

Geberit Mepla Application Technique



09/2001

Hot and cold water
supply system

Abbreviations

B	Width	S/ft	Second per foot
C	Material constant	Gal/sec	Gallon per second
d	External diameter in inches	Psi/ft	Psi per foot
di	Internal diameter in inches	Gal/min	Gallon per minute
K	Kelvin	Ft/s	Foot per second
L	Length	In/ft · °F	Inch per foot and Fahrenheit
LV	Load value	W/ft · °F	watt per foot and Fahrenheit
PE	Polyethylene	mm/m · K	Millimeter per meter · Kelvin
PE-xb	Silane-interlaced polyethylene	W/m · K	Watt per meter · Kelvin
r	Radius	Psi/hr	psi per hour
HDPE	High Density Polyethylene	kPa/hr	kilo Pascal per hour
°F	Degrees Fahrenheit	SB	Bracket distance
in	Inches	Q	Volumetric flow in gal/sec
ft	Foot	v	velocity in ft/s
gal/ft	Gallon per foot	x	Leg length
psi	Pound per square inch	Δt	Change in temperature
oz	Ounce	ΔL	Change in length
lb	Pound	Δp	Fricition loss
hPa	Hecto-Pascal	α	Angle
MPa	Mega-Pascal		

The dimensions stated are subject to tolerances, 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. Please verify that this brochure is the latest MEPLA literature. Call 1-206-6372. Geberit and Pacific Pipe & Pump will be pleased to provide you with the latest information.

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Installation Technique

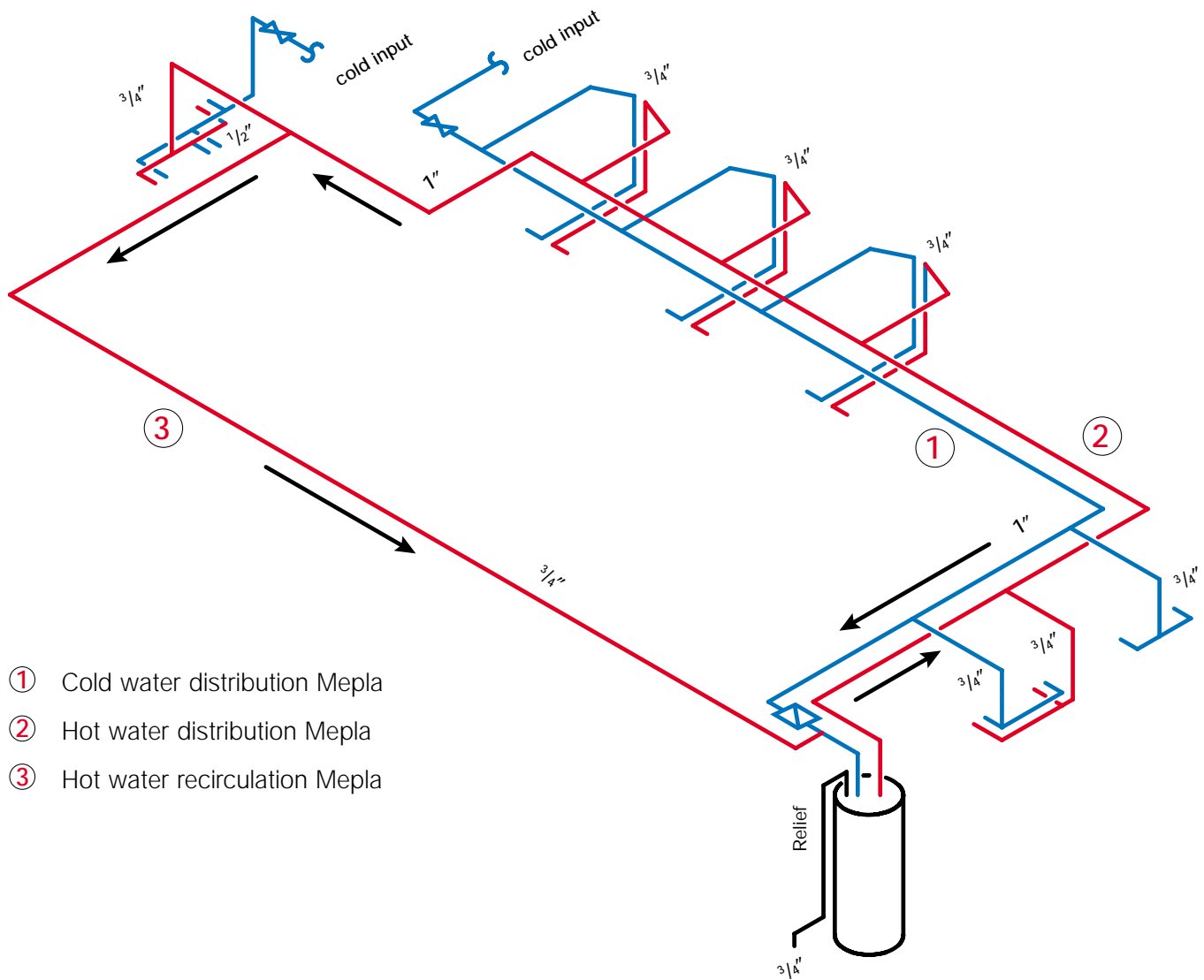
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Water supply system

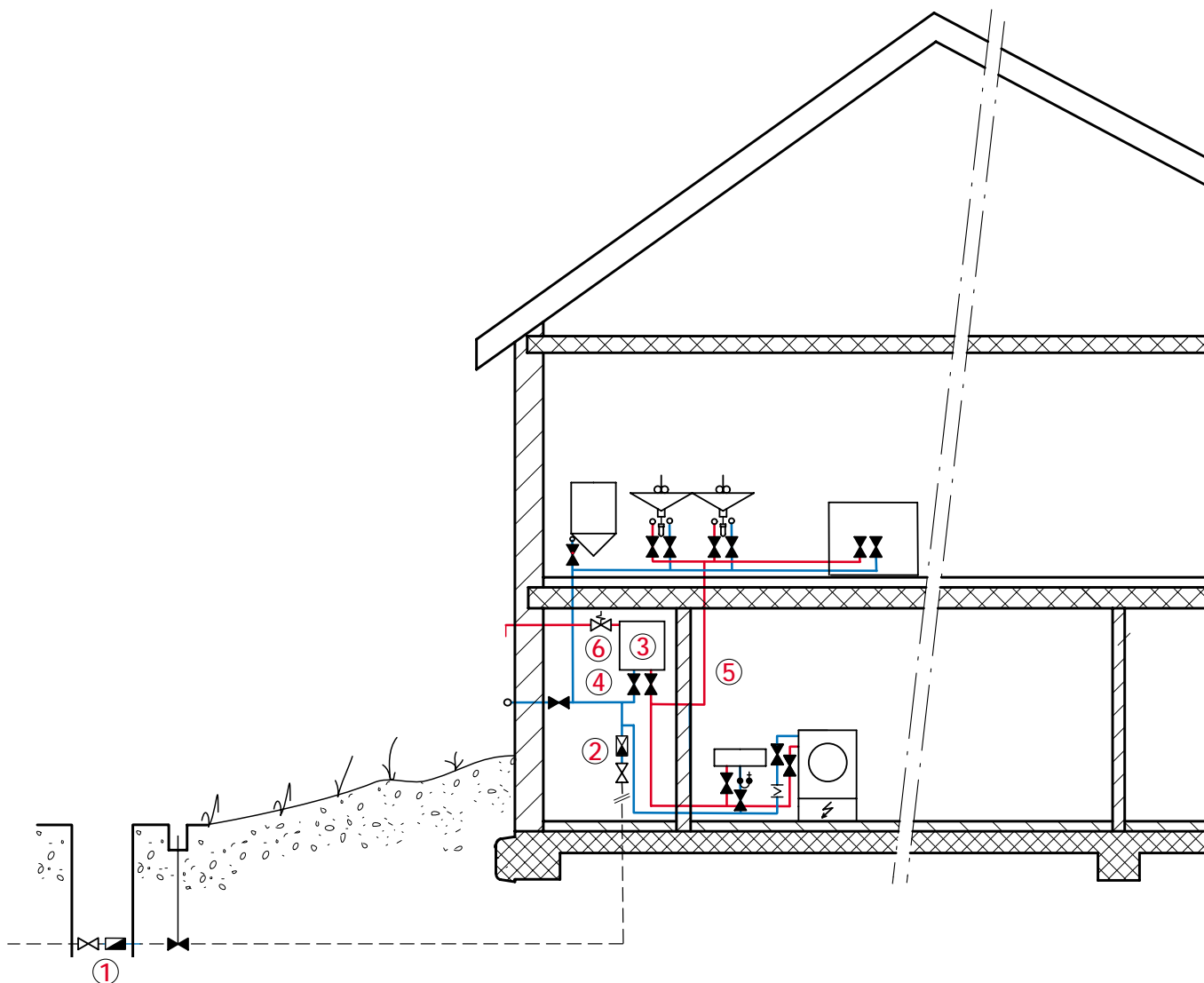
Isometric



This diagram is a schematic only. Comply with local codes for safety relief, pressure reduction etc.

Water supply system

Distribution with direct pressure from main water supply



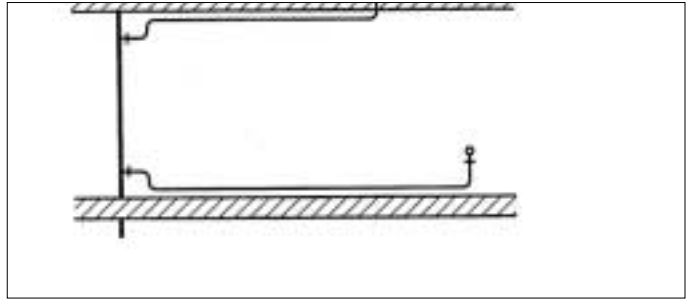
- ① Main water supply with water meter and stop valve
(Mepla not to be used in trench)
- ② Gate valve/pressure reducer valve/filter/back flow preventer
- ③ Boiler/ water heater
- ④ Cold water distribution Mepla ———
- ⑤ Hot water distribution Mepla ———
- ⑥ Safety Relief Line ———

This drawing is a schematic only. Comply with local codes for safety relief, pressure reduction etc.

Field installation examples

- **Concealed piping**

The Geberit Mepla compression joint is a non-releasable connection and it **may be concealed in many desired locations.**



In the riser pipe



Specifications and standards

Product Definition

Geberit Mepla is a hot and cold potable water supply system with a triple layered metal/plastic pipe complying to ASTM, NSF, ISO, DIN 16893.

Structure of the Geberit Mepla Pipe

1. Internal pipe made from interlaced PE-Xb pipe
2. Edge to edge laser welded aluminum pipe
3. Protective layer of HDPE

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



Appearance:

- Mepla Pipe - Black colour

Compliance



ISO- Standard 9001

ISO- Standard 14001

Standards:

USA (ASTM F 1986, NSF)
 International
 European
 Germany
 Switzerland
 Austria
 France
 Italy
 Netherlands
 Belgium
 Denmark
 Great Britain
 Poland
 Czech Republic
 Russia
 for Shipbuilding:
 DNV
 American Bureau of Shipping

Properties

- No internal or external corrosion
- No oxygen diffusion weather and ageing
- Lightweight and simple to use (can be bent easily)
- Ideal pipe joint (compression joint without nipples)
- No soldering
- No special protection required against UV radiation if stored outdoors
- Inherently stable
- Waste materials can be separated and recycled (PE, aluminum)

Properties of the Mepla compression joint fitting

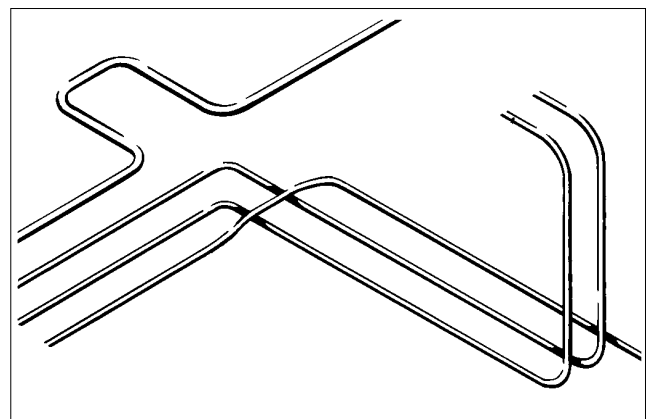
- Resistant to corrosion
- No dezincification due to the effect of moisture
- Press-in profile protected by a cap prior to installation

The Mepla compression joint

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

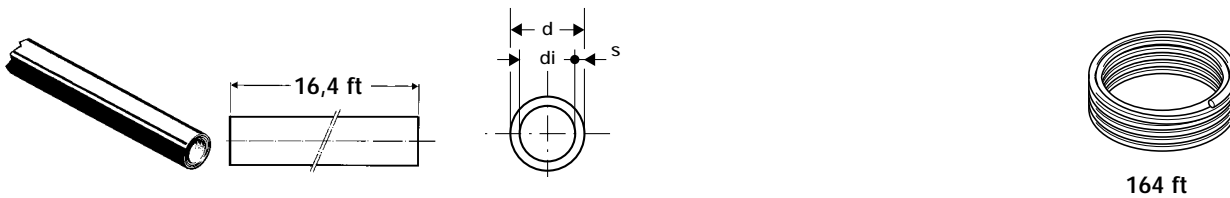
Properties of the Mepla compression

- Clean, secure connection
- Clear positioning of the pressing jaws
- High durability under long-period stressing
- Insertion depth can be checked at any time



The Geberit Mepla pipe is inherently stable and retains its shape

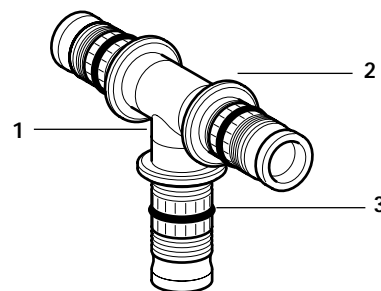
Geberit Mepla pipes and fittings – physical properties



Pipe nominal diameter in inches di x s	1/2 x 0.089	5/8 x 0.098	3/4 x 0.118	1 x 0.118	1 1/4 x 0.138	1 1/2 x 0.157	2 x 0.177
External diameter d	0.630 in	0.787 in	1.024 in	1.260 in	1.575 in	1.969 in	2.480 in
Internal diameter di	0.453 in	0.591 in	0.787 in	1.024 in	1.299 in	1.654 in	2.126 in
Length per roll	164.0 ft	164.0 ft	164.0 ft	–	–	–	–
Length per rod	16.4 ft	16.4 ft	16.4 ft	16.4 ft	16.4 ft	16.4 ft	16.4 ft
Diameter per roll	31.4 in	31.4 in	43.3 in	–	–	–	–
Weight per ft pipe	0.09 lb	0.12 lb	0.20 lb	0.28 lb	0.40 lb	0.56 lb	0.74 lb
Weight per ft pipe with water at 50°F	0.16 lb	0.24 lb	0.41 lb	0.64 lb	0.97 lb	1.50 lb	2.28 lb
Water volume gal/ft	0.008	0.014	0.025	0.043	0.069	0.112	0.184
Surface roughness, internal pipe	0.00028 in	0.00028 in	0.00028 in	0.00028 in	0.00028 in	0.00028 in	0.00028 in
Thermal conductivity W/(ft ·°F)	0.07283	0.07283	0.07283	0.07283	0.07283	0.07283	0.07283
Coefficient of thermal expansion in/(ft ·°F)	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³
Operating temperature/flowing water	32/180 °F	32/180 °F	32/180 °F	32/180 °F	32/180 °F	32/180 °F	32/180 °F
Permitted operating pressure	145 psi	145 psi	145 psi	145 psi	145 psi	145 psi	145 psi
Minimum bending radius with bending pliers	2.28 in	2.76 in	3.66 in	4.57 in	6.30 in	7.87 in	–

Structure of the Geberit Mepla Fitting

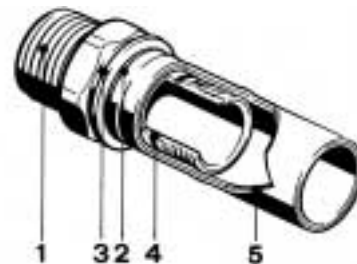
1. Mepla fitting: PVDF (Polyvinylidene fluoride)
2. Tool guidance groove
3. EPDM O-ring



The Mepla fitting

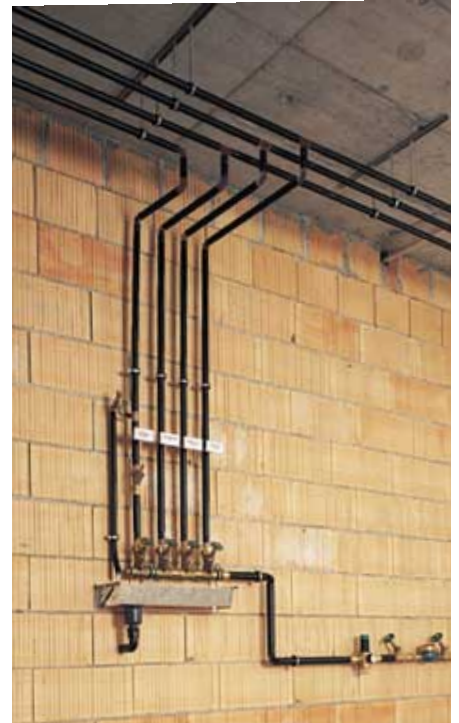
Structure of the compression joint

1. Mepla fitting: PVDF or Brass
2. HDPE washer to prevent electrochemical reaction (only for brass fittings)
3. Tool guidance groove
4. EPDM O-ring
5. Geberit Mepla: PE-Xb/AL/HDPE



