

Geberit Meppla

Application Technique



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Geberit Mepla and Mepla pipe with protective tube – Properties

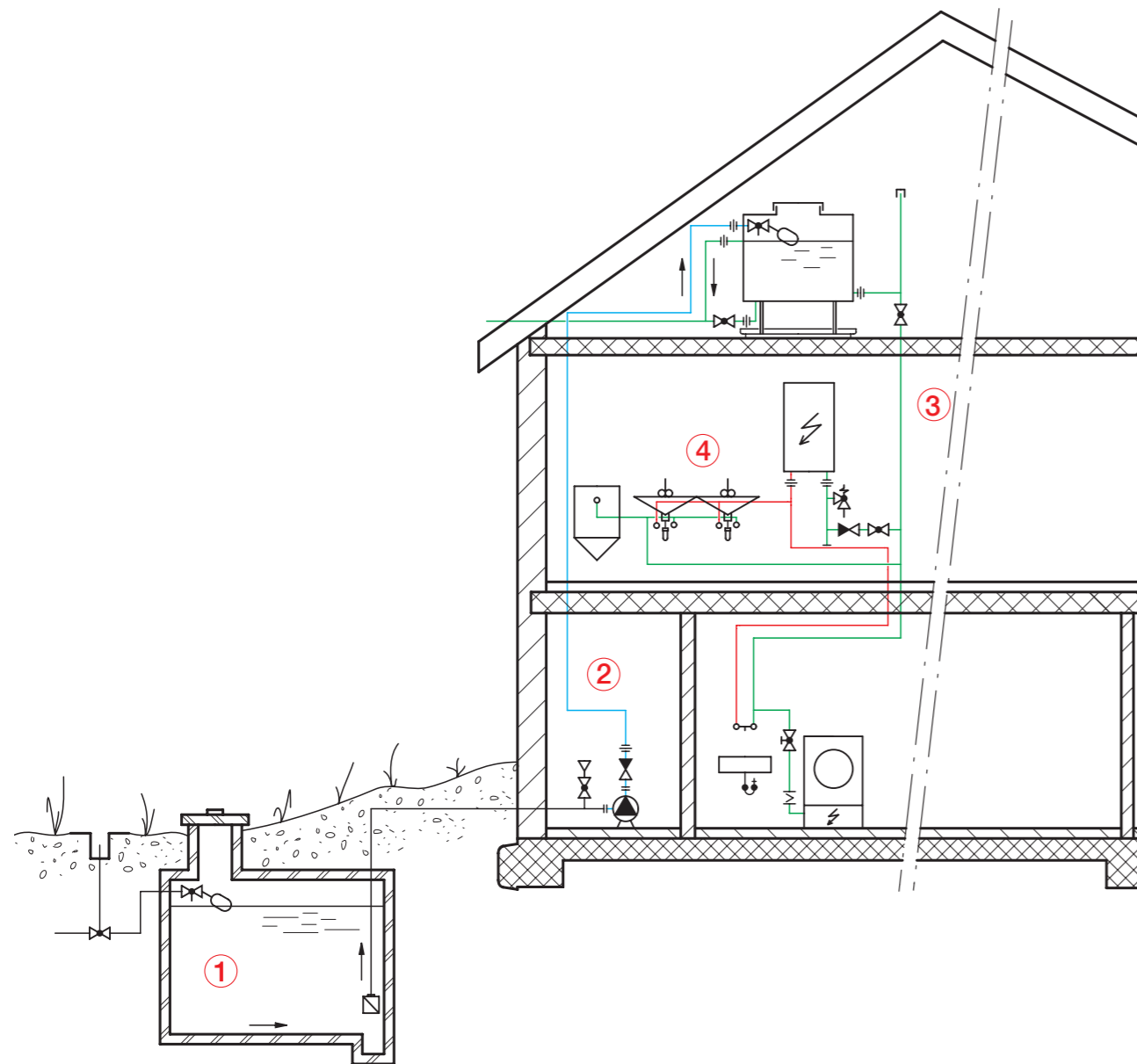
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Water supply system

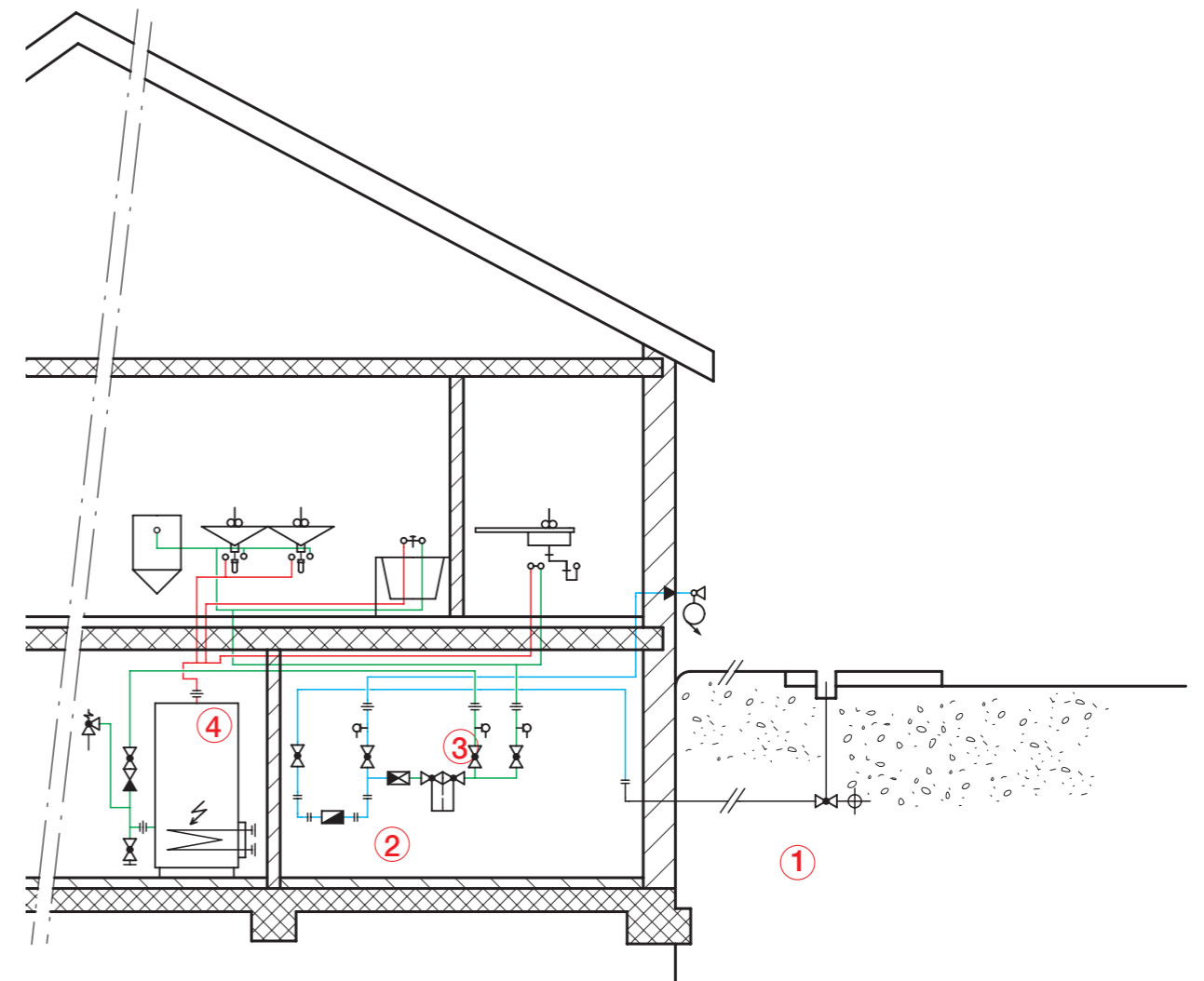
Distribution with ground tank and roof tank



- ① Ground tank
- ② Pump line Mepla
- ③ Cold water distribution Mepla
- ④ Hot water distribution Mepla

Water supply system

Distribution with direct pressure from main water supply



- ① Main water supply
- ② Water metre/pressure reduction valve/filter
- ③ Cold water distribution Mepla
- ④ Hot water distribution Mepla pipe with protective tube

Water supply system

Properties of Mepla

- homogeneous and non-delaminating composite pipe
- internally and externally corrosion resistant
- low thermal expansion
- bending without loss of integrity
- extraordinary ease of installation
- lightweight and aesthetic
- diffusion resistant
- no light penetration
- high mechanical resistance
- no support shell needed
- less fixations needed
- inherently stable yet flexible

Properties of the Mepla compression joint fitting

Resistant to corrosion.

Press-in profile protected by a cap prior to installation.

The Mepla compression joint

The Geberit Mepla joint is a permanent radial compression joint licensed for use in all types of concealed installations.

Properties of the Mepla compression joint

Clean, secure connection.

Clear positioning of the pressing jaws.

High durability under long-period stressing.

Insertion depth can be checked at any time.

Compliance

 <p>ISO-Net THE INTERNATIONAL CERTIFICATION NETWORK CERTIFICATE</p> <p>Member since 2012</p> <p>GEBERIT AG CH-8645 Jona</p> <p>Certified area: Geberit Group (please see appendix)</p> <p>Field of activity: Sanitary Technology</p> <p>has implemented and maintains a Management System which fully complies with the following standards: ISO 9001:2008 / ISO 14001:2004</p> <p>Scope: See 10. 07 Valid until: 2015.03.31 Validity date: 2014.02.05 Registration Number: CH-2064</p>	<p>European Quality Certificate ISO 9000</p> <p>For its manufacturing plants in Europe, Geberit has received the highest quality system certification available, issued by the Swiss EQ-Net member SQS for compliance with the ISO 9001/EN 29000 series, which corresponds to BS 5750. EQ-Net members are in all countries throughout Europe, including BSI QA United Kingdom.</p>
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ISO- Standard 9001

This certificate is renewed every year.

ISO- Standard 14001

Approvals: Germany, Switzerland, Austria, France, Italy, Netherlands, Belgium, Denmark, Great Britain, Poland, Czech. Republic, Russia, Romania, South Africa

For Shipbuilding: DNV, American Bureau of Shipping, Germanischer Lloyd, Lloyd's Register, RINA.

The Geberit Mepla supply system

Geberit Mepla is a corrosion-resistant supply system for all drinking water qualities and universal applications. Mepla system pipes can be used for sanitary applications as well as for heating, cooling and compressed air. The pressed joint and the multilayer pipe meet all requirements of modern domestic drinking water installations.

Geberit Mepla combines the stability advantages of metal with the corrosion resistance of plastic. The stability of the Mepla system pipe is ensured by the longitudinally welded aluminum pipe. This production process and the pressed joint, which does not require any sleeve, are internationally patented by Geberit.

Mepla system pipes are flexible, easy to bend, remain inherently stable and considerably facilitate installation work. This innovative pipe requires no time-consuming measuring and fewer fastenings. The lightweight multilayer pipe also meets the requirements for visually attractive surface-mounted installations. The range of fittings comprises plastic, gunmetal and brass fittings. The metal fittings are used only as adapters to other systems and components (e. g. valves, taps) and were developed in response to the varying demands of the market. Since its introduction in 1990, Geberit Mepla has been developed on an ongoing basis, and has evolved as a reliable and modern piping system. The latest developments from 2004–2006 focused on extending the dimension ranges d 63 mm and d 75 mm as well as a complete revision of the fittings to feature a safety pressed joint. When unpressed, the safety pressed joint indicates the unpressed condition through a defined leak. **Leaky if unpressed – visibly safe.**

Application field

• Embedding of pipes

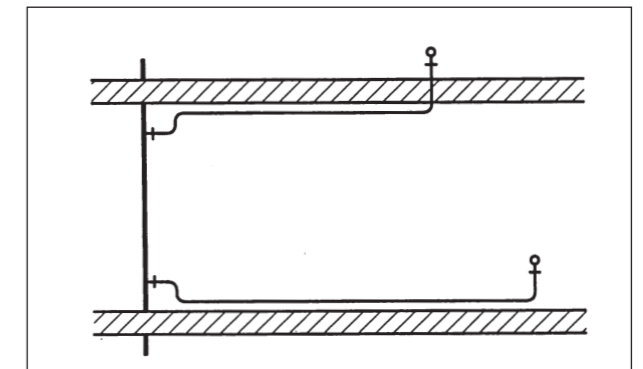
The Geberit Mepla compression joint is a non-releasable connection **and it may be embedded at any desired location.**

The main applications of Geberit Mepla are:

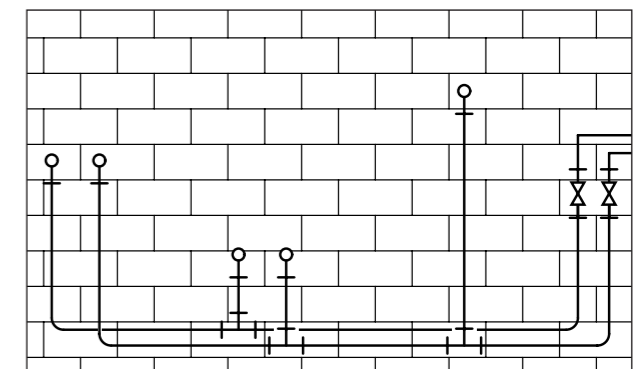
- Drinking water supply
- Heating
- Cooling
- Compressed air



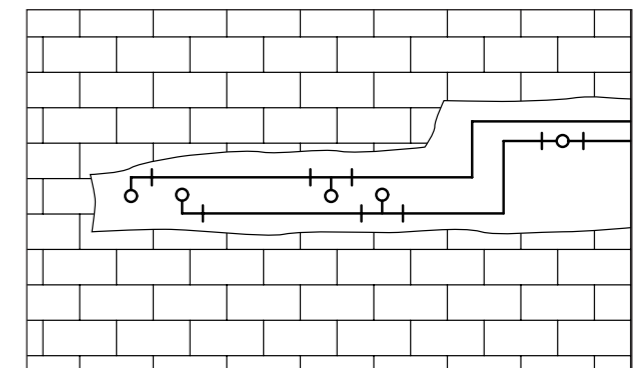
Requirement: Concealed pipes and fittings have to be insulated or placed in protective tubes to meet the requirements of acoustical insulation thermal expansion and corrosion prevention.



In the riser pipe



In subflooring

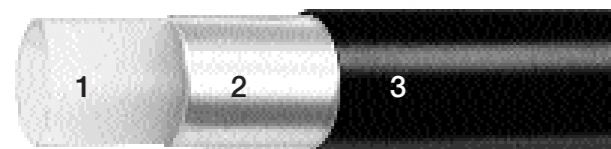


In walls

Geberit Mepla is not suitable for:

- Very hot water (over 70 °C long-term and max. 95 °C short-term, max.150 h per year) and saturated steam
- For extinguishing water and fire extinguishing pipes
- Sprinklers
- Combustible gases (natural gas, town gas)
- Liquefied gases
- Technical inert gases
- Process pipes
- Chemical applications
- Cooling agents and lubricants
- Engine and gearbox oils
- Heating oil
- Fuel

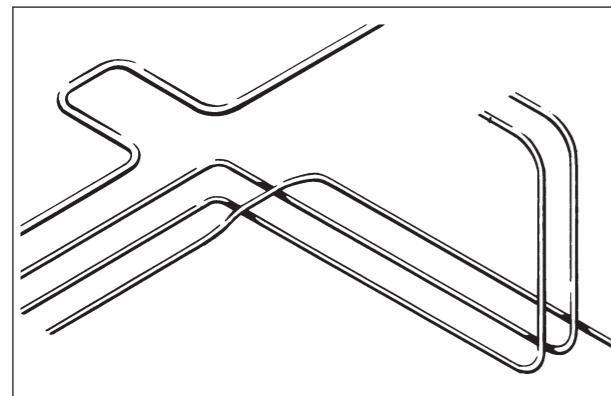
Properties of Mepla fittings and pipes



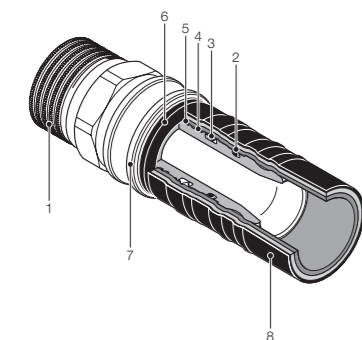
Construction of the Mepla system pipe

1. Inner pipe made of PE-Xb
2. Aluminium pipe
3. Protective jacket made of HDPE

All layers are bonded with adhesive ensuring a strong flexible pipe.



The Geberit Mepla and Mepla pipe with protective tube is inherently stable and retains its shape.

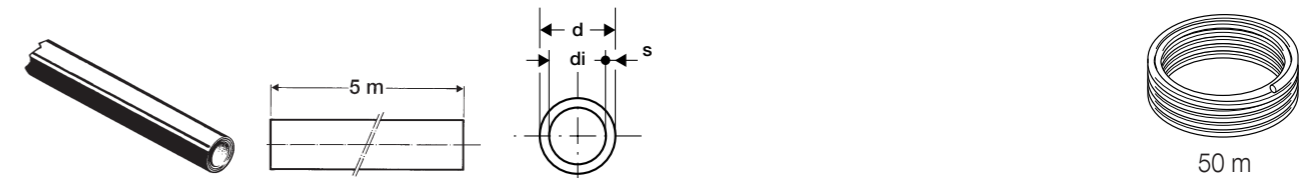


Mepla pressed joint after pressing

1. Fitting body
2. O-ring
3. Pipe holding ring
4. Twist lock
5. Holding grooves
6. Corrosion barrier washer
7. Tool guide rim for pressing jaw
8. Mepla system pipe

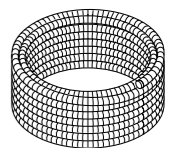
The Mepla compression joint

Geberit Mepla pipes



Nominal (outside) dia d (mm)	16	20	26	32	40	50	63	75
Wall thickness s (mm)	2,25	2,5	3	3	3,5	4	4,5	4,7
Inside diameter (mm)	11,5	15	20	26	33	42	54	65,6
Length per pipe (m)	5	5	5	5	5	5	5	5
Length per roll (m)	50	50	50	-	-	-	-	-
Diameter of roll (m)	0,58	0,80	1,12	-	-	-	-	-
Weight per roll (kg) without protective tube	6,75	9,25	15	-	-	-	-	-
Weight per roll (kg) with protective tube	9,25	13,0	-	-	-	-	-	-
Weight per m pipe (kg/m), without protective pipe	0,135	0,185	-	-	-	-	-	-
Weight per m pipe (kg/m), with protective pipe	0,185	0,260	-	-	-	-	-	-
Weight per m pipe with water 10 °C (kg/m)	0,239	0,362	0,614	0,946	1,450	2,225	3,400	4,83
Water volume (litre/m)	0,104	0,177	0,314	0,531	0,855	1,385	2,290	3,380
Surface roughness inside pipe (mm)	0,007	0,007	0,007	0,007	0,007	0,007	0,007	0,007
Thermal conductivity (W/m . K)	0,430	0,430	0,430	0,430	0,430	0,430	0,430	0,430
Heat capacity (KJ/mK)	0,189	0,268	0,422	0,538	0,795	1,131	1,604	1,864
Thermal expansion coefficient (mm/m . K)	0,026	0,026	0,026	0,026	0,026	0,026	0,026	0,026
Operating temperature range for hot and cold drinking water*	0/70 °C	0/70 °C	0/70 °C	0/70 °C	0/70 °C	0/70 °C	0/70 °C	0/70 °C
Admissible operating pressure (bar)	10	10	10	10	10	10	10	10
Minimum bending radius (mm)	58	70	93	116	160	200	-	-
Recommended bending radius (mm)	80	100	130	160	200	250	-	-

* Permanent load up to max. 70 °C. Short-term load up to max. 95 °C for max. 150 hours per year.



