APPLICATION TECHNIQUE

GEBERIT MEPLA

VALID FROM 1 OCTOBER 2020

KNOW HOW INSTALLED

CONTENT

CHAPTER ONE

HISTORY

1.1 HISTORY OF GEBERIT MEPLA

The market launch of the Geberit Mepla multilayer pipe system in 1990 was Geberit's answer to the requirements in the market for a supply system suitable for drinking water and heating installations with the following features:

- safe
- easy to install
- universally applicable
- can be combined with other supply systems

The Geberit Mepla system pipe ML has quickly proved to be easy to process, stable and very versatile. ML is the abbreviation for multilayer and stands for a multilayer pipe with layers of polyethylene with increased temperature resistance (PE-RT) and aluminium.

In 2011, Geberit added the MeplaTherm system pipe to its product range in addition to the tried-and-tested Geberit Mepla system pipe ML, thus responding to the demand for a supply system that is visually suitable for surface-mounted installations and can be used especially for heating installations.

The Geberit Mepla pressed joint is an in-house development for which Geberit holds the international patent rights. The concept of the pressing nipples was optimised so as to enable a controlled insertion depth and alignment of the pipes before pressing without them sliding out or separating from the fitting.

Since its market launch, the range of fittings and connections has been expanded to approx. 300 products. The pipe range includes dimensions of d16 to d75.

CHAPTER TWO

PRINCIPLES

2.1 OVERVIEW OF GEBERIT MEPLA

Geberit Mepla is a supply system made of composite material, where the pipes and fittings are connected by pressing them together to create permanent, leakproof pipes.

Geberit Mepla system pipes combine the stability advantages of a metal material with the corrosion resistance of plastic. The pipes are easy to bend and inherently stable.

2.2 APPLICATION RANGE

The Geberit Mepla supply system is suitable for both cellar and riser pipes as well as for storey distribution.

The main applications of Geberit Mepla are:
- drinking water pipes for hot and cold water
- heating installations
- compressed air pipes

Geberit Mepla can also be used under the conditions mentioned in the Geberit usage overviews:
- cooling water with and without frost protection
- service water
- treated water
- rainwater with a pH value greater than 6.0
- seawater
- chemicals and technical liquids
- compressed air (oil purity class 0–3)
- inert gases (e.g. nitrogen)
- negative pressure

The negative pressure is derived from the air pressure at the place of installation minus the pressure of 200 bar. Example: Air pressure of 980 mbar minus pressure of 200 mbar = 780 mbar of usable negative pressure in the pipe system

The usage overviews are available in the Geberit Piping Systems Catalogue. If other media is envisaged other than those listed in the usage overviews, they must be approved by Geberit.

2.3 FOR A TYPICAL DRINKING WATER INSTALLATION

The following components are used for a typical drinking water installation:
- Geberit Mepla system pipe ML
- Geberit Mepla pressfittings made of PVDF
- Geberit Mepla pressfittings made of gunmetal or brass
- adapters, permanent
- adapters and connections, detachable
- pipe valve fittings

2.4 ESSENTIAL INFORMATION ON SYSTEM PIPES AND PRESSFITTINGS

2.4.1 Geberit Mepla system pipe ML

The Geberit Mepla system pipe ML is a multilayer pipe made of 3 layers. The outer layer is made of polyethylene with increased temperature resistance (PE-RT II). A longitudinally butt-welded aluminium pipe forms the stabilising core. The medium-transporting grey inner pipe (highlighted in white in the figure) is also made of PE-RT II.

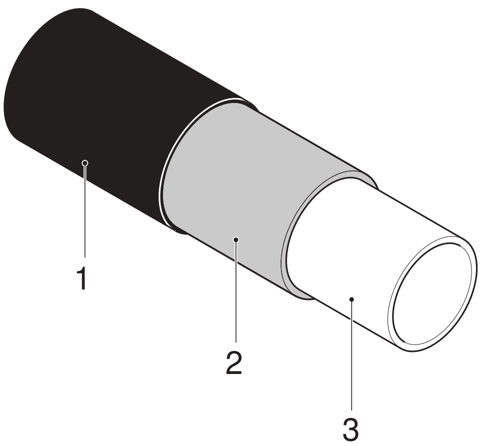


Figure 1: Geberit Mepla system pipe ML

1 Protective jacket
2 Aluminium pipe
3 Inner pipe

The aluminium pipe ensures the inherent stability without affecting the flexibility. It reduces the significant linear thermal expansion that is typical for plastic pipes and allows for larger fastening distances.

The inner pipe made of PE-RT II is food-safe and therefore suitable for all drinking water.

The Geberit Mepla system pipe ML is available in the following designs:

- rough
- pre-insulated
- in a protective tube

2.4.2 Geberit Mepla pressfitting made of PVDF

The structure of the Geberit Mepla pressfitting ensures that a permanent, leakproof connection is formed when pressing.

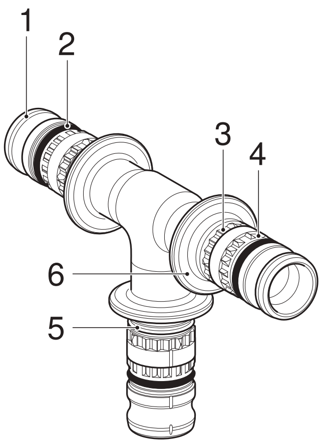


Figure 2: Geberit Mepla pressfitting (T-piece)

1 Fitting body
2 O-ring
3 Retaining cam
4 Antirotation lock
5 Retaining grooves
6 Tool guide rim for pressing jaws

The O-ring is lubricated with a lubricant containing silicone, which means it is not LABS-free.

The retaining cams hold the pipe on the fitting in an unpressed state and ensure that the pipe does not slide out when aligning it.

2.4.3 Geberit Mepla pressfittings made of metal

Geberit Mepla pressfittings with thread made of gunmetal or brass serve as adapters.

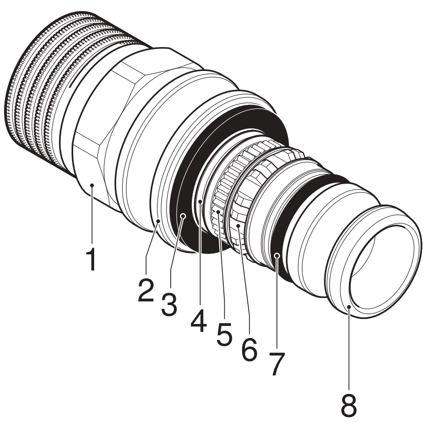


Figure 3: Structure of Geberit Mepla adapter with thread made of metal

1 Wrench flat
2 Tool guide rim for pressing jaws
3 Corrosion barrier washer
4 Retaining grooves
5 Antirotation lock
6 Retaining ring
7 O-ring
8 Fitting body

The O-ring is lubricated with a lubricant containing silicone, which means it is not LABS-free.

The corrosion barrier washer at the end of the pressfitting groove prevents contact between the aluminium core of the system pipe and the metal of the fitting. This prevents electrochemical corrosion.

The retaining ring holds the pipe on the fitting in an unpressed state and ensures that the pipe does not slide out when aligning it.

2.5 GEBERIT MEPLA PRESSED JOINT

The patented Geberit Mepla pressed joint is a permanent, leakproof connection.

2.5.1 Structure of the Geberit Mepla pressed joint

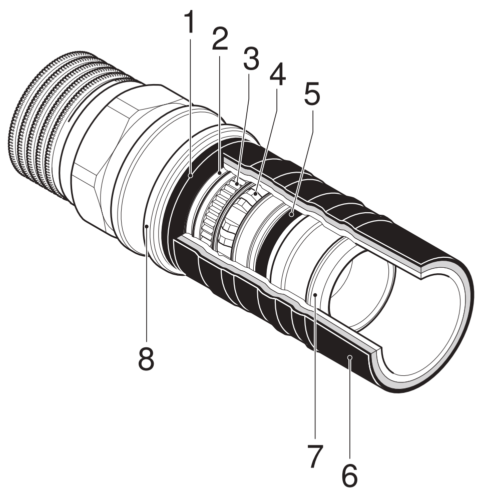
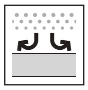
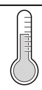
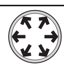
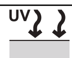
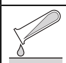


Figure 4: Geberit Mepla pressed joint

1 Washer
2 Retaining grooves
3 Antirotation lock
4 Retaining ring
5 O-ring
6 Geberit Mepla system pipe ML
7 Fitting body
8 Tool guide rim for pressing jaw

2.6 SYSTEM CHARACTERISTICS

The following table provides an overview of the most important physical and chemical properties of Geberit Mepla.

Characteristic		**Meaning**
Diffusion barrier		• Forms a barrier against diffusion
Hot water resistance		• Permanently 0–70 °C for drinking water (heating 80 °C) at 10 bar • Short-time exposure up to 95 °C for drinking water (heating 100 °C) for a maximum of 100 hours in 50 years
Resistance to pressure		• In cold water pipes 16 bar (operating temperature 0–20 °C) • In hot water pipes 10 bar (operating temperature with drinking water 0–70 °C, heating water 0–80 °C)
UV resistance		• UV stabilised, but constant sunlight must be avoided.
Corrosion resistance		• Corrosion-resistant in a normal, dry environment • Corrosion-resistant to a large number of liquid and gaseous media • Corrosion protection required in rooms that are permanently or periodically damp or in aggressive environments
Electrical conductivity		• Dielectric (no uninterrupted metal connection) • Can be installed before, during and after all pipe materials. • Cannot be used as equipotential bonding. Earthing is therefore not required.