The Mepla compression joint

Geberit Mepla fittings – Application



Geberit Mepla can be installed faster, easier and more reliably

Mepla preparation size 1/2"–5/8"

Mepla hand compression tool sizes 1/2"–3/4" pipe

Mepla bend by hand 1/2"–3/4"



1. Cut off

2. Remove burr

3. Compression

A bend? No problem

Mepla preparation size 1/2"–2"

Mepla power compression tool 1/2"–2" pipe

Mepla bend tool 1/2"–1" pipe



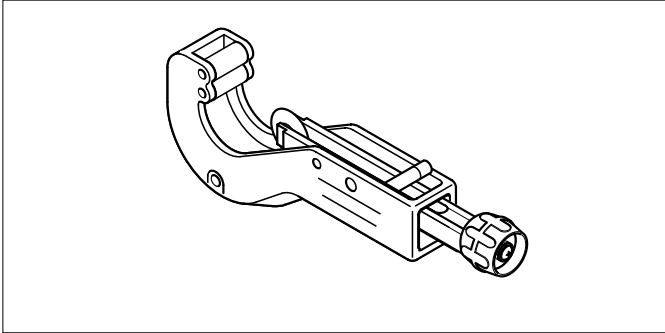
1. Cut off

2. Remove burr

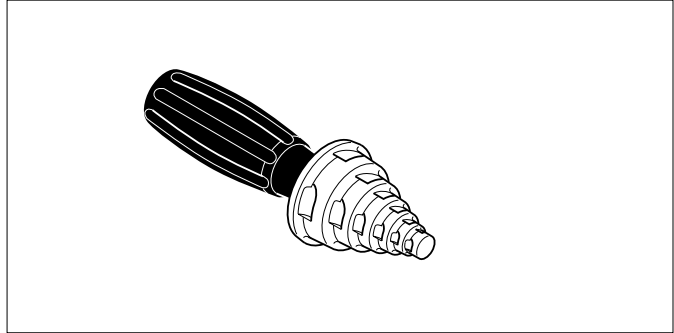
3. Compression

A bend? No problem with the Geberit bend tool

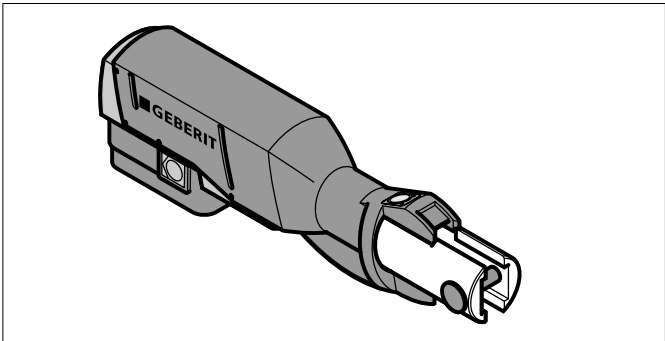
Geberit Mepla tools



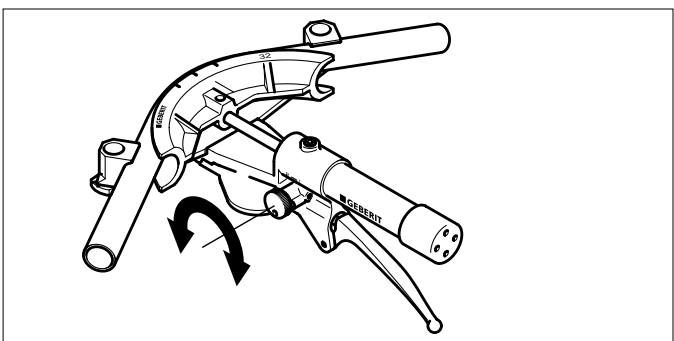
Pipe cutter



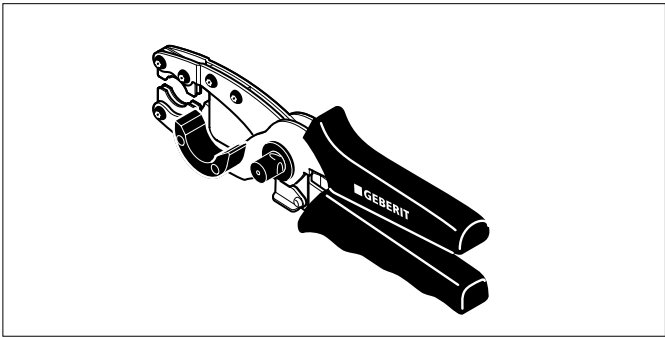
Deburr tool



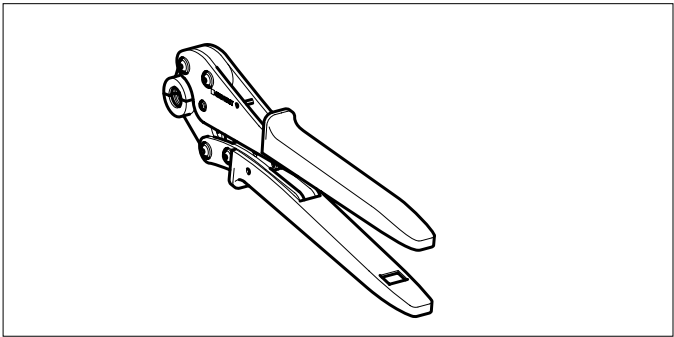
Mepla compression tool 1/2" - 2"



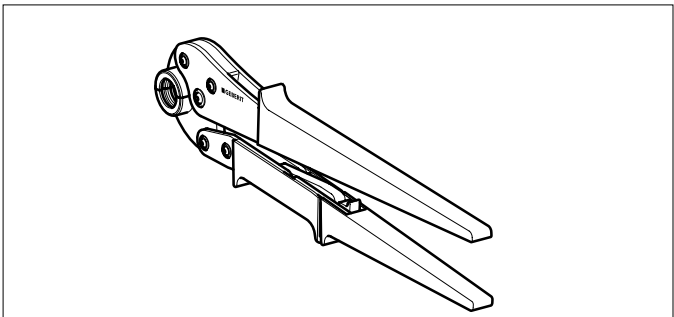
Mepla bending tool 1/2" - 1"



Mepla pliers (pipe cutter and deburr tool 1/2" - 5/8")



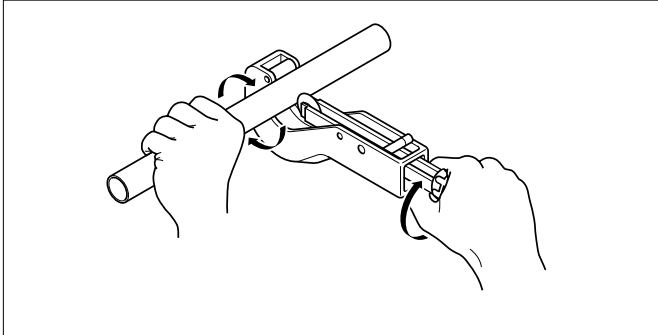
Mepla compression tool 1/2" - 5/8"



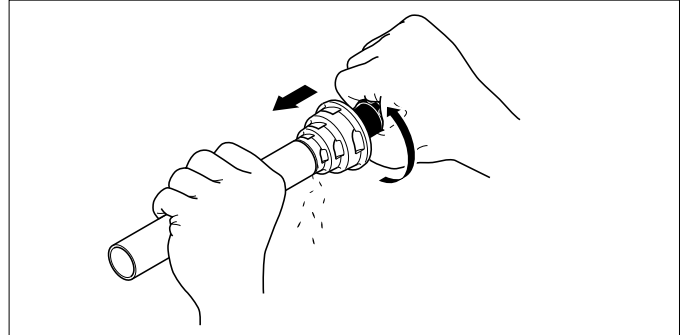
Mepla compression tool 3/4"

Preparation Mepla

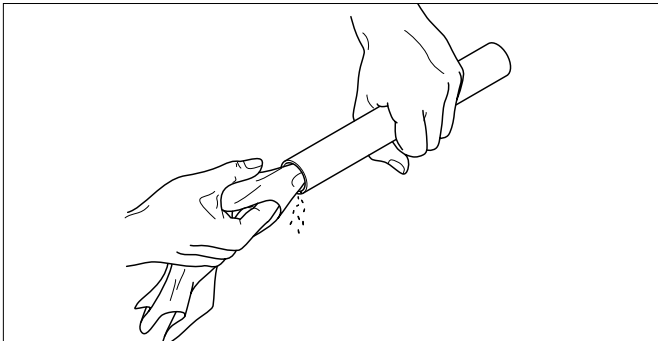
● Preparation of pipe and fitting 1/2" - 2"



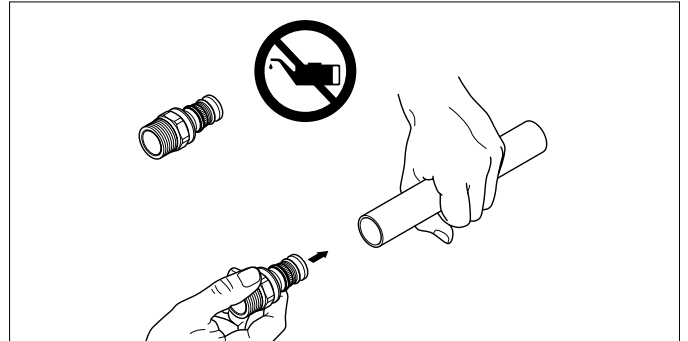
1 Cut off Mepla pipe with Mepla pipe cutter.



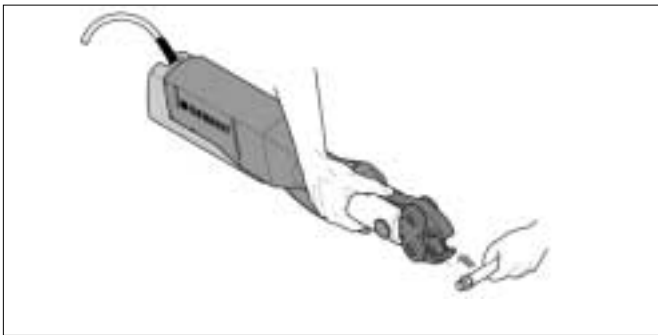
2 Remove burr. Any ovalities will be calibrated automatically.



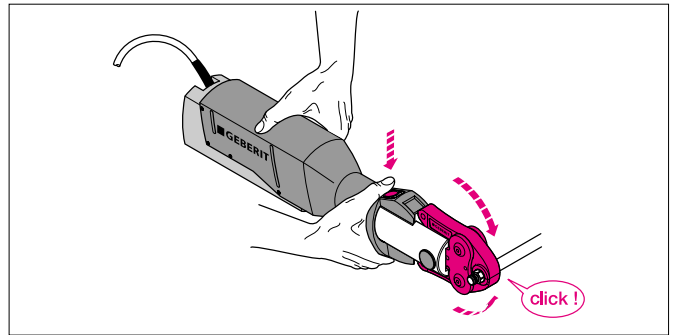
3 Remove chips and check visually that no other dirt is inside the pipe.



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



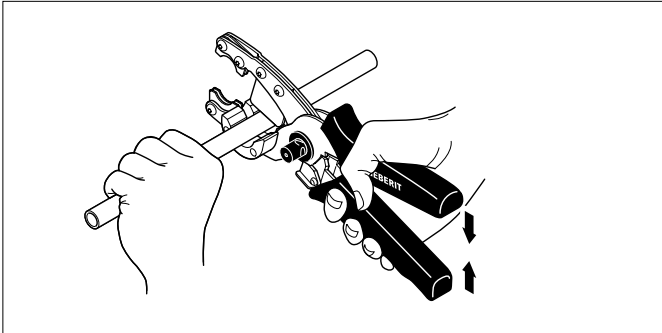
5 Pipe with inserted fitting, ready for compression.



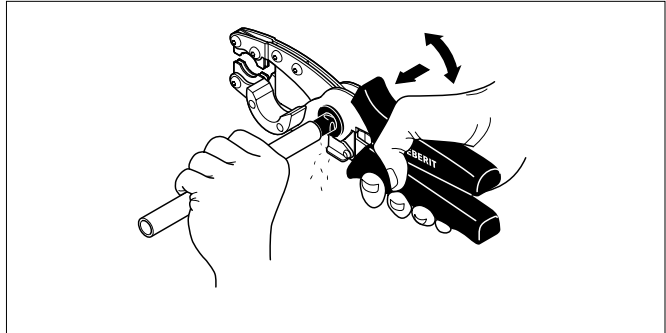
6 Compression.

Preparation Mepla

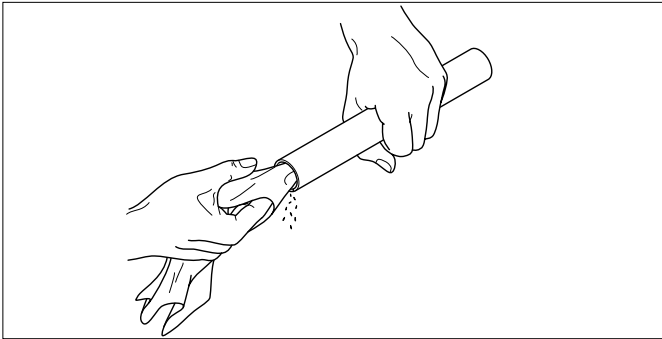
● Preparation of pipe and fitting 1/2" - 5/8"



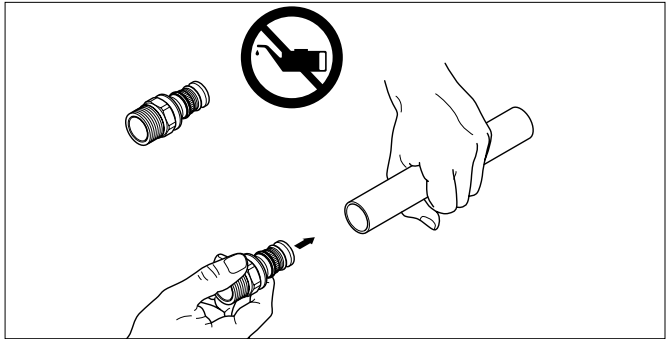
1 Cut off Mepla pipe with cutting pliers.



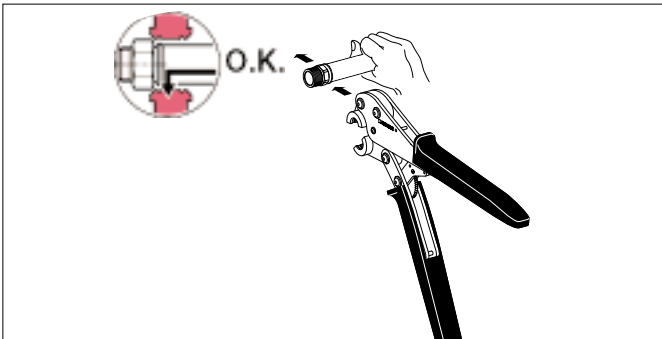
2 Remove burr. Any ovalities will be calibrated automatically.



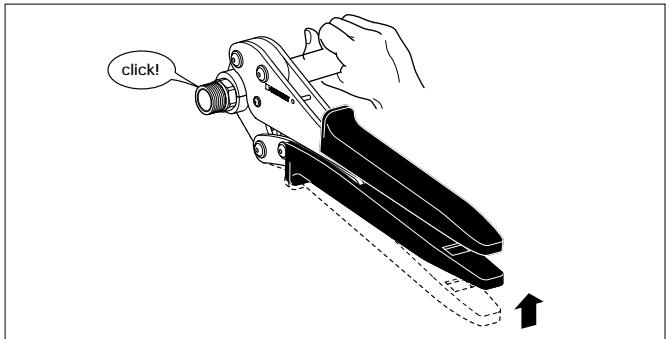
3 Remove chips and check visually that no other dirt is inside the pipe.



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



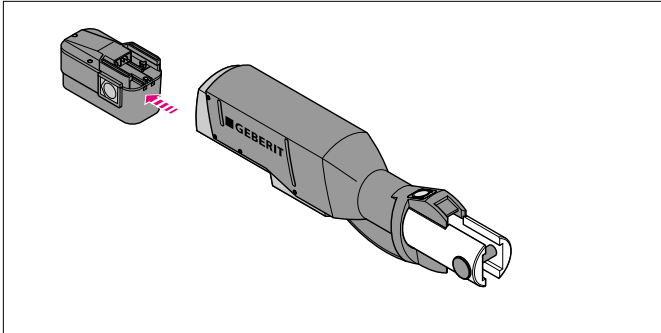
5 Pipe with inserted fitting, ready for compression.