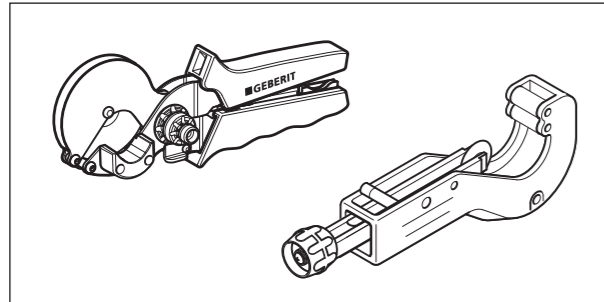
50 m

Protective tube for Mepla

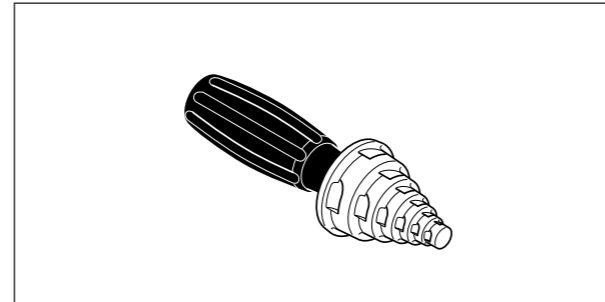
Outside dia D (mm)	23	28	-	-	-	-	-	-
Weight per roll empty (kg)	2,5	3,75	-	-	-	-	-	-

Geberit Mepla tools

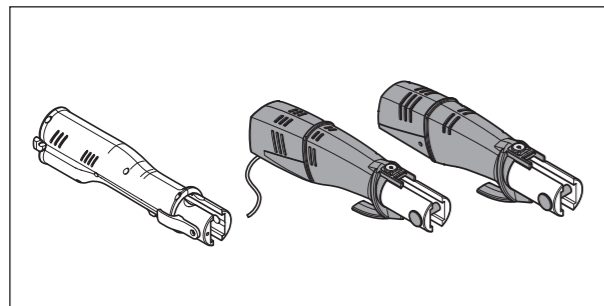
Mepla



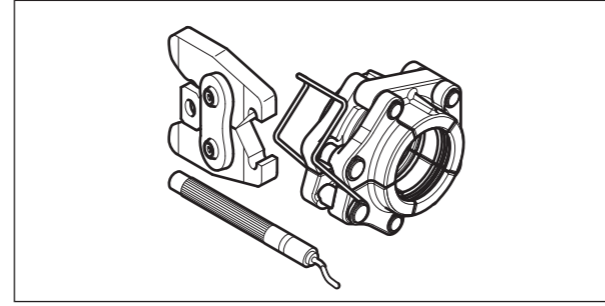
Mepla pliers and cutters



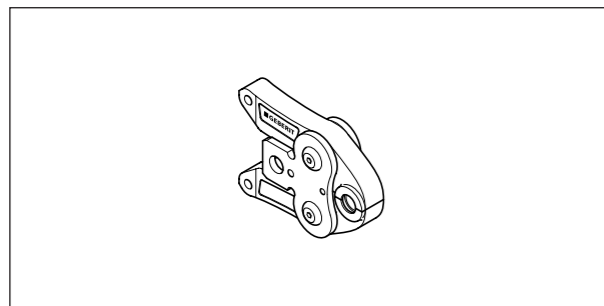
Deburr and calibration tool d 16–50 mm



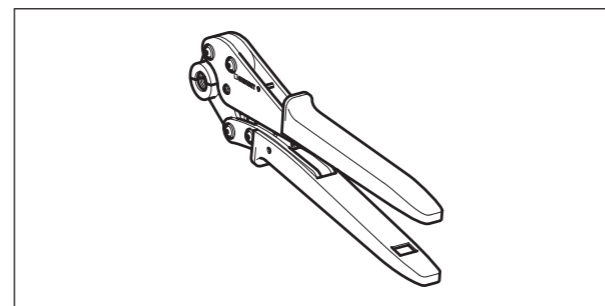
Pressing tools AFP 101, ECO 201 and ACO 201



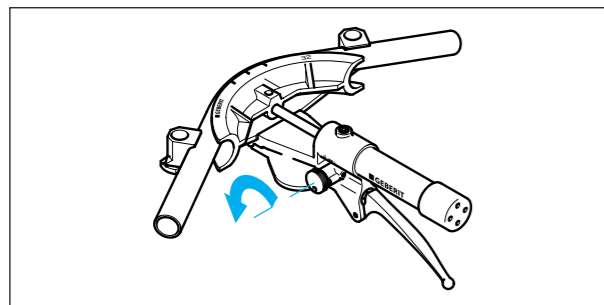
Mepla adapter and pressing collar for d 63 mm and d 75 mm



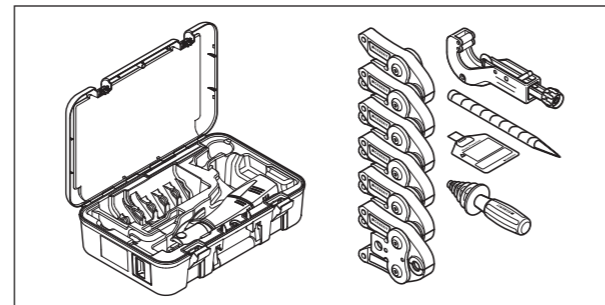
Mepla pressing jaw d 16–50 mm



Mepla hand pressing tool d 16, 20 and 26 mm



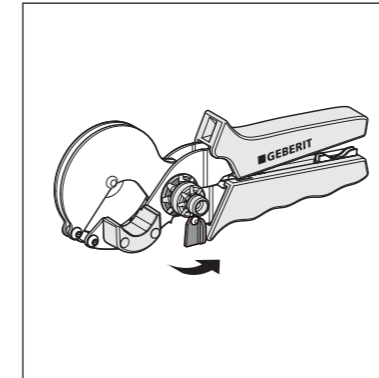
Mepla bending tool d 16–32 mm



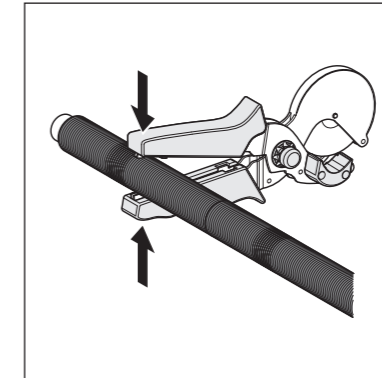
Pressing tool in case and Mepla tool set with pressing jaws

Mepla pipe with protective tube preparation

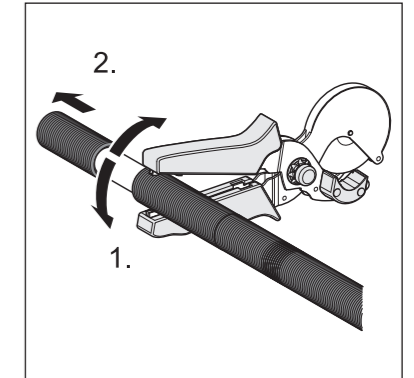
• Preparation of pipe and fitting d 16–20 mm



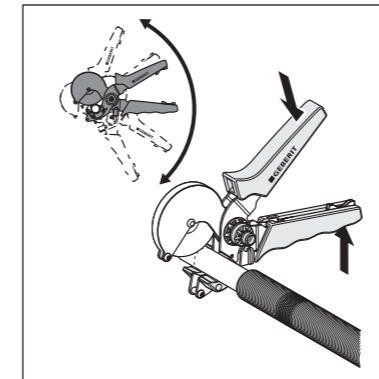
1 Unlock the Mepla pliers.



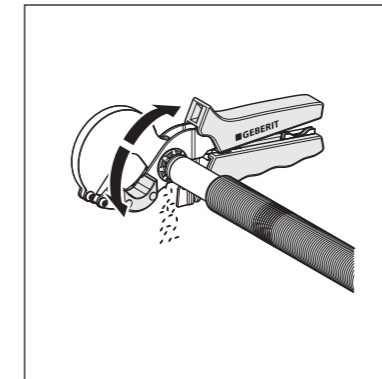
2 Determine the pipe length.



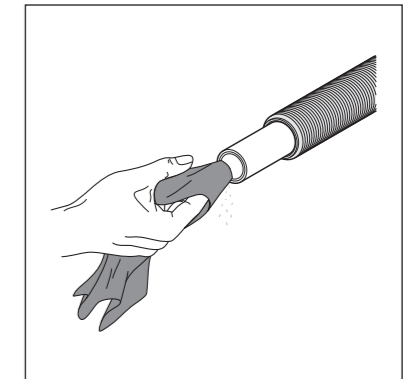
3 Cut the protective tube to length.



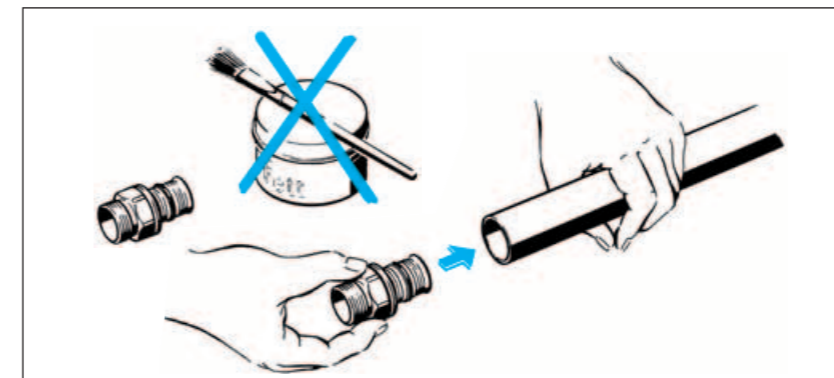
4 Cut the system pipe at a right angle.



5 Calibrate and deburr the ends of the pipe.

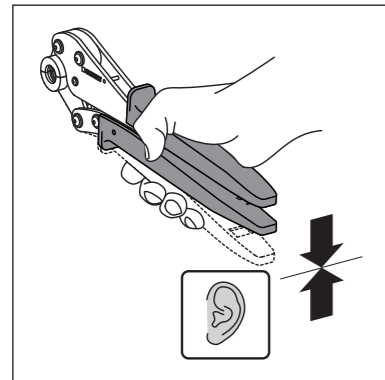


6 Remove chips and check visually that no other dirt is inside the pipe.

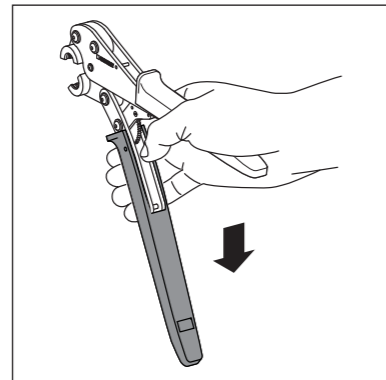


7 Remove protective cap from fitting. The HDPE protective washer remains on the fitting. Press fitting completely into pipe. Do not lubricate under any circumstances the fitting, O-ring or pipe end.

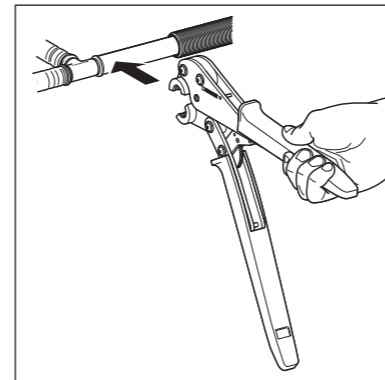
Mepla compression jointing d 16–20 mm



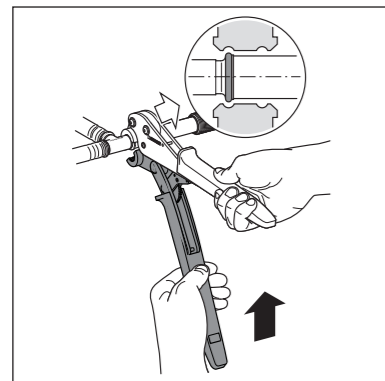
1 Unlock tool by pressing until you hear a click sound.



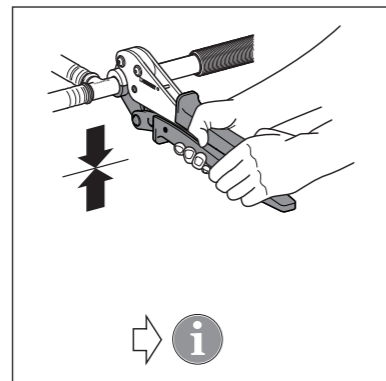
2 Open tool.



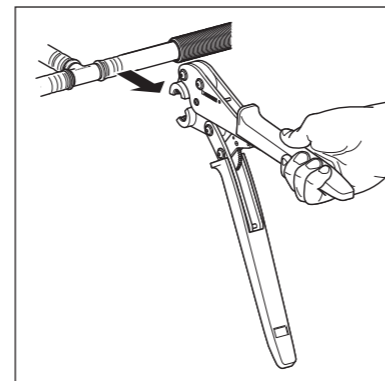
3 Position the tool.



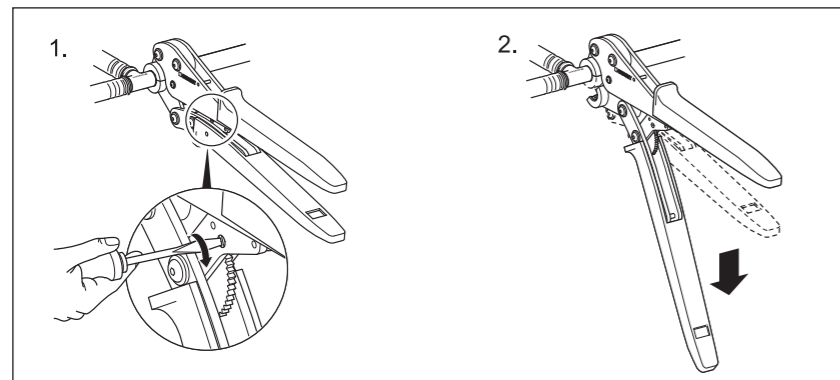
4 Its groove must be on the bulge of the fitting.



5 Press the legs of the pliers completely together.

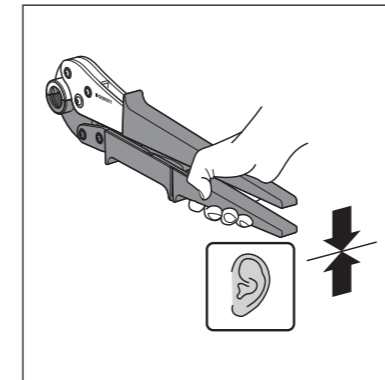


6 Open tool and remove it.

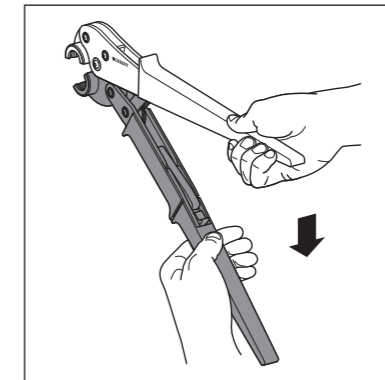


Note:
Releasing a pressing operation made by mistake

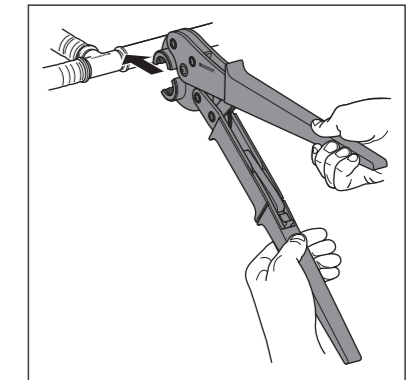
Mepla compression jointing d 26 mm



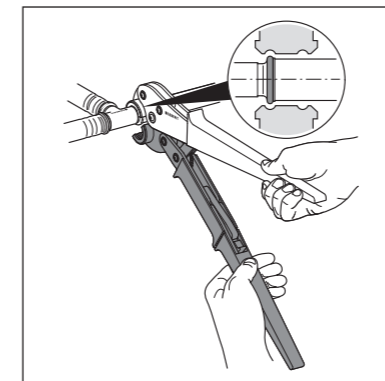
1 Unlock tool by pressing until you hear a click sound.



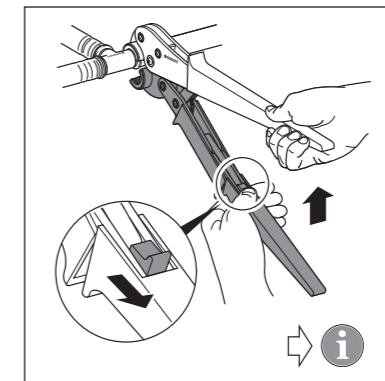
2 Open tool.



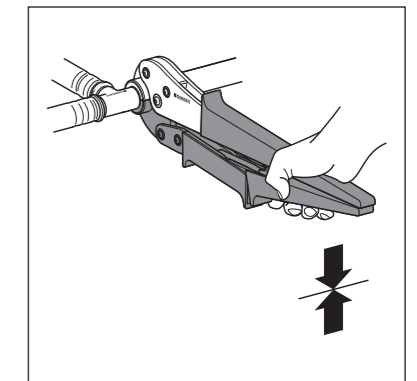
3 Position the tool.



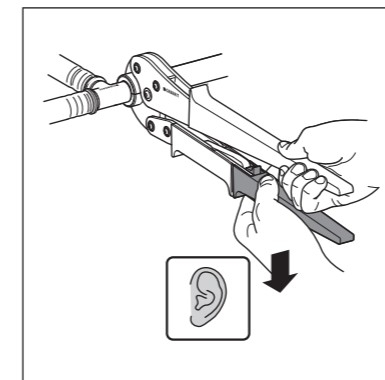
4 Its groove must be on the bulge of the fitting.



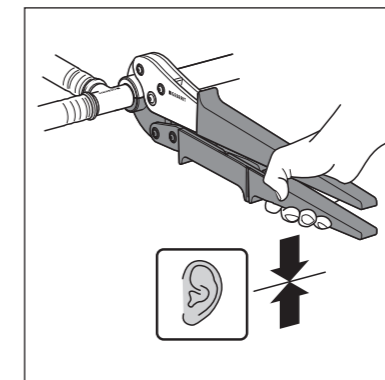
5 Put the legs of the pliers into the offset position by pulling the slide.



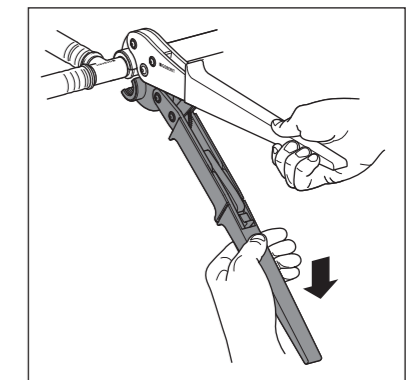
6 Press the legs of the pliers completely together.



7 Put the offset lever back to the initial position.



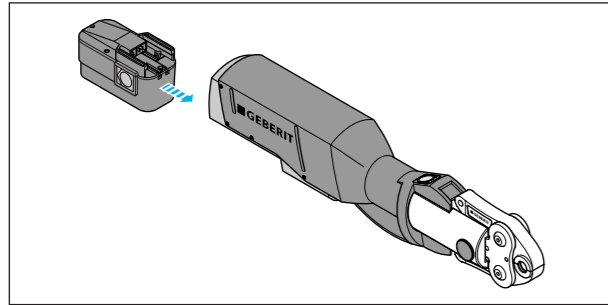
8 Complete the compression operation by closing the legs of the pliers.



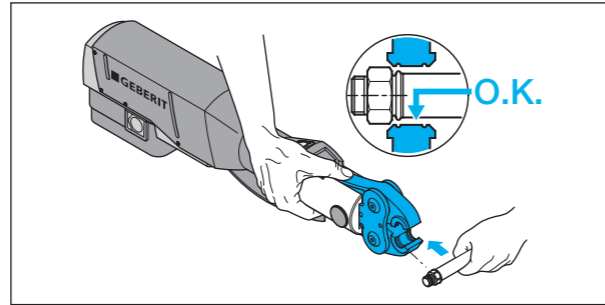
9 Pliers open automatically after the compression has been completed.

Mepla compression jointing d 16–50 mm

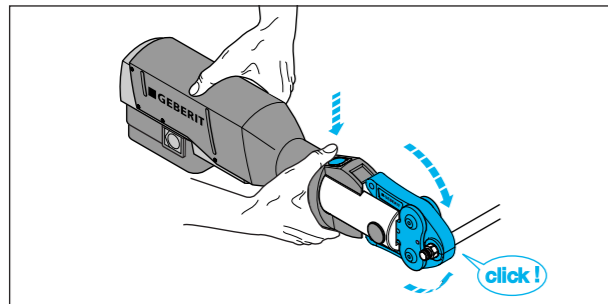
• Compression operation d 16–50 mm



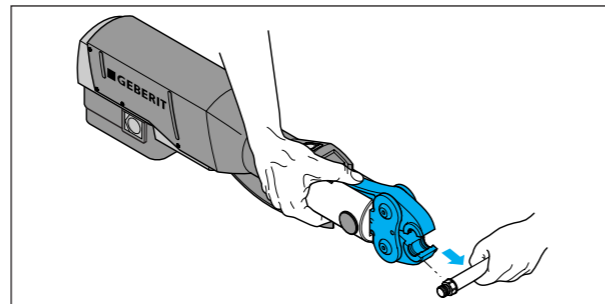
1 Connect power.



2 Place compression tool with corresponding jaw onto guidance groove of the fitting.



3 Switch power on and do not interrupt until jaw is released automatically.



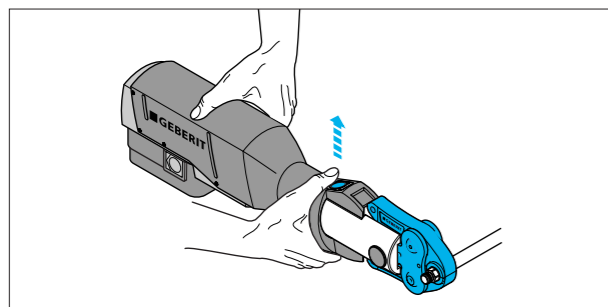
4 Open jaw by hand and remove tool.

Note:

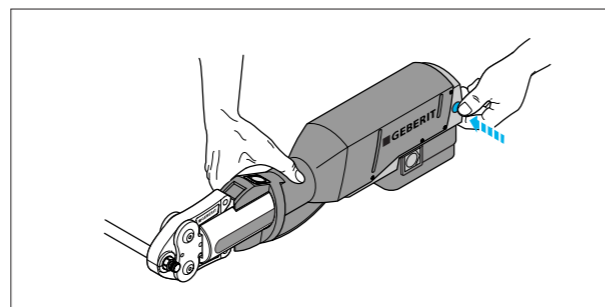
If fittings are turned or pipes are excessively deflected after compression, the procedure must be repeated.

