the composition pipe "Copipe".

#### Cutting

The composition pipe „Copipe“ is cut at right angles to the required length with a pipe cutter, e.g. Oventrop item no. 150 95 80.

#### Deburring and calibrating

By using the Oventrop universal tool, item no. 150 95 94, the pipe end is calibrated and the inner pipe layer is deburred at the same time.

Choose the calibrating and deburring mandrel suitable for the pipe dimension, insert fully into the pipe whilst turning the tool clockwise. Rotate mandrel for at least a further half turn. Remove the tool from the pipe and shavings will be pulled out automatically. Please observe operating instructions.

**Check that the end of the pipe is clean and accurately deburred.**

#### Push pipe onto press fitting

Push pipe under slight pressure as far as it will go onto the press fitting "Cofit P". Check through viewer in stainless steel casing.

#### Placing the press fitting tool into position

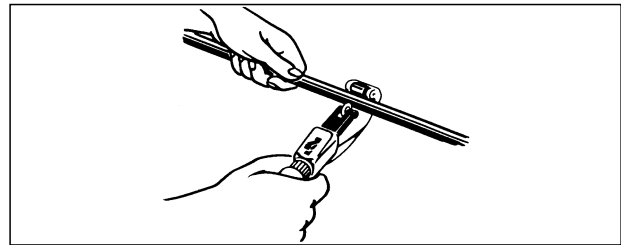
Insert press bits into fitting machine and place machine into position at a right angle. The guiding elements encircle the press fitting "Cofit P" at the collar.

#### Pressing

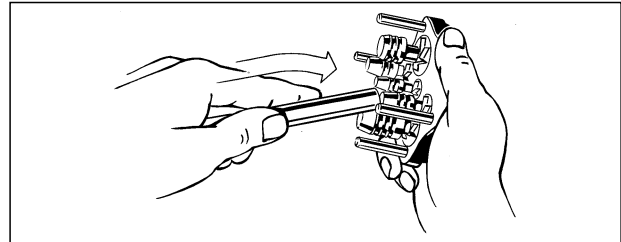
Carry out pressing. The press bits must close completely. Please observe operating instructions.

#### Leakage testing

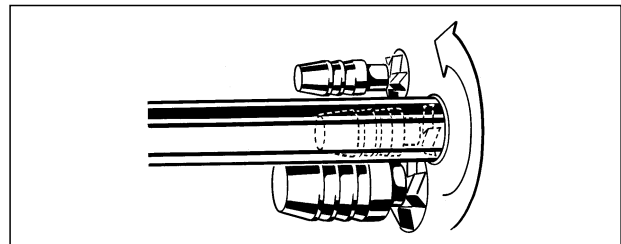
Please ensure that all standard leakage test procedures are carried out.



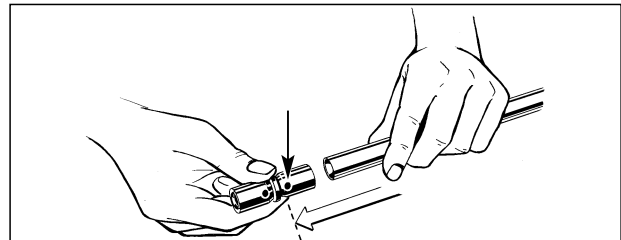
Cut pipe at right angles



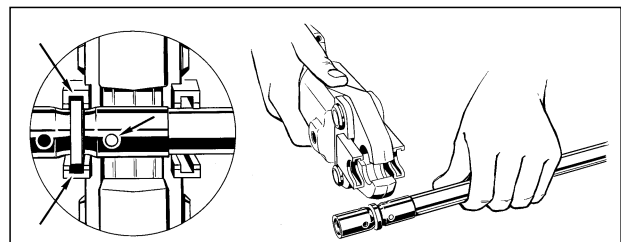
Calibrate pipe



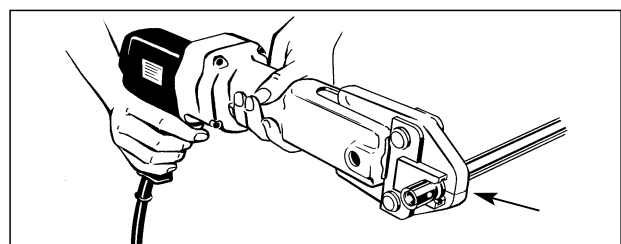
Debur inner plastic pipe layer



Push pipe onto press fitting



Place press fitting tool into position



Carry out pressing

## 8 Installation instructions:

### Press fittings system "Cofit P" 40 x 3.5 mm:

#### Cutting

The composition pipe "Copipe" is cut at right angles to the required length with a pipe cutter, e.g. Oventrop item no. 150 95 80.

#### Deburring and calibrating

Calibrate pipe end and debur inner pipe layer in one operation.

- Oventrop universal tool, item no. 151 95 93:  
Introduce calibrating and deburring mandrel into the pipe whilst twisting the tool clockwise. The cutting edges must be hidden completely.
- Oventrop smoothing tool, item no. 151 95 95, with handgrip, item no. 151 95 96:  
Turn the smoothing tool clockwise whilst pushing it into the pipe as far as it will go.

Rotate both tools for at least a further half turn.