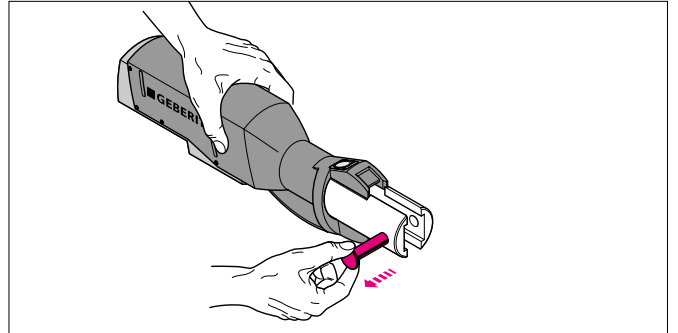
6 Compression

Preparation Mepla

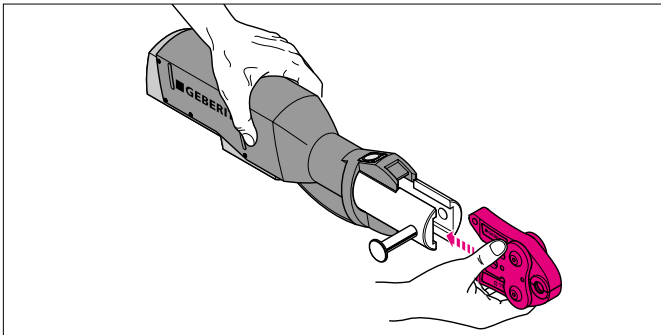
● Preparation of compression tool 1/2" - 1 1/2"



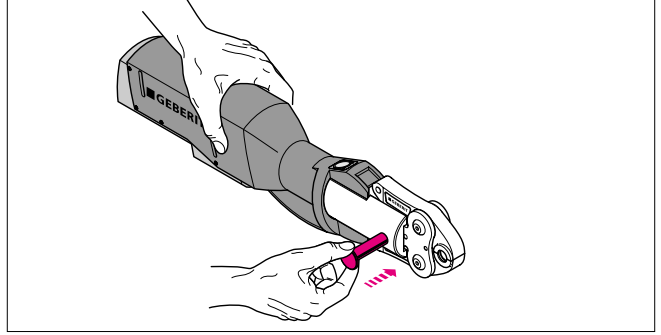
1 Compression tool not connected



2 Lift up locking pin

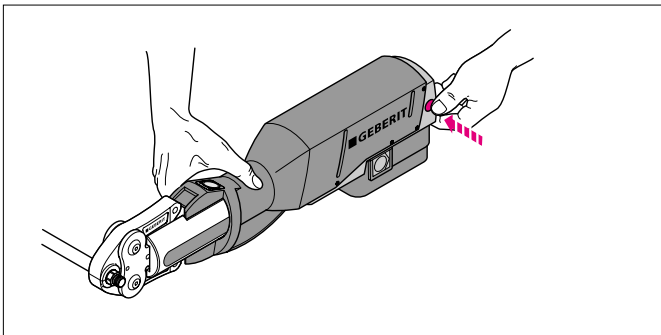


3 Insert jaw 1/2" - 1 1/2"



4 Insert locking pin = ready for pressing

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



5 Note:

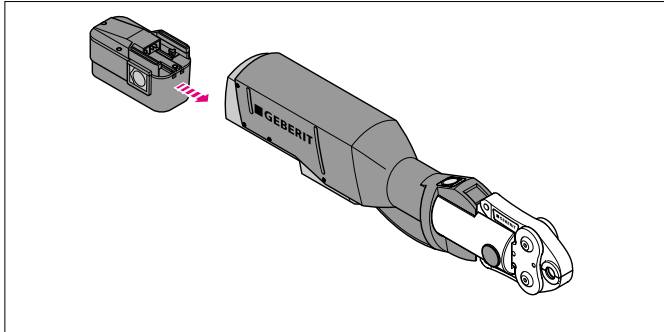
When working at very low temperatures, the following steps might be necessary for correct function:

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

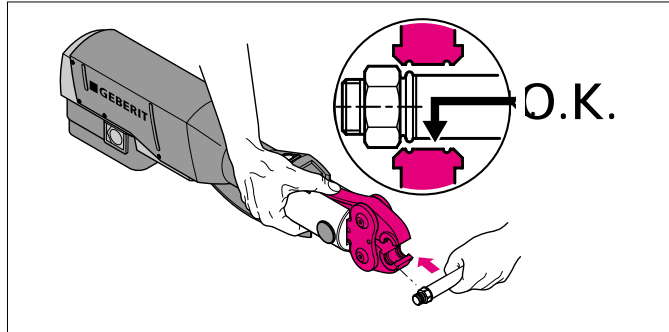
These steps might be repeated if necessary.

Mepla compression connection 1/2" - 1 1/2"

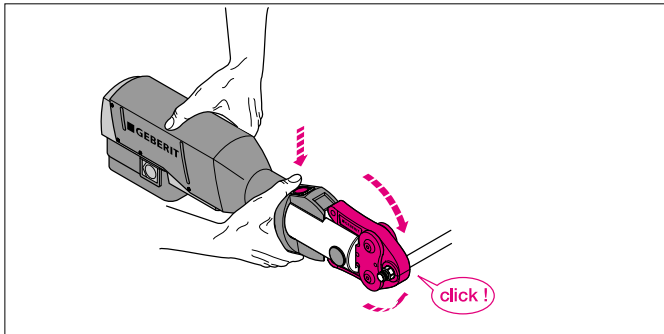
● Compression operation 1/2" - 1 1/2"



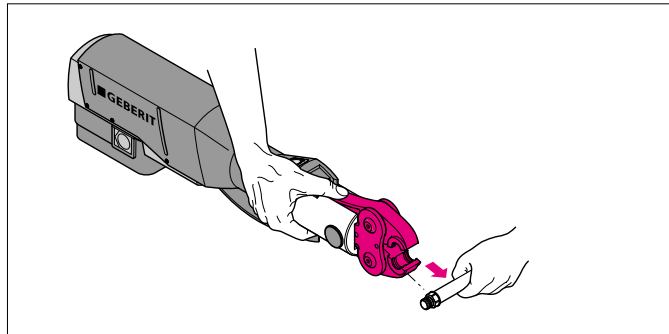
1 Connect power



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

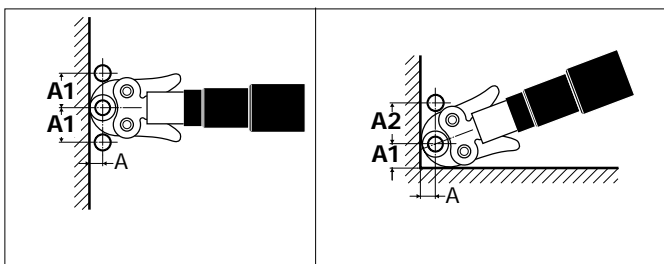


3 Switch power on and do not interrupt until jaw is released automatically.



4 Open jaw by hand and remove tool.

● Required space for compressing procedure:



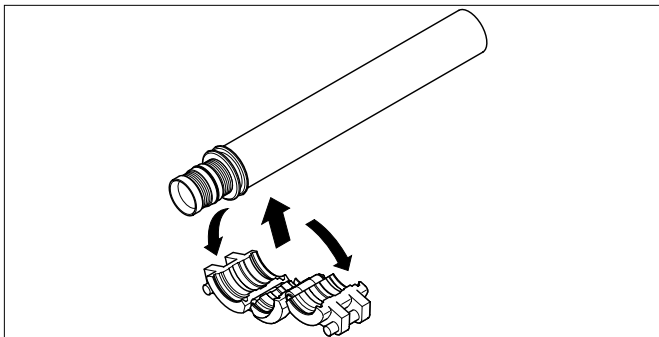
Note:

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

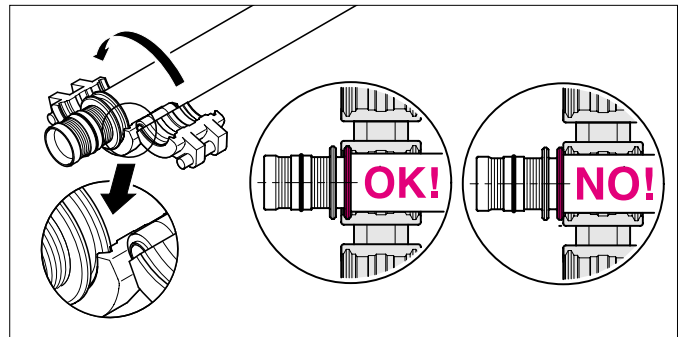
d in	A in	A1 in	d in	A in	A1 in	A2 in
1/2"	0.63	1.65	1/2"	0.75	2.29	1.22
5/8"	0.71	1.81	5/8"	0.79	2.24	1.34
3/4"	0.82	2.08	3/4"	0.90	2.44	1.46
1"	1.06	2.44	1"	1.06	2.64	1.77
1 1/4"	1.22	2.83	1 1/4"	1.22	3.03	2.00
1 1/2"	1.57	3.74	1 1/2"	1.57	3.74	2.36

Mepla compression connection 2"

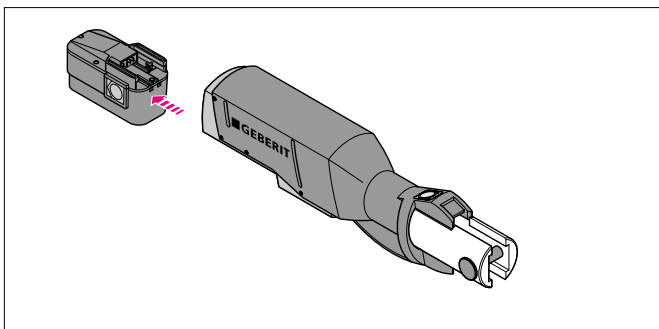
● Compression operation 2"



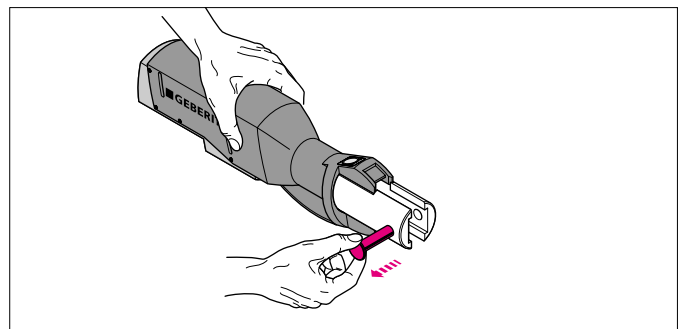
1 Open guidance groove



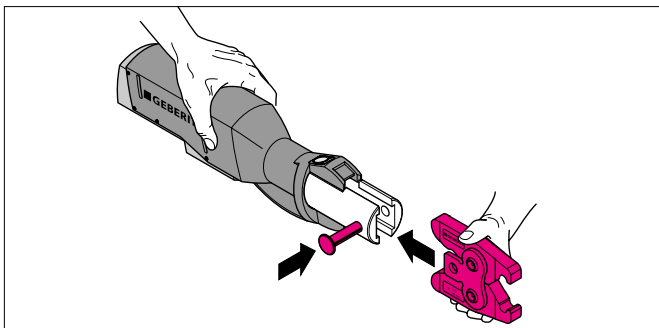
2 Place nose onto guidance groove of fitting and close the nose.



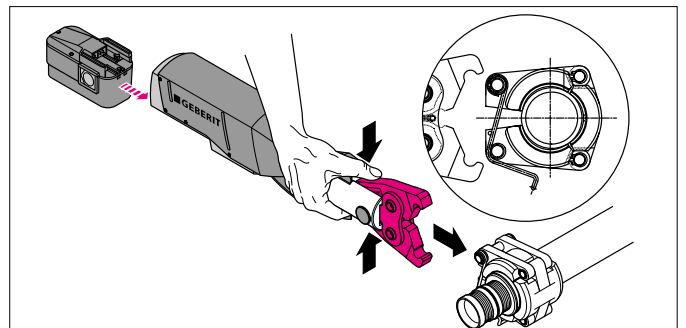
3 Compression tool not connected



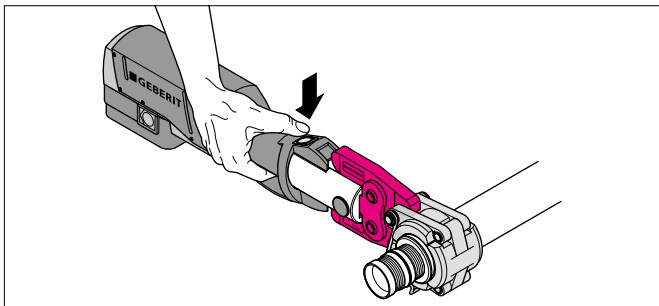
4 Pull out locking pin



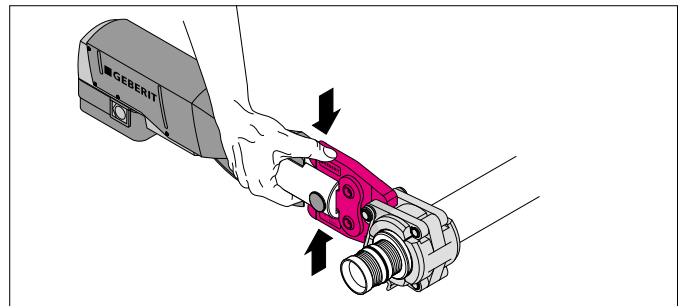
5 Insert tool adapter for compression noose (2") and insert locking pin all the way = Tool is ready for compression



6 Connect power and connect tool adapter to compression noose.

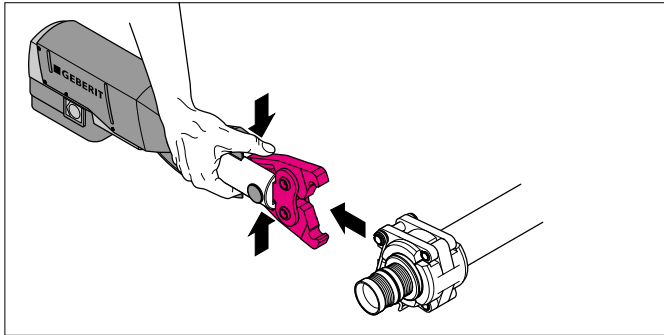


7 Switch power on and do not interrupt until tool adapter is released automatically.

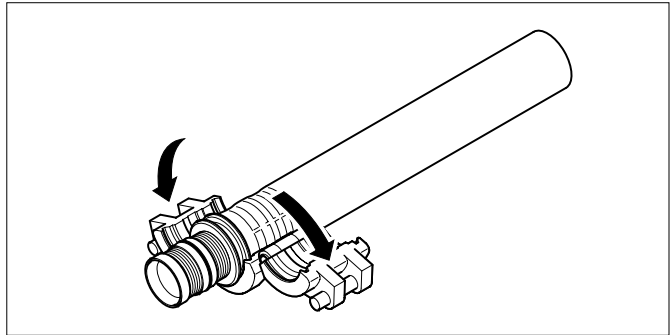


8 Open tool adapter by hand...

Mepla compression connection 2"



9 ...and remove compression tool



10 Open nose by hand and remove tool

Note:

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

● Required space for compressing procedure:

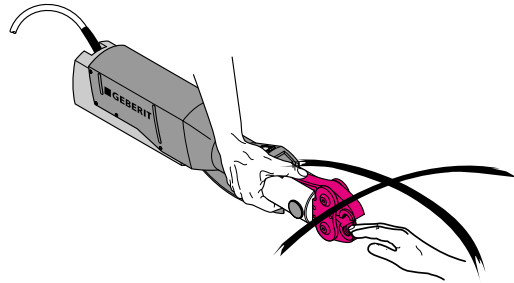
d	A (in)	C (in)	d	A (in)	B (in)	C (in)
2"	3.15	4.33	2"	3.15	3.54	4.33

Mepla compression connection 1/2" - 1 1/2"



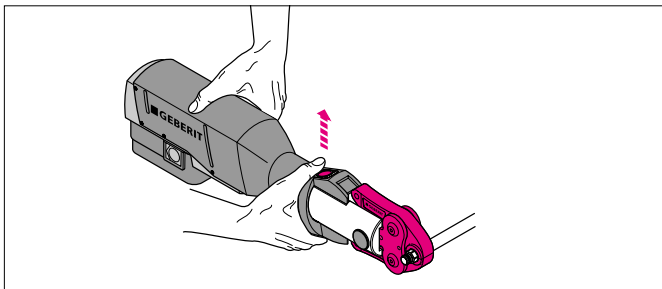
Danger of crushing!

The tool poses a risk of crushing fingers or hands! Never hold any part of your body, or anything other than the intended items, between the compression jaws while you are operating the tool!

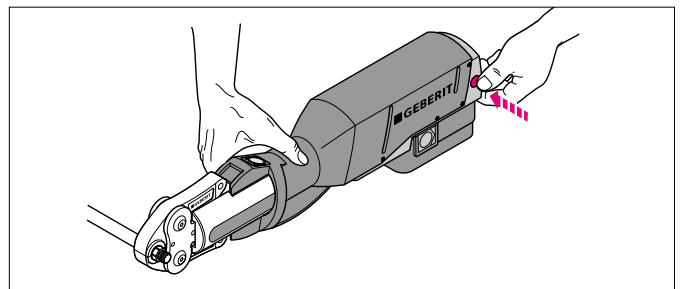


● Interrupting compression procedure

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



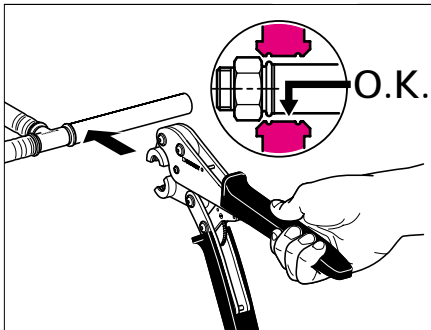
1 Release power switch.



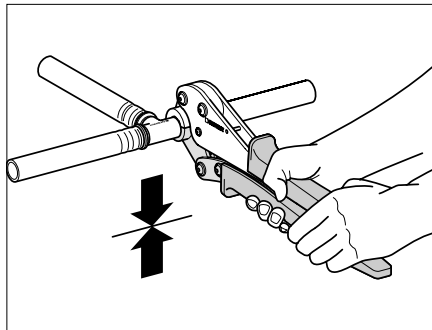
2 The motor can be switched off immediately by pressing the Stop button. This will switch off the tool. After fault display switch power on again to release jaw and begin return stroke.

Note: An interrupted compression must be fully repeated immediately afterwards.