• Interrupting compression procedure

The compression procedure may be interrupted and continued later, as long as hydraulic pressure has not built up.



1 Release power switch.



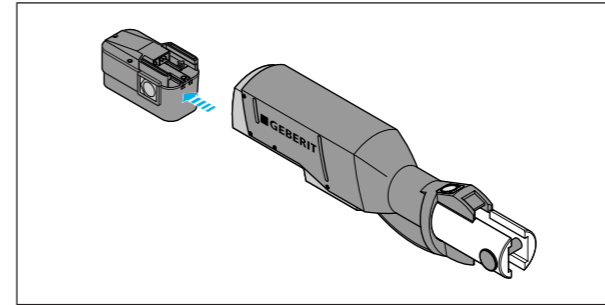
2 The motor can be switched off immediately by pressing the Stop button. This will switch off the tool. After fault display switch power on again to release jaw and begin return stroke.

Note:

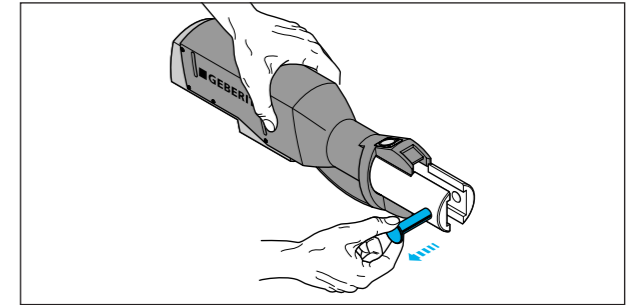
An interrupted compression must be fully repeated immediately afterwards.

Preparation of Mepla compression tool

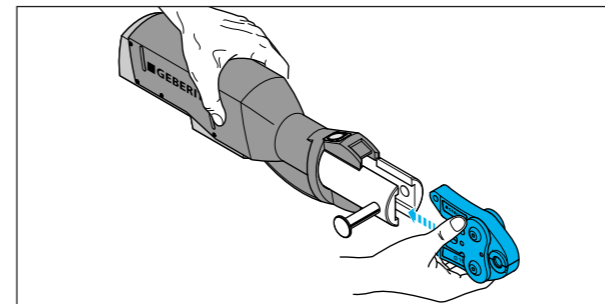
• Preparation of compression tool d 16–50 mm



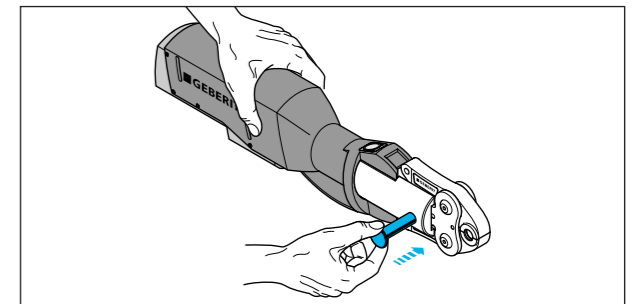
1 Compression tool not connected.



2 Lift up locking pin.

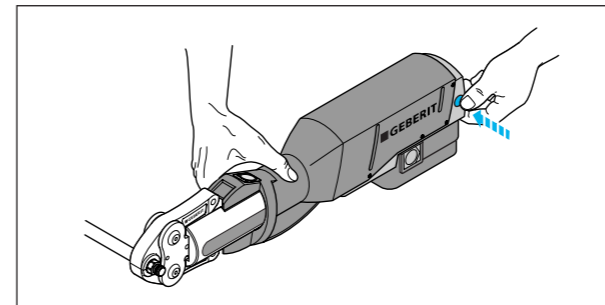


3 Insert jaw d 16–50 mm.



4 Insert locking pin = ready for pressing.

To change compression jaws, carry out steps 3 and 4 in reverse order.



Note:

When working at very low temperatures, the following steps might be necessary for correct function:

- Connect power
- Press release button
- Switch on power and let the tool warm up for approx. 4 seconds.

These steps might be repeated if necessary.

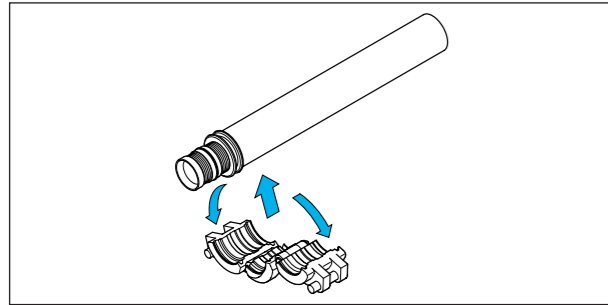
• Required space for compressing procedure:

d mm	A mm	A1 mm	d mm	A mm	A1 mm	A2 mm
16	16	42	16	19	58	31
20	18	46	20	20	57	34
26	21	53	26	23	62	37
32	27	62	32	27	67	45
40	31	72	40	31	77	51
50	40	95	50	40	95	60

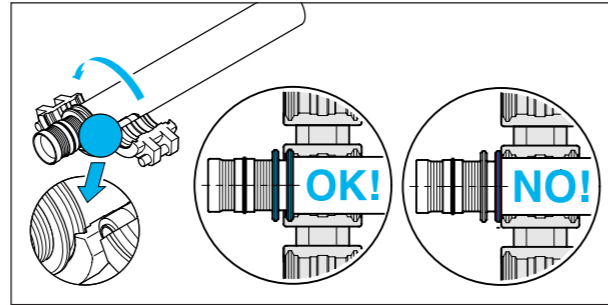
d mm	A mm	C mm	d mm	A mm	B mm	C mm
63	80	110	63	80	90	100
75	95	150	75	95	100	150

Mepla compression jointing d 63–75 mm

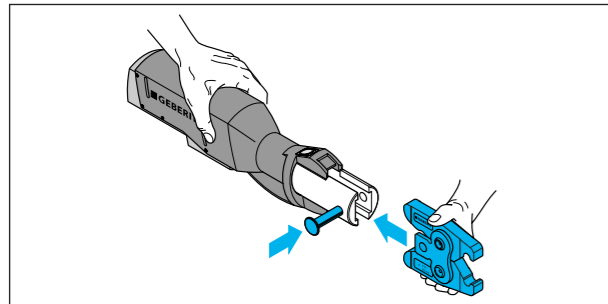
• Compression operation d 63 mm/75 mm



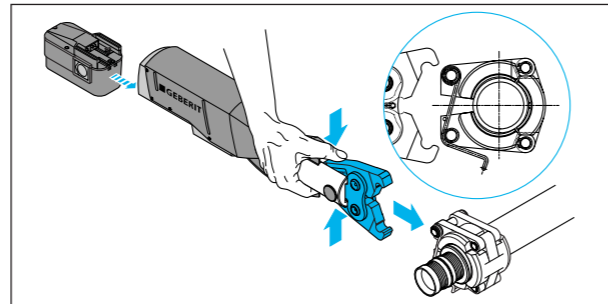
1 Open compression jaw d 63–75 mm.



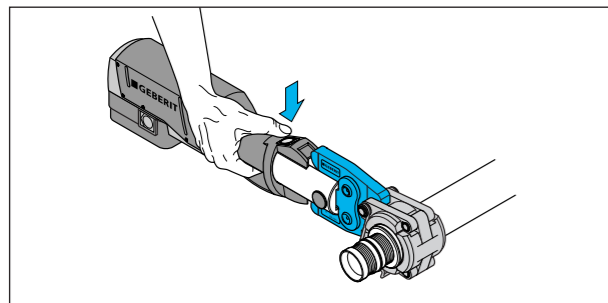
2 Place nozzle onto guidance groove of fitting and close the compression jaw d 63–75 mm.



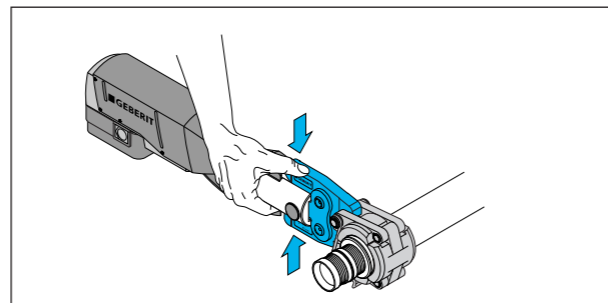
5 Insert adapter for compression jaw d 63–75 mm and insert locking pin all the way = Tool is ready for compression.



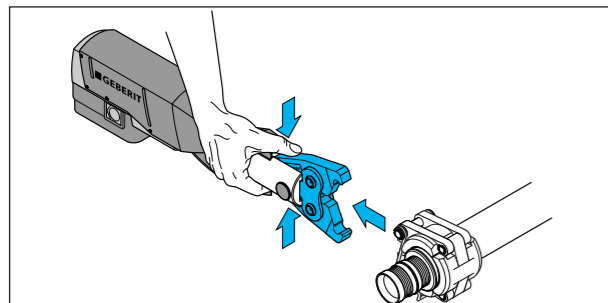
6 Connect power and connect adapter for compression jaw d 63–75 mm to compression jaw.



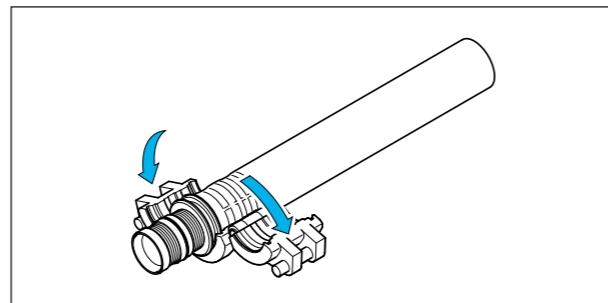
7 Switch power on and do not interrupt until adapter for compression jaw d 63–75 mm is released automatically.



8 Open adapter for compression jaw d 63–75 mm by hand...



9 ...and remove compression tool.



10 Open compression jaw by hand and remove tool.

Service of compression tool

• Care instructions

Compression tool

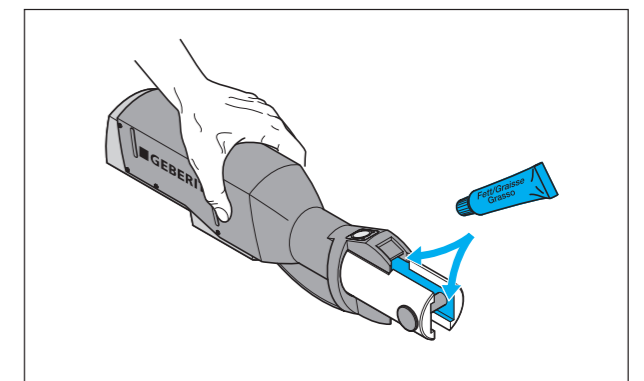
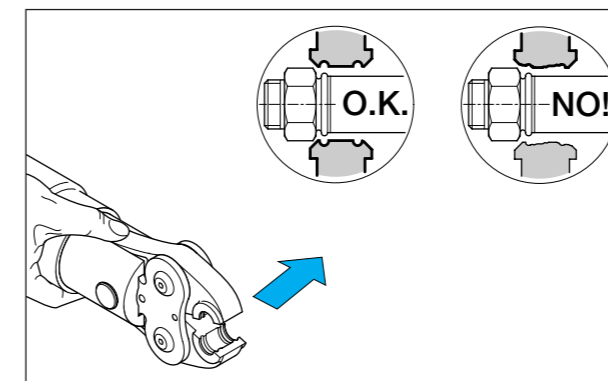
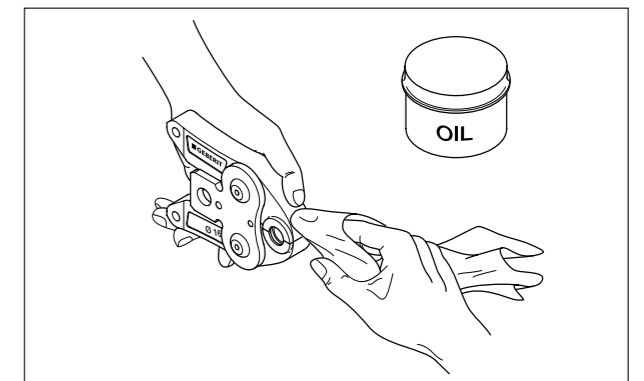
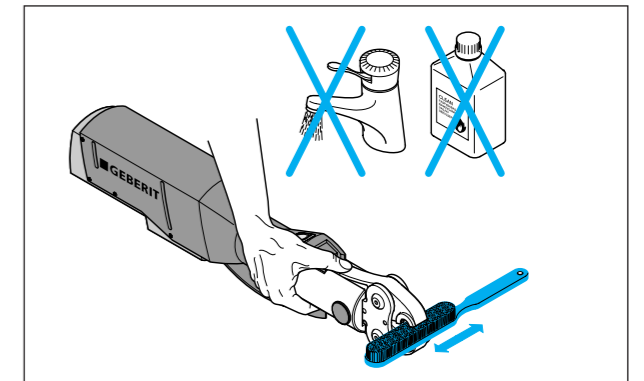
The high quality materials used (pump with ball bearings; valves and plunger heat treated) means wear to the parts and seals is reduced to a minimum. As a result, it is practically impossible for the hydraulic oil to become contaminated. The device can be cleaned with a dry brush or rag if necessary. Never use solvents or any other liquids.

Compression jaws

The profile on the compression jaws should be periodically checked for dirt and damage. Clean the pressing profile using a wire brush if necessary and rub the compression jaws with an oily rag. Clean dirt off the roller drive mechanism and the retaining pin in the cylinder at regular intervals. Blow out the dirt or use a brush. After this, use a standard product to grease the roller drive mechanism, the guide and the retaining pin.

Note:

Damaged pressing jaws must be immediately replaced to guarantee correct compression.



Charger

Regularly examine the power supply cord to the charger. Check the plug and extension cable for damage that can be detected from the exterior and, if necessary, have it repaired.

Testing Function

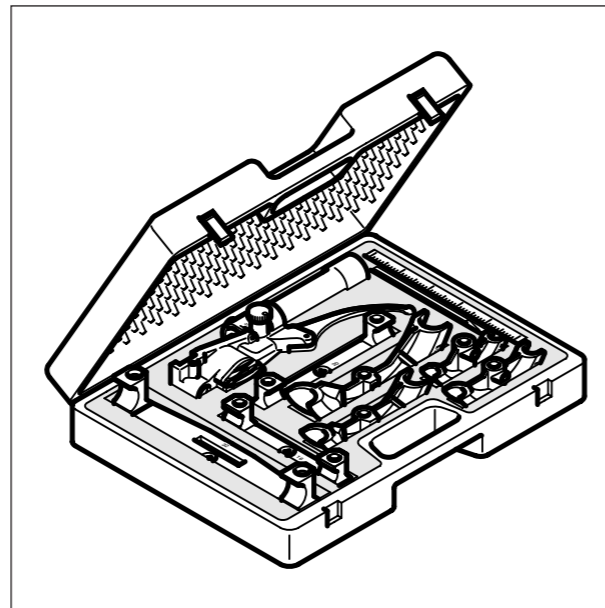
Check the function with the Mepla tool testing device (Art.690.491.00.1) for hand compression tool d 16–26 mm and compression jaw d 16–75 mm every 12 months.



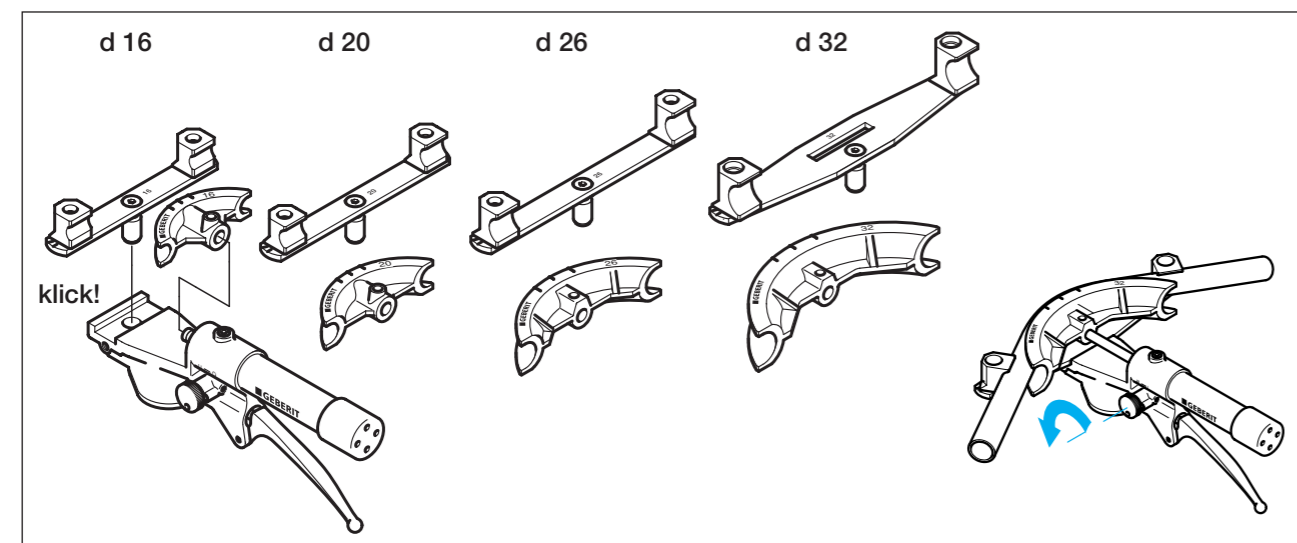
Pipe bending

All pipes of diameter d 16, 20, 26 and 32 mm can be easily bent to any angle, by using the Geberit bending tool. The bending die has markings which take the length of bend into account when bending.

- Bending tool case including:
- Bending plier
 - Bending cheek to plier back (d = 16–32)
 - Bending die (d = 16)
 - Bending die (d = 20)
 - Bending die (d = 26)
 - Bending die (d = 32)
 - Metre stick
 - Yellow marking pencil



• Preparation of tool

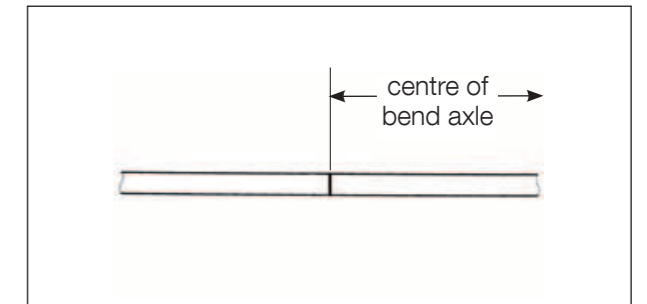


Fix corresponding bending die and cheek according to the pipe diameter.

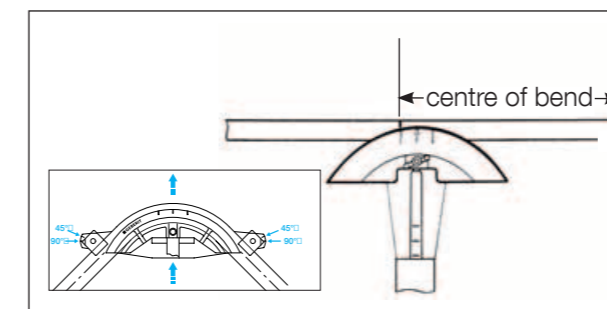
Pipe bending

Bending pipes using the Geberit bending tool
The bending tool can be used for bending Mepla pipes from d 16–32 in a straight forward manner. The bending dies have a marking for the bending axle which takes account of the length of the bend during bending.

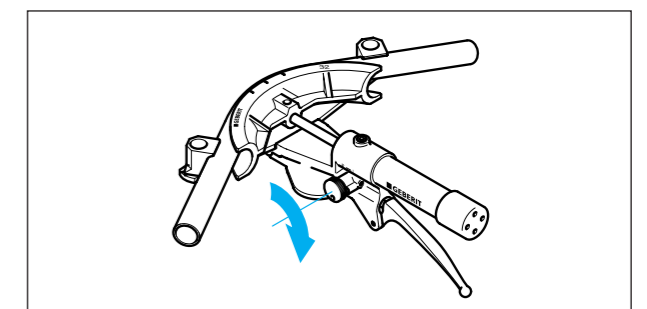
Bending pipes d 40 and 50 mm
With the appropriate tool it is easy to bend Mepla pipes d 40 and 50 mm, thanks to its inherent welded aluminium pipe.



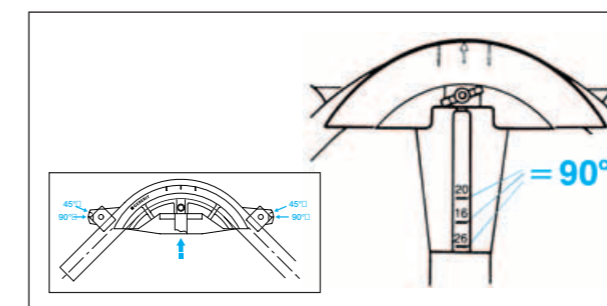
1 Mark the bending axle on the pipe.