Remove the tool from the pipe and any shavings will be pulled out automatically.

The tool has to be cleaned each time the pipe was smoothed or deburred.

Please observe operating instructions.

**Check that the end of the pipe is clean and accurately deburred.**

#### Push casing onto the pipe

Push casing onto pipe so that about 1-2 mm of the pipe end is visible.

#### Introduce press fitting into the pipe

Introduce press fitting "Cofit P" into the pipe until the pipe end touches the insulation ring. Take care that the fitting is clean and not damaged.

#### Place the press fitting tool

Before placing the press fitting tool, it must be ensured that the composition pipe touches the insulation ring.

Place Oventrop press clamp around the pipe. The casing must be located between the guiding elements. One guiding element encircles the collar of the press fitting "Cofit P".

Lock press clamp.

Place auxiliary bits integrated in the press machine into press clamp.

#### Pressing

Carry out pressing. The press clamp must close completely. Please observe the operating instructions.

#### Leakage testing

Please ensure that all standard leakage test procedures are carried out.

## 9 Installation instructions:

### 9.1.1 General information:

For - radiator connection

- underfloor heating systems
- sanitary installations

The Oventrop composition pipe „Copipe“ must be insulated according to current regulations and guidelines:

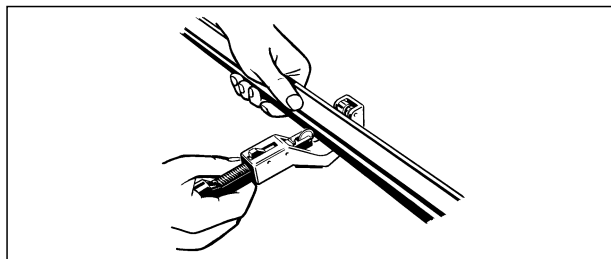
Thermal conductivity of the pipes:

$$\lambda = 0.43 \text{ W / (m} \cdot \text{K)}$$

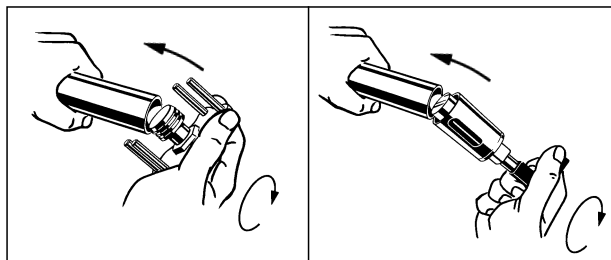
Installation of the press fittings as described under point 7 and 8. In case of installation under plaster or in concrete, fittings must be protected e.g. by a foil.

### 9.1.2 Change in length of pipe:

Temperature changes will effect the composition pipe „Copipe“ and it will either expand or retract. The movements which are to be expected must not be obstructed by the directions or positions of the pipe. To avoid traction on the pipe or bending of the pipe, fixed points must be set in the area where there are connection points.

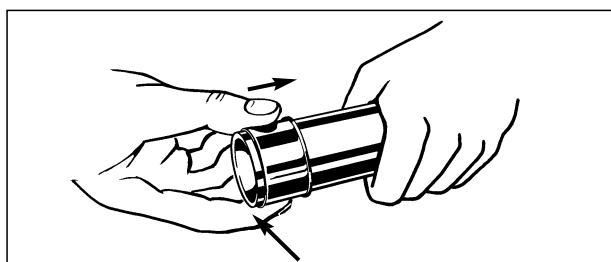


Cut pipe at right angles

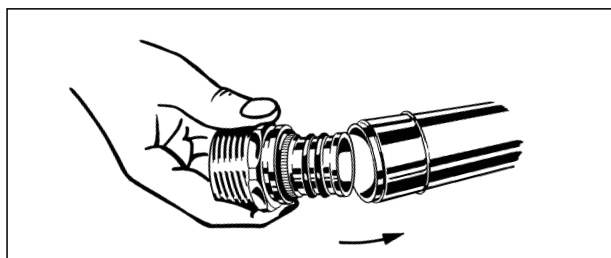


Calibrate and debur pipe

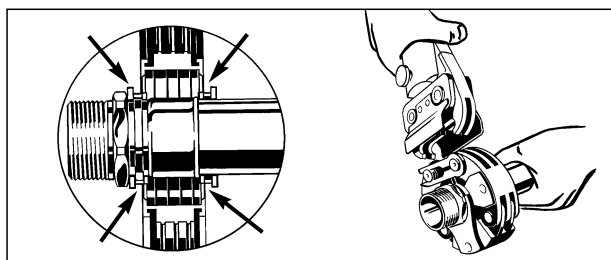
Smooth and debur pipe



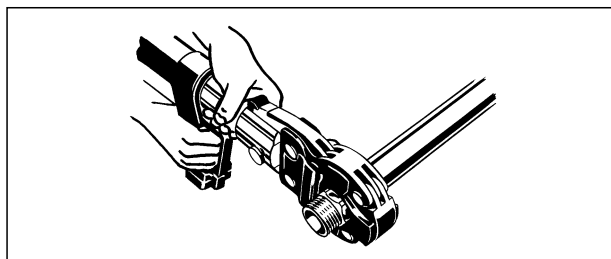
Push casing onto pipe



Introduce press fitting into pipe



Place press fitting tool into position



Carry out pressing

The linear coefficient of expansion is almost the same as that of copper pipes. Regardless of the pipe dimension it amounts to:

$$\alpha = 0,024 \text{ mm} / (\text{m} \cdot \text{K})$$

The thermal conditional change in length is calculated with the following formula:

$$\Delta L = \alpha \cdot L \cdot \Delta \vartheta$$

	Formula sign	Unit	Values for example
Change in length	$\Delta L$	mm	
Coefficient of expansion	$\alpha$	mm / (m · K)	0,024
Length of pipe	L	m	5
Difference in temperature	$\Delta \vartheta$	K	60