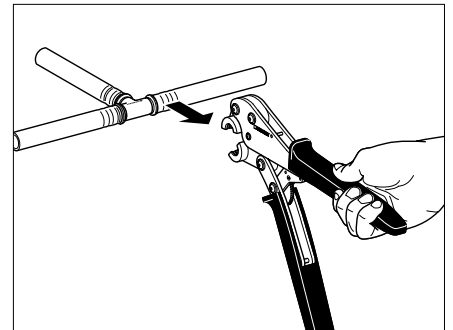
Mepla compression connection 1/2" - 5/8"



1 Place Mepla compression pliers onto guidance groove of fitting.



2 Compression made by fully closing the pliers.

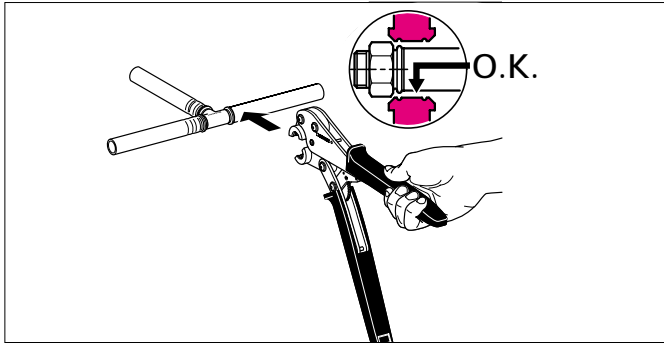


3 The compression tool reopens automatically after completed compression.

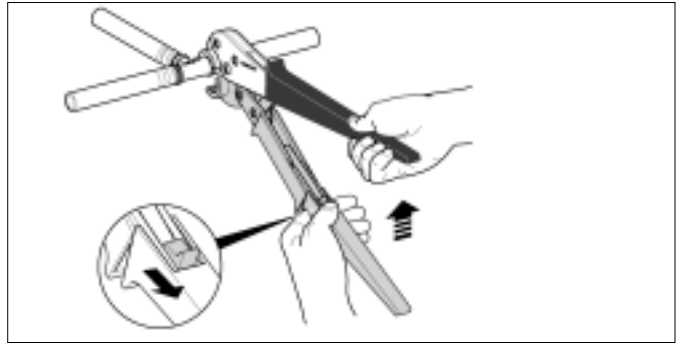
Note:

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

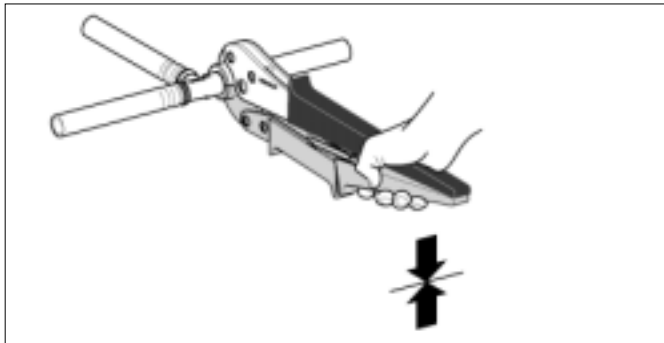
Mepla compression connecting 3/4"



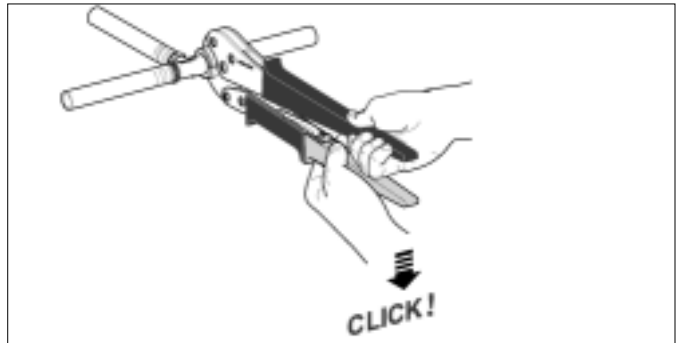
1 Position the hand-operated compression tool with its groove on the bulge of the fitting



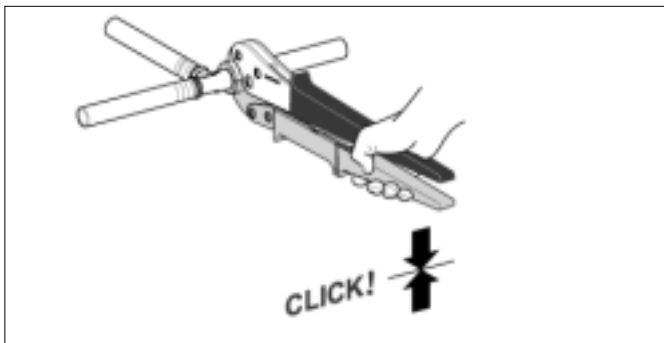
2 Put the legs of the pliers into the offset position by pulling the slide



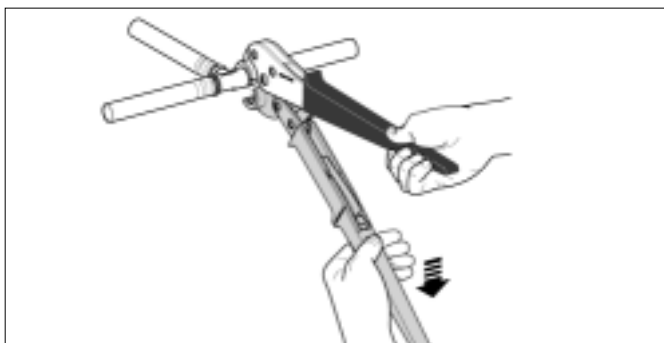
3 Press the legs of the pliers completely together



4 Put the offset lever back to the initial position



5 Complete the compression operation by closing the legs of the pliers



6 Pliers open automatically after the compression has been completed

● Required space for compressing procedure:

d	A	B	C	d	A	B	C
(in)	(in)	(in)	(in)	(in)	(in)	(in)	(in)
1/2"	0.59	1.50	1.65	1/2"	0.75	1.18	1.97
5/8"	0.63	1.65	1.73	5/8"	0.79	1.22	2.16
3/4"	0.75	1.85	2.09	3/4"	0.91	1.30	2.44

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

Service of compression tool

● Care instructions

Compression tool

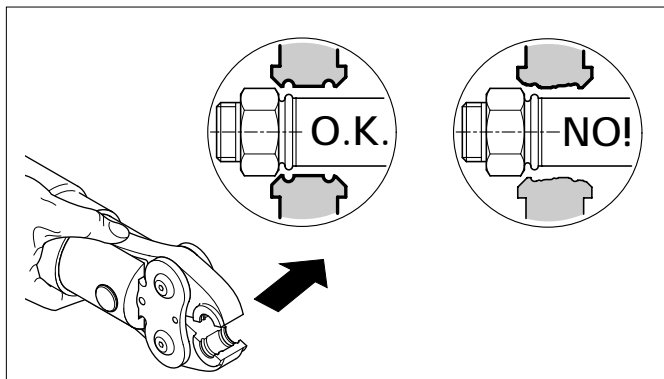
The high quality materials used (pump with ball bearings; valves and plunger heat treated) means wear to the parts and seals is reduced to a minimum. As a result, it is practically impossible for the hydraulic oil to become contaminated. The device can be cleaned with a dry brush or rag if necessary. 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.

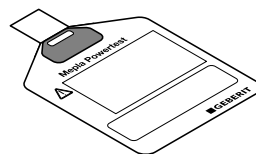
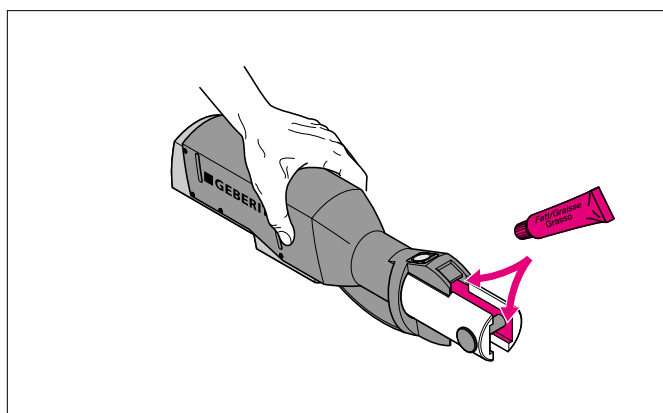
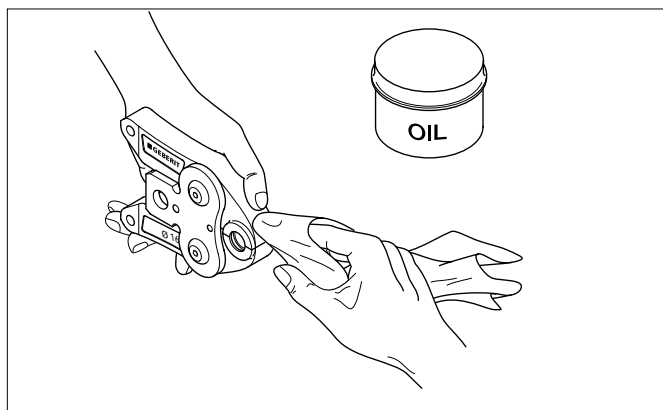
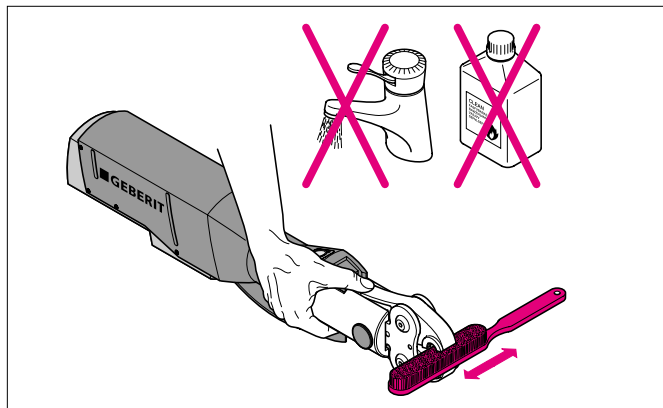


Charger

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 (Part # 690.491.00.1) for hand compression tool 1/2" - 3/4" and compression jaw 1/2" - 1 1/2" **every 12 months**.



Part # 690.491.00.1

Mounting instructions
994.688.00.0

Bending

● Pipe bending

All pipes of diameter $\frac{1}{2}$ " , $\frac{5}{8}$ " , $\frac{3}{4}$ " and 1" 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 ($\frac{1}{2}$ " - 1")

Bending die ($\frac{1}{2}$ "

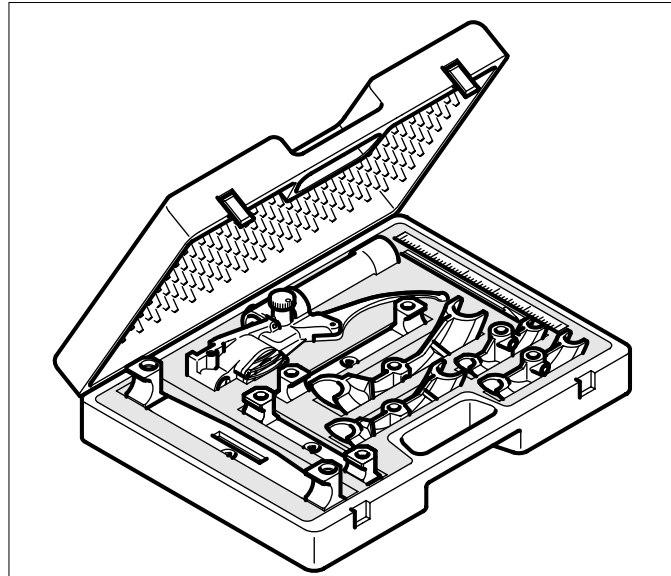
Bending die ($\frac{5}{8}$ "

Bending die ($\frac{3}{4}$ "

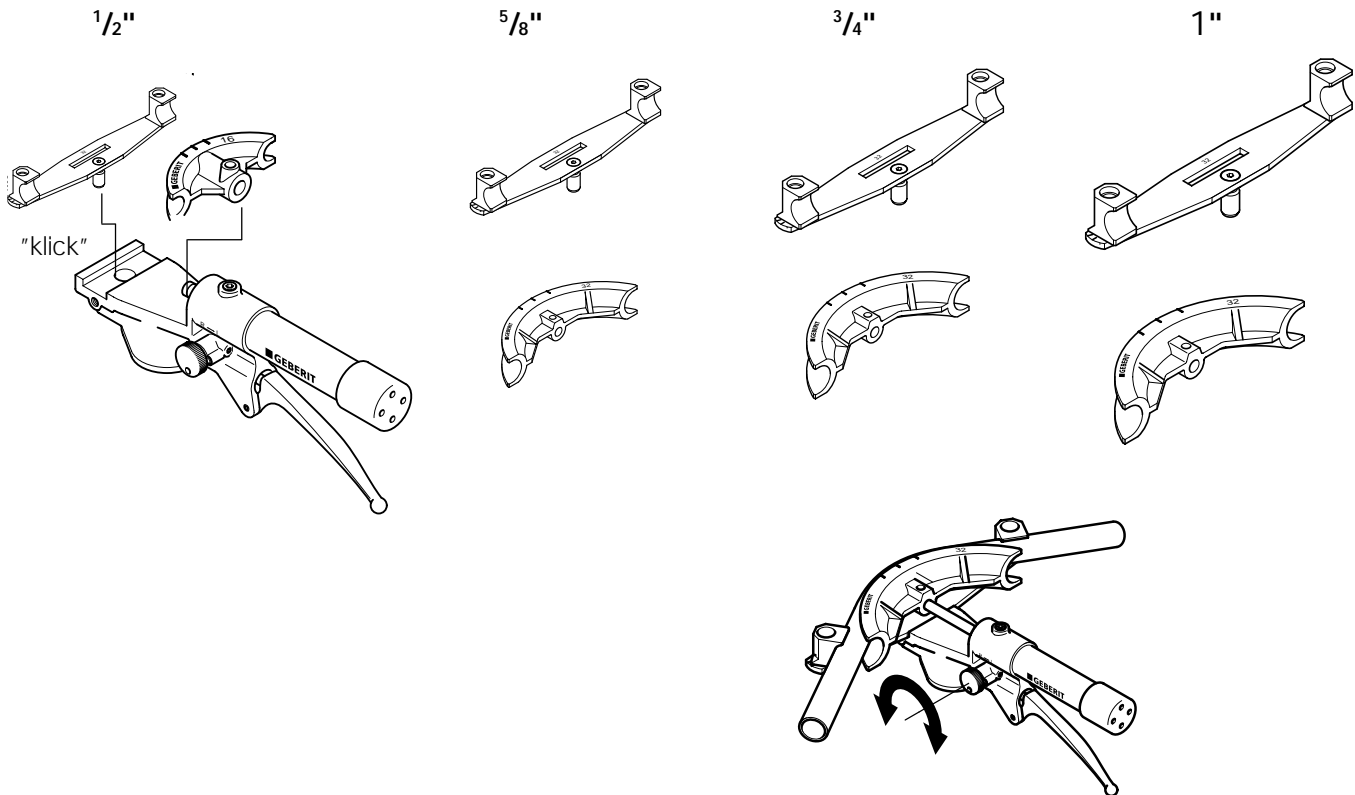
Bending die (1")

Meter stick

Yellow grease pencil



● Preparation of tool

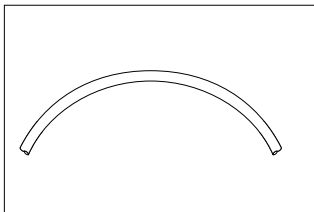
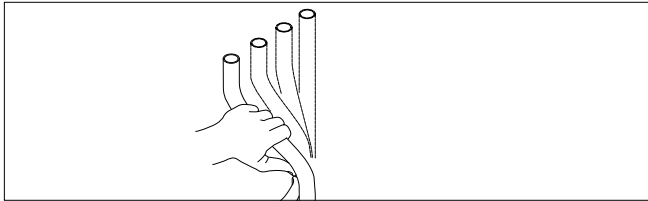


Attach corresponding bending die and cheek according to the pipe diameter.

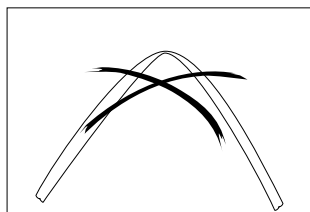
Bending

Bending pipes by hand 1/2" - 3/4"

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



Right



Wrong

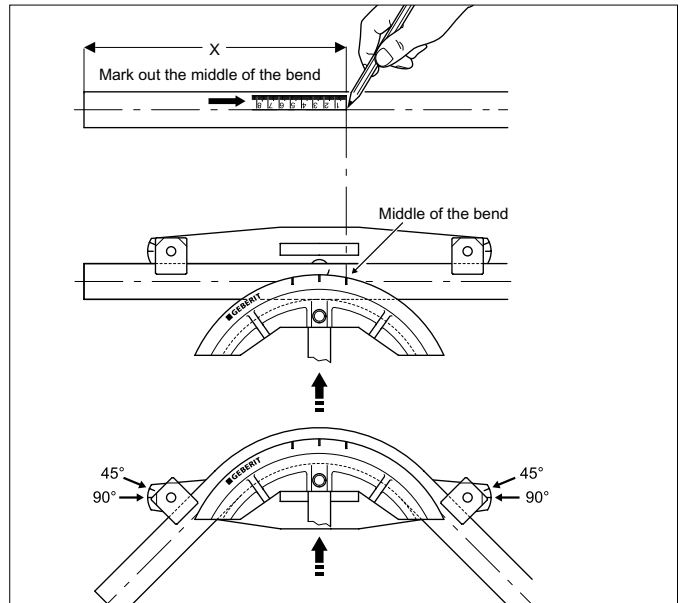
Bending pipes 1 1/4" and 1 1/2"

With the appropriate tool it is easy to bend Mepla pipes 1 1/4" and 1 1/2", thanks to its inherent welded aluminum pipe.