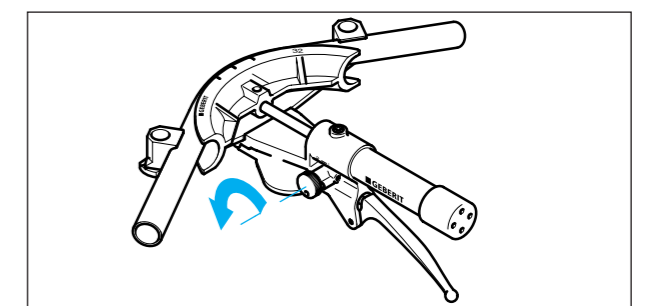
2 Place the pipe in the bending tongs.



3 Bend the pipe by operating the mechanism.

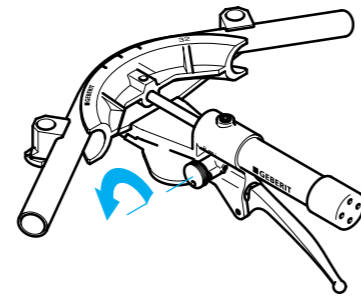


4 For 90° angles keep activating until the corresponding diameter mark appears on the rack.



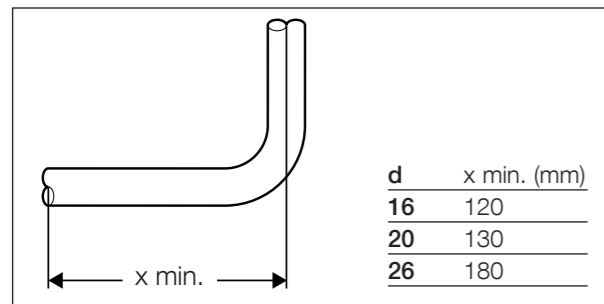
5 Release the rack using the release handle. The rack moves back in automatically.

Pipe bending



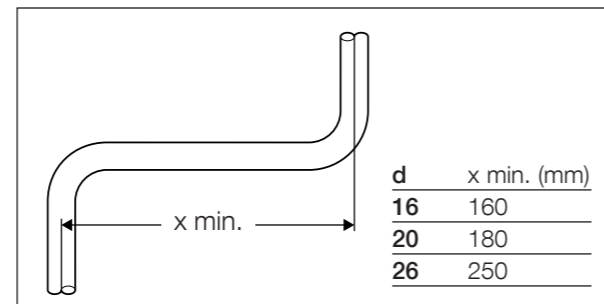
• Minimum leg length

(When using the Geberit Mepla bending tool)



• Minimum axis displacement dimension

(When using the Geberit Mepla bending tool)



The following minimum requirements must be maintained when bending pipes in order to guarantee a constant level of quality throughout the entire Mepla installation:

- Only pipes with d 16–50 mm may be bent
- The inside of the bend should not be dented or deformed
- The protective jacket should not be damaged

The following dimensions must be maintained:

- Minimum bending radius
- Minimum oval pipe diameter

Mepla system pipes d 63 mm and 75 mm should not be bent. Use the 90° and 45° elbows for directional changes.

If a previously pressed pipe is to be bent, the connection points must be secured.

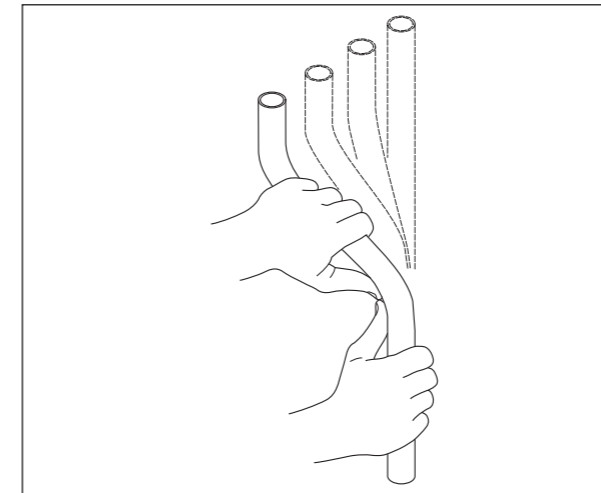
External diameter d (mm)	Ovality smallest diameter d min. (mm)	Minimal bended radius r (mm)	Recommended bended radius r (mm)
16	15	58	80
20	19	70	100
26	24	93	130
32	30	116	160
40	37	160	200
50	47	200	250

Pipe bending

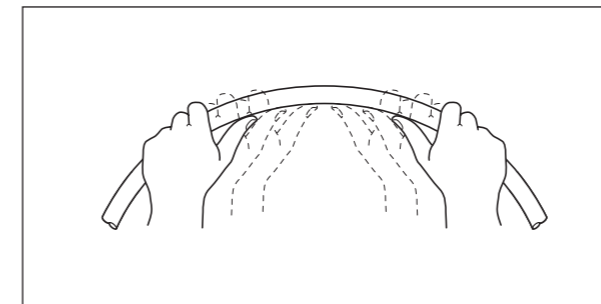
Bending pipes by hand

It is simple to bend Geberit Mepla with or without protective hose.

Make sure pipes bent by hand do not have any impressions on the surface of the pipe or compression damage on the inside of the bend.

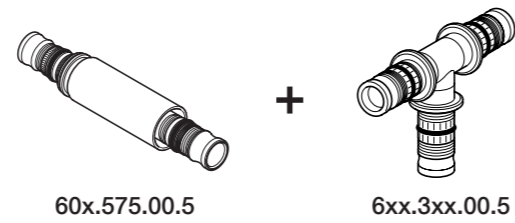


Calculation of minimal bended radius:



Bend from inside to outside step by step.

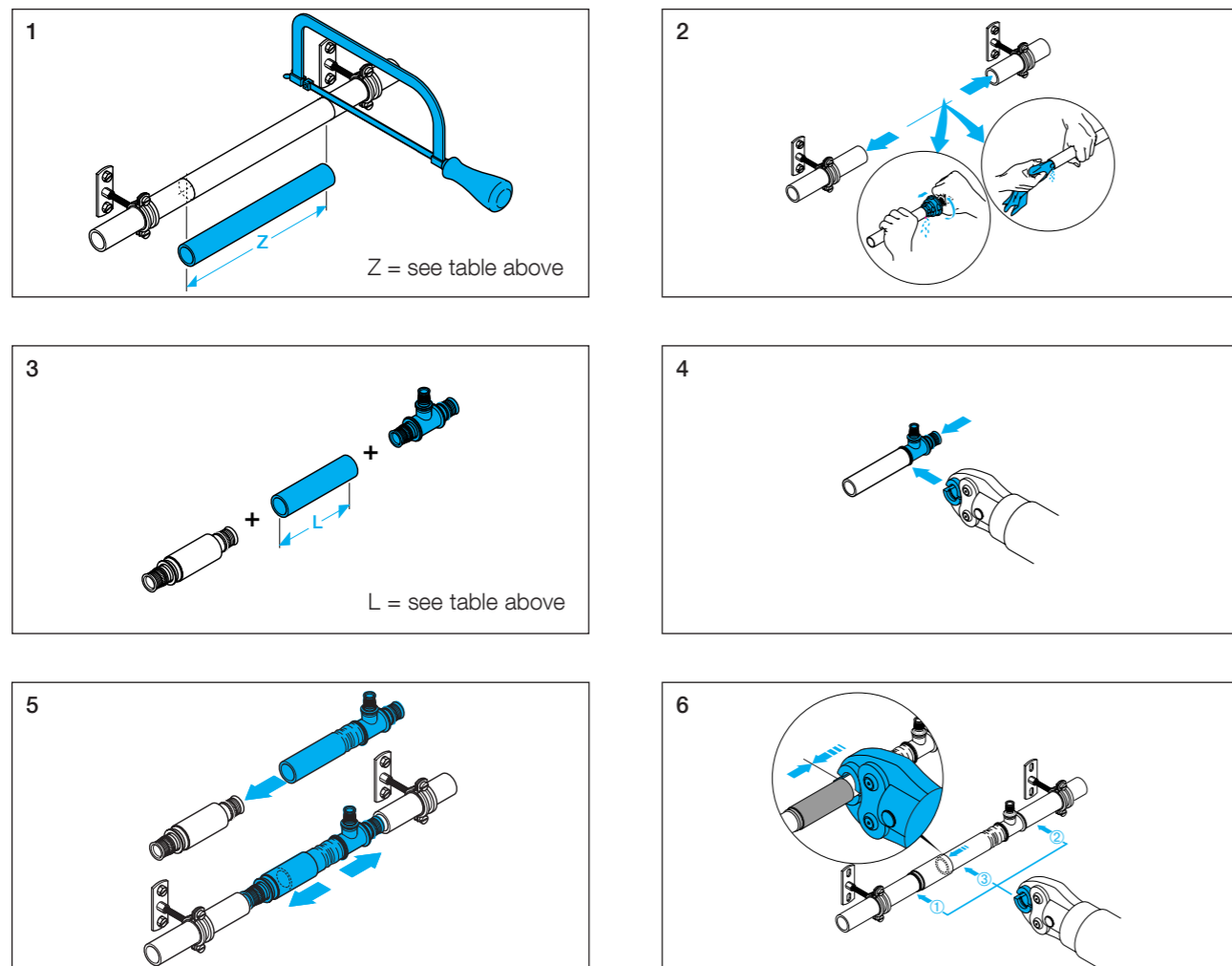
Additional connection



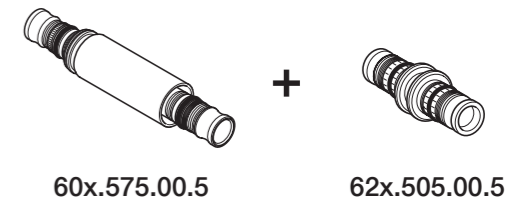
• T-pieces insertions in existing pipe line

d/d2	d1	L Z		d/d2	d1	L Z	
		L	Z			L	Z
16	16	11,0	22,4	32	26	13,5	27,0
16	20	11,0	22,4	32	32	13,5	27,5
20	16	12,0	24,0	40	20	16,5	30,5
20	20	12,0	24,0	40	26	16,5	31,5
26	16	14,0	25,8	40	32	16,5	32,0
26	20	14,0	26,8	40	40	16,5	33,0
26	26	14,0	26,8	50	32	19,0	35,5
32	16	13,5	26,5	50	40	19,0	36,5
32	20	13,5	26,5	50	50	19,0	37,5

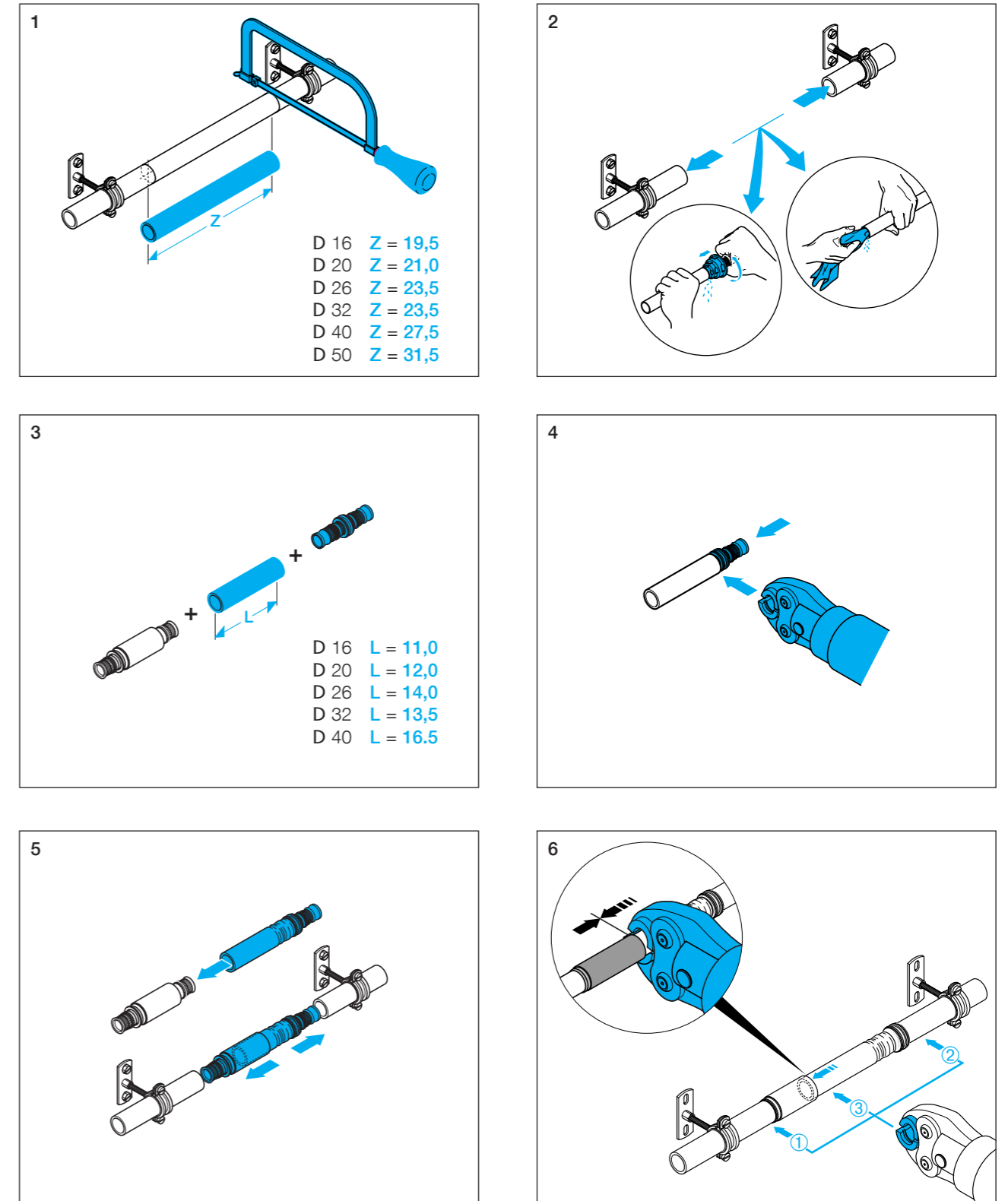
• Insert T-pieces/T-pieces are easy to insert by using repair couplers d 16–50 mm



Pipe repair

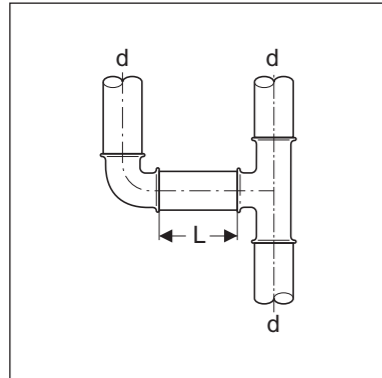


• Pipes are easy to repair by using repair couplers d 16–50 mm



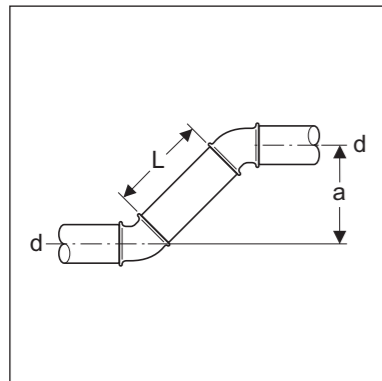
Fitting combinations

• Minimum dimensions when combining fittings



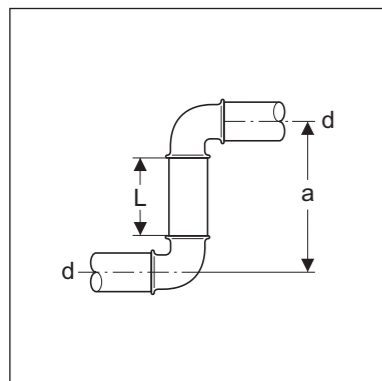
Minimum pipe length between two fittings with compression joints

d (mm)	16	20	26	32	40	50	63	75
L (mm)	55	60	69	79	91	103	150	190



Two 45° angle sections pressed together

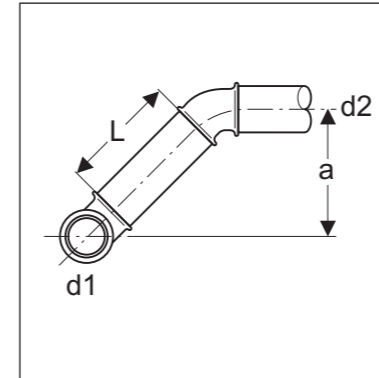
d (mm)	26		32		40		50		63		75	
(mm)	a	L	a	L	a	L	a	L	a	L	a	L
	71	69	81	79	95	91	108	103	146	150	175	190



Two 90° elbows pressed together

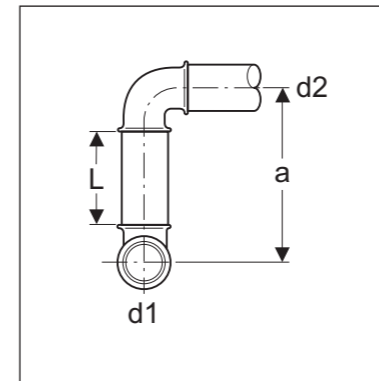
d (mm)	16		20		26		32		40		50		63		75	
(mm)	a	L	a	L	a	L	a	L	a	L	a	L	a	L	a	L
	91	55	98	60	115	69	133	79	157	91	181	103	256	150	309	190

Fitting combinations



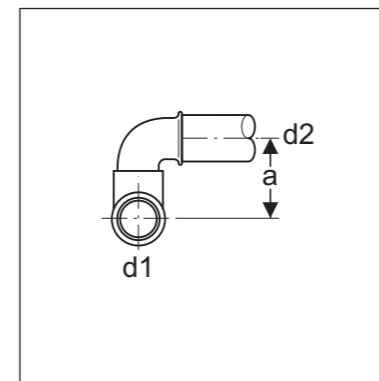
Combine with 45° elbow

d1 (Main pipe)	d2 (Branch pipe)											
d1/d3 (mm)	26		32		40		50		63		75	
(mm)	a	L	a	L	a	L	a	L	a	L	a	L
20	76	69	-	-	-	-	-	-	-	-	-	-
26	76	69	86	79	-	-	-	-	-	-	-	-
32	79	69	88	79	100	91	-	-	-	-	-	-
40	82	69	91	79	107	91	-	-	-	-	-	-
50	-	-	95	79	107	91	118	103	-	-	-	-
63	95	69	105	79	117	91	128	103	164	150	-	-
75	-	-	-	-	-	-	-	-	-	-	197	190



Combine with 90° elbow

d1 (Main pipe)	d2 (Branch pipe)															
d1/d3 (mm)	16		20		26		32		40		50		63		75	
(mm)	a	L	a	L	a	L	a	L	a	L	a	L	a	L	a	L
16	95	55	101	80	-	-	-	-	-	-	-	-	-	-	-	-
20	95	55	101	60	114	79	-	-	-	-	-	-	-	-	-	-
26	99	55	107	60	115	69	130	79	-	-	-	-	-	-	-	-
32	102	55	110	60	119	69	133	79	153	91	-	-	-	-	-	-
40	-	-	114	60	123	69	137	79	158	91	-	-	-	-	-	-
50	-	-	-	-	-	-	148	79	162	91	181	103	-	-	-	-
63	-	-	-	-	142	69	158	79	176	91	195	103	256	150	-	-
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	309	190



Combine female thread with 90° elbow with male thread

d1 (Main pipe)	d2 (Branch pipe)					
(mm)	16	20	26	32	40	50
	a	a	a	a	a	a
20	41	43	-	-	-	-
26	46	-	-	-	-	-
32	49	57	62	-	-	-
40	-	52	62	65	74	-
50	-	-	-	-	-	88

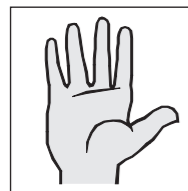
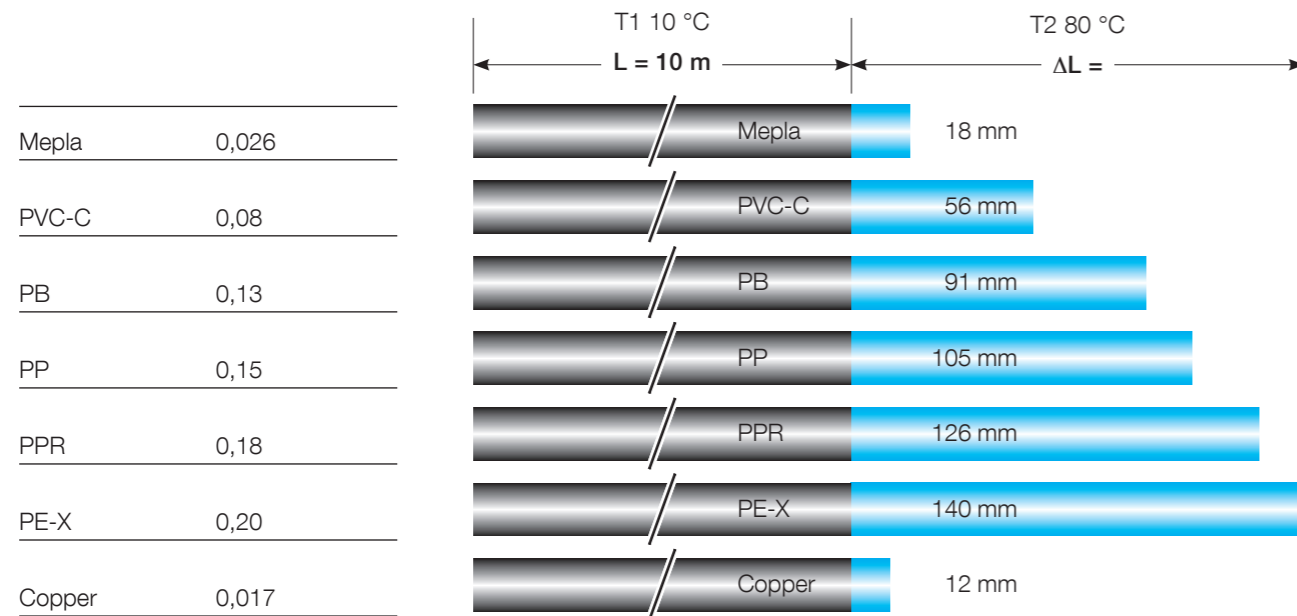
Expansion movement

Physical principle: All materials expand as temperature increases. If the temperature falls, the material contracts.