2.7 TECHNICAL DATA

2.7.1 Geberit Mepla system pipe ML

Material and physical characteristics

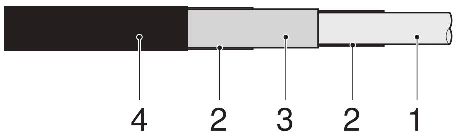


Table 1: Material used for the Geberit Meplasystem pipe ML

Item no.	Designation	Material
1	Inner pipe	PE-RT II
2	Bonding agent	
3	Aluminium pipe	Aluminium
4	Protective jacket	PE-RT II, black

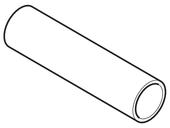
Table 2: Physical properties of the Geberit Meplasystem pipe ML

Thermal expansion coefficient α at 20–100 °C	0.026 mm/(m·K)
Thermal conductivity λ at 20 °C	0.43 W/(m·K)
Surface roughness k	7 μm

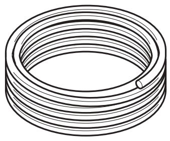
Table 3: Thermal capacity of the Geberit Mepla system pipe ML

Nominal width	Outer diameter	Wall thickness	Thermal capacity per metre
DN	d [mm]	s [mm]	c [J/(m•K)]
12	16	2.25	188.76
15	20	2.5	268.43
20	26	3	422.00
25	32	3	537.95
32	40	3.5	794.76
40	50	4	1,131.38
50	63	4.5	1,604.32
65	75	4.7	1,863.75

Pipe dimensions and weights



3 and 5 m



50 and 100 m

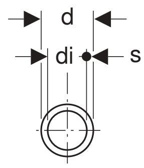


Table 4: Geberit Mepla system pipe ML

Nominal width	Outer diameter	Wall thickness	Inner diameter	Pipe weight	Pipe weight with water 10 °C	Water volume
DN	**d [mm]**	**s [mm]**	**di [mm]**	**m [kg/m]**	**m [kg/m]**	**V [l/m]**
12	16	2.25	11.5	0.135	0.239	0.104
15	20	2.5	15	0.185	0.362	0.177
20	26	3	20	0.300	0.614	0.314
25	32	3	26	0.415	0.946	0.531
32	40	3.5	33	0.595	1.450	0.855
40	50	4	42	0.840	2.225	1.385
50	63	4.5	54	1.100	3.400	2.290
65	75	4.7	65.8	1.450	4.830	3.380

2.7.2 Geberit Mepla system pipe ML, in a protective tube

Material and physical characteristics

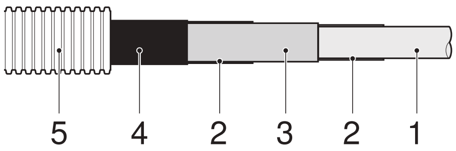


Table 5: Material used for the Geberit Mepla system pipe ML, in a protective tube

Item no.	Designation	Material
1	Inner pipe	PE-RT II
2	Bonding agent	
3	Aluminium pipe	Aluminium
4	Protective jacket	PE-RT II, black
5	Protective tube	PP, black

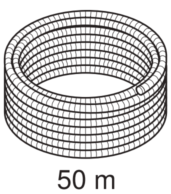
Table 6: Physical characteristics of the Geberit Mepla system pipe ML, in a protective tube

Thermal expansion coefficient α at 20–100 °C	0.026 mm/(m·K)
Thermal conductivity λ at 20 °C	0.43 W/(m·K)
Surface roughness k	7 μm

Table 7: Thermal capacity of the Geberit Mepla system pipe ML, in a protective tube

Nominal width	Outer diameter	Wall thickness	Thermal capacity per metre
DN	d [mm]	s [mm]	c [J/(m•K)]
12	16	2.25	300.76
15	20	2.5	399.43

Pipe dimensions and weights



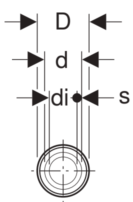


Table 8: Geberit Mepla system pipe ML, in a protective tube

Nominal width	Outer diameter	Wall thickness	Inner diameter	Outer diameter	Pipe weight	Pipe weight with water 10 °C	Protective tube weight	Water volume
DN	d [mm]	s [mm]	di [mm]	D [cm]	m [kg/m]	m [kg/m]	m [kg/m]	V [l/m]
12	16	2.25	11.5	2.7	0.163	0.267	0.053	0.104
15	20	2.5	15	3.1	0.214	0.391	0.063	0.177

2.7.3 Geberit Mepla system pipe ML, with circular pre-insulation

Material and physical characteristics

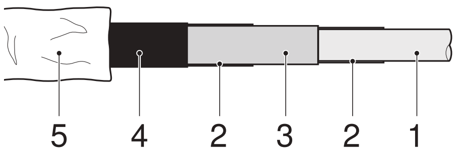


Table 9: Material used for the Geberit Mepla system pipe ML, with circular pre-insulation

Item no.	Designation	Material
1	Inner pipe	PE-RT II
2	Bonding agent	
3	Aluminium pipe	Aluminium
4	Protective jacket	PE-RT II, black
5	Insulation	PE soft foam, closed-cell, 100 % free of HCFCs and HFCs, Fire protection class B1 in accordance with DIN 4102 (flame resistant)
	Protective foil (outside)	PE, red or blue

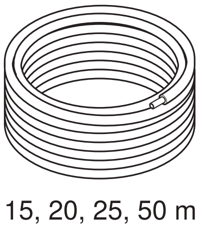
Table 10: Physical characteristics of the Geberit Mepla system pipe ML, with circular pre-insulation

Designation	Pipe dimension			
	Pre-insulated 6 mm	Pre-insulated 10 mm	Pre-insulated 13 mm	Pre-insulated 26 mm
Thermal expansion coefficient α at 20–100 °C	0.026 mm/(m·K)			
Thermal conductivity λ, pipe at 20 °C	0.43 W/(m·K)			
Thermal conductivity λ, insulation at 20 °C	0.04 W/(m·K)			
Thermal conductivity λ, pipe and insulation at 20 °C	0.065 W/(m•K)	0.056 W/(m•K)	0.049 W/(m•K)	0.020 W/(m•K)
Surface roughness k	7 μm			

Table 11: Thermal capacity of the Geberit Mepla system pipe ML, with circular pre-insulation

Nominal width	Outer diameter	Wall thickness	Thermal capacity per metre			
DN	d [mm]	s [mm]	c [J/(m•K)]			
			Pre-insulated 6 mm	Pre-insulated 10 mm	Pre-insulated 13 mm	Pre-insulated 26 mm
12	16	2.25	199.82	209.13	216.11	246.36
15	20	2.5	281.82	292.68	300.83	336.15
20	26	3	438.88	452.07	461.96	504.82

Pipe dimensions and weights



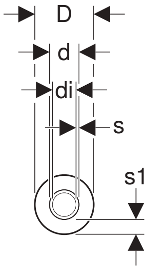


Table 12: Geberit Mepla system pipe ML, with circular pre-insulation, 6 mm

Nominal width	Outer diameter	Wall thickness	Inner diameter	Outer diameter with insulation	Pipe weight	Insulation weight	Pipe weight with water 10 °C	Water volume
DN	d [mm]	s [mm]	di [mm]	D [cm]	m_P [kg/m]	m_I [kg/m]	m_{PW} [kg/m]	V [l/m]
12	16	2.25	11.5	2.8	0.148	0.013	0.252	0.104
15	20	2.5	15	3.2	0.201	0.016	0.378	0.177
20	26	3	20	3.8	0.319	0.019	0.633	0.314

Table 13: Geberit Mepla system pipe ML, with circular pre-insulation, 10 mm

Nominal width	Outer diameter	Wall thickness	Inner diameter	Outer diameter with insulation	Pipe weight	Insulation weight	Pipe weight with water 10 °C	Water volume
DN	d [mm]	s [mm]	di [mm]	D [cm]	m_P [kg/m]	m_I [kg/m]	m_{PW} [kg/m]	V [l/m]
12	16	2.25	11.5	3.6	0.162	0.027	0.266	0.104
15	20	2.5	15	4	0.216	0.031	0.393	0.177
20	26	3	20	4.6	0.336	0.036	0.650	0.314

Table 14: Geberit Mepla system pipe ML, with circular pre-insulation, 13 mm

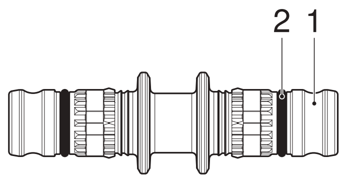
Nominal width	Outer diameter	Wall thickness	Inner diameter	Outer diameter with insulation	Pipe weight	Insulation weight	Pipe weight with water 10 °C	Water volume
DN	d [mm]	s [mm]	di [mm]	D [cm]	m_P [kg/m]	m_I [kg/m]	m_{PW} [kg/m]	V [l/m]
12	16	2.25	11.5	4.2	0.173	0.038	0.277	0.104
15	20	2.5	15	4.6	0.227	0.042	0.404	0.177
20	26	3	20	5.2	0.349	0.049	0.663	0.314

Table 15: Geberit Mepla system pipe ML, with circular pre-insulation, 26 mm

Nominal width	Outer diameter	Wall thickness	Inner diameter	Outer diameter with insulation	Pipe weight	Insulation weight	Pipe weight with water 10 °C	Water volume
DN	d [mm]	s [mm]	di [mm]	D [cm]	m_P [kg/m]	m_I [kg/m]	m_{PW} [kg/m]	V [l/m]
12	16	2.25	11.5	7	0.226	0.091	0.330	0.104
15	20	2.5	15	7.5	0.283	0.098	0.460	0.177
20	26	3	20	8	0.411	0.111	0.725	0.314

2.7.4 Geberit Mepla pressfittings made of PVDF

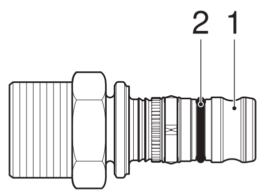
Material



Item no.	Designation	Material
1	Fitting body (medium-transporting)	PVDF
2	O-ring	EPDM

2.7.5 Geberit Mepla fittings made of gunmetal or brass

Material



Item no.	Designation	Material
1	Fitting body (medium-transporting)	Gunmetal CC499K or Brass CW617N
2	O-ring	EPDM

CHAPTER THREE

SOLUTIONS

3.1 DETERMINATION OF THE PIPE DIMENSION

The aim of determining the pipe dimension is to supply the user with sufficient hygienically perfect drinking water under optimum pressure conditions.

The determination of the pipe dimension has changed drastically in the drinking water installation. This is based on the following reasons, amongst others, in accordance with SVGW W3, edition 2013:

- increased number of points of use, e.g. due to there being several sanitary rooms in apartments
- falling occupancy rate per apartment
- new installation techniques
- different user behaviour

SVGW directive W3 describes the following methods for determining the pipe dimension:

- simplified method
- calculation method

System-related loading unit tables are required for the simplified method.

The pipe dimensions are calculated according to pressure loss with the calculation method.

Alternatively, Geberit offers the Geberit loading unit tables for the quick and easy determination of the pipe dimension in small and medium-sized objects.

Geberit offers the following aids for determining the pipe dimension with the calculation method:

- the Geberit pressure loss calculation program can be downloaded as an Excel tool from the sales company's website under the section “Service/Services/Determination of Water Pipe Dimension”
- the Geberit ProPlanner planning software
- the Geberit Pro app for the quick calculation of individual sections

3.1.1 Loading units

The loading unit is the basis for all calculation methods. It denotes the flow rate available at the connection point before the point of use depending on the application purpose and the period of use. A loading unit corresponds to an outlet flow rate of 0.1 l/s.