Example:  $\Delta L = 0,024 \text{ mm} / (\text{m} \cdot \text{K}) \cdot 5 \text{ m} \cdot 60 \text{ K}$   
 $\Delta L = 7,2 \text{ mm}$

This result can also be taken from the chart shown under point 14.

This change in length may e.g. be compensated by the insulation material absorbing this expansion.

In openly installed pipework, unhindered expansion is ensured by the use of fixed point brackets and mobile brackets, for instance with 90° pipe loops.

The minimum length of the loop is calculated by using the following formula:

$$BS = c \cdot \sqrt{(D \cdot \Delta L)}$$

	Formula sign	Unit	Values for example
Loop length	BS	mm	
Material constant of "Copipe" (= 33)	c	-	33
Outer pipe diameter	D	mm	16
Change in length	$\Delta L$	mm	7,2

Example:  $BS = 33 \cdot \sqrt{(16 \text{ mm} \cdot 7,2 \text{ mm})}$   
 $BS = 354 \text{ mm}$

This result can also be taken from the chart shown under point 15.

## 9.2 Radiator connection:

One- and two pipe systems

### 9.2.1 Pipework (risers):

For this application, Oventrop offers the composition pipe "Copipe" in dimensions up to 40 x 3,5 mm as well as the press fittings "Cofit P".

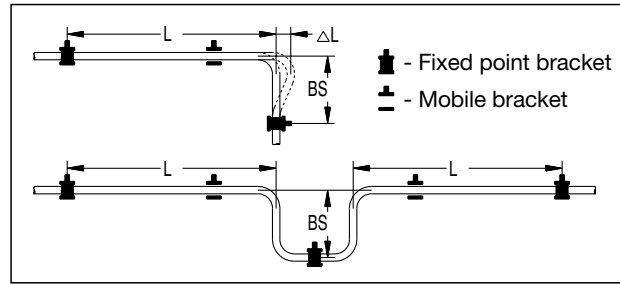
Pipes are to be bent and cut according to the indications of the architect or contractor. Oventrop offers the required installation tools. The minimum pipe bending radii can be taken from table 1. Commercial pipe bending tools may be used to bend larger pipe dimensions.

The connection to Oventrop valves and controls is made by means of the appropriate connection press fittings. The installation instructions are to be followed.

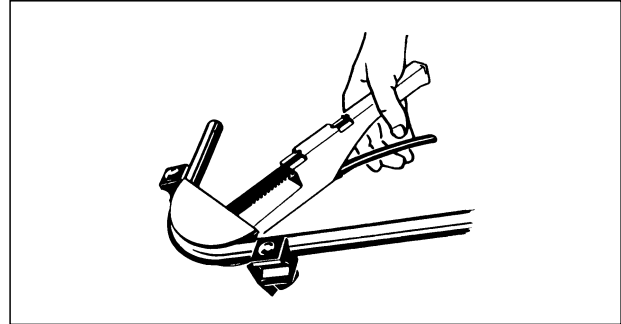
Fixing of pipework onto walls or under ceilings can be carried out e.g. by means of standard sound absorbing pipe brackets for plastic pipes. The distances between the fixing points are given in table 2.

### 9.2.2 Multi storey pipe distribution:

Quick installation of pipework directly of the roll. The pipe can be bent by hand, by using the bending spring or the bending tool. The pipe must not be kinked. Damaged parts are to be removed.



Compensation of changes in length



Bending of pipes with bending tool

Outer pipe diameter x wall thickness $D_a \times s$	Bending by hand ( $5 \times D_a$ )	Bending by hand with bending spring ( $3 \times D_a$ )	Bending with Oventrop bending tool
Ø 14 x 2.0 mm	70 mm	42 mm	42mm
Ø 16 x 2.0 mm	80 mm	48 mm	49 mm
Ø 20 x 2.5 mm	100 mm	60 mm	79 mm
Ø 26 x 3.0 mm			88 mm
Ø 32 x 3.0 mm	Installation with elbows or bending with standard tools		
Ø 40 x 3.5 mm			

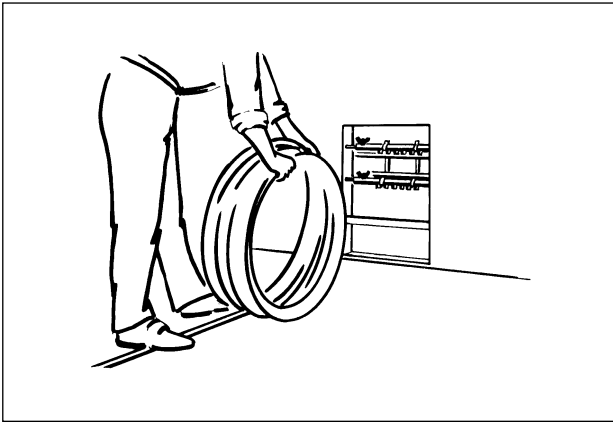
Table 1: Minimum bending radii for Oventrop composition pipe „Copipe”