• Geberit Mepla Expansion Coefficient

$$0,026 \frac{\text{mm}}{\text{m} \cdot \text{K}}$$

Comparison to other pipe materials



Rule of thumb:

Cold water:

- No particular measures are necessary.

Hot water:

- No particular measures are necessary for straight Mepla pipe sections of less than 12 m.
- An anchor point is necessary for straight Mepla pipe sections of more than 12 m.

Expansion movement

Length variation table

Pipe length L in m	Δ L (mm)								
	Change in temperature Δt in K								
	10	20	30	40	50	60	70	80	90
0.5	0.13	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.17
1.0	0.26	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34
2.0	0.52	1.04	1.56	2.08	2.60	3.12	3.64	4.16	4.68
3.0	0.78	1.56	2.34	3.12	3.90	4.68	5.46	6.24	7.02
4.0	1.04	2.08	3.12	4.16	5.20	6.24	7.28	8.32	9.36
5.0	1.30	2.60	3.90	5.20	6.50	7.80	9.10	10.40	11.70
6.0	1.56	3.12	4.68	6.24	7.80	9.36	10.92	12.48	14.04
7.0	1.82	3.64	5.46	7.28	9.10	10.92	12.74	14.56	16.38
8.0	2.08	4.16	6.24	8.33	10.40	12.48	14.56	16.64	18.72
9.0	2.34	4.68	7.02	9.36	11.70	14.04	16.38	18.72	21.06
10.0	2.60	5.20	7.80	10.40	13.00	15.60	18.20	20.80	23.40

Example:

Pipe length 6 m/change in temperature (10° ÷ 60°) Δt 50 K

Formula:

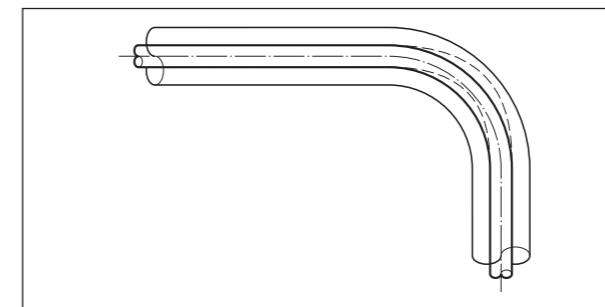
$$\Delta L = a \times \Delta t \left[\frac{\text{m} \cdot \text{m} \cdot \text{K}}{\text{m} \cdot \text{K}} = \text{mm} \right]$$

Calculation:

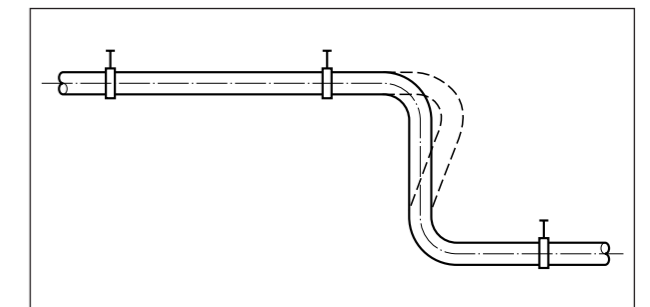
$$\Delta L = 6 \times 0.026 \times 50 = 7.8 \text{ mm expansion}$$

Compensate length variation in the change of direction or by deflection leg. Make sure that every bend has a buffer zone (e.g. protective tube or insulation).

Rule of thumb: $1.5 \cdot D \cdot L = \text{insulation thickness}$



Expansion absorbed by the insulation or protective tube

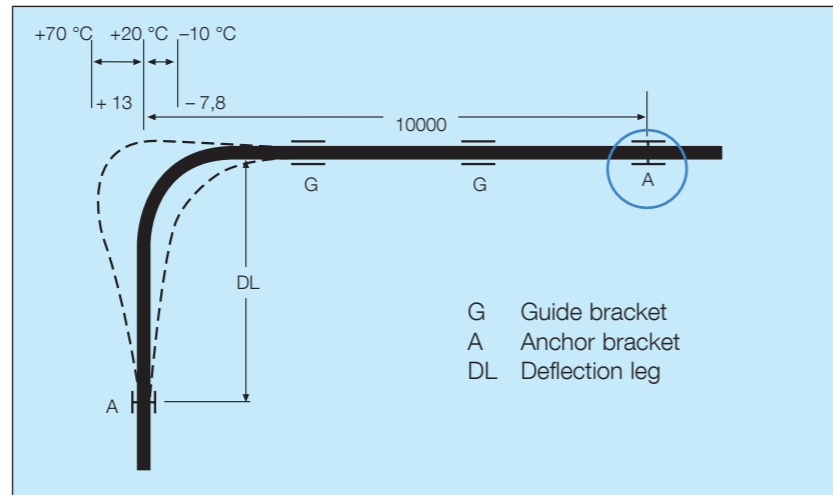


Expansion absorbed by one or several bends

Concealed lines must always be fitted with the protective tube or soft insulation to enable the resultant movements to be cushioned by the insulation material.

Deflection leg

- Compensating thermal expansion of hot water systems by deflection leg



- Determining the length of the deflection leg by calculation

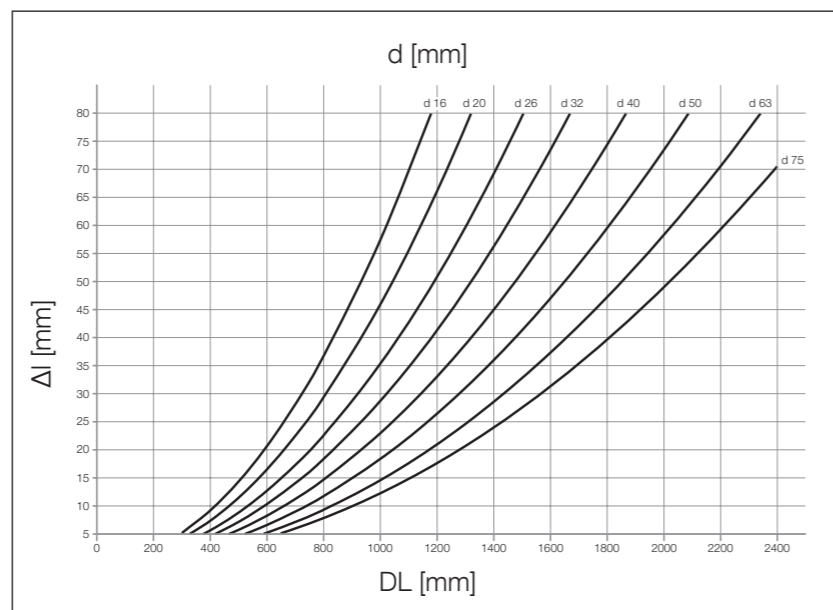
Length of the deflection leg (DL) in mm according the formula:

$$DL = C \sqrt{d \cdot \Delta l}$$

Example: $DL = 33 \cdot \sqrt{26 \cdot 7.8} = 470 \text{ mm}$

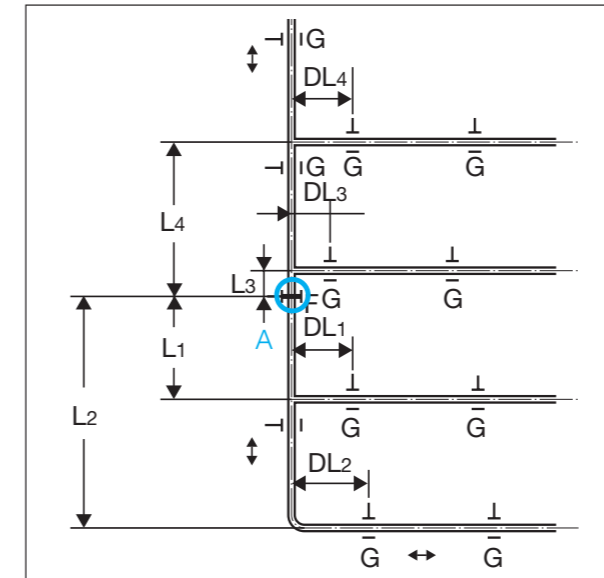
C = material constant for Mepla = 33
 Δl = change in length (mm)
 d = outside diameter (mm)
 DL = length of the deflection leg (mm)

- Determining the length of the deflection leg from chart

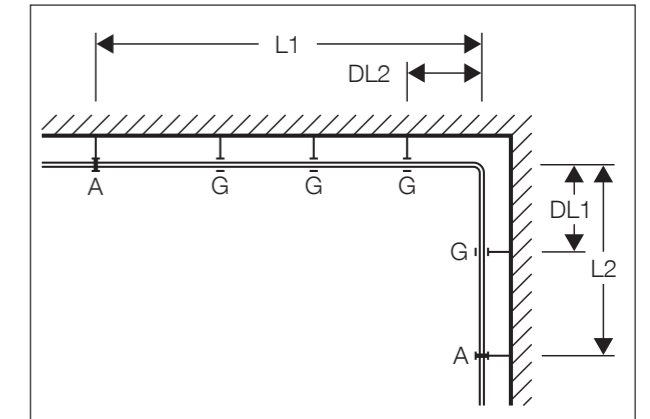


Deflection leg

- Compensating thermal expansion of hot water systems in bends (pipe length > 12 m)



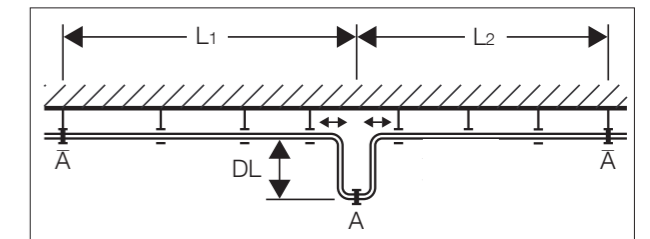
Position anchor bracket as centrally as possible



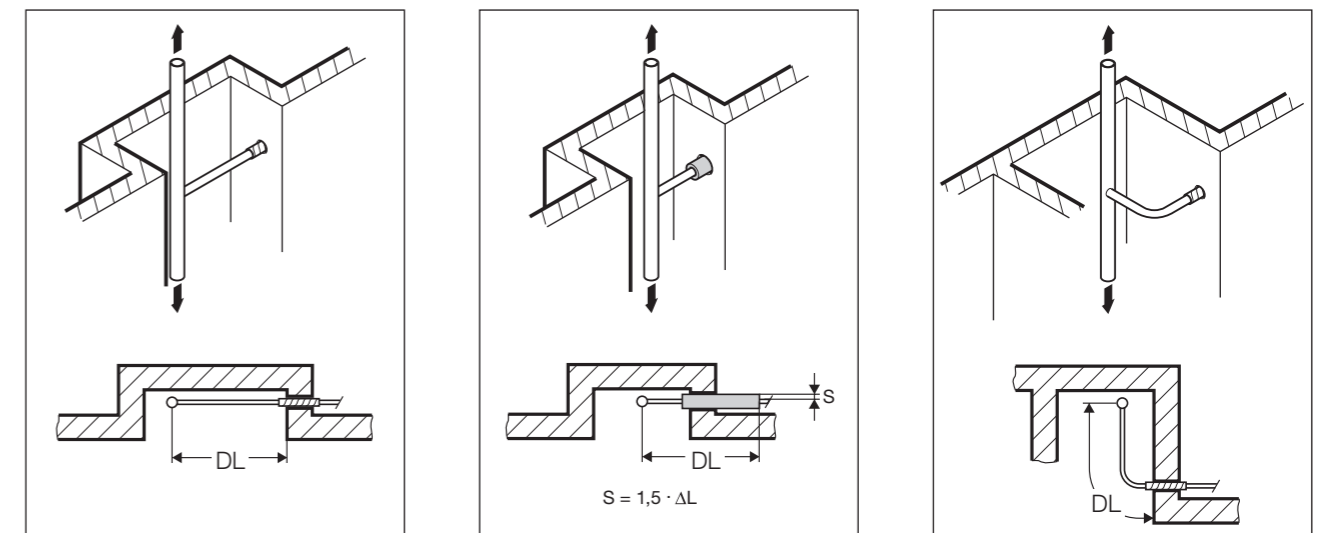
L1, L2, L3, L4 = pipe length
 DL1, DL2, DL3 = deflection leg
 A = anchor bracket
 G = guide bracket

- Compensating thermal expansion of hot water systems with compensating loop

The longest pipe determines the compensating loop.



- Examples for arranging compensating loops in shafts

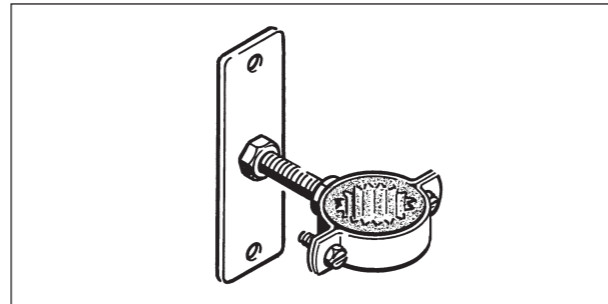


Fixations, guide and anchor brackets

• Guide brackets

Commercially available pipe brackets with or without rubber insert are suitable for insert shell.

The rubber insert avoids acoustic transmission to the building structure.

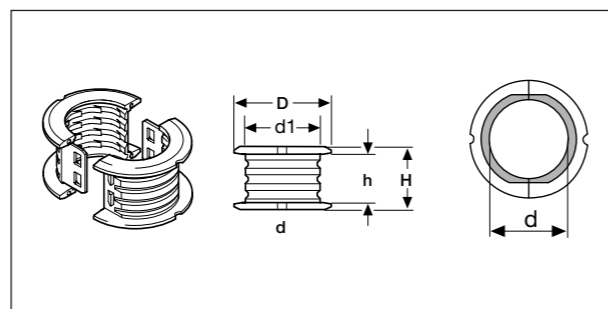


For important fixations in bigger projects, Geberit provides with the insert shells an adapted solution (d 32–75 mm).

Pipe bracket insert shell, complete, PP black, for anchor points and guide brackets.

d	d ₁	D	H	h ₁	Art. No.
26	32	3.2	2.5	3.4	603.702.00.1
32	40	49	32	25	604.702.00.1
40	50	57	33	25	605.702.00.1
50	63	76	34	25	606.702.00.1
63	75	91	48	30	607.702.00.1
75	90	107	50	30	608.702.00.1

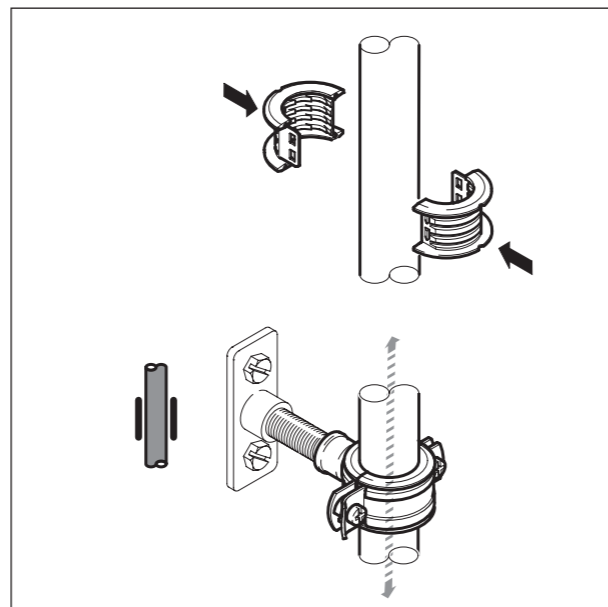
d = Mepla pipe (outside) diameter (mm)
 d₁ = bracket diameter (mm)
 h₁ = bracket width (mm)



d 32	d 32	d 40
d 40	d 40	d 50
d 50	d 50	d 63
d 63	d 63	d 75
d 75	d 75	d 90

Non rigidly jointed pipeworks

The shell halves are fitted onto the horizontal or vertical pipe. A commercially available pipe bracket is then mounted to cover the shell and prevent it from coming apart. The supporting surface of the insert shell guarantees that the pipe slides smoothly.

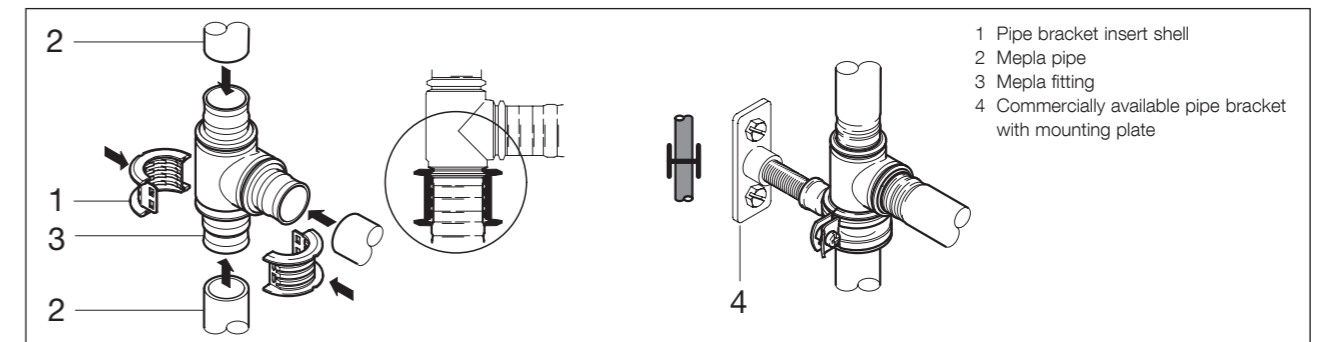


Fixations, guide and anchor brackets

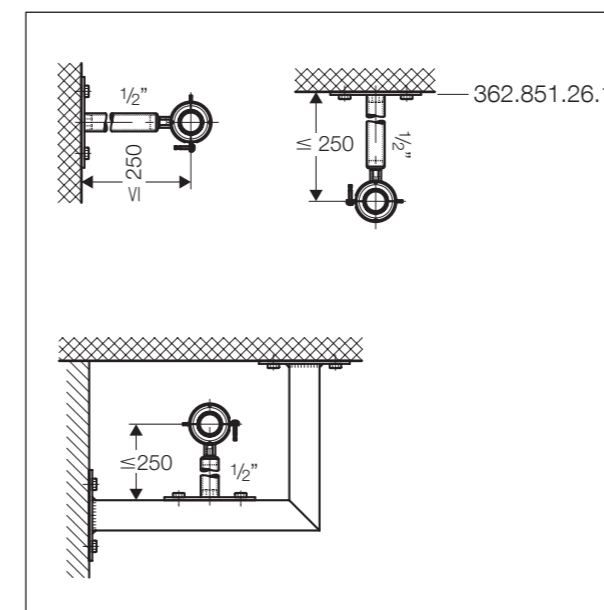
• Anchor brackets

The main purpose of the anchor bracket is to control thermal movements and to guide length variation into the desired direction.

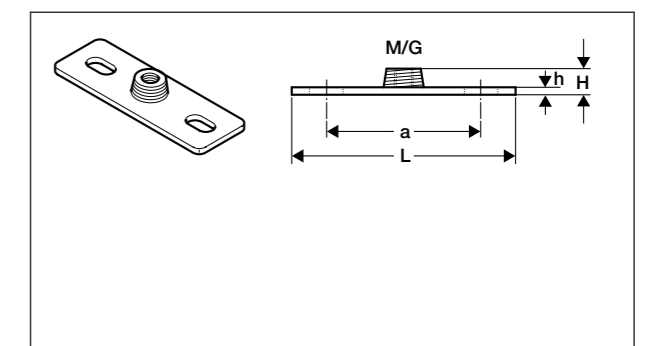
When mounting the Geberit pipe bracket insert onto a fitting, the deep groove on the inside of the insert shell locks the fitting firmly. The bracket surrounds the shells and prevents them from gliding apart. The location of the anchor point is determined by the fitting position.



Depending on the distance to the ceiling, the fixing pipe must be carefully selected to withstand arising forces. When using the Geberit flange 362.851.26.1 together with a 1/2" pipe nipple and the bracket, the distance must not exceed 250 mm.