Table 16: Loading units LU per consumer in accordance with SVGW directive W3, edition 2013

Consumers with connector DN 15 (1/2˝)	Q_A cold [l/s]	Q_A hot [l/s]	LU cold	LU hot
WC cistern, drinks dispenser	0.1	–	1	–
Washbasin, washing trough, bidet, hairdresser shower	0.1	0.1	1	1
Household dishwasher	0.1	–	1	–
Household washing machine	0.2	–	2	–
Outlet tap for balcony	0.2	–	2	–
Shower, kitchen sink, sink, cleaner sink, pedestal and wall-hung sink	0.2	0.2	2	2
Automatic urinal water flush	0.3	–	3	–
Bathtub	0.3	0.3	3	3
Outlet tap for garden and garage	0.5	–	5	–

– No hot water connection available

Q_A Outlet flow rate

LU Loading unit (Loading Unit)

The following must be observed when determining the pipe dimension:

- Heating filling valves must not be included.
- Consumers with connectors larger than 1/2" and special flow capacities must always be calculated according to pressure loss in accordance with manufacturer information.

3.1.2 Geberit loading unit table

The Geberit loading unit tables for the Geberit drinking water supply systems are considered an alternative to the simplified method for determining the pipe dimension in accordance with SVGW directive W3 for drinking water installations, edition 2013. The pressure conditions and maximum flow rates specified in the SVGW W3 are adhered to in the Geberit loading unit tables taking the following criteria into account:

- no points of use larger than specified in the loading unit table
- the peak must not be exceeded according to SVGW directive W3, edition 2013, diagram 1
- no continuous use (longer than 15 minutes)
- maximum height difference of 12 m between distribution battery and highest point of use
- static pressure of 5 bar after the water pressure reducing valve
- maximum 150 LU and maximum 50 m unwound pipe length for each stack from the distributor battery

Table 17: Geberit Mepla

Total loading units LU	**1**	**2**	**3**	**4**	**8**	**16**	**50**	**150**
Largest loading unit LU	1	2			3	5		
Pipe dimension da [mm]	16				20	26	32	40
Inner diameter di [mm]	11.5				15	20	26	33
Recommended pipe length [m]	15[1]	10[1]	5[1]	3[1]	–	–	–	–

LU Loading Unit

– Does not apply

1) Recommended by Geberit: With small pipe dimensions, bended pipe sections are to be preferred over fittings with regard to flow characteristics.

3.2 PRESSURE LOSS IN DRINKING WATER SYSTEMS

There must be sufficient pressure in drinking water systems to be able to extract the necessary amount of water at the points of use. In order to ensure the minimum flow pressure before the points of use, the pressure losses arising from liquids flowing in piping systems must be taken into account when dimensioning drinking water systems:

The total pressure loss of a drinking water system is derived from the sum of the

- pressure losses in straight pipes
- pressure losses from individual resistances

Geberit offers the Geberit ProPlanner calculation software for the dimensioning of drinking water systems. If other calculation software is used, the required data can be requested from Geberit.

3.2.1 Pressure loss through pipe friction in pipes

The pressure loss through pipe friction Δp_R is the product of the pressure drop R (pressure drop through pipe friction in a straight pipe) and the pipe length L. The pressure drop R is dependent on the volumetric flow rate, inner diameter, piping material and temperature. It can be calculated or taken from tables and diagrams, see → Pressure loss diagrams and tables in the appendix.

$$\Delta p_R = R \cdot L$$

Δp_R Pressure loss through pipe friction [Pa]
R Pressure drop [Pa/m]
L Pipe length [m]

3.2.2 Pressure loss from the individual resistance of fittings

Changes in direction in pipes or speed changes, e.g. in bended pipe sections, branch fittings or valves, additionally cause pressure losses from individual resistance.

The essential factor for determining an individual resistance is the pressure loss coefficient ζ (zeta value), a dimensionless value representing the resistance to the dynamic pressure of the water. The pressure loss coefficient must be determined empirically. Geberit provides tables with pressure loss coefficients determined according to the procedures defined independently from the manufacturer in the W 575 (P) testing guidelines issued by the DVGW in 2012.

The pressure loss coefficients for fittings for DVGW and SVGW-certified piping systems must be determined according to DVGW data sheet W 575 (P) and specified in the product documents.

The pressure loss from individual resistance Δp_E is derived from the sum of the pressure loss coefficients ζ (zeta values) multiplied by the dynamic pressure:

$$\Delta p_E = Z = \sum \zeta \cdot \frac{\rho}{2} \cdot v^2 \qquad \left[\frac{kg \cdot m^2}{m^3 \cdot s^2} = \frac{N}{m^2} = Pa\right]$$

Δp_E Pressure loss from individual resistance [Pa]
$\sum \zeta$ Sum of the pressure loss coefficients [factor]
ρ Density [kg/m³]
v Speed [m/s]

3.2.3 Square Law

The pressure loss is proportional to the square of the volumetric flow rate. As a result, a volumetric flow rate reduced by half still represents a quarter of the pressure loss. The volumetric flow rate is therefore a value that significantly influences the pressure loss.

$$\frac{\Delta p_1}{\Delta p_2} = \frac{\dot{V}_1^{\,2}}{\dot{V}_2^{\,2}} \qquad \left[\frac{\text{mbar}}{\text{mbar}} = \frac{\text{l} \cdot \text{s}}{\text{s} \cdot \text{l}}\right]$$

Δp_1 Pressure loss before change [mbar]
Δp_2 Pressure loss after change [mbar]
$\dot{V}_1$ Volumetric flow rate before change [l/s]
$\dot{V}_2$ Volumetric flow rate after change [l/s]

3.2.4 Tables on pressure loss, pressure loss coefficients and the equivalent pipe length

See the Calculation tables ▸ page 77 for tables and diagrams on pressure loss, pressure loss coefficients and the equivalent pipe length of the individual resistances (fittings and valves).

3.3 HOT WATER DRAW-OFF TIMES

The draw-off time is defined as the maximum time it takes hot water to flow from the point of use at the effective temperature. Draw-off times should not be too high in the interest of economical water and energy consumption and should meet the user's comfort requirements.

The draw-off time is influenced by the following parameters:

- arrangement of the sanitary appliances
- hot water distribution (laying technique)
- pipe dimension
- pipe length
- hot water temperature
- volumetric flow rate

Country-specific regulations apply for the draw-off times. Planning software, such as Geberit ProPlanner, is available to calculate the draw-off times, which issues warnings, for example, if the defined draw-off time is exceeded.

3.3.1 Reference values for draw-off times

The draw-off times specified in the following table apply when the outlet taps set to hot are fully open. The calculations and measurements of SIA 385-2:2015 are based on an effective temperature of 40 °C at the point of use of the hot water. A temperature of 40 °C signals the start of the usability of the hot water according to SIA 385-1:2011.

Table 18: Maximum admissible draw-off time (according to SIA 385-1:2011)

Point of use	**Draw-off time [s]**	
	Without heat maintenance (e.g. without circulation)	**With heat maintenance (e.g. with circulation)**
Washbasin, handrinse basin, bidet, shower, bathtub, kitchen sink, cleaner sink	15	10

3.3.2 Determination of the draw-off time

The draw-off time consists of two phases:

1. Cold phase: Pipe content is drawn off.
2. Warm-up phase: Pipes, valves and distributors warm up until an effective temperature of 40°C is achieved at the point of use.

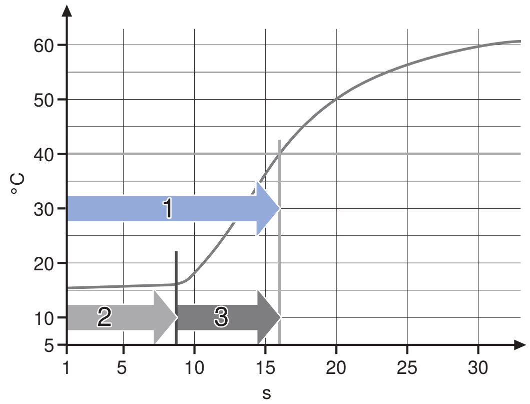


Figure 5: Temperature profile at the point of use when hot water is initially drawn off depending on the effective temperature and time

1 Draw-off time
2 Cold phase
3 Warm-up phase

Calculation of the draw-off time

The cold phase is calculated as follows:

$$\text{Cold phase} = \frac{V \cdot L}{\dot{V}}$$

V	Pipe content [l/m]
L	Pipe length [m]
$\dot{V}$	Volumetric flow rate [l/s]

The warm-up phase lasts about the same length of time as the cold phase. The cold phase is therefore considered as factor 2 in the calculation of the draw-off time. This factor is not dependent on the pipe material chosen, the pipe diameter or the installation type chosen at a water temperature of at least 55°C in pipes that are kept warm. The draw-off time is therefore calculated as follows:

Draw-off time = cold phase • 2

This results in the following formula, which is used to calculate the draw-off time t:

$$t = \frac{V \cdot L}{\dot{V}} \cdot 2 \qquad \left[\frac{m \cdot l \cdot s}{m \cdot l}\right]$$

t	Draw-off time [s]
V	Pipe content [l/m]
L	Pipe length [m]
$\dot{V}$	Volumetric flow rate [l/s]

Sample calculation:

- distribution system: with heat maintenance, e.g. circulation
- sanitary appliance: kitchen sink (2 LU) = 0.2 l/s
- pipe content:
  - discharge pipe: Geberit PushFit d16 mm (0.113 l/m), 8 m = 0.9 l

Required:

- draw-off time t

Solution:

$$t = \frac{0.9}{0.2} \cdot 2 \qquad \left[\frac{m \cdot l \cdot s}{m \cdot l}\right]$$

$$t = 9\ s$$

The maximum draw-off time of 10 s is not exceeded.

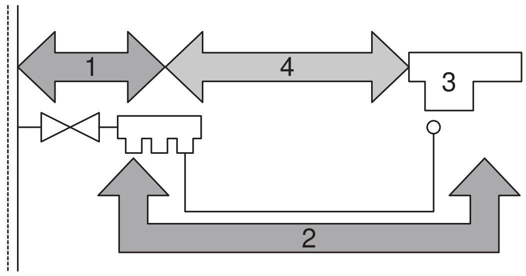


Figure 6: Illustration of sample calculation

1	Manifold 3/4"
2	Relevant pipe length (discharge pipe)
3	Kitchen sink
4	Manifold from distributor to kitchen sink

Note

If the manifold is not more than 1 m away from the hot pipe and is insulated, this pipe volume must not be included in the calculation.

Relevant pipe length for calculating the draw-off time: In the example, the unwound pipe length of the discharge pipe is 8.0 m.

In the example, the distance from the manifold to the kitchen sink is about 7 m.