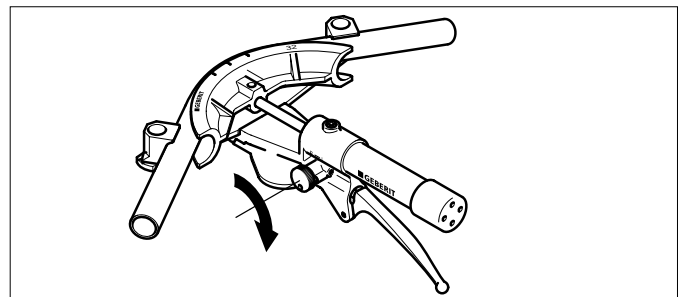
See also page 20 for "Additional Bending Tools".

Bending pipes using the Geberit bending tool 1/2" - 1"

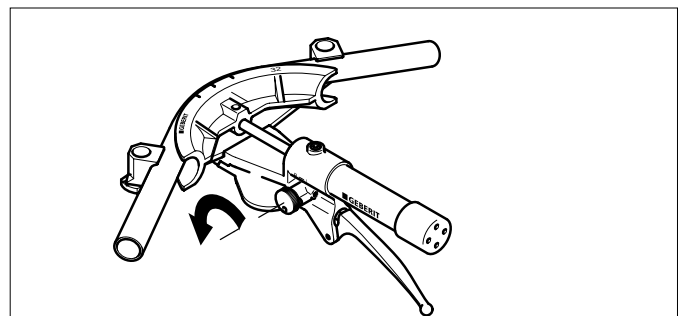
Mepla pipes size 1/2" through 1" can be easily bent in the field using the Geberit bending tool. Bending dies are marked with settings for accurately bending pipes to 45° and 90°.



1 Mark the middle of the bend on the pipe and place the pipe in the bending tongs.



2 Bend the pipe by operating the mechanism.

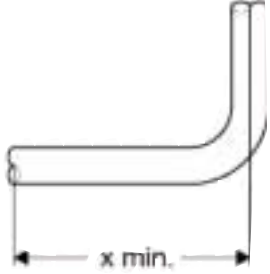


3 Release the rack using the release handle. The rack moves back in automatically.

Bending

● Minimum leg length

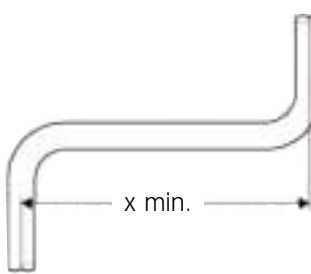
(When using the Geberit Mepla bending tool)



d	x min. (in)
1/2"	4.72
5/8"	5.12
3/4"	7.09
1"	9.45

● Minimum axis displacement dimension

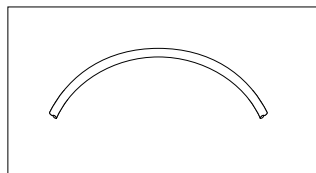
(When using the Geberit Mepla bending tool)



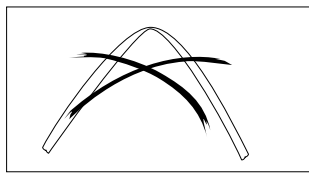
d	x min. (in)
1/2"	6.30
5/8"	7.09
3/4"	9.84
1"	12.20

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

- The pipes must not have any impressions on the surface
- There must not be any compression damage on the inside of the bend (kinks)
- Minimum dimensions to be maintained



Right



Wrong

Diameter d	Ovality Smallest diameter d min. (in)	Minimal bended radius r (in)	Recommended bended radius (in)
1/2"	0.59	2.28	3.15
5/8"	0.75	2.76	3.94
3/4"	0.94	3.66	5.12
1"	1.18	4.57	6.30
1 1/4"	1.46	6.30	7.87
1 1/2"	1.85	7.87	9.84

Additional bending tools

(not supplied by Geberit)

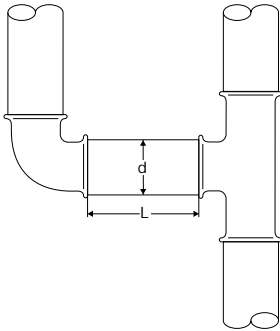
Geberit has tested the following bending tools. When using one of the listed tools, together with the indicated bending die, Geberit guarantees for the resulting Mepla bends.

Manufacturer	Type	Pipe diameter/Bending dies						Tested by Geberit
		1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	
Gardner	Bender 930B	X	X	X				04.2001
Ridgid	326	X	X	X				11.1996
Ercolina	Junior	X	X	X				11.1996
Ercolina	Mini Bender "A"	X	X	X	X	X		11.1996
FAE	Mepla	X	X	X	X	X	X	11.1996
Rems	Curvo	X	X	X	X			11.1996
Rems	Swing	X	X	X				11.1996
Rothenberger	Tube-Bender-Maxi	X	X	X				11.1996
Rothenberger	Tube-Bender-Maxi 32	X	X	X	X			11.1996

X = tested and approved for correct Mepla bends

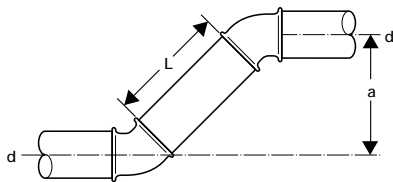
Fitting combinations

- Minimum dimensions when combining fittings



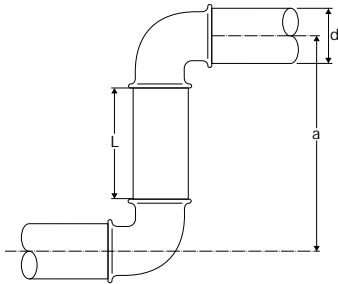
Minimum pipe length between two fittings with compression joints

d (in)	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
	L	L	L	L	L	L	L
(in)	2.16	2.36	2.72	3.11	3.58	4.06	5.91



Two 45° angle sections pressed together

d (in)	3/4"		1"		1 1/4"		1 1/2"		2"	
	a	L	a	L	a	L	a	L	a	L
(in)	2.79	2.72	3.19	3.11	3.74	3.58	4.25	4.05	5.75	5.91

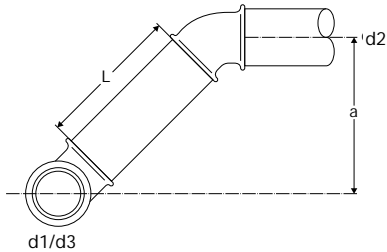


Two 90° elbows pressed together

d (in)	1/2"		5/8"		3/4"		1"		1 1/4"		1 1/2"		2"	
	a	L	a	L	a	L	a	L	a	L	a	L	a	L
(in)	3.58	2.16	3.86	2.36	4.53	2.72	5.24	3.11	6.18	3.58	7.13	4.06	10.08	5.91

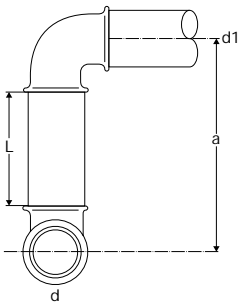
Fitting combinations

- Minimum dimensions when combining fittings



T-piece with Bend 45° (fitting)

d1/d3 (throughflow)	d2 (branch)										
	3/4"		1"		1 1/4"		1 1/2"		2"		
	L	a	L	a	L	a	L	a	L	a	
5/8"	2.72	2.98	-	-	-	-	-	-	-	-	-
3/4"	2.72	3.01	3.11	3.37	-	-	-	-	-	-	
1"	2.72	3.12	3.11	3.45	3.58	4.01	-	-	-	-	
1 1/4"	2.72	3.23	3.11	3.68	3.58	4.15					
1 1/2"	2.72	3.49	3.11	3.84	3.58	4.31	4.06	4.74	-	-	
2"	2.72	3.76	3.11	4.15	3.58	4.59	4.06	5.04	5.91	6.43	



T-piece with Elbow 90°

d (main pipe)	d1 (branch pipe)													
	1/2"		5/8"		3/4"		1"		1 1/4"		1 1/2"		2"	
	a	L	a	L	a	L	a	L	a	L	a	L	a	L
1/2"	3.74	2.16	3.97	2.36	-	-	-	-	-	-	-	-	-	-
5/8"	3.74	2.16	3.97	2.36	4.49	2.72	-	-	-	-	-	-	-	-
3/4"	3.89	2.16	4.21	2.36	4.53	2.72	5.12	3.11	-	-	-	-	-	-
1"	4.01	2.16	4.33	2.36	4.69	2.72	5.24	3.11	6.22	3.58	-	-	-	-
1 1/4"	-	-	4.49	2.36	4.85	2.72	5.55	3.11	6.41	3.58	-	-	-	-
1 1/2"	-	-	-	-	5.20	2.72	5.79	3.11	6.65	3.58	7.37	4.06	-	-
2"	-	-	-	-	5.60	2.72	6.22	3.11	7.04	3.58	7.08	4.06	10.08	5.91

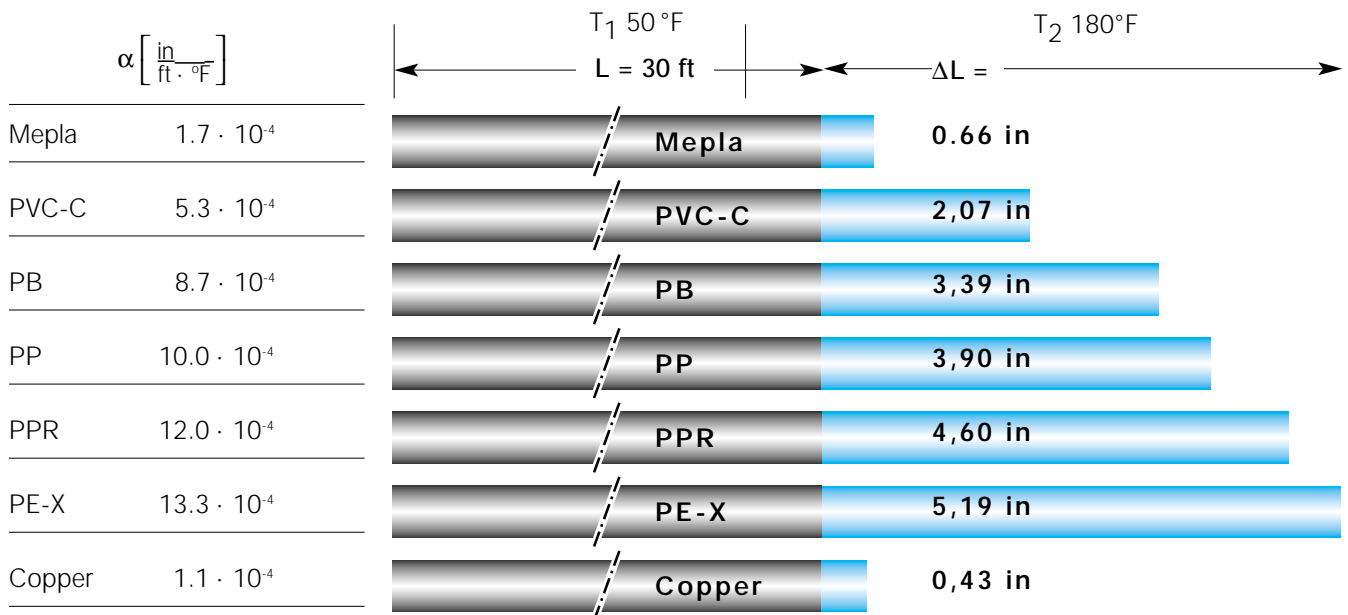
Thermal movement

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

● Geberit Mepla Expansion Coefficient

$$0,0001733 \frac{\text{in}}{\text{ft} \cdot ^\circ\text{F}}$$

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 40 ft.**
- An **anchor point** is necessary for straight Mepla pipe sections of **more than 40 ft.**

Thermal movement

Length Variation Table

Pipe length L in ft	Δ L (in)									
	Change in temperature Δt in °F									
	20	40	60	80	100	120	140	160	180	200
1.5	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05
4.5	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	0.16
6.0	0.02	0.04	0.06	0.08	0.10	0.12	0.15	0.17	0.19	0.21
7.5	0.03	0.05	0.08	0.10	0.13	0.16	0.18	0.21	0.23	0.26
9.0	0.03	0.06	0.09	0.12	0.16	0.19	0.22	0.25	0.28	0.31
10.5	0.04	0.07	0.11	0.15	0.18	0.22	0.25	0.29	0.33	0.36
12.0	0.04	0.08	0.12	0.17	0.21	0.25	0.29	0.33	0.37	0.42
13.5	0.05	0.09	0.14	0.19	0.23	0.28	0.33	0.37	0.42	0.47
15.0	0.05	0.10	0.16	0.21	0.26	0.31	0.36	0.42	0.47	0.52
5.5	0.06	0.11	0.17	0.23	0.29	0.34	0.40	0.46	0.51	0.57
18.0	0.06	0.12	0.19	0.25	0.31	0.37	0.44	0.50	0.56	0.62
19.5	0.07	0.14	0.20	0.27	0.34	0.41	0.47	0.54	0.61	0.68
21.0	0.07	0.15	0.22	0.29	0.36	0.44	0.51	0.58	0.66	0.73
22.5	0.08	0.16	0.23	0.31	0.39	0.47	0.55	0.62	0.70	0.78
24.0	0.08	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83
25.5	0.09	0.18	0.27	0.35	0.44	0.53	0.62	0.71	0.80	0.88
27.0	0.09	0.19	0.28	0.37	0.47	0.56	0.66	0.75	0.84	0.94
28.5	0.10	0.20	0.30	0.40	0.49	0.59	0.69	0.79	0.89	0.99
30.0	0.10	0.21	0.31	0.42	0.52	0.62	0.73	0.83	0.94	1.04

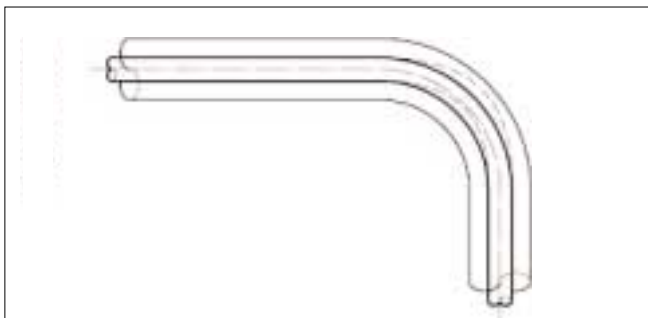
Example: Pipe length 18 ft / change in temperature 50 °F ÷ 170 °F) Δt 120 °F

Formula: $L \times \alpha \times \Delta t \left[\frac{\text{ft} \cdot \text{in} \cdot ^\circ\text{F}}{\text{ft} \cdot ^\circ\text{F}} = \text{in} \right]$

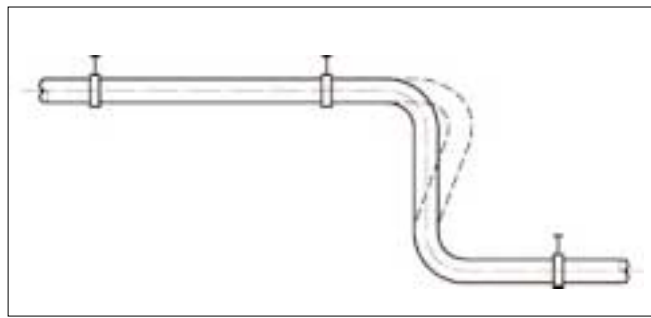
Calculation: 18 x 0,000173 x 120 = **0,374 in** expansion

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: $1.5 \cdot \Delta L = \text{insulation thickness}$



Expansion absorbed by the insulation or protective tube

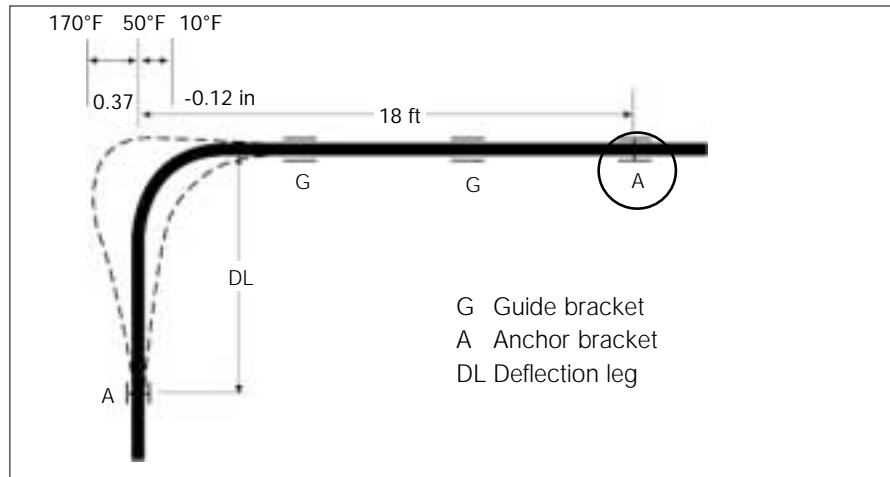


Expansion absorbed by one or several bends.