Anchor bracket with insert shell, flange 362.851.26.1 and 1/2" pipe nipple



G	M	a	B	H	h	L
1/2"	M10	10.0	4.0	1.4	0.5	12.0

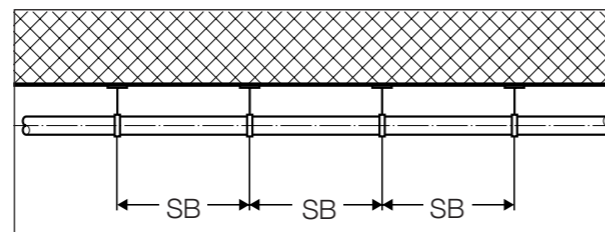
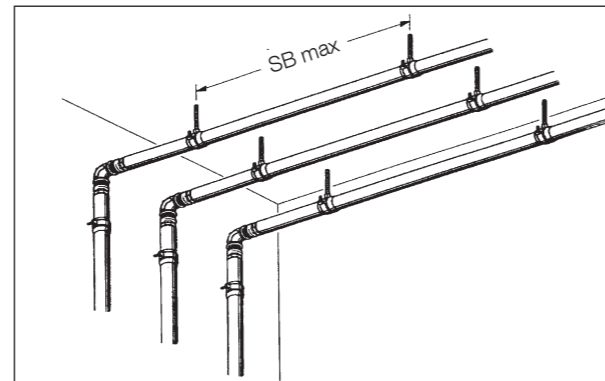
Fixation distances

Fastenings for Mepla

The distance between brackets used with Mepla pipes depends on the diameter of the pipe.
No additional support shells are needed under the ceiling.

Δ	16	20	26	32	40	50	63	75
SB (m)	1.0	1.0	1.5	2.0	2.0	2.0	2.5	2.5
F [N]	2.39	3.62	9.21	18.92	29.00	44.50	85.00	120

SB = distance between pipe brackets
F = effective force per bracket when pipe full with water 10 °C.

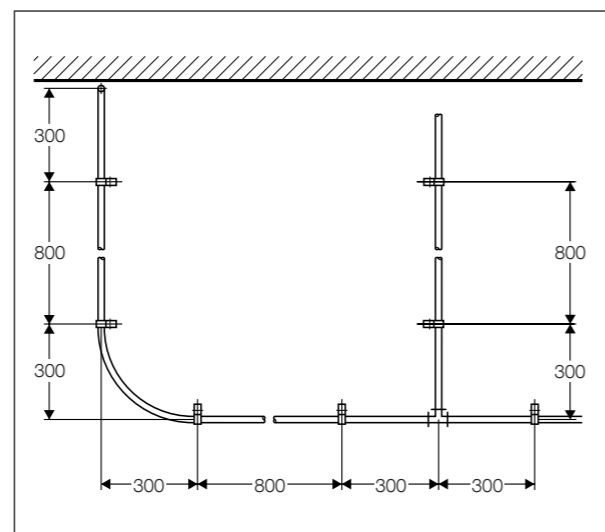


Fixtures on lines laid clear of the surface.

Guide bracket on ceiling	Pipe diameter	d [mm]	16	20	26	32	40	50	63	75
	Distance A from wall in mm	≤ 100	M8	M8	M8	M8	M8	M8	M10	M10
	110-200	M8	M8	M8	M10	M10	M10	M10	M10	M10
	210-300	M8	M8	M10	M10	M10	M10	1/2"	1/2"	1/2"
	310-400	M10	M10	M10	M10	M10	1/2"	1/2"	1/2"	1/2"
	410-600	M10	M10	M10	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Guide bracket on wall	Distance A from ceiling in mm	≤ 100	M8	M8	M8	M10	M10	M10	M10	1/2"
		110-200	M10	M10	M10	M10	M10	M10	M10	1/2"
		210-300	M10	M10	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
		310-600	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Anchor bracket inkl. insert shell		≤ 25	-	-	-	1/2"	1/2"	1/2"	1/2"	1/2"

The maximum distance between fastenings on Mepla pipes laid on concrete floor or in the sub-floor should be 800 mm max.
Pipes should be fastened 300 mm in front of and 300 mm behind bends and branches.

d	16-26
Distance between clips	800 mm
Distance between clips and bends/branches	300 mm

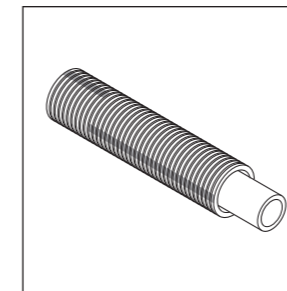


Laying on the concrete ceiling.

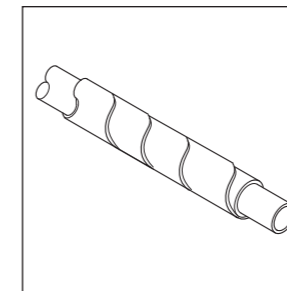
Soundproofing

Water pipes do not generate additional noise if they are correctly sized and installed. However, they do transmit noise from plumbing fixtures (apparatus and fittings). They need to be fitted with soundproofing material. This material must guarantee complete structure-borne noise insulation from the building structure.

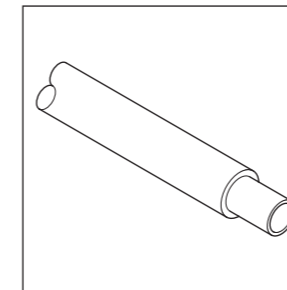
Acoustical insulation



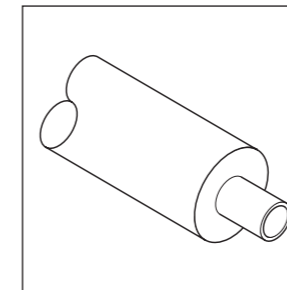
Protective tube



Bandage



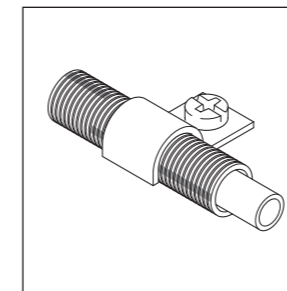
Insulating hose



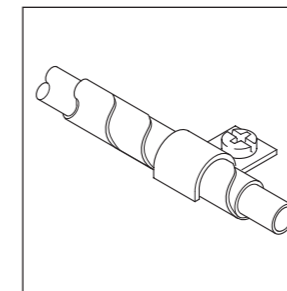
Semicircular shells with jacket

Clips and insulation of structure-borne noise

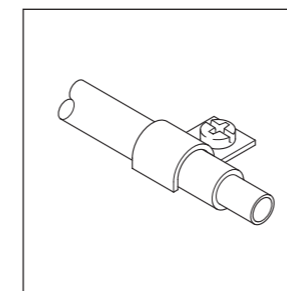
Insulated pipes can be directly fixed with pipe clips. The pipe insulation guarantees acoustical insulation.



Clip on protective tube



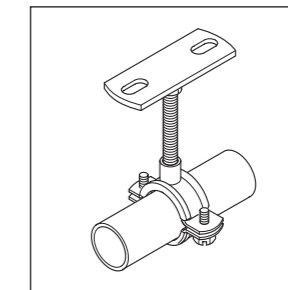
Clip on a bandage



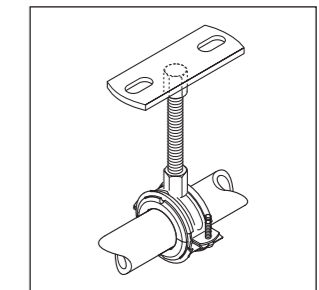
Clip on an insulated pipe

Brackets with acoustical noise insulation

Use pipe brackets with soundproofing inserts (e.g. Geberit Art. No 60x.700.00.1)



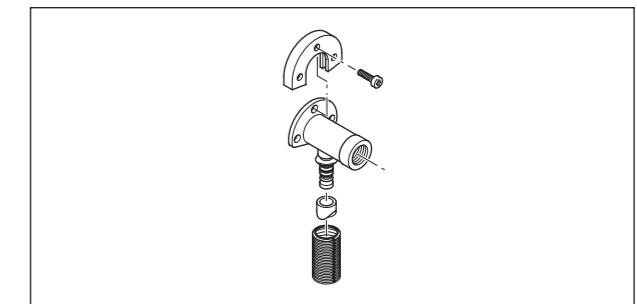
Bracket with rubber insert



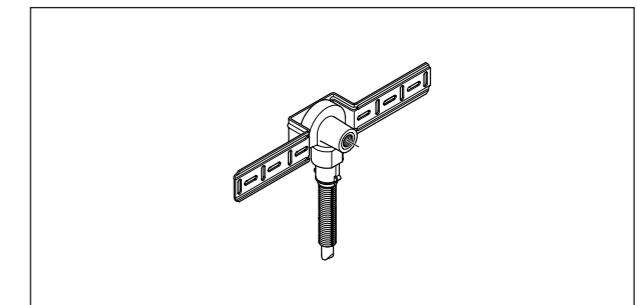
Bracket with insertion shell

Soundproofing on tap connections

Make sure the tap connections are decoupled from the structure and that the noise generated by the fixture cannot be transmitted to the structure. This is a requirement for both surface mounted and concealed installations.



Surface mounted
Acoustical insulation with rubber inserts (Geberit 601.802.00.1)



Concealed
Acoustical insulation with rubber base and cover (Geberit 601.801.00.1)

Pipe insulation

Insulation of drinking water pipes

Heat insulation for drinking water pipes is required:

- to avoid the formation of condensation with cold water pipes
- to avoid heat loss with heating water and hot water lines

The minimum insulation layer thickness must be determined based on country-specific regulations.

Function	Drinking water pipe (cold)	Drinking water pipe (hot)	Tap connection
Anti-condensation insulation	✓	✓	✓
Accommodation of expansion	✓	✓	-
Thermal insulation	-	✓	-
Acoustic insulation	✓	✓	✓

Pipe laying in hazardous areas

The Mepla system pipe is protected against corrosion by an outer PE layer. Aluminium corrosion can occur on open cut pipe sections.

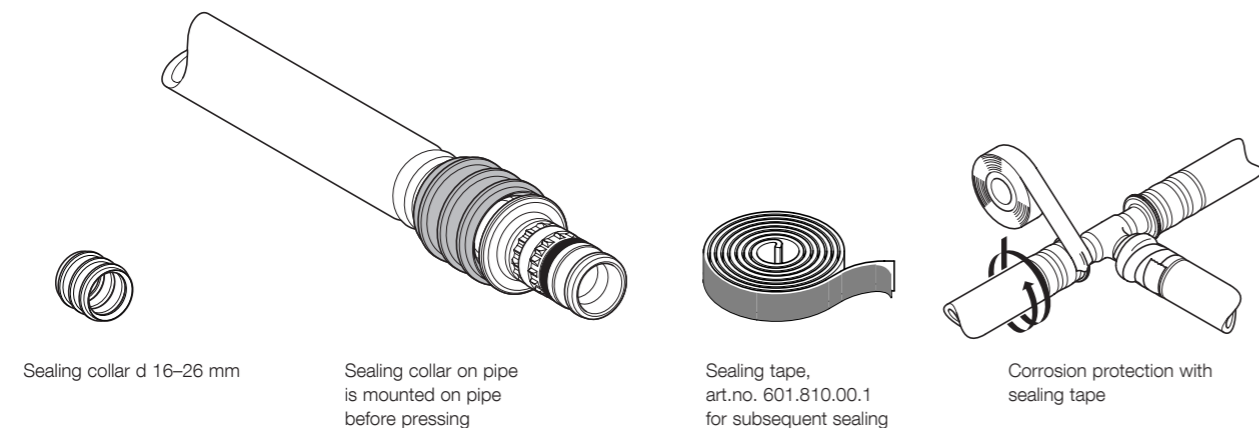
If the pipes are installed in hazardous areas, for example with aggressive gases or permanent moisture exposure, the connecting parts must be protected by sleeves.

Mepla is not suitable for cast in concrete.

Special corrosion protection is necessary in the following areas:

- Aggressive environment (gases, vapours and liquids), e. g.:
- Stables
- Dairies
- Cheese dairies
- Concrete casings
- Cast plaster floors
- Storage rooms for chlorine, ammonium, etc.
- Swimming pool centres
- Wet or moist environments (permanent or temporary), e. g.:
- Cellar floors in ground water areas
- Rooms endangered by flooding from external water sources or permanent water exposure
- Surface area of the floor (e. g., large kitchens, washing plants, tiled shower tubs, areas of high-pressure cleaning)

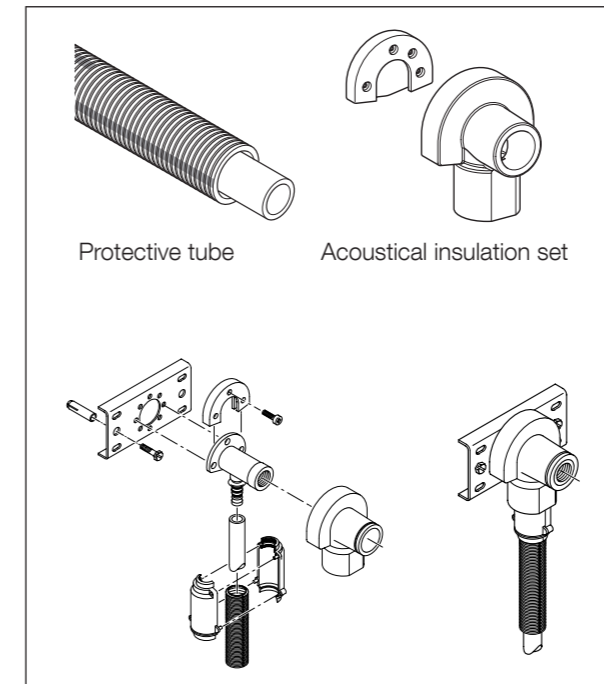
Sealing collars, sealing tape or other suitable materials can be used for corrosion protection.



Tap connections

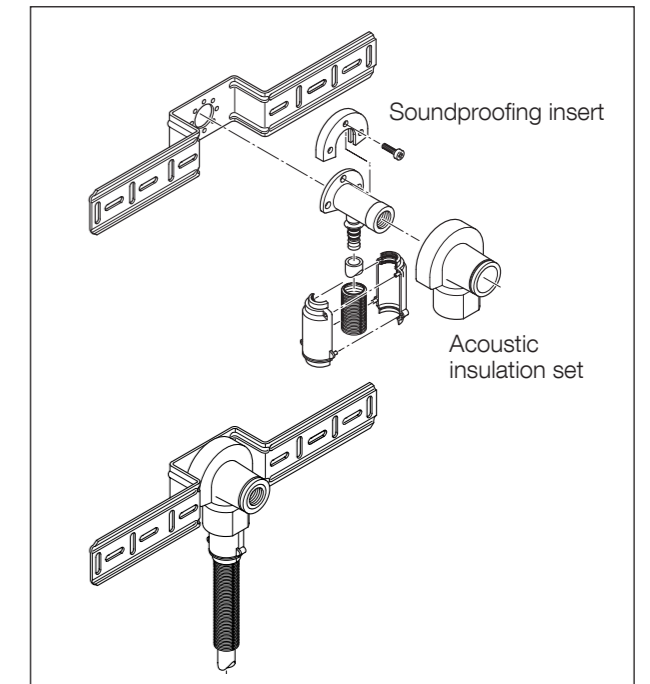
● Attaching the tap connections

Tap connections should be attached in the same way as the pipeline so they are decoupled from the structure. This can be achieved using a soundproofing insert fitted between the flange of the fixture mounting



Attachment to a flat mounting bracket, concealed and surface installation

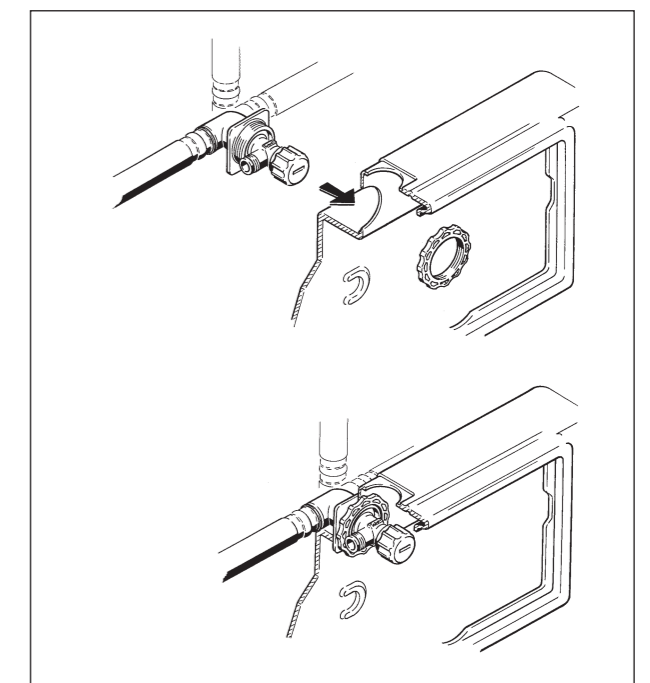
bracket (for surface installation) and an additional acoustic box over the fixture mounting bracket (for concealed installation).



Attachment to a fixture mounting bracket

● Installing a concealed cistern

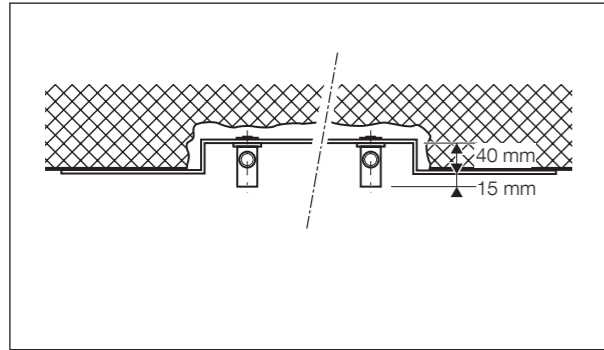
- Screw in the angle stop valve on the T-piece or elbow
- Press Mepla compression joints
- Insert complete unit from the rear and use nut to screw it onto the cistern (by hand only)



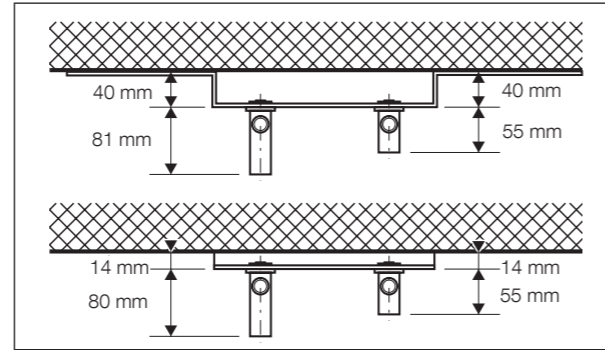
Concealed cistern connection using an elbow or T-piece

Tap connections

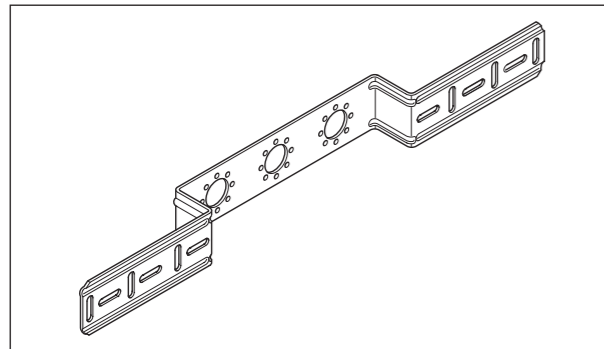
The tap connections are fixed onto the mounting bracket with precise dimensional accuracy.



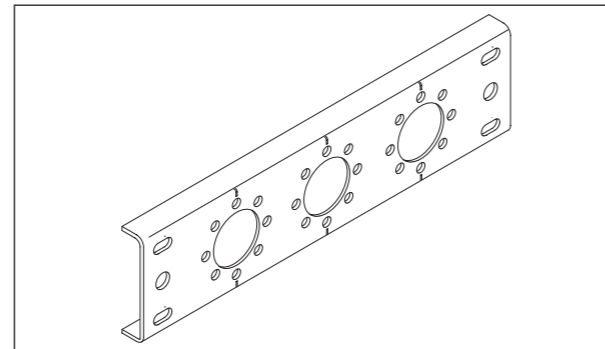
1 Installation depth of a concealed fixture connection.



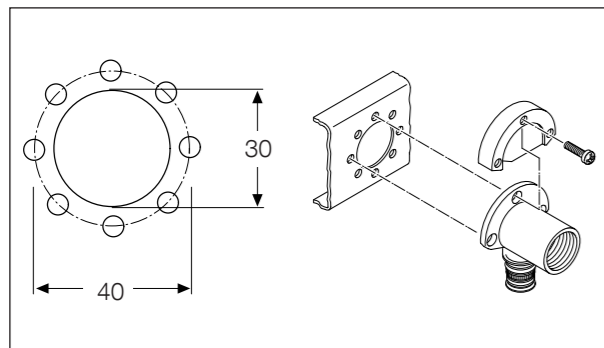
2 Intermediate gap of a surface fixture connection.