3.3.3 Factors influencing the draw-off time

The draw-off time is influenced by various factors, in particular by the following:

- pipe dimension
- volumetric flow rate
- length of the discharge pipe

The maximum length of the discharge pipe with which the draw-off time is maintained is dependent on the pipe dimension. The smaller the pipe dimension, the longer the discharge pipe. However, the smaller pipe dimension results in a higher pressure loss. These factors must be weighed against each other in the specific case.

The discharge pipes are often executed with Geberit Mepla pipes. The following tables therefore list the maximum lengths of the discharge pipe and the pressure losses through pipe friction for the available pipe dimensions of this system.

Length of the discharge pipe, Geberit Mepla

Table 19: Maximum length of the discharge pipe $L_{max.}$ for maintaining the draw-off time of 10 seconds, Geberit Mepla

	Outer pipe diameter d [mm]					
	16		20		25	
	$L_{max.}$ [m]	Pressure loss [mbar]	$L_{max.}$ [m]	Pressure loss [mbar]	$L_{max.}$ [m]	Pressure loss [mbar]
Washbasin 1 LU	4.8	60	2.8	10	–	–
Kitchen sink 2 LU	9.6	412	5.7	67	3.2	10
Shower / bathtub 3 LU	5.6[1)]	498	8.5	208	4.8	33

– Does not apply

1) Reduced pipe length to achieve a pressure loss of less than 500 mbar

Table 20: Maximum length of the discharge pipe $L_{max.}$ for maintaining the draw-off time of 15 seconds, Geberit Mepla

	Outer pipe diameter d [mm]					
	16		20		25	
	$L_{max.}$ [m]	Pressure loss [mbar]	$L_{max.}$ [m]	Pressure loss [mbar]	$L_{max.}$ [m]	Pressure loss [mbar]
Washbasin 1 LU	7.2	90	4.2	15	–	–
Kitchen sink 2 LU	11.6	496	8.5	101	4.8	14
Shower / bathtub 3 LU	5.6[1)]	498	12.7	311	7.2	50

– Does not apply

1) Reduced pipe length to achieve a pressure loss of less than 500 mbar

3.4 THERMAL EXPANSION OF PIPES

Pipes expand differently due to thermal effects depending on the material. This thermal expansion is designated as change in length Δl. The higher the temperature differences, the greater also the change in length.

The following affect the change in length:

- material
- ambient conditions
- operating conditions (e.g. media with different temperatures)

The change in length must be taken into account in the planning of the pipe installation.

Sliding points are used to keep the pipes movable.

Anchor points direct the change in length in the desired direction. Appropriate measures must be taken to absorb the change in length, depending on the extent of the change in length.

3.4.1 Control of the change in length with sliding points and anchor points

The pipe length and installation type have an influence on which measures must be taken to absorb the temperature-related changes in length.

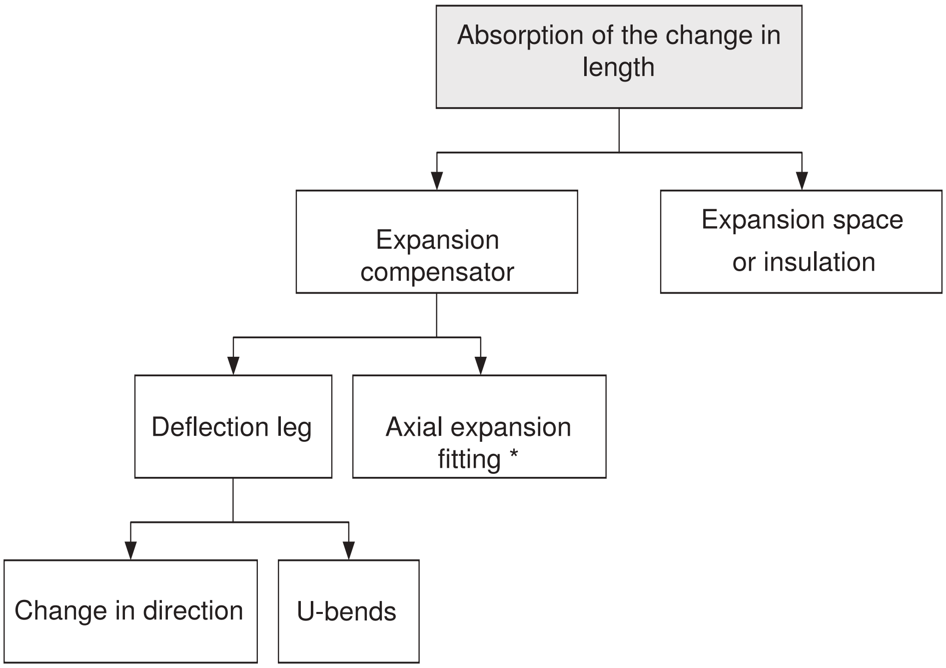
Table 21: Control of the change in length depending on the pipe length and installation type

Pipe length L in the case of straight pipes	Installation type		
	Cold water	Hot water/circulation	
	d16–75	d16–26	d32–75
< 12 m	No control of the change in length is required through sliding brackets and anchor points if the pipe is insulated[1)]		
> 12 m	No control of the change in length is required through sliding brackets and anchor points if the pipe is insulated[1)]		Control of the change in length through sliding brackets and anchor points

1) As a rule of thumb: Insulation thickness = 1.5 · change in length Δl

3.4.2 Absorption of the change in length

Temperature-related changes in length Δl can be compensated for with the following measures:



* Only for Geberit Mapress Stainless Steel and Geberit Mapress Carbon Steel

Expansion space or insulation

Slight changes in the length of pipes can be absorbed by means of the elasticity of the piping system or by means of compressible insulation.

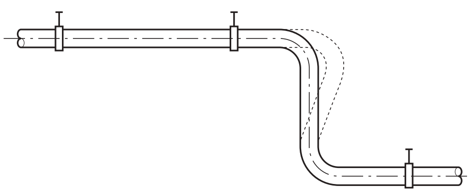


Figure 7: Absorption of a change in length Δl by means of the elasticity of the piping system

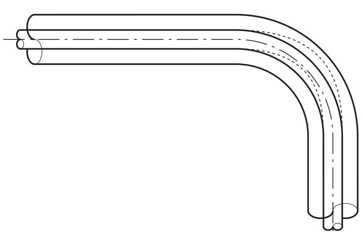


Figure 8: Absorption of a change in length Δl by means of compressible insulation

Determination of the insulation thickness

The following rule of thumb applies for the determination of the insulation thickness:

insulation thickness = 1.5 · change in length Δl

Regulations (country-specific standards, provisions or directives) define a minimum insulation thickness for the insulation. If the calculated insulation thickness is less than the minimum insulation thickness defined in the regulations, the insulation thickness defined in the regulation must be used.

Deflection legs as an expansion compensator

If the changes in length cannot be compensated for by means of insulation, then the change in length must be absorbed by means of an expansion compensator. Deflection legs are a type of expansion compensator.

Deflection legs can be used if there is a change in direction or as a U-bend for long straight pipes.

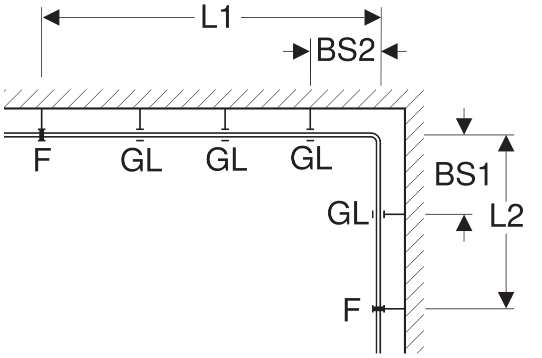


Figure 9: Expansion compensation through change in direction

BS	Deflection leg
F	Anchor point
GL	Sliding point
L	Pipe length

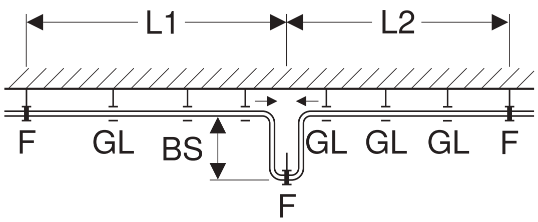


Figure 10: Expansion compensation by a U-bend

BS	Deflection leg
F	Anchor point
GL	Sliding point
L	Pipe length

With a U-bend, the longer pipe section (L1 or L2) is used as pipe length L to determine the deflection leg length.

Deflection legs in rise pipes

The thermal expansion is controlled with anchor points in riser pipes over several floors. The thermal expansion is absorbed by means of deflection legs in the floor connections. The sliding brackets on the horizontal pipes work like anchor points for the vertical thermal expansion.

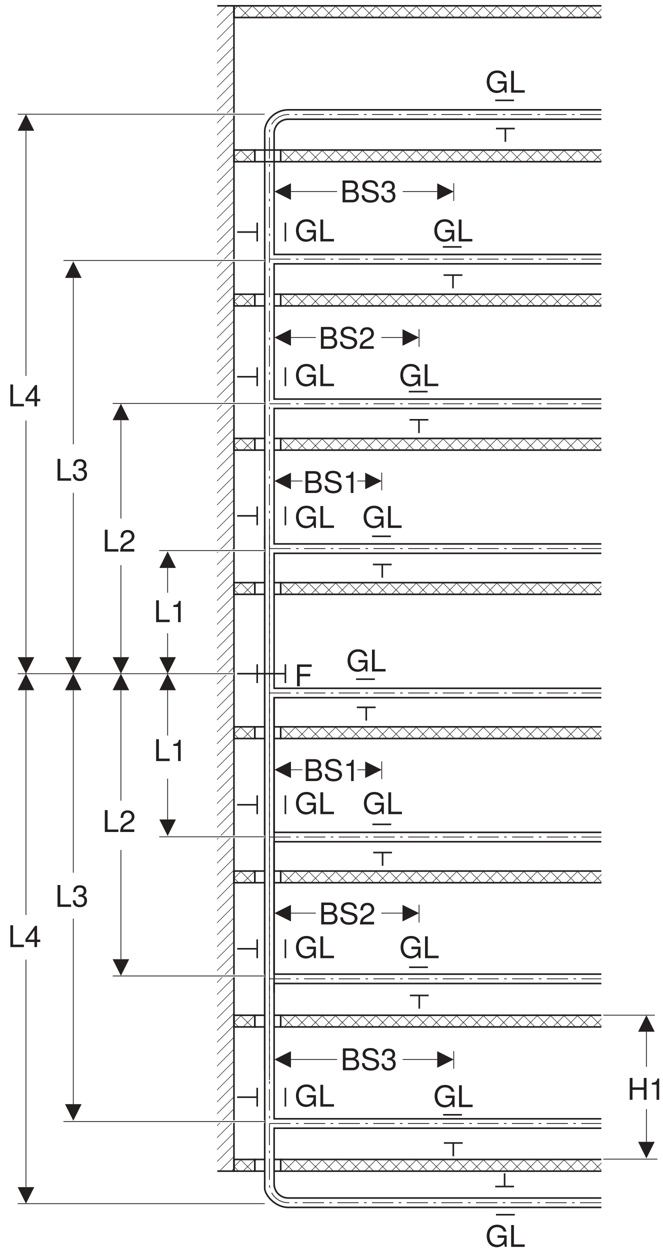


Figure 11: Riser pipe with anchor point in the middle: directing the thermal expansion upwards and downwards halves the deflection leg length