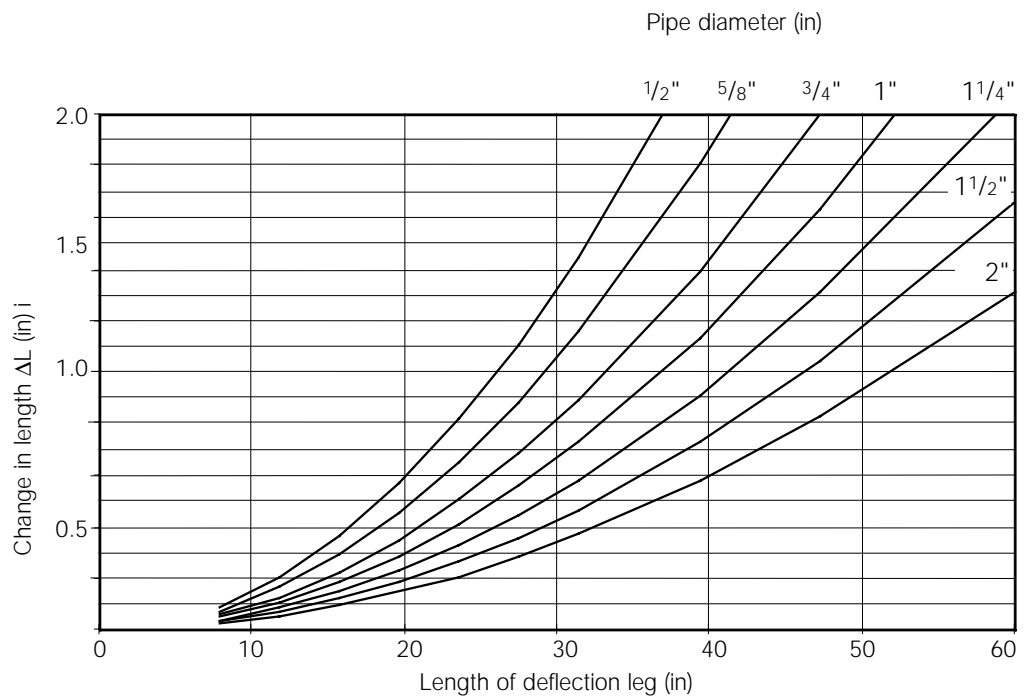
Highly concealed lines must always be installed within a protective sleeve or soft insulation to allow thermal expansion to be cushioned by the insulation material.

Deflection leg

- Compensating thermal expansion of hot water systems by deflection leg

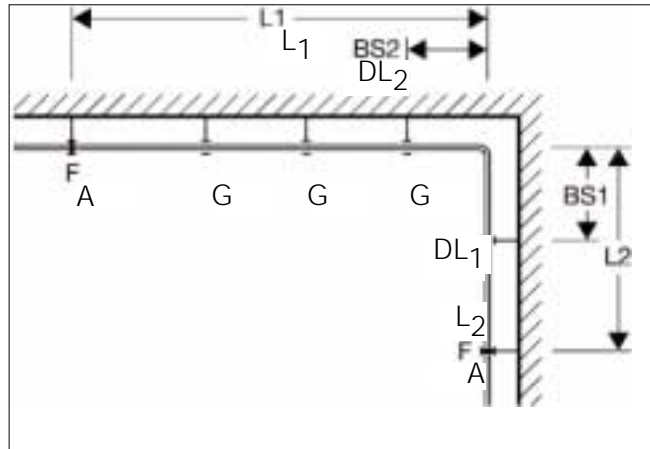
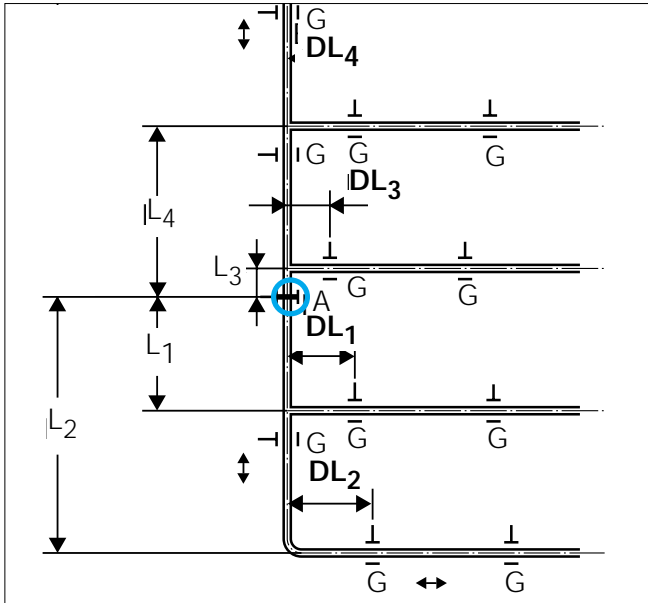


- Determining the length of the deflection leg from chart



Deflection leg

- Compensating thermal expansion of hot water systems in bends (pipe length > 40 ft)

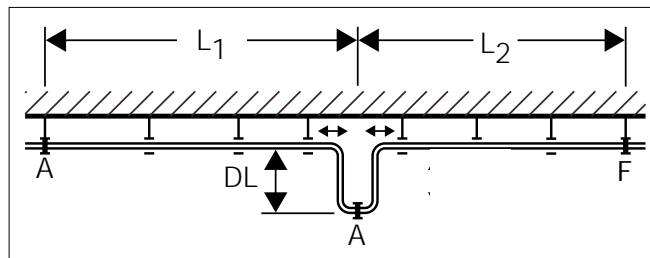


L_1, L_2, L_3, L_4 = pipe length
 DL_1, DL_2, DL_3 = deflection leg
 A = anchor bracket
 G = Guide bracket

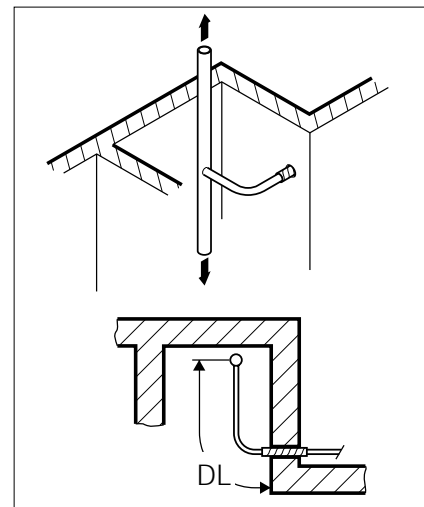
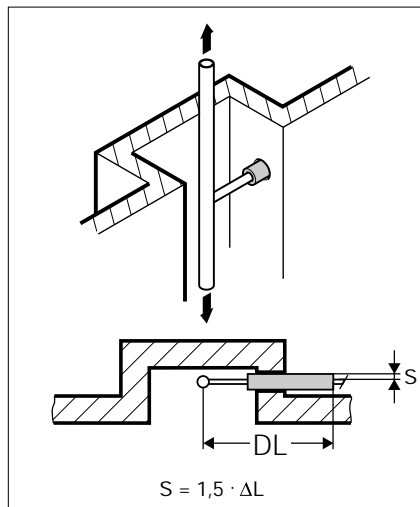
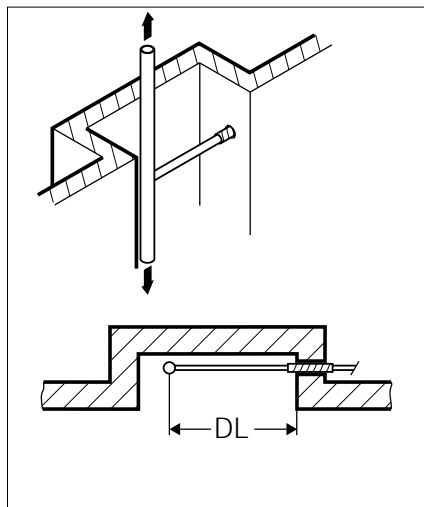
Position anchor bracket as centrally as possible.

- Compensating thermal expansion of hot water systems with compensating loop

The longest pipe determines the compensating loop.



- Examples for arranging compensating loops in shafts



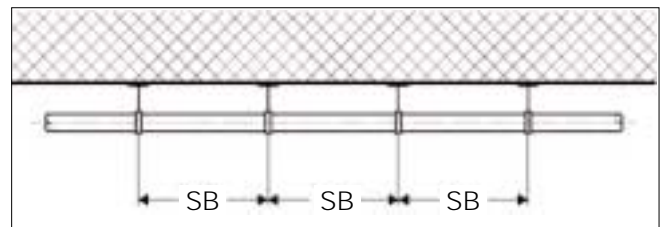
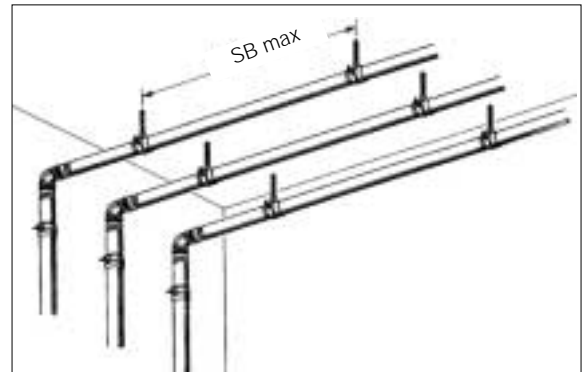
Support Spacing

Mepla

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

Ø	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
SB (ft)	3	3	5	6.5	6.5	6.6	8
F [lb]	0.54	0.81	2.07	4.25	6.52	10.0	19.1

SB = distance between pipe brackets
F = effective force per bracket when pipe full with water
50 °F.



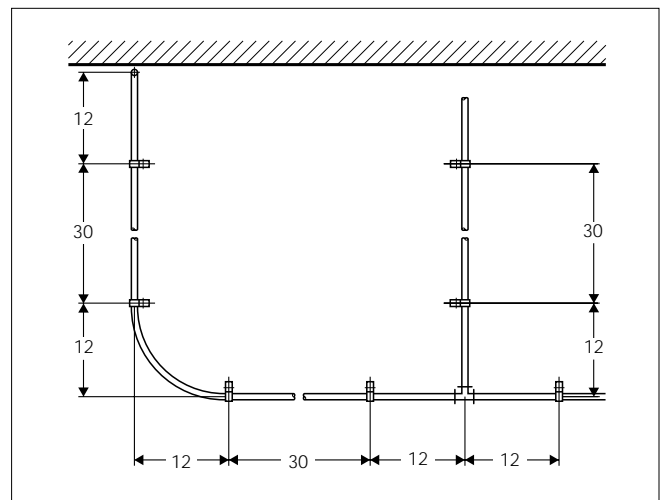
Supports on lines laid clear of the surface.

Mepla Rolls

The maximum distance between fastenings on Mepla pipes laid on the concrete floor or in the sub-floor should be 30" max.

Pipes should be fastened 12" in front of and 12" behind bends and branches.

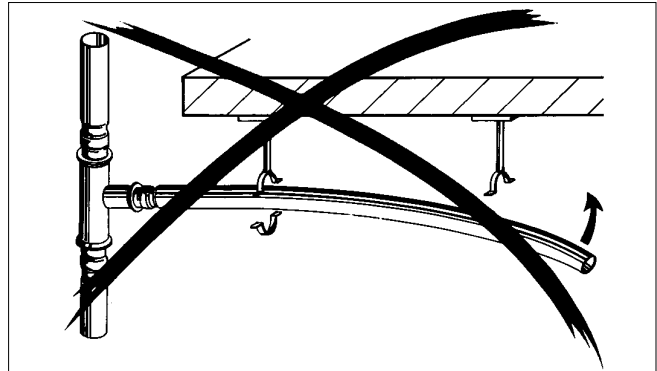
d	1/2" - 3/4"
Distance between clips	30 in
Distance between clips and bends/branches	12 in



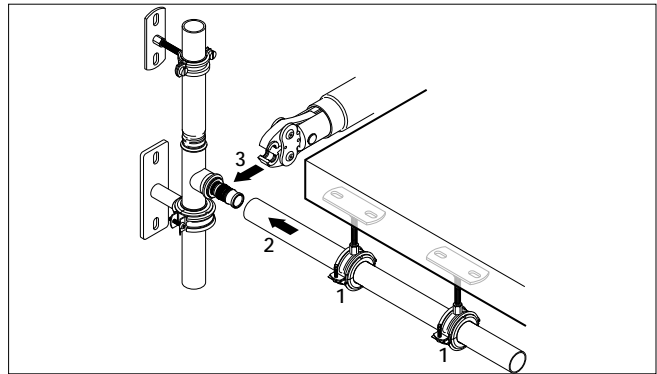
Attached to the concrete ceiling.

Important installation rules

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

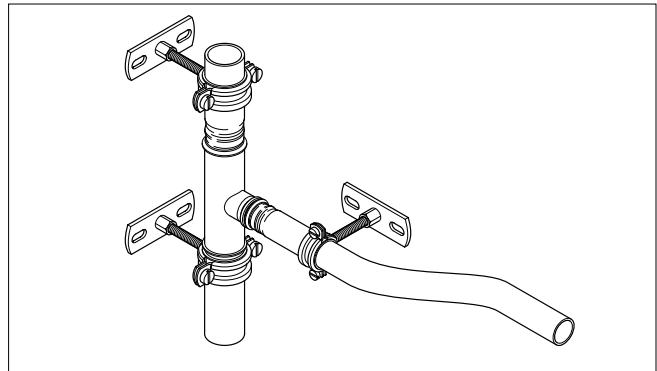


Wrong

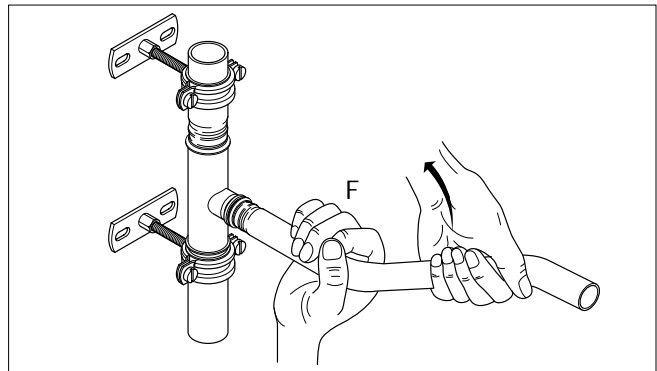


Right

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

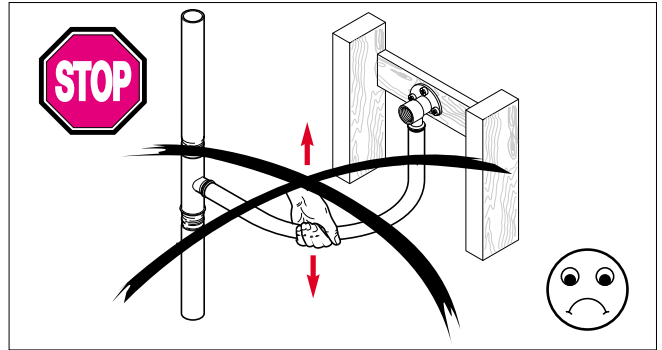


Rule no 3 : Do not bend pipes which have already been compressed. If this is impossible to avoid for technical reasons, the pipe should be stabilised manually during bending.

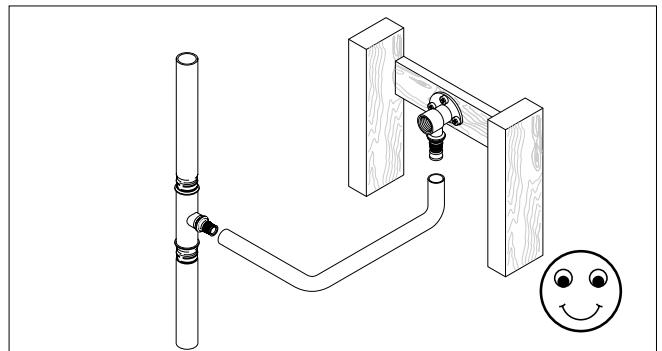


Important installation rules

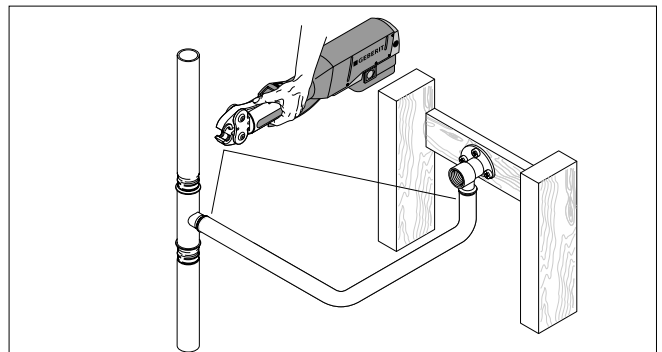
Rule no 4 : Prepare the connecting pipe correctly before connecting it to the fittings.



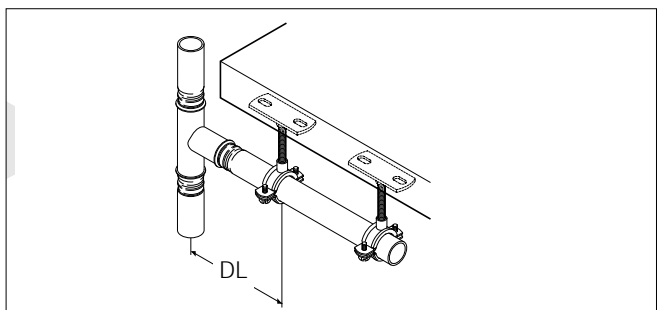
Wrong



Right
Measure and bend with bending tool, or by hand and adjust length as necessary.