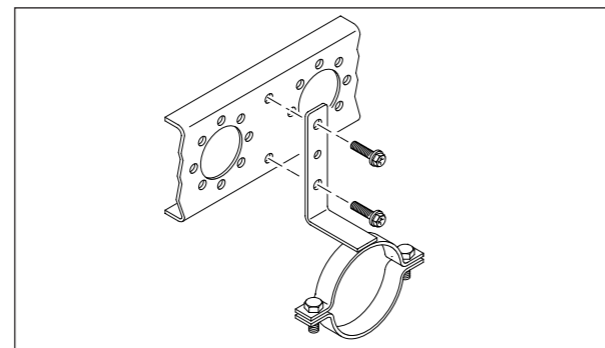
3 Mounting bracket for connection distances:
 - AD 153, 76,5 mm
 - AD 100, 120 mm
 - Single connection



4 Flat mounting bracket for connection distances:
 - AD 153, 76,5 mm
 - AD 100, 120 mm
 - Single connection

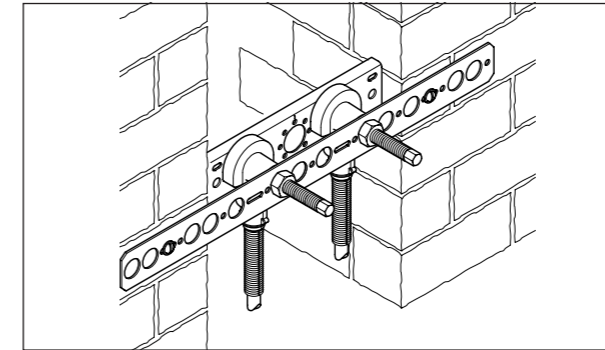


5 The hole circle diameter for the Geberit Mepla system is always 40 mm.

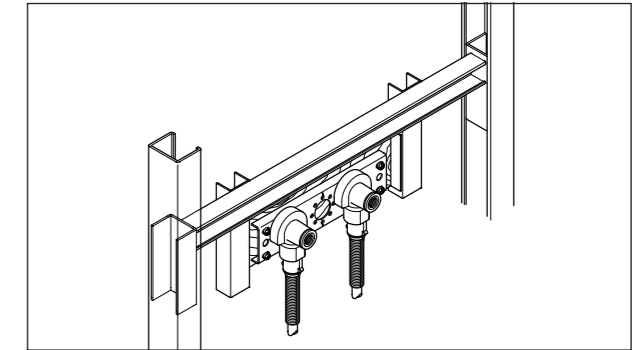


6 Bracket for trap connection installed on a flat mounting bracket.

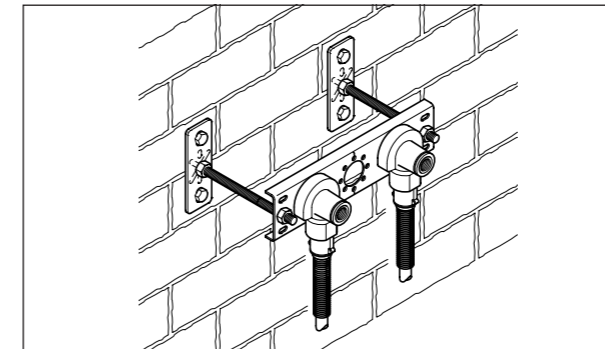
Tap connections



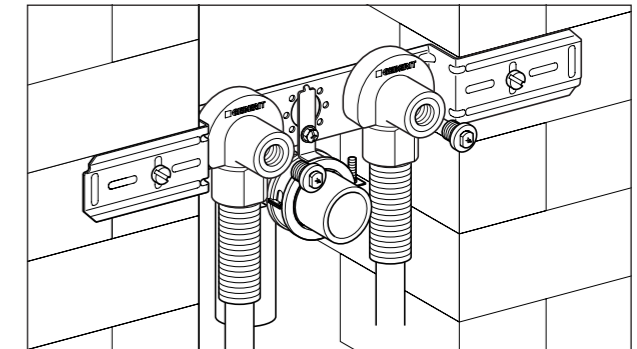
7 Installation with a commercially available rail.



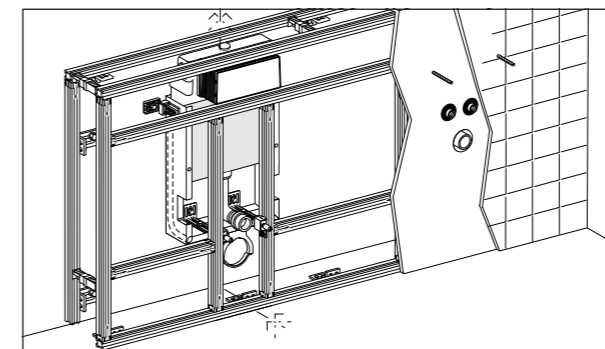
8 Installation on a drywall plumbing fixture.



9 Installation in front of a duct.



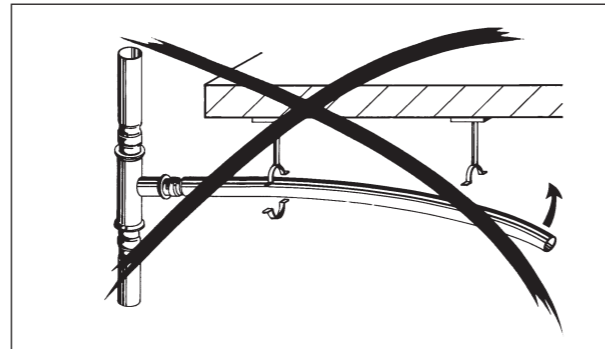
10 Water and drainage connections for washbasin.



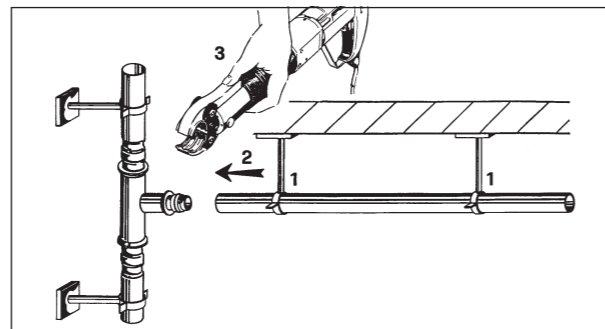
11 Installation in GIS PreWall ... the individually adapted solution for modern bathroom design.

Important installation rules

Rule no 1: As far as possible, ensure that the installation is free from tension when compressing joints.

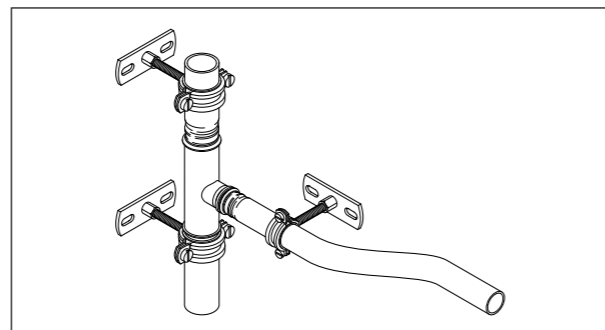


Wrong

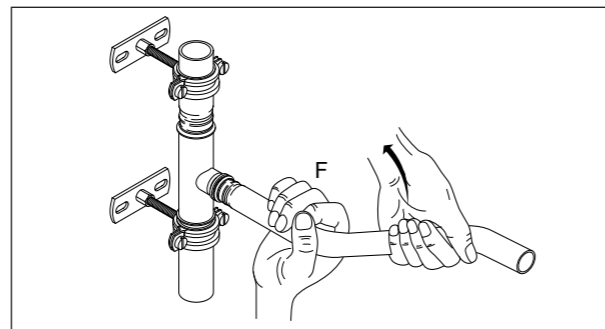


Right

Rule no 2: Compressed pipes must be kept free from tension during subsequent installation (e.g. with brackets).

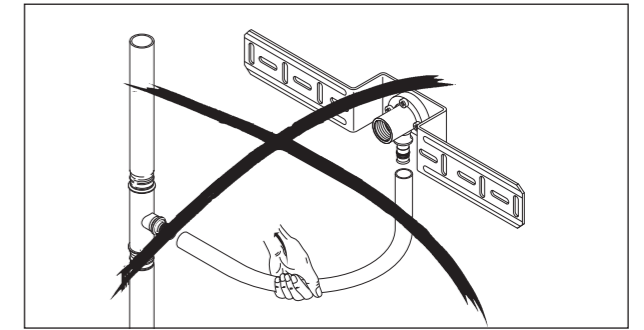


Rule no 3: Do not bend pipes which have already been compressed. If this is impossible to avoid for technical reasons, the pipe should be stabilised manually during bending.

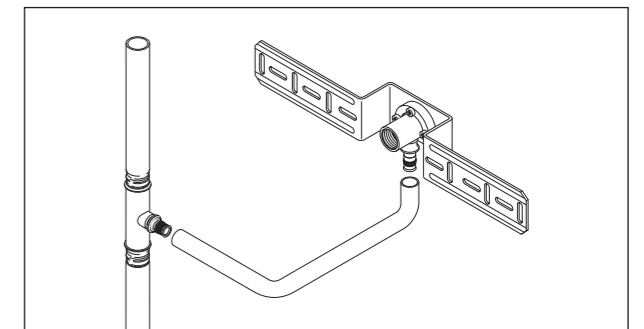


Important installation rules

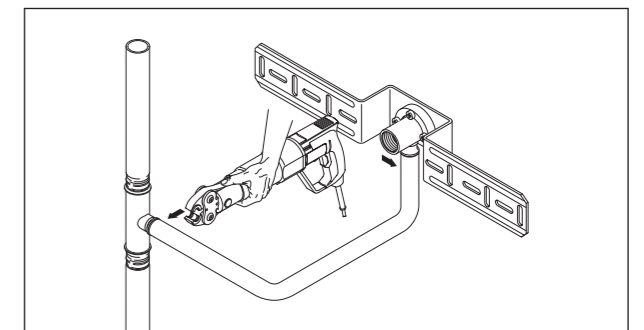
Rule no 4: Prepare the connecting pipe correctly before connecting it to the fittings.



Wrong

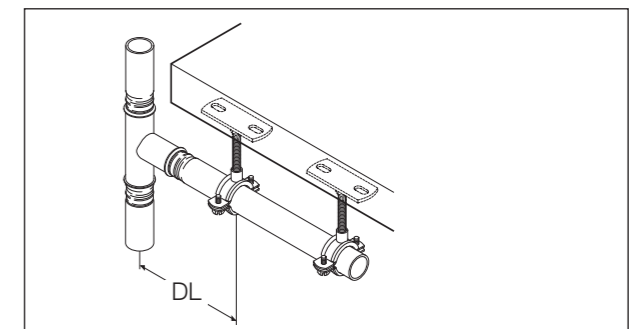


Right
Measure and bend with bending tool, or use MeplaFlex and adjust length as necessary.



Press

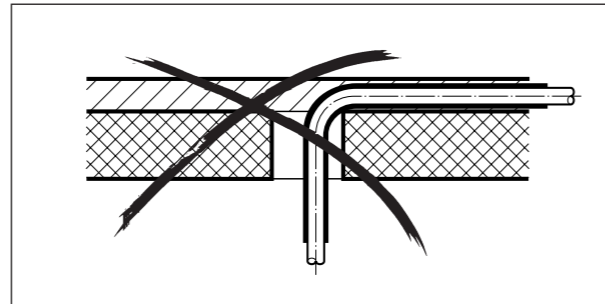
Rule no 5: Take into account the thermal movement of the vertical pipe.



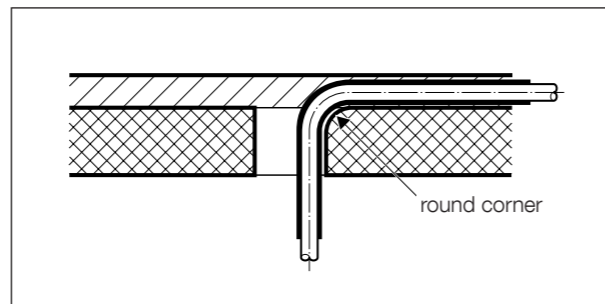
For deflection legs
DL = Deflection leg length, refer to page 26.

Important installation rules

Rule no 6: Never bend pipes passing through opening over edges (kink danger).

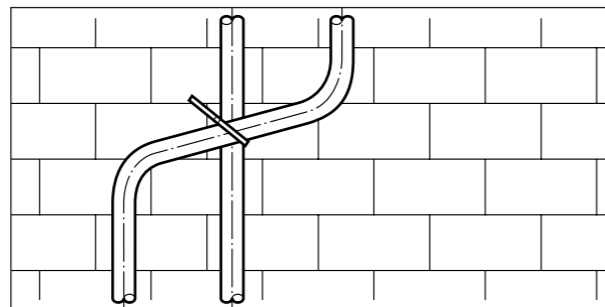


Wrong



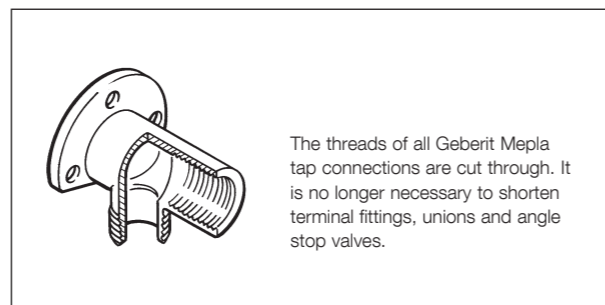
Right

Rule no 7: Crossing Mepla pipes on floors or ceilings should be tied together with a cable tie.



Fixing pipe crossovers

Rule no 8: Final installation.



Pressure test

Recommendation:

The pressure must be 1½ times the service pressure, but at least 15 bar.
The pressure drop may not exceed 0.1 bar/h.

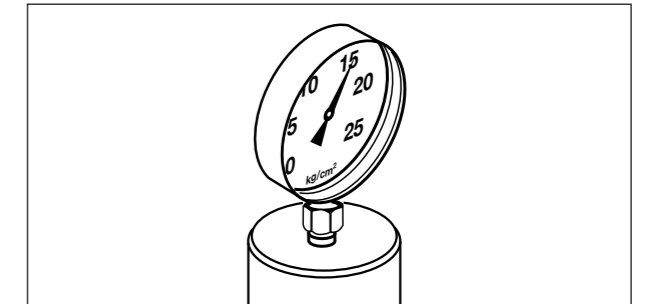
The pressure test and the flushing of pipes is governed in the following standards:

- CH – by the water code W3d, edition 2000, page 44, sections 11.000 to 11.300.
- Germany – by DIN 1988, part 2.
- Austria – by ÖN standard B 2531-1.
- others – by DIN 1988, part 2.
- local standards

Plug for pressure test

To do the pressure test step by step, the end of pipes can be closed by the reusable plug for pressure test, with female thread.

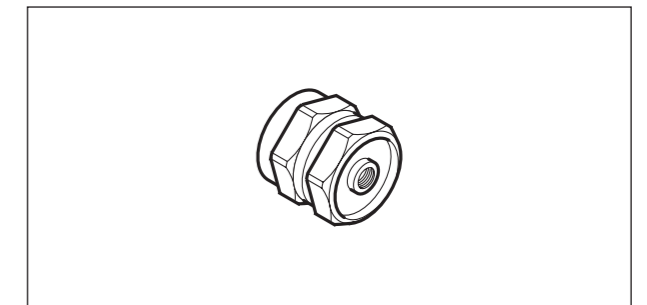
d	Art. Nr.
16	601.485.00.1
20	602.485.00.1
26	603.485.00.1
32	604.485.00.1
40	605.485.00.1
50	606.485.00.1
63	607.485.00.1



The pipes are to be pressure tested before embedding in the wall.

Note:

Do not use compressed air nor gas to test a water supply system!



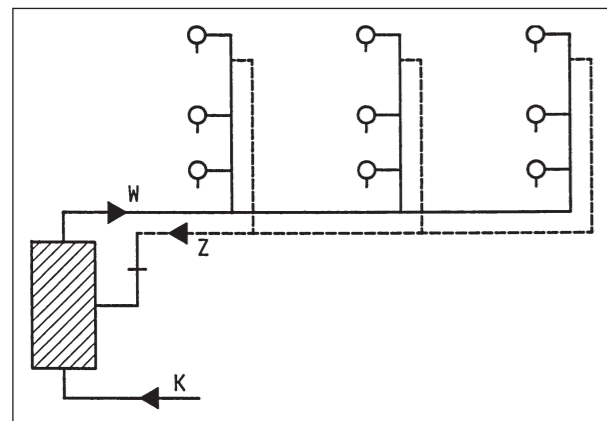
Open vent screw to release possible air pockets.

Hot water distribution

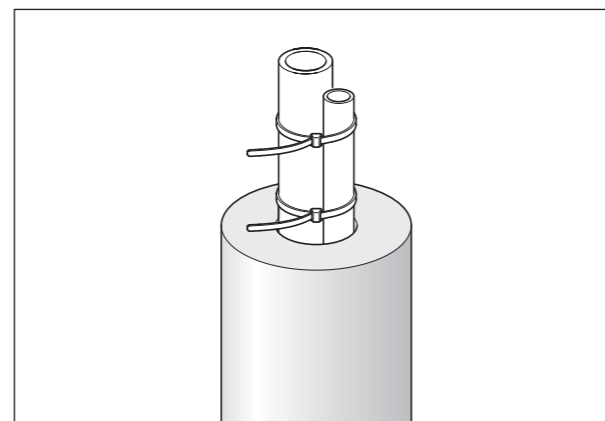
● Types of circulation

The Geberit Mepla system is recommended for all types of hot water installations:

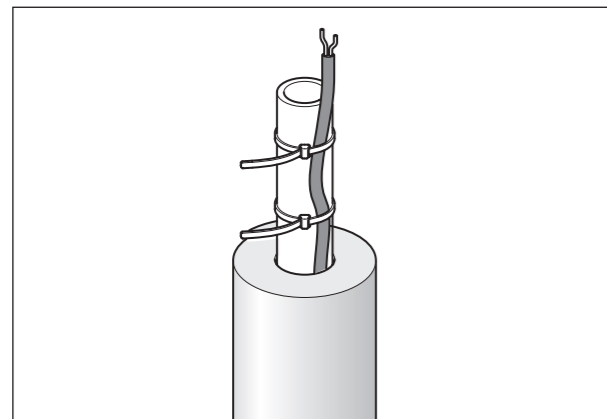
- Circulation with lower distribution
- Circulation with upper distribution
- Pipe-attached-to-pipe circulation (RaR)
- Ring circulation system
- Trace heating with self-regulating trace heater strips



1 Circulation with lower distribution



2 Detail of pipe-attached-to-pipe circulation (RaR)



3 Trace heating with self-regulating strip heater

Safety note:

Self-regulating trace heater strips must not exceed a temperature of 70 °C.

Note:

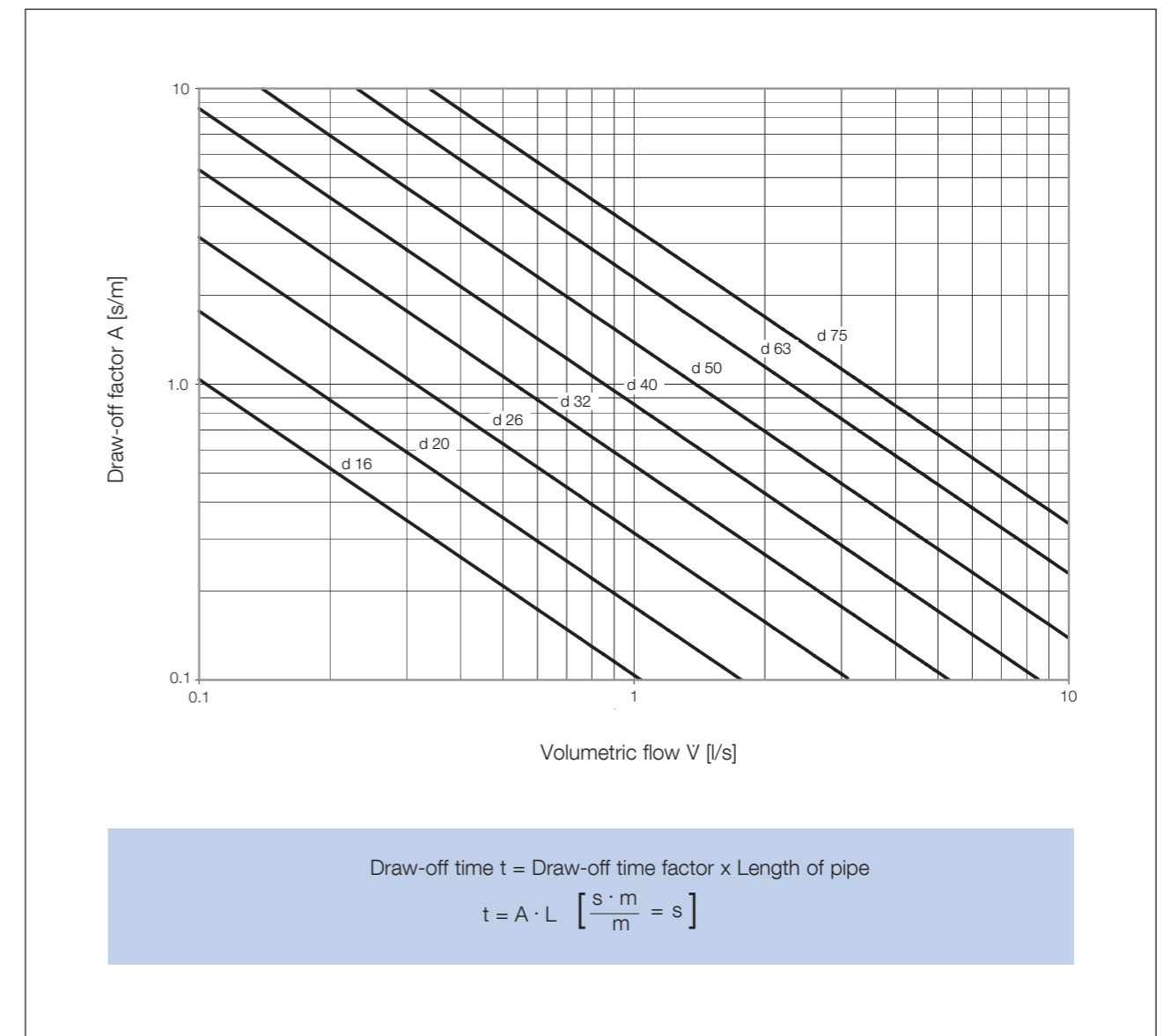
Use heat-resistant materials for attaching the heater strips and circulation lines used in pipe-attached-to-pipe circulation.