F	Anchor point
BS	Deflection leg
GL	Sliding point
L	Pipe length
H1	Floor height

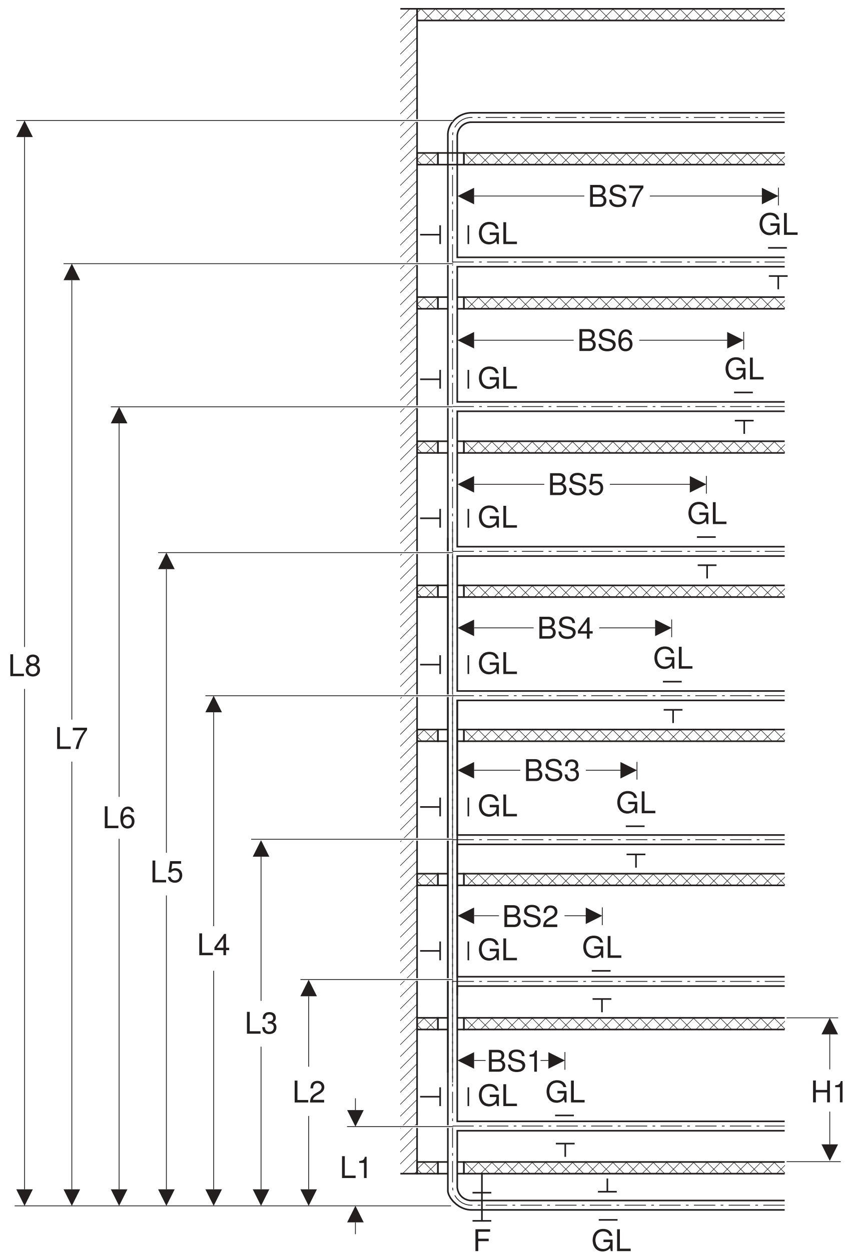
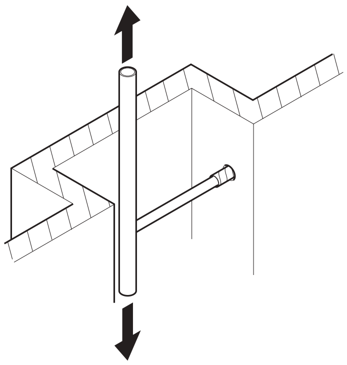


Figure 12: Riser pipe with anchor point at the bottom: directs the thermal expansion upwards

F	Anchor point
BS	Deflection leg
GL	Sliding point
L	Pipe length
H1	Floor height

Deflection legs for pipe laying in a duct

If the pipe is laid in a duct, the change in length can be absorbed by deflection legs as follows:



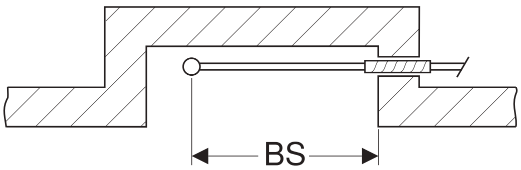
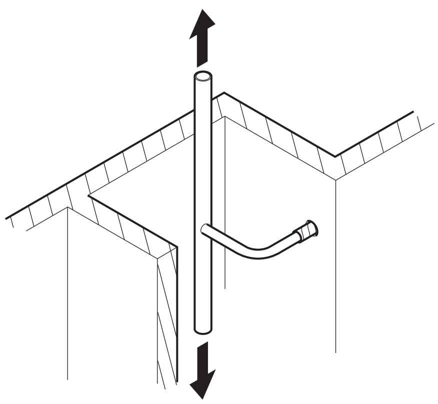


Figure 13: Straight deflection leg, without insulation

BS Deflection leg



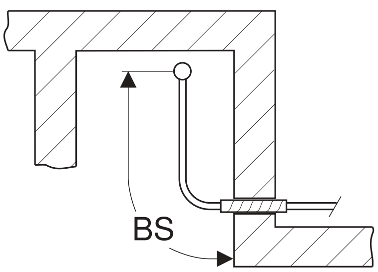


Figure 14: Bent deflection leg, without insulation

BS Deflection leg

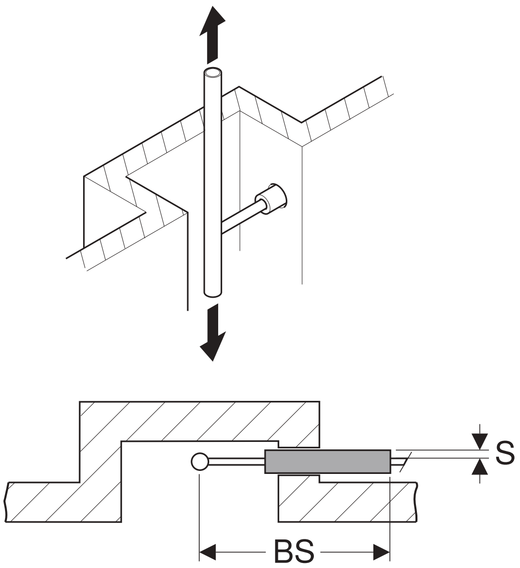


Figure 15: Straight deflection leg, with insulation

BS Deflection leg
S Insulation thickness

Calculation of the deflection leg length

The thermal expansion of pipes is dependent on the material, among other things. Material-dependent parameters must be considered when determining the deflection leg length.

Table 22: Material-dependent Geberit Mepla parameters for calculating the deflection leg length

Product material of pipe	Thermal expansion coefficient α[1)] [mm/(m•K)]	Material constant	
		C	U
PE-RT II / Al / PE-RT II	0.026	33	19

1) The thermal expansion coefficient α = 0.026 mm/(m•K) is valid for temperatures in the range 20–100 °C. It is applicable for all pipe dimensions, per length and per Kelvin temperature increase.
C Material constant for determining the deflection leg length L_B (change in direction, outlet pipe)
U Material constant for determining the deflection leg length L_U (U-bend)

The calculation of the deflection leg length comprises the following steps:

- calculation of the change in length Δl
- calculation of the deflection leg length L_B with a change in direction and outlet pipe or calculation of the deflection leg length L_U in the case of U-bends.

Calculation of the change in length Δl

The change in length Δl is calculated using the following formula:

$$\Delta l = L \cdot \alpha \cdot \Delta T$$

Δl Change in length [mm]
L Pipe length [m]
ΔT Temperature differential (operating temperature - ambient temperature at time of installation) [K]
α Thermal expansion coefficient α [mm / (m • K)]

Given:
- material: Geberit Mepla system pipe ML
- L=30 m
- α = 0.026 mm/(m•K)
- ΔT = 50 K

Required:
- change in length Δl [mm]

Solution:

$$\Delta l = L \cdot \alpha \cdot \Delta T \left[\frac{m \cdot mm \cdot K}{m \cdot K} = mm\right]$$

Δl = 30 • 0.026 • 50

Δl = 39 mm

The change in length Δl can also be calculated in a simplified manner from the following tables.