Outer pipe diameter $D_a$	Distance A	
Ø 14 x 2.0 mm	1.0 m	
Ø 16 x 2.0 mm	1.0 m	
Ø 20 x 2.5 mm	1.25 m	
Ø 26 x 3.0 mm	1.5 m	
Ø 32 x 3.0 mm	2.0 m	
Ø 32 x 3.0 mm	2.0 m	
Ø 40 x 3.5 mm	2.0 m	

Table 2: Distances between fixing points for Oventrop composition pipe „Copipe”

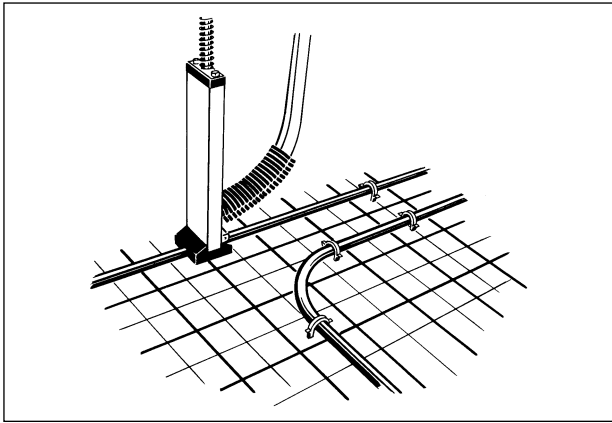


**Radiator connection:**

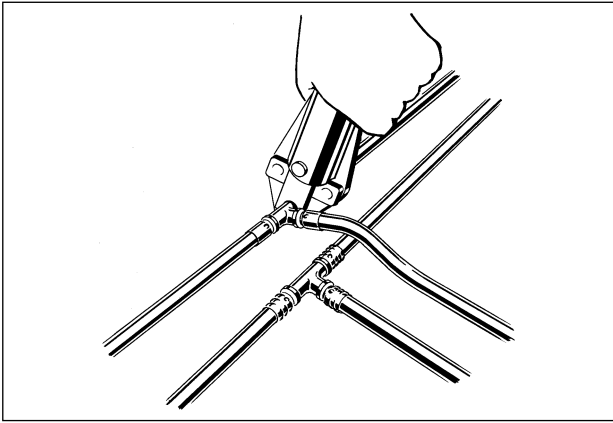


Lay pipes by taking it of the roll

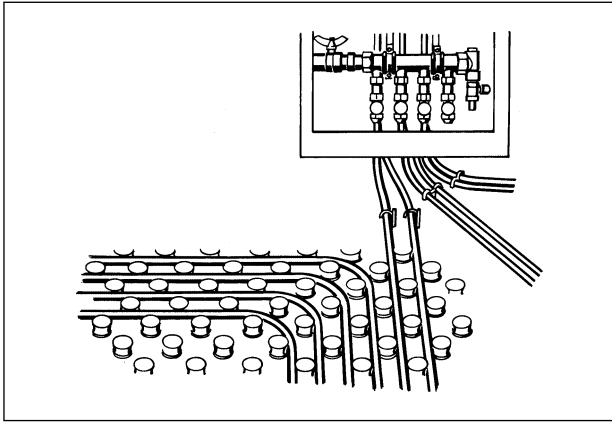
**Underfloor heating systems:**



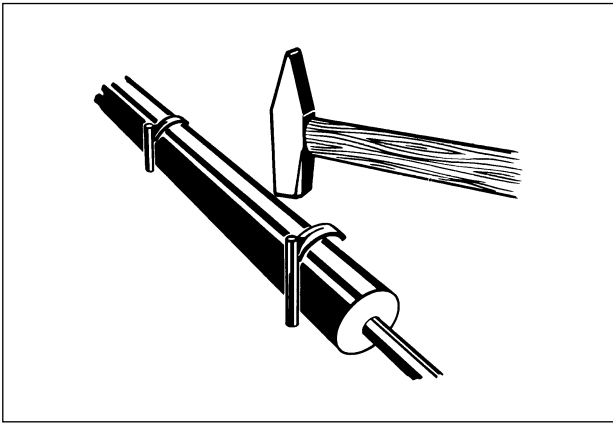
Fix pipe with U-clips and tacker



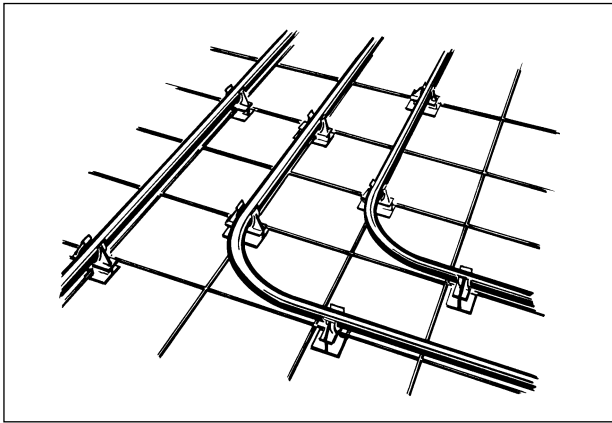
Connect pipes



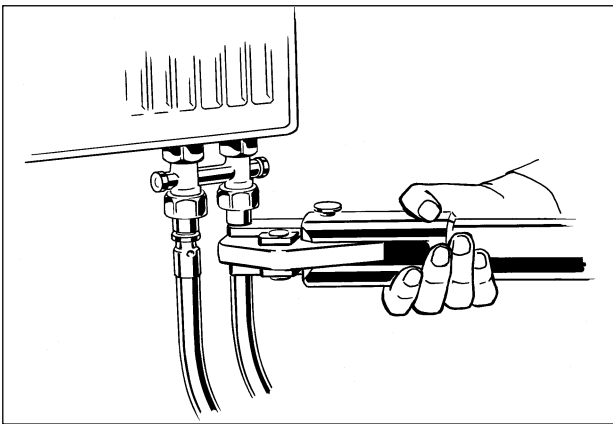
Base mat system



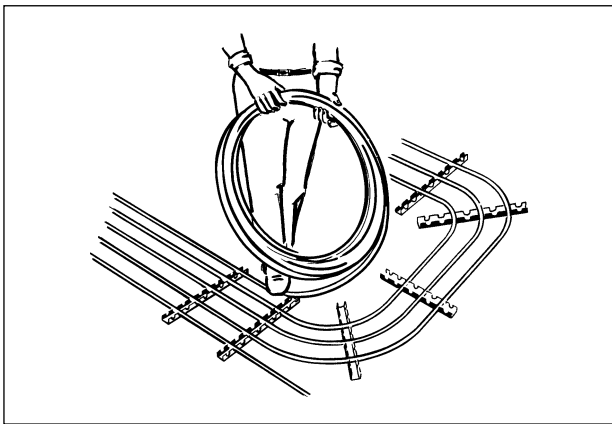
Fix insulated pipes



Steel mat system



Connect to radiator



Mounting rails system

Fix pipe onto concrete or onto an insulation layer with Oventrop dowel hooks. To do so, drill 8 mm holes and drive the dowels into the floor. Fix pipe onto wall by using the Oventrop pipe brackets. Use a regular pin with M 6 sized thread and screw the pipe onto the wall. Press pipe into bracket. When installing pipes in horizontal position on plaster, the distances between fixing points as per table 2 are to be observed.

The "Combi-System" allows two principal methods of installation:

- direct connection to centrally located distributor/collector and radiator
- installation of a ring pipe system by means of press fittings

The Oventrop programme offers valves and controls for the connection of radiators with and without integrated distributor. The variety of connection possibilities can be taken from the technical data sheets.

When connecting pipes to the Oventrop valves by means of press fittings, the installation instructions have to be followed.