Hot water distribution

● Draw-off times

Draw-off times should not be too high in order to avoid excessive water and energy consumption (5 to 20 sec.). Draw-off times must be adapted to suit the pipe diameter, line length and the number and time intervals of drawing off water.

A circulation line must be planned and installed if it is impossible to choose a distribution system that can transport the heated water from the hot water tank to the draw-off point within a reasonable time (the draw-off time).



Load values

- **Planning and determining the pipe diameter of drinking water lines**

- **Load values of the apparatus (LV)**

Apparatus	Volumetric flow per connection		Number of load values per connection LV	Minimum connection dimension d	Recommended connection dimension d/RP
	l/s	l/min			
Bidets, washbasins, WC cisterns	0.1	6	1	16*	20 / 1/2"
Sinks, hand showers, flow water heater, domestic dishwasher	0.2	12	2	16*	20 / 1/2"
Medium-strong showers, flow water heaters	0.3	18	3	16*	20 / 1/2"
Bathtub mixers, flow water heaters, large sinks, urinal flush valves, washing machines up to 6 kg	0.4	24	4	20	20 / 1/2"
Large valves for garden and garage	0.5	30	5	20	20 / 1/2"
3/4" connections: – Showers – Large bathtub mixers – Sinks for industrial kitchens	0.8	48	8	20	20 / 3/4"

* The minimum dimension d 16 mm can be used for hot water connections if the draw-off time is too high for the dimension d 20 mm as shown in the diagram on page 41.

- **Permitted load values for Geberit Mepla pipes**

Max. number of LV	4	8	20	55	180	540	1300	2250
d mm	16*	20	26	32	40	50	63	75
di mm	11.5	15	20	26	33	42	54	65.6

* Suitable for hot water draw-off lines and circulation lines:

- Up to 2 LV: max. permitted pipe length 12 m
- Up to 3 LV: max. permitted pipe length 8 m
- Up to 4 LV: max. permitted pipe length 5 m

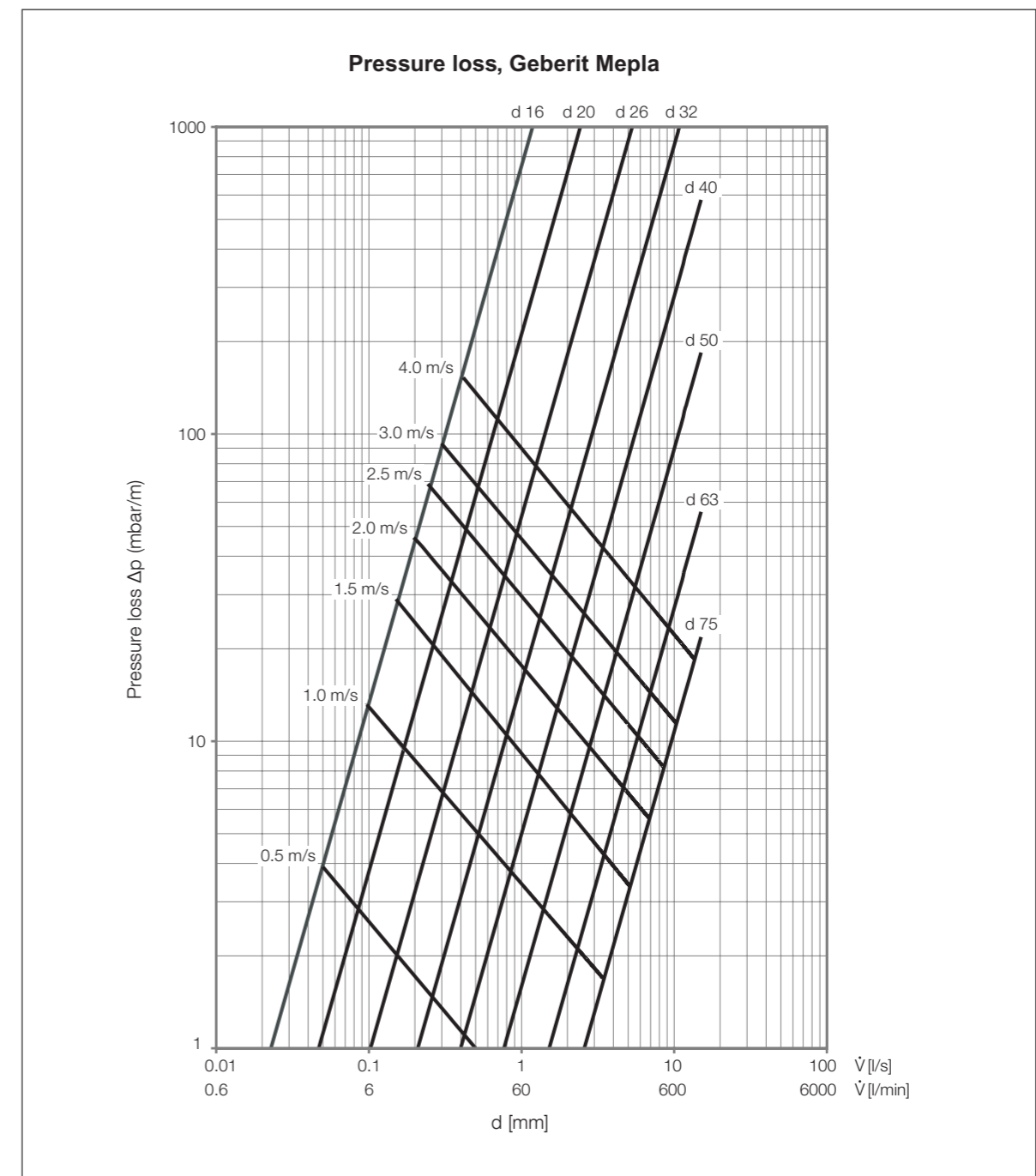
Pressure loss sanitary applications cold water

Pressure loss chart for Geberit Mepla

(Water temperature 10 °C)

The current pressure loss charts can be found on www.international.geberit.com in the download area.

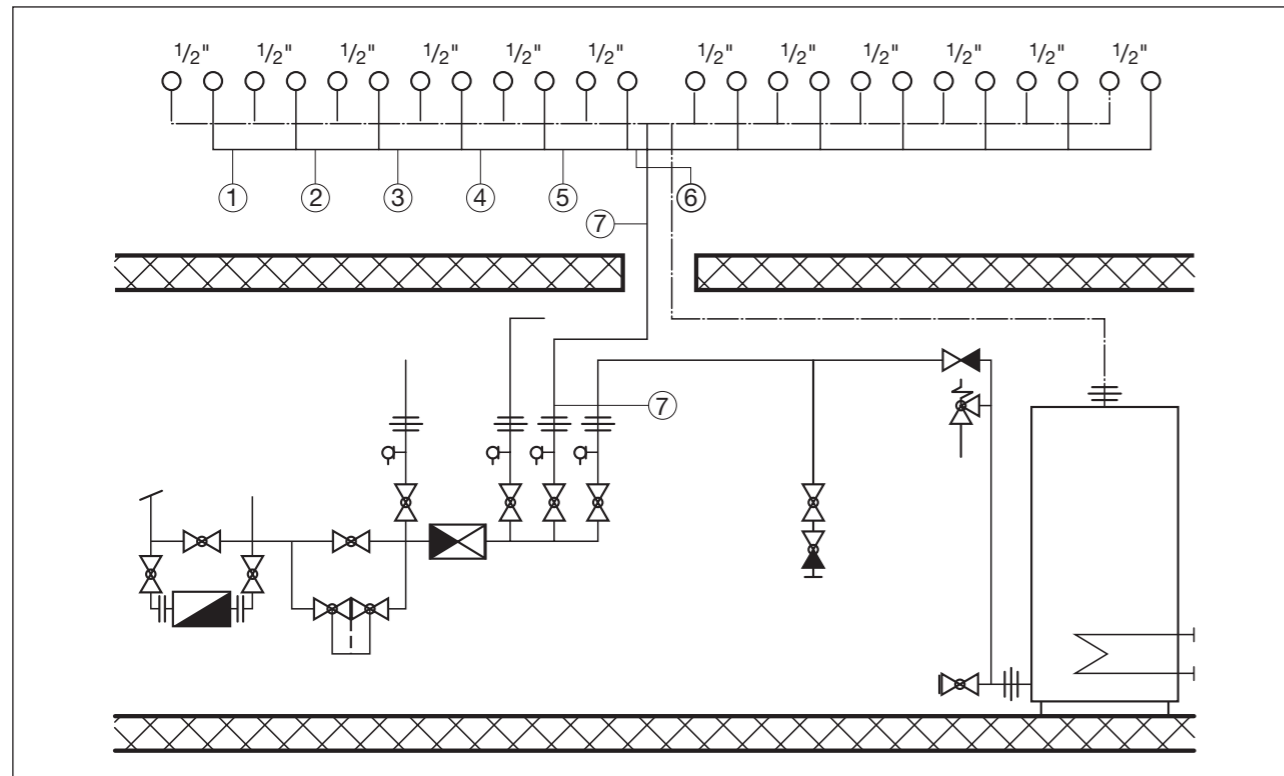
- Medium: water
- Temperature: 10 °C
- Density: 999.7 kg/m³
- Viscosity: 0.00131 Pa·s
- Surface roughness: 0.007 mm



Example

Calculation of shower group installation

Showers (100% simultaneity)



A	B	C	D	E (= C+D)	F	G	H (= Ex G)
Section S	Pipe dia. [mm]	Length TS [m]	Equivalent pipe length for fittings [m]	Total length [m]	Volumetric flow V [l/s]	Pressure loss Δp [mbar]	mbar
1	20	1.00	1 Fixture connection 1 Elbow	1.35 1.20			
2	26	0.75	1 T-piece	0.75	0.22	15.5	55.0
3	26	0.75	1 T-piece	0.75	0.44	13.4	20.1
4	32	0.75	1 T-piece	0.60	0.66	27.0	40.5
5	32	0.75	1 T-piece	0.60	0.88	14.3	19.3
6	32	0.25	1 T-piece	0.60	1.10	19.0	25.6
7	40	15.70	1 T-piece 4 Elbows 1 Coupling 1 Inclined seat valve 1 Distributor outlet	0.85 3.40 0.20 2.00 1.20	0.85	8.5	7.2
				7.65			
				23.35	2.64	29.0	677.2
Total m		20.00	Pressure loss 1-7				844.9

Life cycle assessment for the Geberit Mepla pipe

The development of environmentally friendly products which are distinguished, among other things, by their longevity, unproblematic materials, good reusability and minor environmental impact during their life cycle plays a major role for Geberit. Life Cycle Assessments (LCAs) enable comparisons between various pipes and help make safely based decisions within the product development process.

What does a Life Cycle Assessment tell us?

In the LCAs the environmental impact of a product over its entire life cycle is summed up and weighted– from the extraction of raw materials to disposal. The method used – the Dutch Eco-indicator, 1999, measured with Eco-indicator points (EIP99) – permits to express the environmental impact in a single score. The lower the number of points, the lower the environmental impact.

Objects of investigation / method

Assessed was one-metre of pipe with an inner diameter of 20 mm.

Plastic pipes

- PE-X pipe (polyethylene crosslinked)
- PB pipe (polybutene pipe)

Plastic/aluminum pipes

- Geberit Mepla pipe

These three-layer pipes are composed of an interior coating (polyethylene crosslinked), an aluminium core and an exterior coating (polyethylene).

Metal pipes

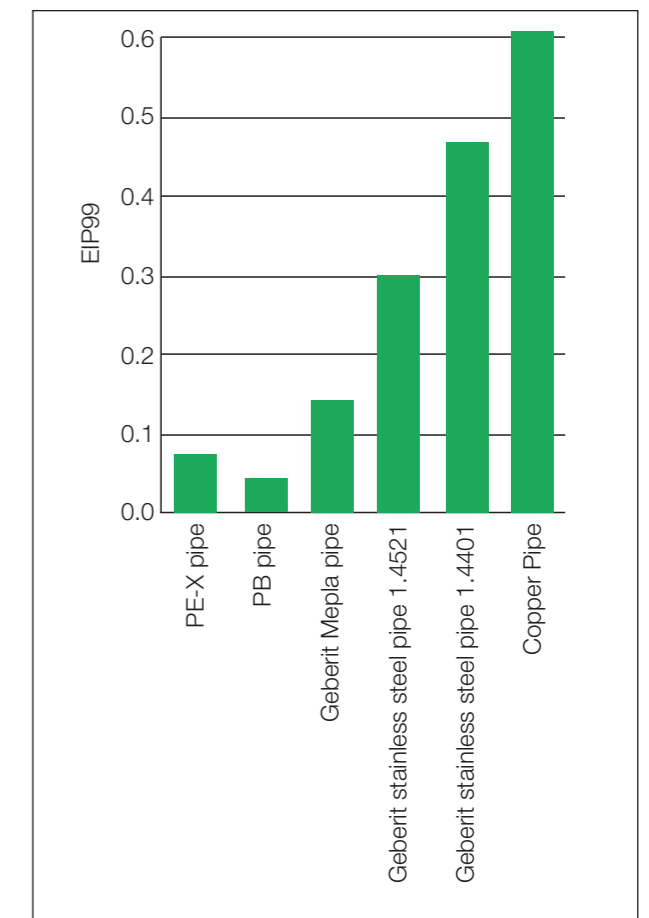
- Geberit stainless steel pipes 1.4521 and 1.4401
- Copper pipe

The service life of all pipes was assumed to be at least 50 years. This study was based on the standard ISO 14040 including an external review and covering the extraction of raw materials and energy sources, the production of pipes and, finally, the disposal of used pipes.

Results

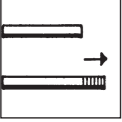
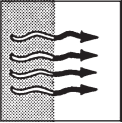




The chart shows the environmental impact of the various pipes. From an ecological point of view, pure plastic drinking water pipes (PE-X and PB) have the best results. Plastic-aluminium multilayer pipes (Mepla) have a slightly higher environmental impact due to the additional aluminium layer. The high environmental impact of copper, stainless and also carbon steel pipes is due to the weight per metre, which is two to three times as high, and because extracting metal from metal ores is extensive and energy intensive.

For more details please consult the Leaflet "Life Cycle Assessment Supply pipes for buildings" available at www.international.geberit.com or contact your local sales company.





Physical and chemical properties

● Physical and chemical properties of Geberit Mepla pipes

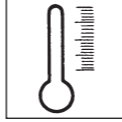
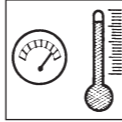

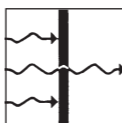



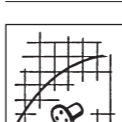
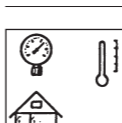
	Thermal expansion 0.000026 m/mK (0.026 mm/mK)	The thermal expansion of the Mepla pipe is 8 times less than PE-X, 5 times less than polybutene and 3 times less than PVC-C. The bending loops are therefore much smaller with Mepla pipes.
	Thermal conductivity 0.43 W/mK	The Mepla pipe is a poor conductor of heat, so the heat losses from hot water pipes are 900 times less than from a non insulated copper pipe.
	Behaviour in fire Fire code 5 Smoke rating 1	The Geberit Mepla pipe is flame retardant and produces dense smoke.
	Resistance to diffusion	The Mepla pipe is absolutely resistant to diffusion.
	Resistance to abrasion	The internal cross linked polyethylene layer is resistant to abrasion. No material abrasion takes place even at high flow speeds.
	Inherent stability	The pipe remains in the required position, which is a great advantage for prefabrication. No support shells are required during installation provided the specified bracket distances are maintained.

● Physical and chemical properties of Mepla fittings

	Stress corrosion cracking	The use of Mepla fittings means stress corrosion cracking cannot take place.
	Dezincification corrosion	The use of gun metal means the effect of moisture cannot lead to dezincification either. Restrictions apply when Mepla is used for salty sea water transport.

Physical and chemical properties

● Physical and chemical properties of Geberit Mepla pipes

	Thermal stability	The maximum operating temperature range is between 0–95 °C. Conditions: <table border="1"> <thead> <tr> <th>Operating temperature</th> <th>pressure</th> <th>guaranteed service life</th> <th>remark</th> </tr> </thead> <tbody> <tr> <td>0–70 °C</td> <td>10 bar</td> <td>min. 50 years</td> <td>up to 95 °C intermittent peak temperature for 150 hrs./a</td> </tr> </tbody> </table>	Operating temperature	pressure	guaranteed service life	remark	0–70 °C	10 bar	min. 50 years	up to 95 °C intermittent peak temperature for 150 hrs./a
Operating temperature	pressure	guaranteed service life	remark							
0–70 °C	10 bar	min. 50 years	up to 95 °C intermittent peak temperature for 150 hrs./a							
	Resistance to pressure	The permitted operating pressure is 10 bar at an operating temperature of 0– 70 °C, with intermittent peak temperature up to 95 °C for 150 hrs./a								
	Electrical continuous conductivity	The system is not electrically conductive because it does not have a metallic connection. The Geberit Mepla system must not be used for equipotential bonding or integrated into the earthing system.								
	Effect of sunlight	The material is UV-ray resistant.								
	Soundproofing	No flowing noises are generated within the pipelines provided the correct pipe dimension has been chosen. Noises from taps can be decoupled from the structure by applying suitable insulation to the pipework.								
	Resistance to corrosion	The system is optimally suited for hot and cold water installations. The internal cross linked polyethylene layer and the fittings are resistant to corrosion.								
	Hygienic	The materials used for pipes and fittings are hygienic and consequently can be used for drinking water (foodstuffs).								
	Service life	The service life of the materials under the specified conditions (10 bar pressure and 70 °C constant operating temperature) is at least 50 years.								
	Applications	The Geberit Mepla supply system is perfectly suited to applications involving hot water (up to 95 °C intermittent peak temperature for 150 hrs./a), cold water and water softened down to 0°F under the specified conditions. The range is designed for all water supply and heating system applications.								

Converting tables

DN	12		15		20		25		32		40		50		65	
	d	di	d	di	d	di	d	di	d	di	d	di	d	di	d	di
Mepla	16	11.5	20	15	26	20	32	26	40	33	50	42	63	54	75	65.6
PP	20	13.2	25	16.6	32	21.2	40	26.6	50	33.4	63	42	–	–	–	–
VPE	16	11.6	20	14.4	25	18	32	23.2	40	29	50	36.2	63	45.6	–	–
PB	16	11.6	20	14.4	25	20.4	32	26	40	32.6	50	40.8	63	51.4	–	–
PVC-C	16	12	22	17	28	22	32	24.8	40	31	50	38.8	63	48.8	–	–
CU	12	10	15	13	22	20	28	25	35	32	42	39	54	52	76.1	72.1
Steel	1/2"		1/2"		3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"	

Abbreviations

AD	Connection distance	R	External pipe thread, conical for connections with internal thread seals (to ISO 7/1) in inches (")
B	Width	RP	Internal pipe thread, conical for connections with internal thread seals (to ISO 7/1) in inches (")
C	Material constant	SB	Bracket distance
cm	Centimetre	TS	Pipe Section
d	External diametre in mm	V	Volumetric flow in l/s
di	Internal diametre in mm	v	Speed in m/s
fH°	French degree of hardness	x	Leg length
K	Kelvin	Z	Z dimension
kg	Kilogram	°C	Degrees centigrade
L	Length	Δt	Change in temperature
l/s	Litres per second	ΔL	Change in length
l/m	Length per metre	Δp	Pressure loss
l/min.	Litres per minute		Angle
LV	Load value	μ	Micrometre
m	Metre		
m/s	Metres per second		
mm	Millimetre		
PE	Polyethylene		
PE-xb	Silane-interlaced polyethylene		
r	Radius		

Pressure scale

1 bar = 1000 mbar
1 bar = 100 000 Pa (= $\frac{N}{m^2}$)
1 bar = 10,2 m Water column
1 bar = 14,5 psi
1 psi = 6896.43 (= $\frac{N}{m^2}$)
1 psi = 1 lb/square inch

Length scale

1 m = 1000 mm
1 m = 100 cm
1 m = 10 dm
1 cm = 10 mm
1 dm = 10 cm = 100 mm

The dimensions stated are not binding, are given subject to tolerances and to any subsequent changes and additional installation options.

No liability will be accepted for the consequences of incorrect or incomplete information.

This System Information renders all previous Technical Information documents invalid.

All specifications and information in this brochure are based on the state of knowledge of December 2009 and are subject to change without notice. The information in this document contains general description of the technical options available, which do not always have to be present in the individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

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