Table 23: Change in length Δl for Geberit Mepla multilayer pipes

L [m]	Temperature differential ΔT [K]						
	10	20	30	40	50	60	70
	Change in length Δl [mm]						
1	0.3	0.5	0.8	1.0	1.3	1.6	1.8
2	0.5	1.0	1.6	2.1	2.6	3.1	3.6
3	0.8	1.6	2.3	3.1	3.9	4.7	5.5
4	1.0	2.0	3.1	4.2	5.2	6.2	7.3
5	1.3	2.6	3.9	5.2	6.5	7.8	9.1
6	1.6	3.1	4.7	6.2	7.8	9.4	10.9
7	1.8	3.6	5.5	7.3	9.1	10.9	12.7
8	2.0	4.2	6.2	8.8	10.4	12.5	14.6
9	2.3	4.7	7.0	9.4	11.7	14.0	16.4
10	2.6	5.2	7.8	10.4	13.0	15.6	18.2
20	5.2	10.4	15.6	20.8	26.0	31.2	36.4
30	7.8	15.6	23.4	31.2	39.0	46.8	54.6
40	10.4	20.8	31.2	41.6	52.0	62.4	72.8
50	13.0	26.0	39.0	52.0	65.0	78.0	91.0

L Pipe length

Calculation of the deflection leg length LB

The deflection leg length L_B to be calculated is defined as follows for a change in direction and for outlet pipes:

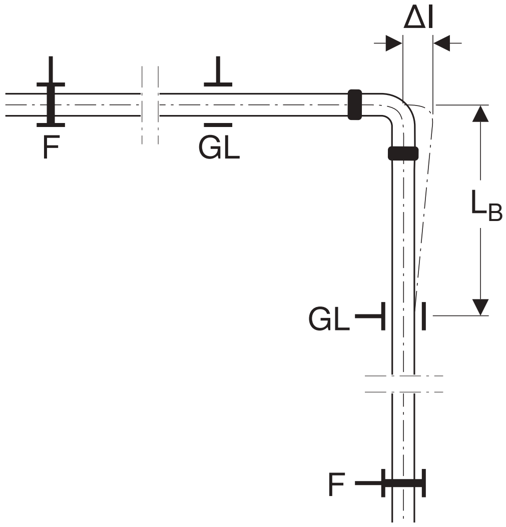


Figure 16: Expansion compensation with a change in direction

F	Anchor point
GL	Sliding point
L_B	Deflection leg length
Δl	Change in length

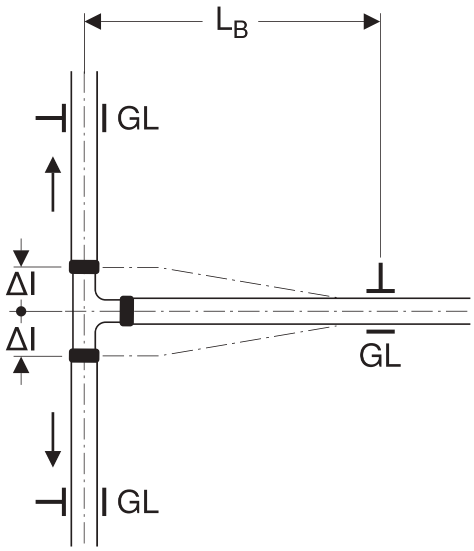


Figure 17: Expansion compensation with an outlet pipe

F	Anchor point
GL	Sliding point
L_B	Deflection leg length
Δl	Change in length

The deflection leg length L_B is calculated using the following formula:

$$L_B = \frac{C \cdot \sqrt{d \cdot \Delta l}}{1000}$$

L_B	Deflection leg length [m]
d	Outer pipe diameter [mm]
Δl	Change in length [mm]
C	Material constant

Given:

- material: Geberit Mepla system pipe ML
- C = 33
- d=32 mm
- Δl = 39 mm

Required:

- L_B [m]

Solution:

$$L_B = \frac{C \cdot \sqrt{d \cdot \Delta l}}{1000} \left[\frac{\sqrt{mm \cdot mm}}{\frac{mm}{m}} = m \right]$$

$$L_B = \frac{33 \cdot \sqrt{32 \cdot 39}}{1000}$$

$$L_B = 1.17\ m$$

The deflection leg length L_B can also be calculated in a simplified manner from the following graphics.

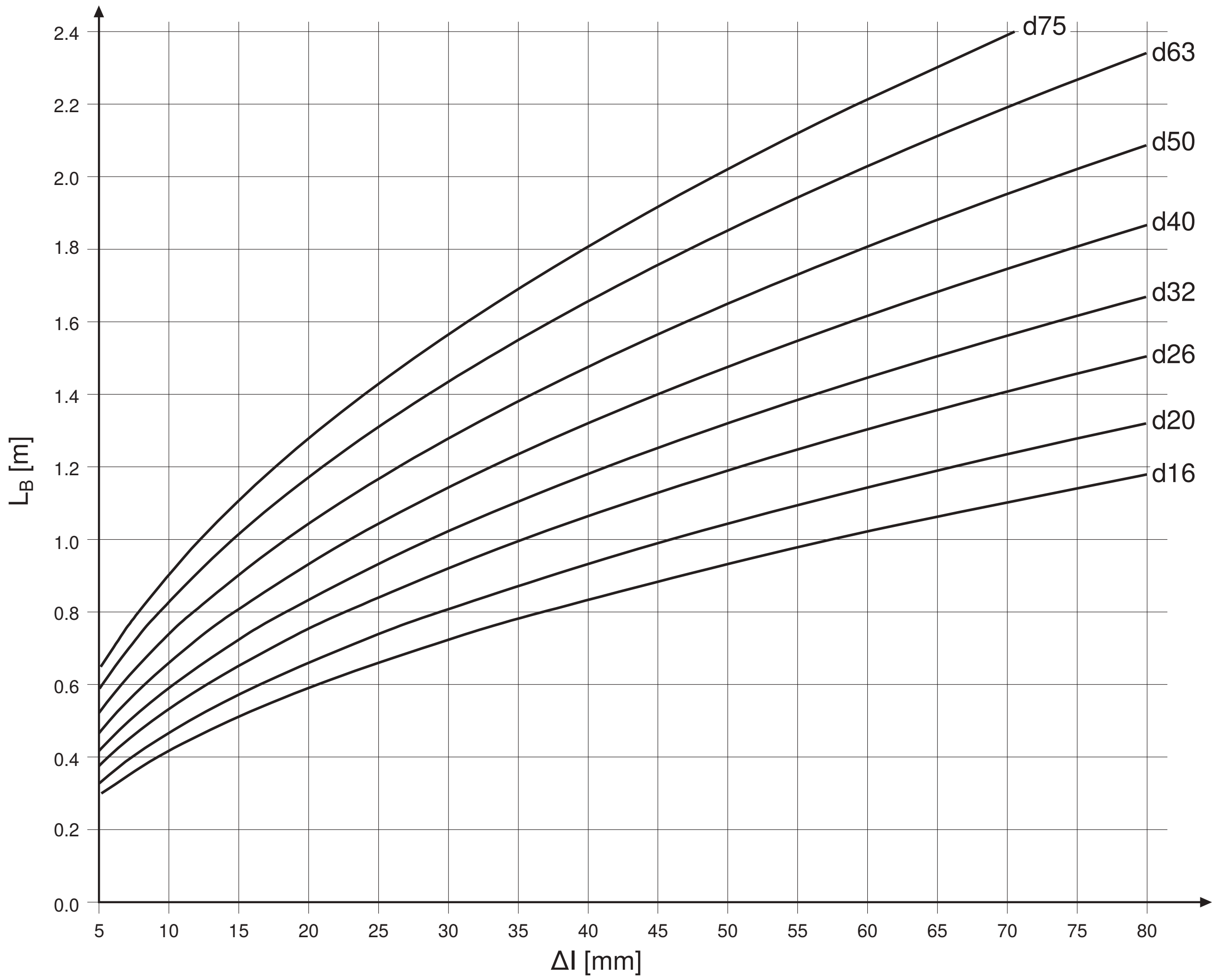


Figure 18: Graphical calculation of the deflection leg length L_B for Geberit Mepla

Calculation of the deflection leg length LU

The deflection leg length L_U to be calculated is defined as follows:

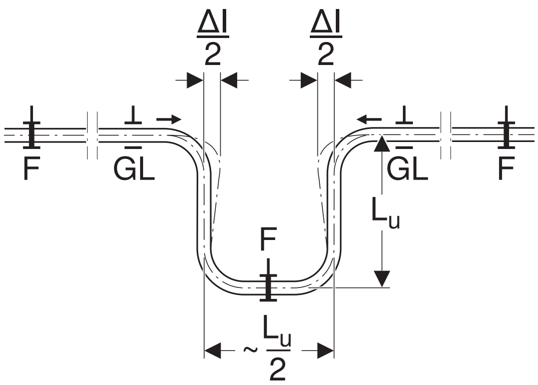


Figure 19: U-bend, made of bent pipe

F Anchor point
GL Sliding point
L_U Deflection leg length
Δl Change in length

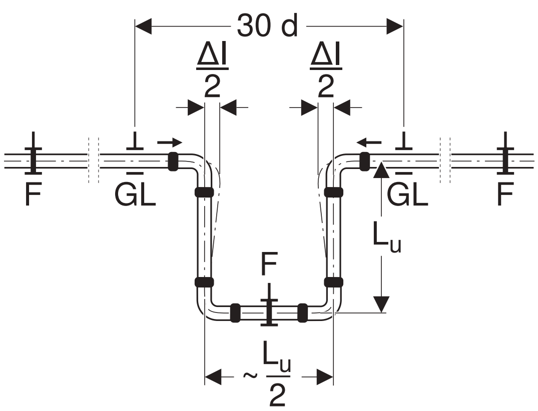


Figure 20: U-bend, made with pressfittings

F Anchor point
GL Sliding point
L_U Deflection leg length
Δl Change in length

The deflection leg length L_U is calculated using the following formula:

$$L_U = \frac{U \cdot \sqrt{d \cdot \Delta l}}{1000}$$

L_U Deflection leg length [m]
d Outer pipe diameter [mm]
Δl Change in length [mm]
U Material constant

Given:

- material: Geberit Mepla system pipe ML
- U=19
- d = 32 mm
- Δl = 39 mm

Required:

- L_U [m]

Solution:

$$L_U = \frac{U \cdot \sqrt{d \cdot \Delta l}}{1000} \left[\frac{\sqrt{mm \cdot mm}}{\frac{mm}{m}} = m \right]$$

$$L_U = \frac{19 \cdot \sqrt{32 \cdot 39}}{1000}$$

$$L_U = 0.67 \text{ m}$$

The deflection leg length L_U can also be calculated in a simplified manner from the following graphics.