### 9.3 Underfloor heating systems:

#### 9.3.1 Pipework (risers):

Install pipework as described under point 9.2.1.

#### 9.3.2 Multi storey pipe distribution:

Installation of pipework from centrally located distributor/collector:

- laying pipes on insulation boards covered with anchoring cloth and foil  
fixing pipes by means of U-clips and tacker
- laying pipes on base mats by pressing pipe into mouldings
- fixing pipes on concrete-steel mats
- laying pipes on mounting rails by pressing pipe into grooves

Further information regarding installation of pipework see point 9.2.2.

When connecting pipes to the Oventrop valves by means of press fittings, the installation instructions have to be followed.

The Oventrop programme for underfloor heating systems includes all necessary regulating valves and controls for individual room temperature control.

### 9.4 Sanitary installations:

#### 9.4.1 Pipework (risers):

Installation of pipes as described under point 9.2.1. The installation of circulation pipes is possible by using pipes of smaller dimensions.

#### 9.4.2 Multi storey pipe distribution:

The "Combi-System" allows the known installation methods:

- Installation with straight pattern wall mounted connection pieces. All connection points are near the extraction points
- Installation of a ring pipe system. The final valve is connected to the supply pipe again
- Installation of a circulation pipe for hot water supply
- Connection of all delivery valves to branch lines, installation by means of press T-pieces and wall mounted connection pieces
- Installation with sanitary distributor, connection of the delivery valves via individual supply pipes

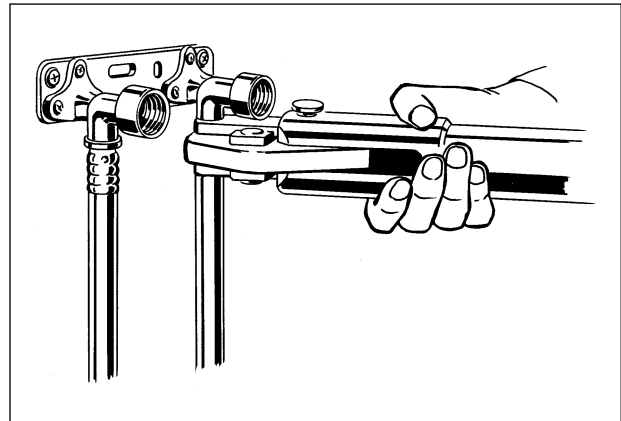
Information regarding installation of pipework see point 9.2.2.