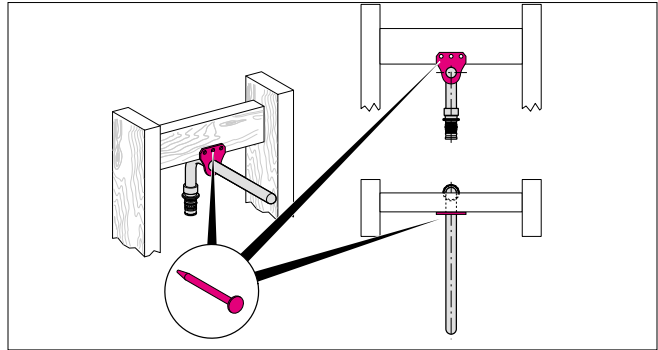
Press



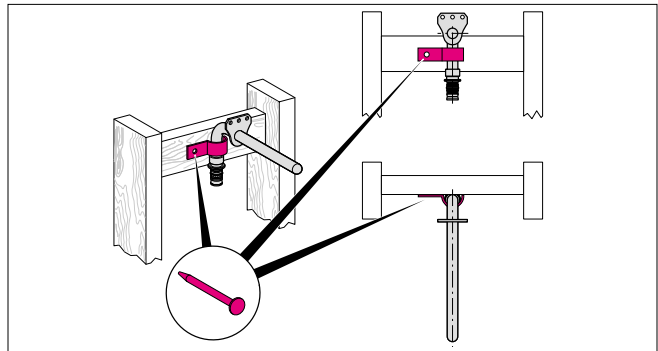
For deflection legs
DL = Deflection leg length, refer to page 25.

Installation technique

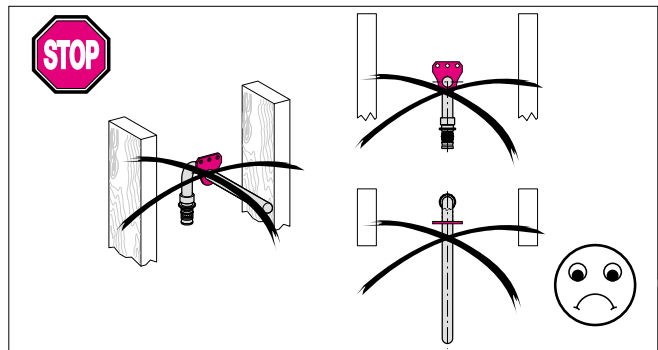
The Mepla Stub-out must be attached properly



Right

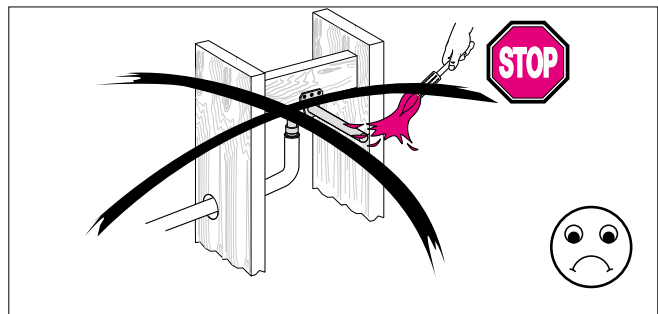


Right



Wrong

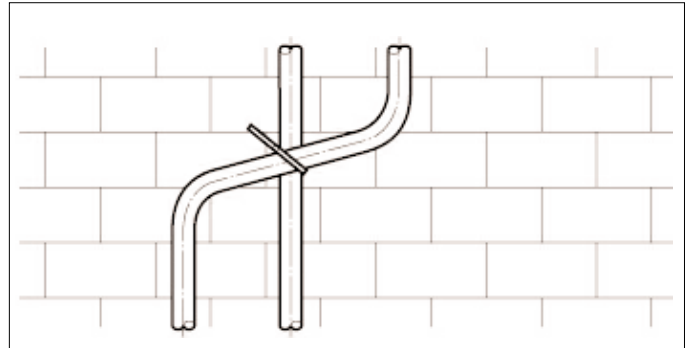
Do not solder after you did the connection to the Mepla pipe.



Wrong

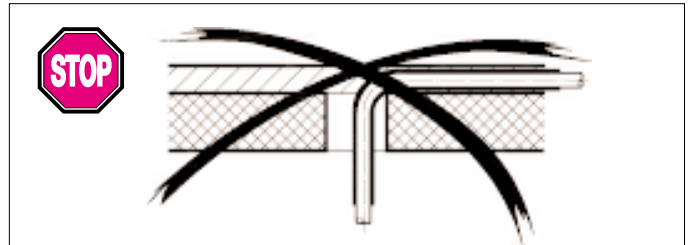
Installation technique

Crossing Mepla pipes on floors or ceilings should be tied together with a cable tie.

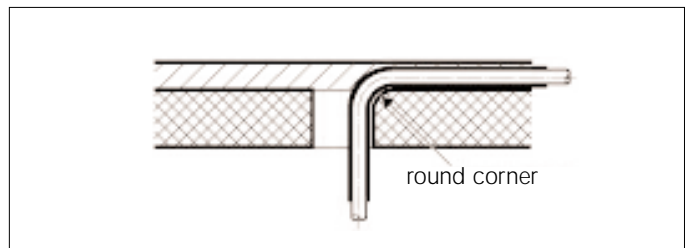


Fixing pipe crossovers.

Never bend pipes passing through openings over edges (kink danger).

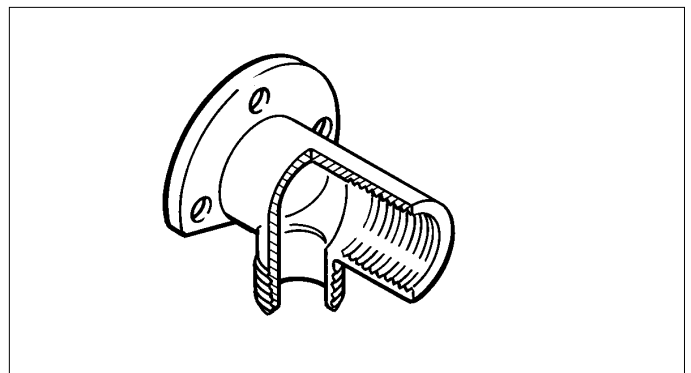


Wrong



Right

The threads of all Geberit Mepla faucet connections are cut through. It is no longer necessary to shorten terminal fittings, unions and angle stop valves.



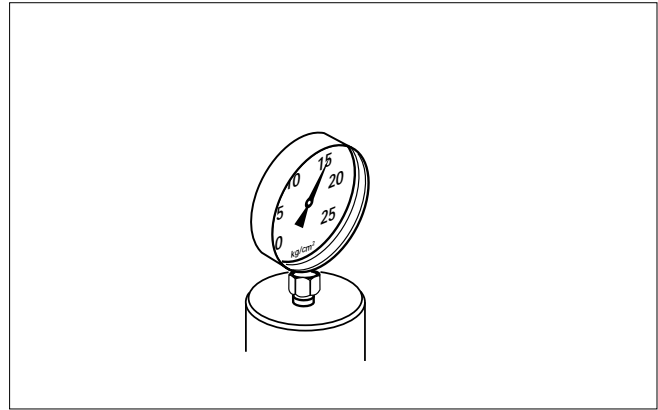
Pressure test and flushing out

Pressure test:

In accordance with requirements of the local code authority or with the "International Plumbing Code" (IPC) Section "Water supply system test".

International Plumbing Code (IPC):

Upon completion of a section of, or the entire water supply system, the system or portion completed, shall be tested and proved tight under a water pressure not less than the working pressure of the system; or, for piping systems other than plastic, by an air test of not less than **50 psi (344 hPa)**. The water utilized for tests shall be obtained from a potable source of supply.



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

Note: Do not use compressed air or gas to test a water supply system !

Recommendation:

The **water-pressure shall be 1½ times** the service pressure, but at least **220 psi (1.5 MPa)**.

The pressure drop may not exceed **1.4 psi/hr (10 kPa/hr)**.

Flushing out:

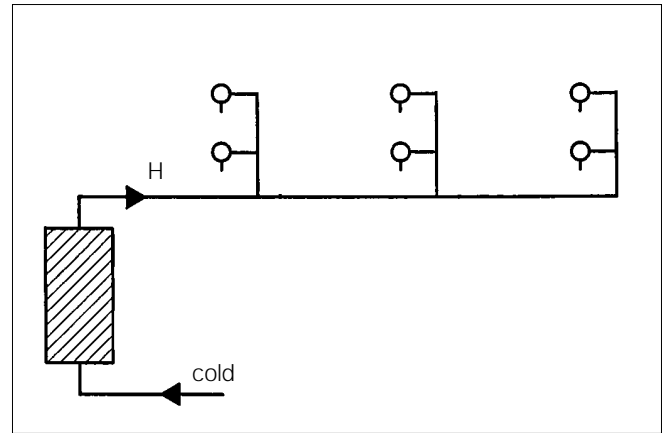
Flush the water supply system out well out before using it.

Hot water distribution

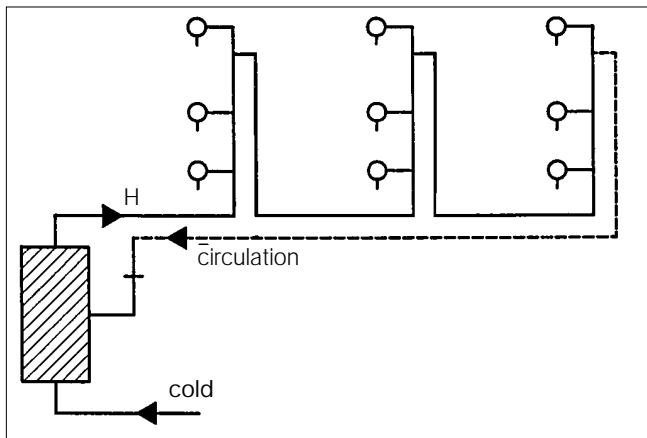
● Types of circulation

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

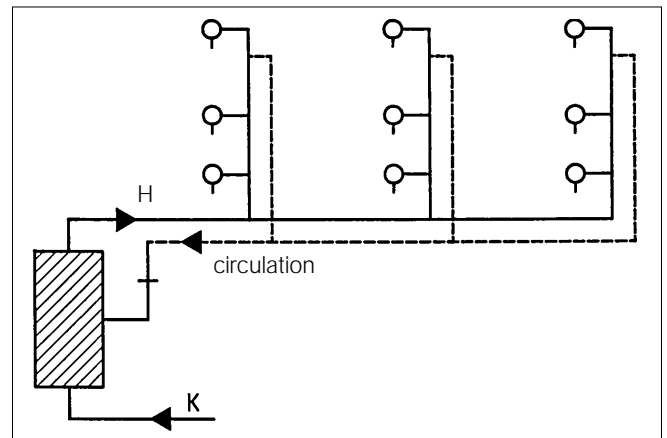
- Circulation with lower distribution
- Circulation with upper distribution
- Pipe-attached-to-pipe circulation (RaR)
- Ring circulation system
- Trace heating with self-regulating trace heater strips



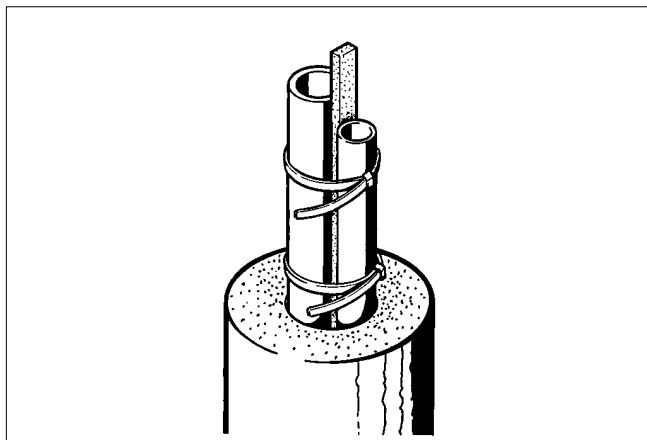
1



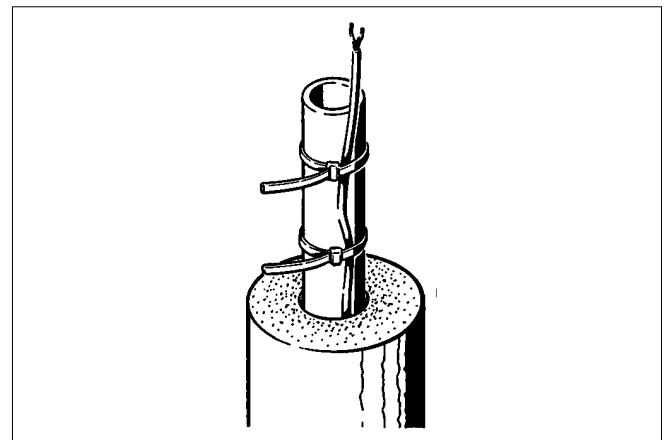
2 Circulation with lower distribution.



3 Circulation with lower distribution.



4 Detail of pipe-attached-to-pipe circulation (RaR).



5 Trace heating with self-regulating strip heater.

Note:

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

Safety note:

Self-regulating trace heater strips must not exceed a temperature of 158 °F.

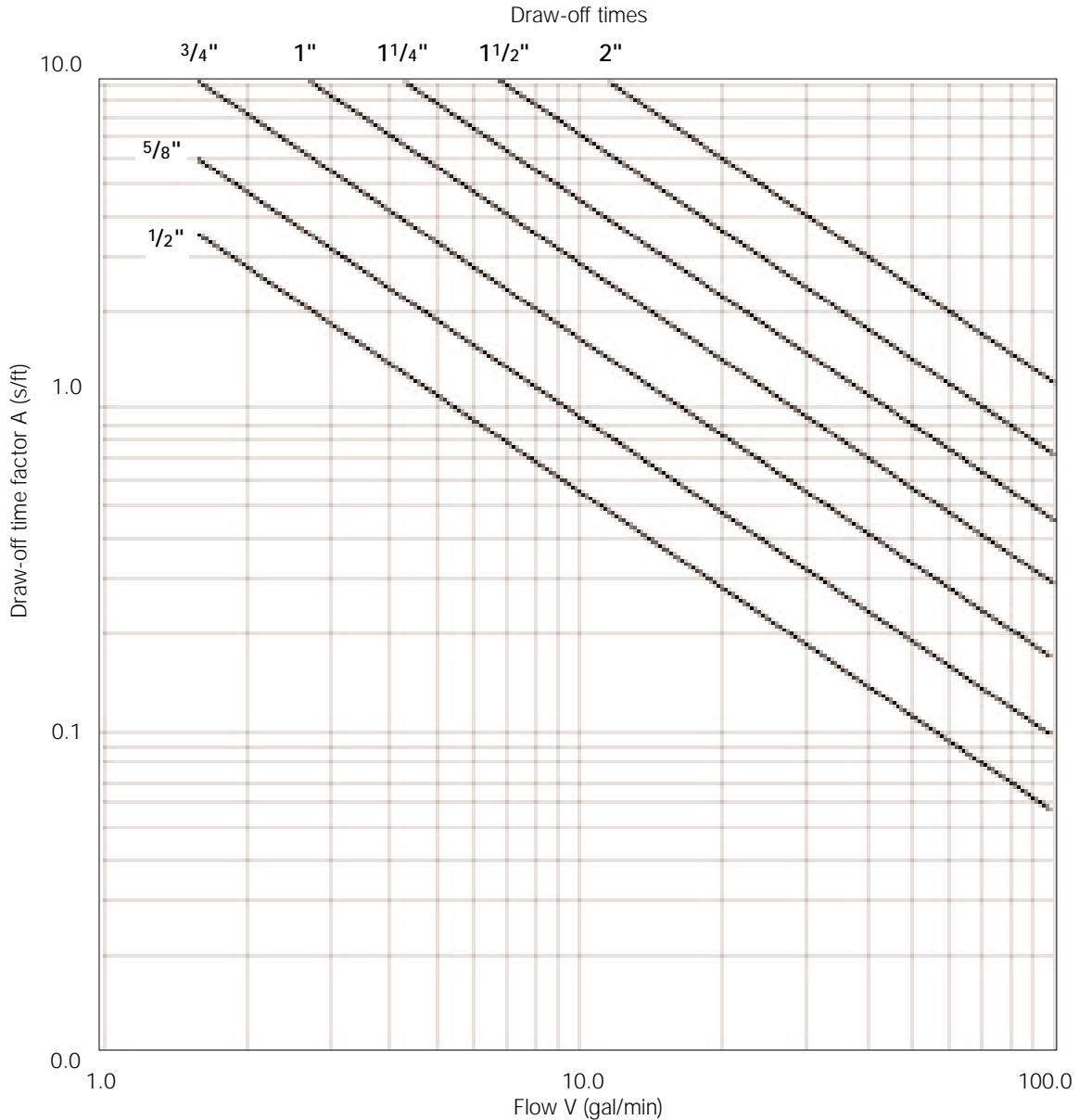
Hot water distribution

● Draw-off times

Draw-off times should not be too high in order to avoid excessive water and energy consumption (5 to 20 seconds).

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).