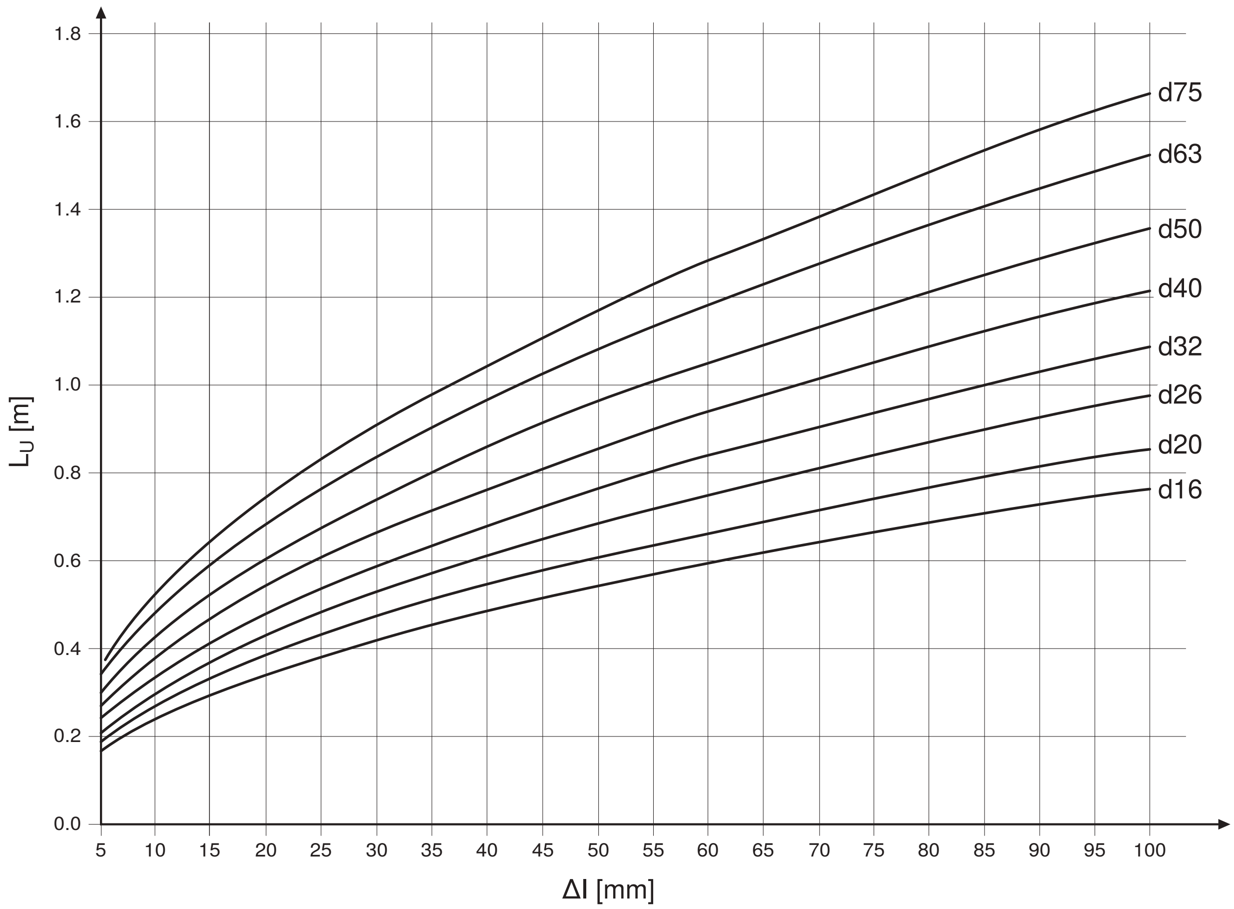


Figure 21: Graphical calculation of the deflection leg length L_U for Geberit Mepla

3.5 INSULATION OF PIPE SYSTEMS

The insulation of piping systems must fulfil various functions depending on the constructional situation:
- anticondensation insulation
- thermal insulation
- sound insulation
- absorption of low thermal expansion of the pipe

A few basic rules must be considered when insulating piping systems:
- It is essential that the choice of insulation is designed to suit the area of use in order to ensure that insulation materials do not damage the pipe material. The restrictions on use provided by the insulation material manufacturers must be observed.
- Insulation materials must be protected against moisture or consist of closed cells in order to avoid corrosion and a reduction in the insulating effect.
- The installation and routing guidelines provided by the insulation material manufacturers must be observed.
- Insulation shells are not suitable for absorbing low thermal expansion.
- The absorption of low thermal expansion of the pipe is only possible in soft insulation.

3.5.1 Sound insulation

Geberit supply systems do not produce any inherent noises with the correct system planning and installation. However, they emit noises that come from appliances and valves. Pipes must therefore be equipped with structure-borne sound insulation that consistently decouples the piping system from the building structure, for example, with feed-throughs or through the use of insulated pipe brackets. The insulation must be implemented correctly and without any gaps. The thickness of the insulation is not of importance. Any country-specific requirements must be observed.

Geberit pipe bracket with structure-borne sound insulation

Geberit offers the insulated pipe bracket M8/M10 for sound decoupling of the pipe from the building:

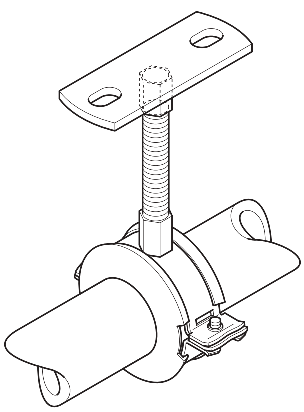


Figure 22: Fastening with Geberit pipe bracket, insulated, with threaded socket M8 / M10

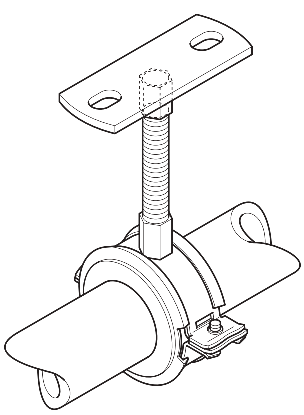


Figure 23: Fastening with Geberit Mepla pipe bracket lining shell, inner diameter of 26 to 75 mm

Tap connections

The fastening of valves is achieved with Geberit elbow connectors. The elbow connectors must be decoupled from both the mounting plate and the building structure in order to prevent the spread of structure-borne sound from the valves.

In the case of exposed installation, sound insulation is achieved by means of the Geberit sound insulation base between the flange and the elbow connector:

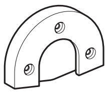


Figure 24: Sound insulation base for Geberit single elbow tap connector 90°

In the case of concealed installation, sound insulation is achieved with the Geberit sound insulation set, comprising the Geberit sound insulation base and a sound insulation cap:

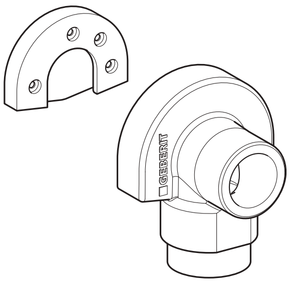


Figure 25: Geberit sound insulation set for a single elbow tap connector 90°

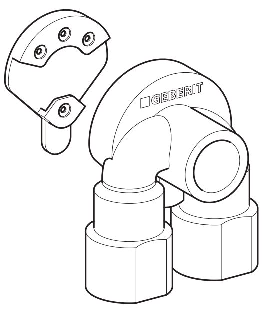


Figure 26: Geberit sound insulation set for a double elbow tap connector 90°

Geberit offers the following solution for termination of protective tubes and insulation for Geberit elbow connectors:

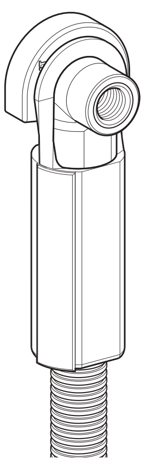


Figure 27: Geberit sound insulation set for single elbow tap connector 90° with Geberit termination for elbow tap connector shells

3.6 CORROSION

Corrosion is the reaction of a metallic material to its environment, which causes a measurable change in the material and can lead to an impairment in the function of a component or an entire system. Different types of corrosion can occur depending on the material and application area. A distinction is generally made between external corrosion and internal corrosion. However, certain types of corrosion can occur both internally and externally. Corresponding corrosion measures must be implemented to avoid corrosion occurring.

The following factors influence the corrosion behaviour of metallic materials:

- material characteristics
- water quality
- operating conditions
- planning and implementation
- leak test and commissioning

3.6.1 Resistance to internal corrosion

The inner pipe of the Geberit multilayer pipes made of PE-RT II is corrosion-resistant.

3.6.2 Resistance against external corrosion

Thanks to the protective jacket made of PE-RT II, the Geberit multilayer pipe is corrosion-resistant.

However, corrosion of the internal aluminium pipe may occur at the cut pipe sections if the pipes are laid in the following environments:

- aggressive environment
- permanently damp environment

In these cases, the connection points must be sealed with corrosion protection.

Aggressive environment

An aggressive environment exists in all areas where corrosive gases or vapours can occur, for example in:

- animal facilities
- dairies
- cheese dairies
- storage areas for chemicals
- swimming pools
- areas with acids or alkalis

3.6.3 Measures to protect against corrosion

Geberit sealing collars, Geberit sealing tape or Geberit terminations can be used to protect against corrosion in an aggressive or permanently damp environment. If Geberit terminations are used, the adapters to the pipe must be additionally sealed with Geberit sealing tape so that they are completely protected.

Corrosion protection with a sealing collar

The sealing collar is used to protect the pipe cross-sections against external corrosion factors.

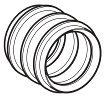


Figure 28: Geberit Mepla sleeve, di16 mm (art. no. 601.811.00.1), di20 mm (art. no. 602.811.00.1) and di26 mm (art. no. 603.811.00.1)

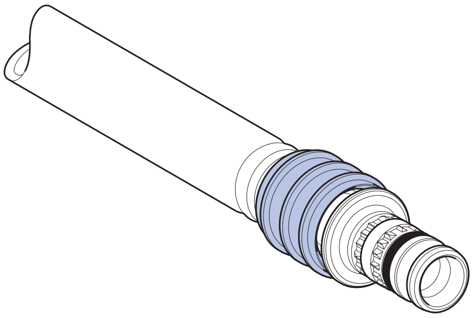


Figure 29: Geberit Mepla sleeve mounted over the Geberit Mepla pressed joint

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The Geberit Mepla sleeve must not be pressed onto the pipe.

Corrosion protection with Geberit sealing tape

Geberit sealing tape is used to protect pipes and fittings against external corrosion factors. In connections insulated with Geberit terminations, the adapters from the termination to the pipe must be fully protected with Geberit sealing tape.

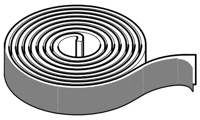


Figure 30: Geberit sealing tape 3 cm wide (art. no. 601.813.00.1) or 5 cm wide (art. no. 601.815.00.1)

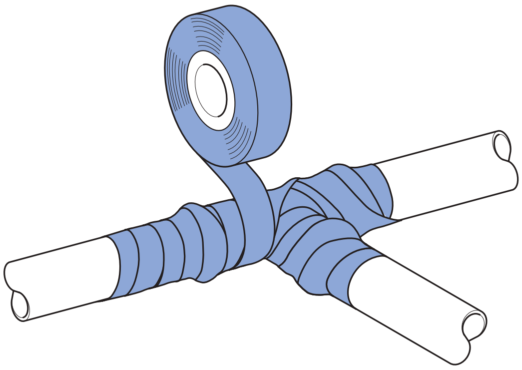


Figure 31: Corrosion protection of a connection with T-piece

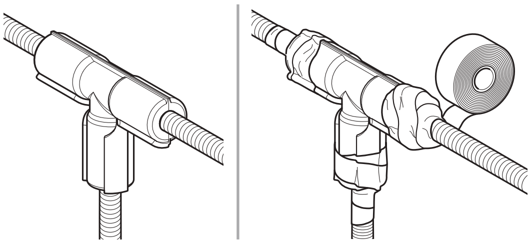


Figure 32: Geberit T-piece shell (insulation) with sealing tape

Corrosion protection in the case of concealed installation

Concealed pipes must be protected with fibre insulation materials (e.g. glass or rock wool) or with a solid insulation hose. In addition, the fitting and pipe adapters must be protected against corrosion with closed-cell foam.