When connecting pipes to the Oventrop valves by means of press fittings, the installation instructions have to be followed.

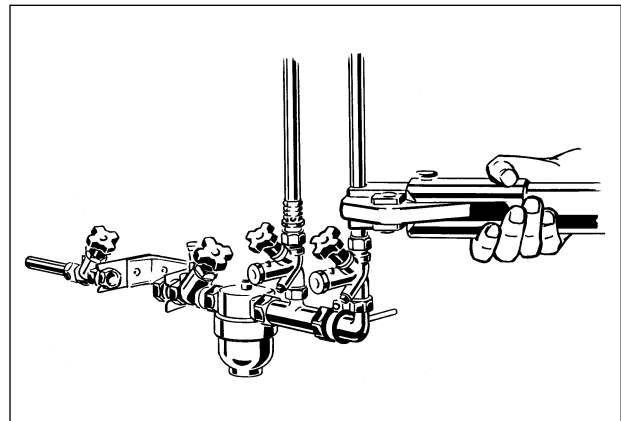
#### 9.4.3 Water content of pipework:

The opposite table helps to determine the water content of the pipework.

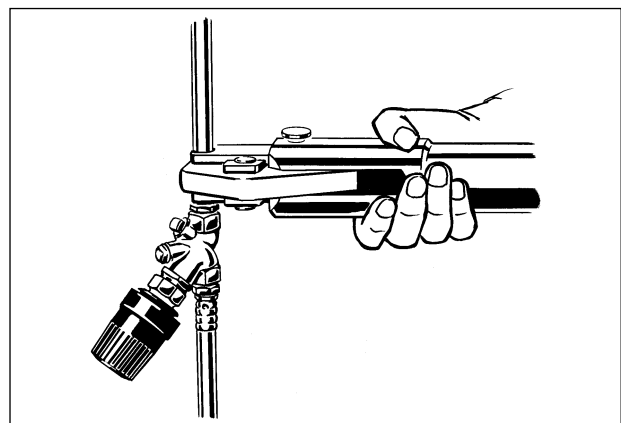
### Sanitary installation:



Connection for delivery valves



Domestic water connection and risers



Circulation pipe with thermostatic regulating valve

Dimension	Size	Inner volume	Weight of pipe
Ø 14 x 2,0 mm	DN 10	0,079 l/m	104 g/m
Ø 16 x 2,0 mm	DN 12	0,113 l/m	125 g/m
Ø 20 x 2,5 mm	DN 15	0,177 l/m	185 g/m
Ø 26 x 3,0 mm	DN 20	0,314 l/m	285 g/m
Ø 32 x 3,0 mm	DN 25	0,531 l/m	393 g/m
Ø 40 x 3,5 mm	DN 32	0,855 l/m	605 g/m

Composition pipe "Copipe"  
Inner volume, weight of pipe

## 10 Fire protection:

For reasons of preventive fire protection, the national construction guidelines and the regulations for high buildings prescribe special wall and ceiling ducts for the pipework for certain types of buildings. They serve to avoid the transmission of fire and smoke to neighbouring parts of the building. Moreover, the regulations regarding sound insulation and heat protection are to be observed.

The composition pipes "Copipe" are classed flammable pipes, building material class B2.

Up to an outer diameter of 26 mm, non-flammable and sound absorbing coatings act as a fire barrier in accordance with Fire Resistance Regulations Class R 90.

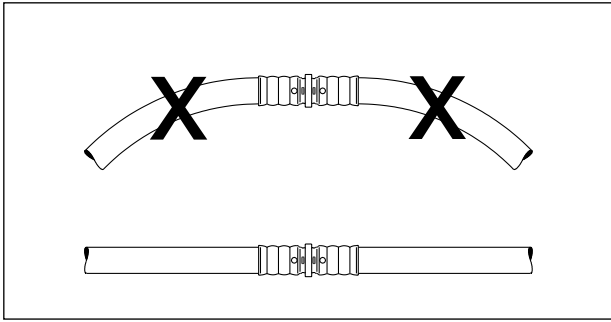
For pipe diameters exceeding 32 mm, fire protection systems which are tested and approved by the construction supervising authority, are prescribed. The specialist store offers two such systems which are suitable for the composition pipe "Copipe", e.g.

- Fire barrier type 3088-ALU of the company Doyma. In case of a fire, two fire barrier packs swell and close the wall or ceiling duct. The fire barrier has to be installed together with the pipe, a subsequent installation is not possible.
- Pipe coating Conlit 150 and continuing insulation shells RS 800 or 835 made of mineral wool of the company Rockwool.

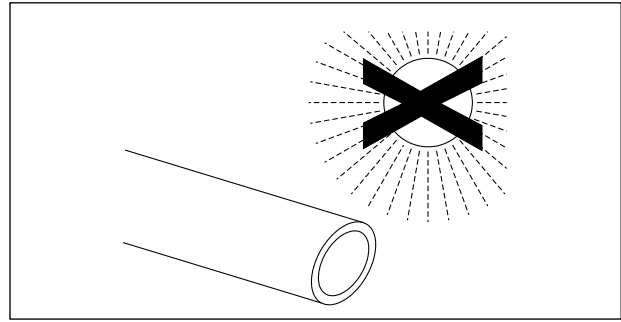
For further information regarding planning and installation of fire protection systems, please contact the a.m. manufacturers.