Draw-off time t = Draw-off time factor \times Length of pipe

$$t = A \cdot L \left[\frac{s \cdot ft}{ft} = s \right]$$

Load values

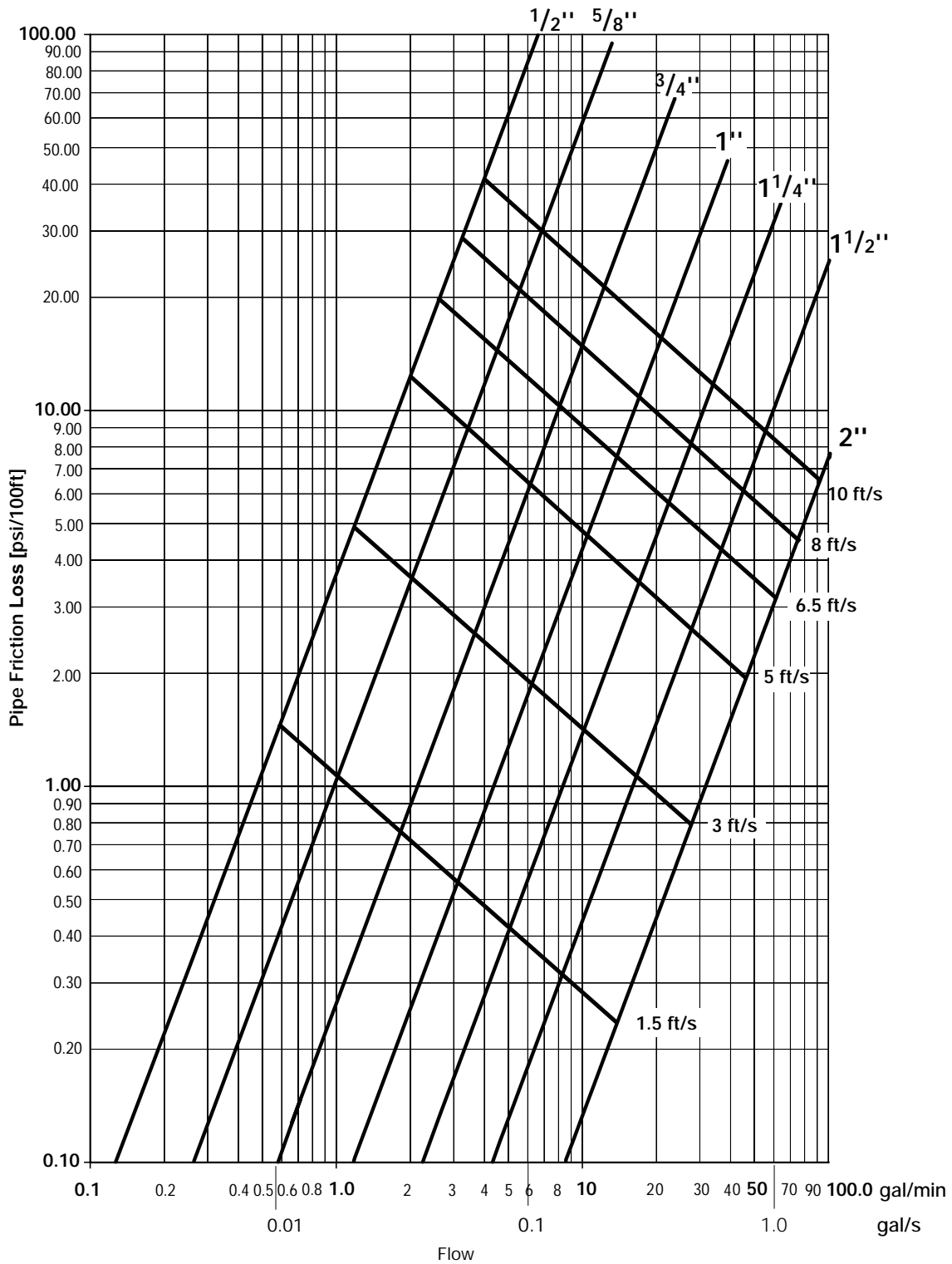
- **Planning and determining the pipe diameter of drinking water lines**

Water supply systems for domestic and industrial applications must always be planned and calculated in accordance with the regulations of the specific local plumbing code.

Example:
International Plumbing Code 2000
Section 604
"Design of building water distribution systems"

Friction loss

Friction loss chart for Geberit Mepla pipes










Friction Loss








Friction Loss Table for Geberit Mepla Pipe

Pipe friction pressure drop R and calculated flow speed v as a function of the peak throughflow Vs

Q gal/min	Ø = 1/2"		Ø = 5/8"		Ø = 3/4"		Ø = 1"		Ø = 1 1/4"		Ø = 1 1/2"		Ø = 2"	
	V ft/s	R psf/100 ft	V ft/s	R psf/100 ft	V ft/s	R psf/100 ft	V ft/s	R psf/100 ft	V ft/s	R psf/100 ft	V ft/s	R psf/100 ft	V ft/s	R psf/100 ft
0.13	0.32	0.11	0.19	0.03	0.10	0.01								
0.26	0.63	0.36	0.37	0.10	0.21	0.03								
0.40	0.95	0.72	0.56	0.20	0.31	0.05								
0.53	1.26	1.20	0.74	0.34	0.42	0.09								
0.66	1.58	1.77	0.93	0.50	0.52	0.13								
0.79	1.90	2.43	1.11	0.69	0.63	0.18								
0.92	2.21	3.19	1.30	0.90	0.73	0.23								
1.06	2.53	4.03	1.49	1.14	0.84	0.29	0.49	0.08						
1.19	2.84	4.95	1.67	1.40	0.94	0.36	0.56	0.10						
1.32	3.16	5.95	1.86	1.68	1.04	0.43	0.62	0.12						
1.98	4.74	12.10	2.78	3.43	1.57	0.87	0.93	0.25						
2.64	6.32	20.02	3.71	5.67	2.09	1.45	1.24	0.42						
3.30			4.64	8.38	2.6	2.14	1.54	0.61						
3.96			5.57	11.52	3.13	2.94	1.85	0.85	1.15	0.27				
4.62					3.66	3.85	2.16	1.11	1.34	0.36				
5.28					4.18	4.86	2.47	1.40	1.53	0.45				
5.94					4.70	5.97	2.78	1.72	1.73	0.55				
6.60					5.22	7.18	3.09	2.07	1.92	0.67	1.18	0.21		
7.26							3.40	2.44	2.11	0.79	1.30	0.25		
7.92							3.71	2.84	2.30	0.92	1.42	0.29		
8.58							4.02	3.27	2.49	1.05	1.54	0.34		
9.24							4.33	3.72	2.69	1.20	1.66	0.38		
9.90							4.63	4.20	2.88	1.35	1.78	0.43	1.07	0.13
10.56							4.94	4.70	3.07	1.52	1.89	0.48	1.15	0.15
11.22							5.25	5.23	3.26	1.68	2.01	0.54	1.22	0.16
11.88									3.45	1.86	2.13	0.59	1.29	0.18
12.54									3.64	2.05	2.25	0.65	1.36	0.20
13.20									3.84	2.24	2.37	0.71	1.43	0.22
13.86									4.03	2.44	2.49	0.78	1.50	0.24
14.52									4.22	2.65	2.60	0.84	1.58	0.26
15.18									4.41	2.86	2.72	0.91	1.65	0.28
15.84									4.60	3.08	2.84	0.98	1.72	0.30
16.50									4.79	3.31	2.96	1.05	1.79	0.32
17.16									4.99	3.54	3.08	1.13	1.86	0.34
17.82									5.18	3.79	3.20	1.20	1.93	0.36
18.48											3.32	1.28	2.01	0.39
19.14											3.43	1.36	2.08	0.41
19.80											3.55	1.45	2.15	0.44
20.46											3.67	1.53	2.22	0.46
21.78											3.91	1.71	2.36	0.52
23.10											4.14	1.90	2.51	0.57
24.42											4.38	2.09	2.65	0.63
25.74											4.62	2.29	2.79	0.69
27.06											4.85	2.50	2.94	0.76
28.38											5.09	2.72	3.08	0.82
29.70													3.22	0.89
31.02													3.37	0.96
32.34													3.51	1.04
33.66													3.65	1.11
34.98													3.80	1.19
36.29													3.94	1.27
37.61													4.08	1.35
38.93													4.23	1.43
40.25													4.37	1.52
41.57													4.51	1.61
42.89													4.66	1.70
44.21													4.66	1.70
45.53													4.80	1.79
46.85													4.94	1.89

Friction Loss

Fittings		Equivalent pipe lengths in ft						
		1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
Pipe bend		2.20	1.77	1.61	1.67	1.51	1.64	-
90° elbow		4.92	3.94	3.61	3.28	3.94	3.94	4.27
90° T-section		4.27	2.30	2.46	1.97	1.97	2.30	2.30
		5.25	4.92	4.76	4.43	4.27	4.27	4.59
		5.58	4.27	4.10	3.94	4.59	4.59	4.92
Coupling		2.95	1.97	0.98	0.82	0.98	1.31	0.98
Faucet connection elbow (Drop ear)		4.27	4.43	3.61	-	-	-	-

Fittings		Zeta values						
		1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
Pipe bend		1.30	0.90	0.70	0.45	0.30	0.26	-
90° elbow		3.45	2.10	1.40	1.00	0.80	0.55	0.50
90° T-section		3.10	1.40	0.85	0.55	0.40	0.35	0.30
		4.50	3.25	1.70	1.20	0.85	0.70	0.65
		4.20	2.00	1.50	1.10	0.90	0.75	0.70
Coupling		2.00	1.00	0.35	0.25	0.20	0.20	0.10
Faucet connection elbow (Drop ear)		2.85	2.20	1.30	-	-	-	-

Ecological balance sheet for the Geberit Mepla pipe

The aspect of environmental protection is playing an ever more important role, not just during production, but also right from the product development stage. One method of analysing this process is the ecological balance sheet. For example, in the form of ecological product balance sheets.

What does an ecological balance sheet tell us?

It evaluates the materials and energy requirements throughout the entire product lifecycle. It also gives information about the main pollution resulting from products. It shows a comparison between the pollution characteristics of two products made from different materials. However, this is not just restricted to disposal aspects; it also takes in the following points:

- Manufacturing of raw materials
- Pipe production
- Disposal

This study should enable environmentally aware users to base any comparisons on reliable data.

Object studied / method

The main objective of the study undertaken was to compare the environmental impact of water supply pipes made from different materials. A meter length of pipe with an internal diameter of approx. 0,8 in (3/4") was taken as the functional unit. The following materials were studied:

Plastic pipe

- Interlaced polyethylene pipe

Plastic/aluminum pipe

- Interlaced polyethylene internal pipe with an aluminium core and polyethylene outer cover (corresponding to the Geberit Mepla pipe)

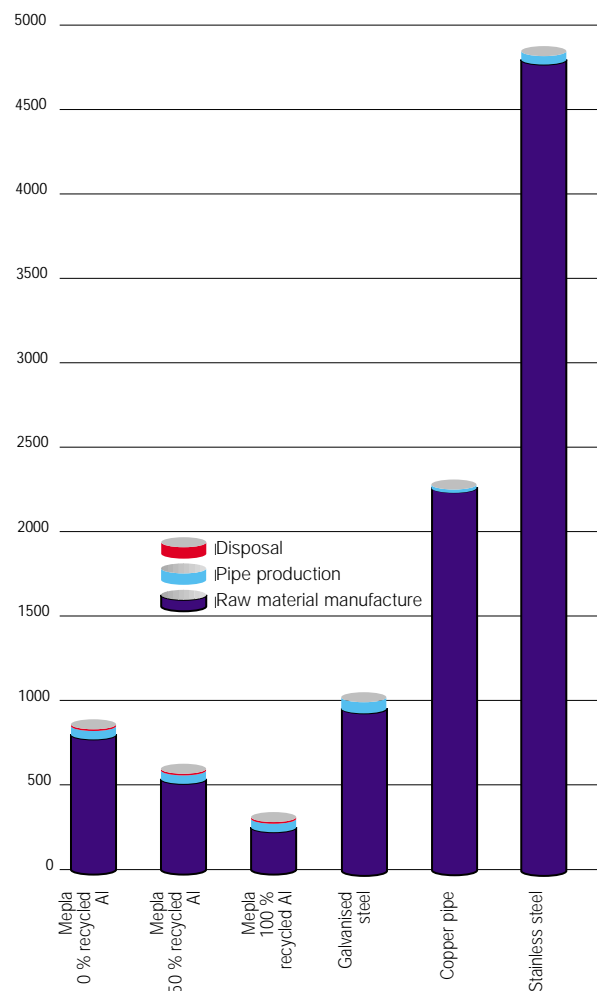
Metal pipes

- High-grade steel pipe, stainless (stainless steel)
- Galvanized iron pipe
- Copper pipe

This study was based on the new standard, ISO 14040. The environmental impact points (UP) method was used for evaluating the material balance sheet (basis: Buwal SRU 133). The environmental impact is expressed in the form of an environmental impact number.

Results

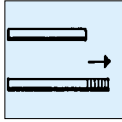
The results are shown in graphic form in the adjacent ecological balance sheet. It shows that metal pipes have by far the greatest environmental impact and that the Mepla pipe only has a small effect on the environment.



Environmental impact of drinking water supply pipes (internal diameter 20).

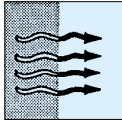
Properties of Geberit Mepla

● Physical and chemical properties of Geberit Mepla pipes



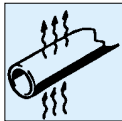
Thermal expansion
0.0001733 in/ft · °F
(0.026 mm/m · K)

The thermal expansion of the Mepla pipe is 5 times less than VPE and polybutene and 3 times less than PVC-C. The bending loops are therefore much smaller with Mepla pipes.



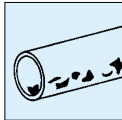
Thermal conductivity
0.07283 W/ft · °F
(0.43 W/m · K)

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.



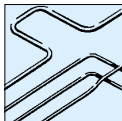
Resistance to diffusion

The Mepla pipe is absolutely resistant to diffusion, i. e. no gases can diffuse through the walls of the pipe.



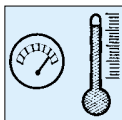
Resistance to abrasion

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.




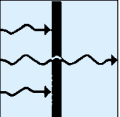
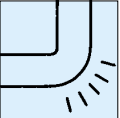


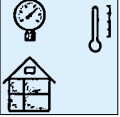
Thermal stability to pressure

The permitted operating pressure is 145 psi at an operating temperature of 32 °F–180 °F, with short peaks of 203 °F.

According to the Standard ASTM F 1986

Properties of Geberit Mepla

● Physical and chemical properties of the Geberit Mepla system

	Electrical conductivity	The system is not electrically conductive because it does not have a continuous 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 in such systems.
	Hygienic	The materials used for pipes and fittings are hygienic and consequently can be used for potable water systems (foodstuffs).
	Applications	The Geberit Mepla supply system is perfectly suited to applications involving hot water, cold water and water softened under the specified conditions. The range is designed for all water supply and heating system applications.

Medium	Additive/treatment/limitation	Temperature	Pres. psi
Water	Cold water	32– 70°F	145
Water	Hot water	70–180°F	145
Water	Heating water	32–180°F	145
Rain water	pH value < 6.0	32–104°F	145
Water	Osmosis treatment	32–180°F	145
Water	Softened to 0°fH	32–180°F	145
Solution of water and antifreeze	≤ 90% glycol by volume	≤104°F	145
Solution of water and antifreeze	≤ 90% Antifrogen L by volume	≤104°F	145
Solution of water and antifreeze	≤ 90% Antifrogen N by volume	≤104°F	145
Solution of water and antifreeze	≤ 90% ethyl alcohol by volume	≤104°F	145
Soap/water solution	≤ 90% soap solution	32–104°F	145
Water with disinfectant solution at a concentration appropriate for use (dilute)	<ul style="list-style-type: none"> • Quaternary ammonium-compounds • Guandine compounds • Amino acetic acid 	32–104°F	145
Compressed air		32–160°F	145

Geberit Mepla, Technical Specifications, Standards

Pipe nominal diameter in inches di x s	1/2 x 0.089	5/8 x 0.098	3/4 x 0.118	1 x 0.118	1 1/4 x 0.138	1 1/2 x 0.157	2 x 0.177
External diameter d	0.630 in	0.787 in	1.024 in	1.260 in	1.575 in	1.969 in	2.480 in
Internal diameter di	0.453 in	0.591 in	0.787 in	1.024 in	1.299 in	1.654 in	2.126 in
Length per roll	164.0 ft	164.0 ft	164.0 ft	–	–	–	–
Length per rod	16.4 ft	16.4 ft	16.4 ft	16.4 ft	16.4 ft	16.4 ft	16.4 ft
Diameter per roll	31.4 in	31.4 in	43.3 in	–	–	–	–
Weight per ft pipe	0.09 lb	0.12 lb	0.20 lb	0.28 lb	0.40 lb	0.56 lb	0.74 lb
Weight per ft pipe with water at 50°F	0.16 lb	0.24 lb	0.41 lb	0.64 lb	0.97 lb	1.50 lb	2.28 lb
Water volume gal/ft	0.008	0.014	0.025	0.043	0.069	0.112	0.184
Surface roughness, internal pipe	0.00028 in	0.00028 in	0.00028 in	0.00028 in	0.00028 in	0.00028 in	0.00028 in
Thermal conductivity W/(ft · °F)	0.07283	0.07283	0.07283	0.07283	0.07283	0.07283	0.07283
Coefficient of thermal expansion in/(ft · °F)	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³	0.1733·10 ⁻³
Operating temperature/flowing water	32/180 °F	32/180 °F	32/180 °F	32/180 °F	32/180 °F	32/180 °F	32/180 °F
Permitted operating pressure	145 psi	145 psi	145 psi	145 psi	145 psi	145 psi	145 psi
Minimum bending radius with bending pliers	2.28 in	2.76 in	3.66 in	4.57 in	6.30 in	7.87 in	–

ASTM F 1986



The pressure rating at 180 °F is 145 psi.

Geberit Mepla, proven technology for a faster, easier and more reliable installation.

ISO-Standard 9001

ISO-Standard 14001

European Quality Certificate ISO 9001

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 9000/EN29000** series, which corresponds to BSI 5750. EQ-Net members are in all countries throughout Europe, including BSI QA United Kingdom.



This product is sold with a Limited Lifetime Warranty in lieu of all implied warranties, the details of said Limited Lifetime Warranty to accompany all product delivery.

The features of Geberit Mepla

- fast and easy to install
- complete range of pipes and fittings
- no soldering, brazing, thread cutting
- corrosion resistant
- 145 psi @ 180°F
- simple prefabrication
- combines advantages of metal and plastic pipes

Geberit Manufacturing, Inc., Geberit Water Supply Systems
 Pacific Pipe & Pump, 18760 Ridgefield Road NW, Shoreline, WA 98177
 Phone 1-206-542-6372 Fax 206-542-0532
www.pacificpipeandpump.com

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 Advanced plumbing technology