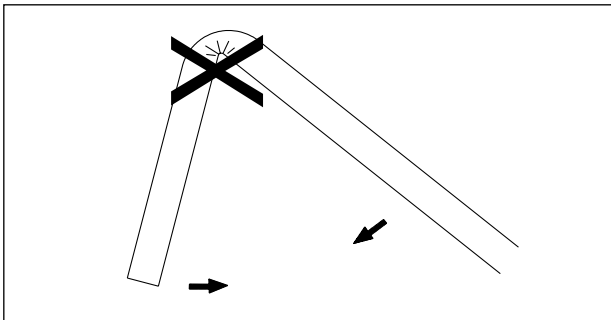
**12 Additional information on composition pipe „Copipe“:**



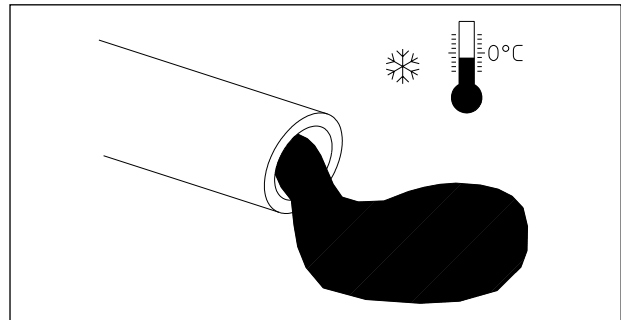
Use only connections and fittings belonging to the system. Install connections and fittings only on straight pipes, never on bends.



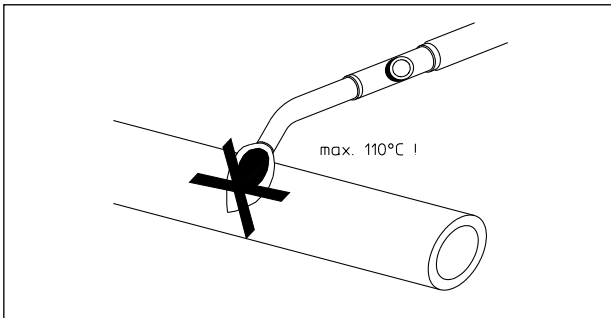
Protect pipe from direct sunlight (UV rays). Do not store in the open without protection.



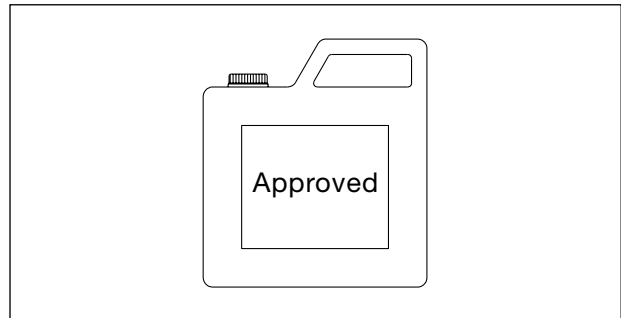
Do not kink/break pipes. Any accidentally kinked parts of the pipe or pipe ends must be removed.



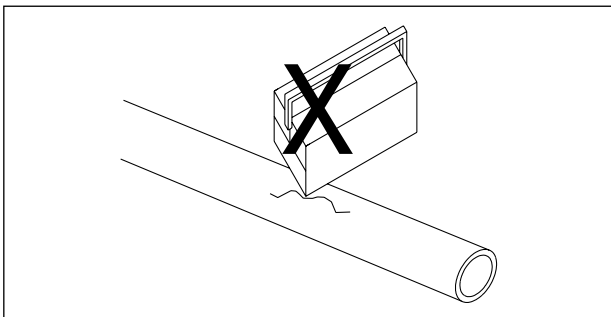
Protect from frost damage by draining pipes or adding a suitable antifreeze liquid to the heating system.



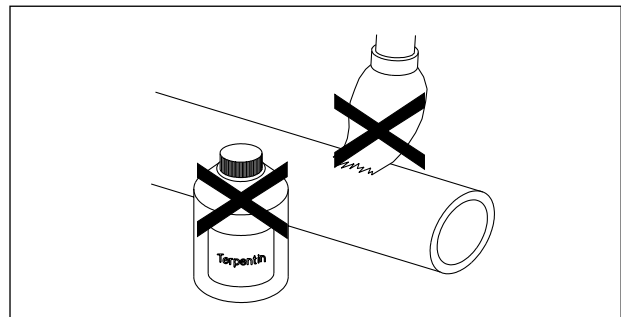
Do not subject pipes to temperatures exceeding 110°C.



Only use fluids which do not impair the conditions of the pipe. Care must also be taken with additives for heating systems and concrete mixes.



Protect pipes from deformation and mechanical damages.

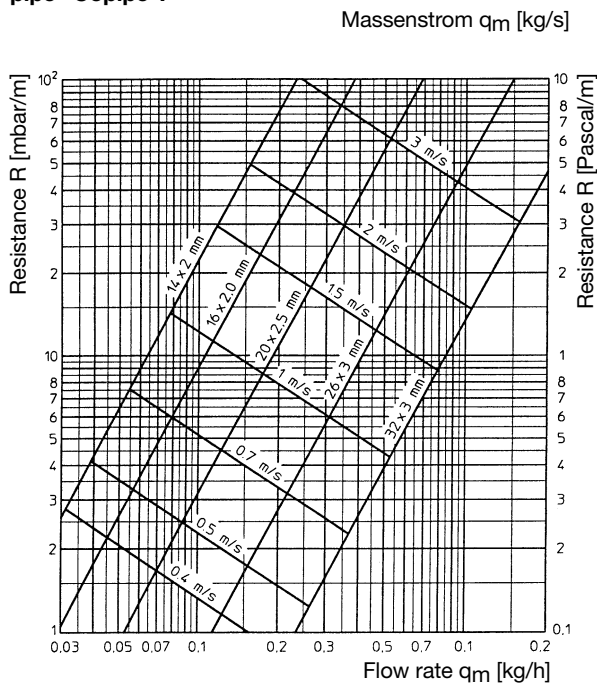


Do not use paints, sprays, pens, cleaning agents, adhesive tape etc. containing solvents on the pipe. When insulating the pipe, use only those materials which will cause no damage to the pipe.

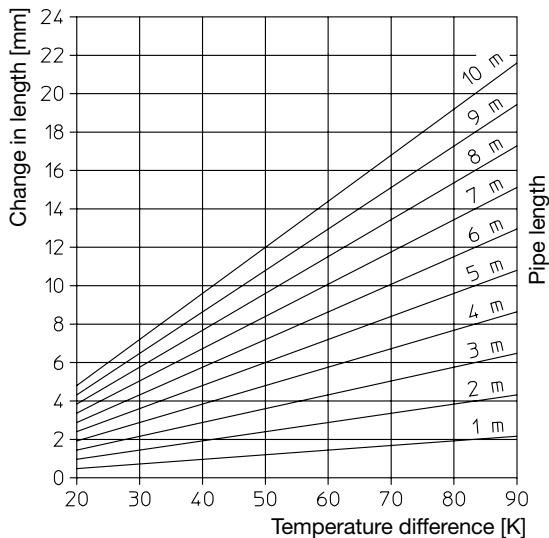
**Important:**

Follow the instructions of Oventrop and the manufacturers of other components, as well as the guidelines, DVGW work sheets and technical rules and regulations.

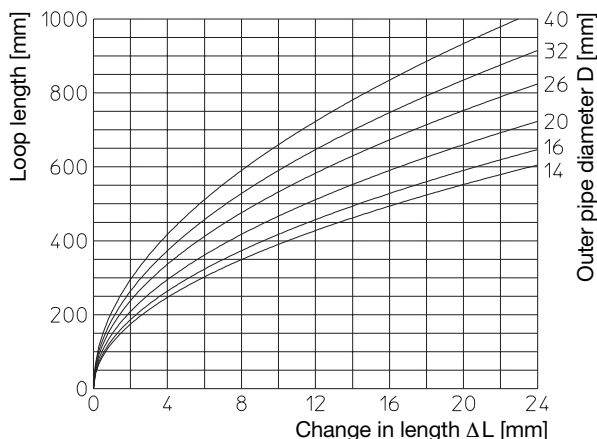
**13 Pressure loss chart for Oventrop composition pipe "Copipe":**



**14 Thermal conditional change in length of Oventrop composition pipe "Copipe":**



**15 Loop chart for Oventrop composition pipe "Copipe":**



Subject to technical modification without notice.

Product range 14  
ti 91-1/10/4.2000/MW

**16 Advantages:**

- complete system from one supplier
- DVGW system approval (DVGW DW-8501AT2407) for all dimensions
- lasting tightness, thus installation even under plaster and concrete
- same pipe and fittings programme for these applications:
  - o radiator connection
  - o underfloor heating systems
  - o sanitary installations
  - o rain water usage plants
- no mistaken identity of pipes and fittings
- high quality composition pipe "Copipe" combines the advantages of metal and plastic pipes
  - o flexibility allows bending by hand, small bending radii (5 x  $D_a$  without tool, 3 x  $D_a$  with bending spring or bending tool)
  - o no spring back of pipe
  - o no diffusion of oxygen
  - o corrosion resistant, no build up of residues
  - o minimal long term pressure loss
  - o minimal heat expansion (as with metal pipes)
  - o high stability
  - o erosion resistant outer pipe layer
  - o small weight important with rising pipework
  - o pipe connection without using heat
  - o excellent long term durability
- all components of the "Cofit P" programme coming into contact with water are made of high quality corrosion-resistant materials
- time-saving and easy to install
- clean connection system
- safe due to triple radial pressing
- double O-ring seal
- galvanic separation between fitting and pipe
- captive stainless steel casing
- control of insertion depth of pipe by means of viewers
- mixed installation with any pipe material is possible, independent of the direction of flow
- materials may be recycled



**DVGW-Reg.-Nr.  
DW-8501AT2407**