Geberit diffusion-tight sealing tape is suitable for protecting the fitting and pipe adapters.

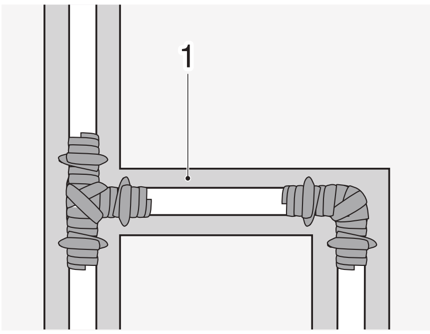


Figure 33: Concealed pipe, with corrosion protection

1 Insulation made of fibre insulation material or insulation hose

3.7 EQUIPOTENTIAL BONDING

To protect against electric shock, the relevant standards and regulations require that “conductive” water and heating pipes are included in the equipotential bonding.

The metallic fittings in the Geberit Mepla supply system have a permanently integrated corrosion barrier washer made of PE-LD. The corrosion barrier washer ensures that no conductive connections are formed through the press connection of Geberit Mepla system pipes and fittings.

Geberit Mepla is therefore not a conductive pipe system. It therefore does not need to be included in the equipotential bonding and also earthed.

The plumber or site manager must inform the customer or customer's representative that a qualified electrician must check whether the existing electrical protection and earthing measures are negatively affected by the installation of Geberit Mepla.

3.8 PIPE FIXATION

Pipe fastenings support the pipe and direct the temperature-related change in length in the desired direction. Pipe fastenings are distinguished according to anchor points and sliding points. For information on compensating for temperature-related changes in length, see chapter Absorption of the change in length.

An anchor point is a rigid installation of the pipe, which directs the pipe expansion to an expansion compensator.

A sliding point is an axially movable pipe bracket.

Sliding points must be set so that they do not become unwanted anchor points during operation.

3.8.1 Creating anchor and sliding points

Pipe bracket with lining shells as an anchor point construction

The following are required for a Geberit pipe bracket, insulated for an anchor point construction:

- Geberit double nipple M10xG1/2" (art. no. 362.856.26.1)
- Geberit base plate (art. no. 362.851.26.1)
- Geberit pipe bracket lining shell (art. no. 60x.702.00.1)

The two identical half shells of the pipe bracket lining shell are connected around the fitting bead. The bracket construction permanently anchored to the fitting is therefore an anchor point that simultaneously retains all the features of the sound-tested pipe bracket.

Table 24: Geberit pipe brackets with pipe bracket lining shells

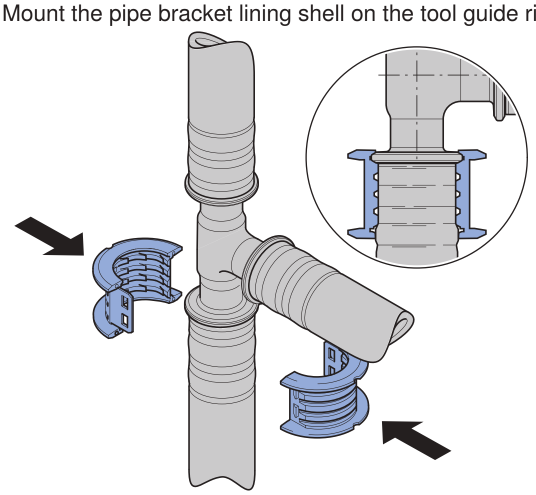
DN	d [mm]	Pipe bracket, insulated	Pipe bracket lining shell
		Art. no.	Art. no.
20	26	601.854.26.1	603.702.00.1
25	32	601.855.26.1	604.702.00.1
32	40	601.856.26.1	605.702.00.1
40	50	601.858.26.1	606.702.00.1
50	63	601.859.26.1	607.702.00.1
65	75	601.860.26.1	608.702.00.1

d Outer pipe diameter

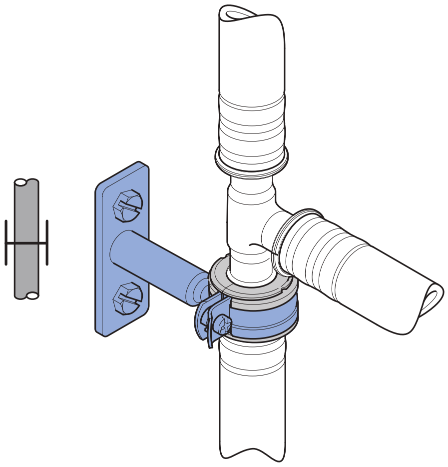
Installing the anchor point

In the case of outlets, the anchor point position depends on the load direction:
- If the load is from below, the anchor point must be installed underneath the outlet.
- If the load is from above, the anchor point must be installed above the outlet.

1 Mount the pipe bracket lining shell on the tool guide rim of the pressfitting.



2 Fit the pipe bracket onto the pipe bracket lining shell.



Pipe bracket as a sliding bracket

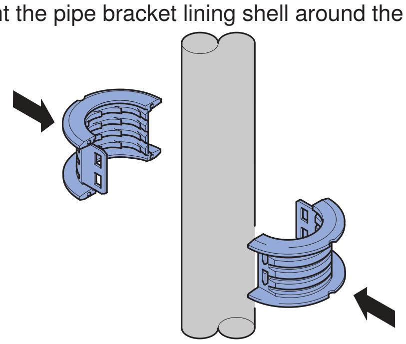
If the Geberit pipe bracket lining shell is connected over the Geberit Mepla system pipe ML and a pipe bracket is secured on top of it, the result is a pipe bracket with sliding properties.

Geberit pipe brackets, insulated (art. no. 601.85x.26.1) are used in addition to Geberit pipe bracket lining shells (art. no. 60x.702.00.1) for sliding brackets. The pipe bracket lining shells guarantee a regular slide with a defined force.

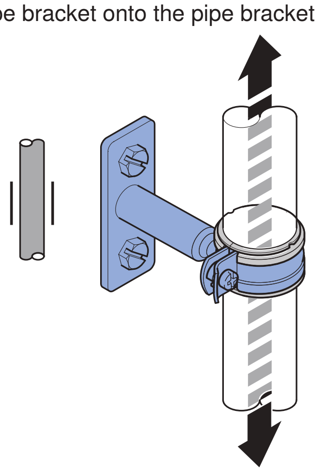
The pipe brackets are fastened depending on the distance from the wall or ceiling and according to the following table and designed according to the admissible forces per fastening point.

Installing the sliding point

1 Mount the pipe bracket lining shell around the pipe.



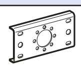
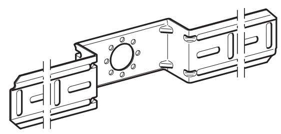
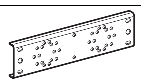
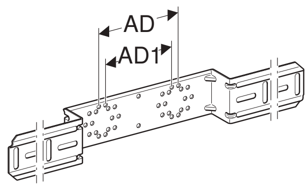
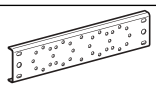
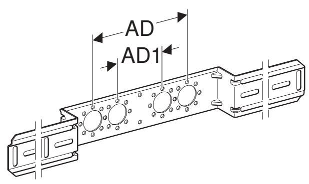
2 Fit the pipe bracket onto the pipe bracket lining shell.



3.9 FASTENING OF TAP CONNECTORS

3.9.1 Installation dimensions of Geberit mounting plates

Geberit mounting plates serve to fasten Geberit connections.

Geberit mounting plate		Number of possible connections	Connecting distance AD [cm]	Connecting distance AD1 [cm]
Straight	Offset			
		1	–	–
		2	12	10
		2	15.3	7.3

Different installation dimensions and depths are achieved with the concealed and exposed installation of Geberit mounting plates.

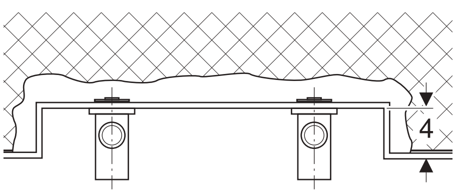


Figure 34: Installation dimension for concealed installation with a Geberit mounting plate, offset

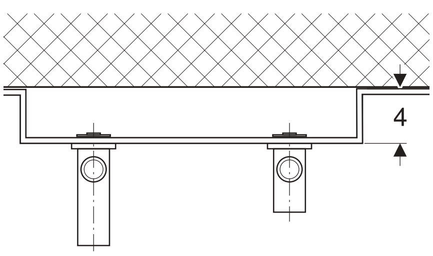


Figure 35: Installation dimension for exposed installation with a Geberit mounting plate, offset

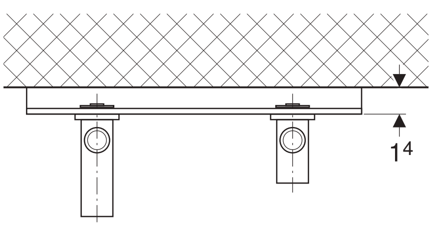


Figure 36: Installation dimension for exposed installation with a Geberit mounting plate, straight

3.9.2 Examples of mounting

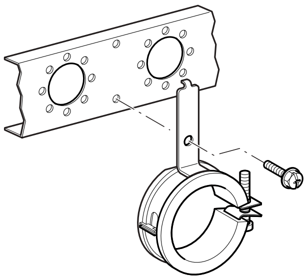


Figure 37: Installation of a Geberit drain pipe bracket for mounting plates

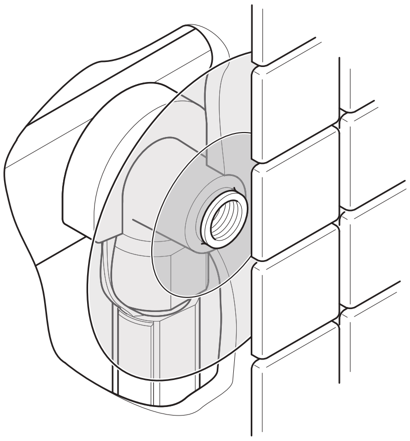


Figure 38: Installation with a Geberit sealing washer for connections

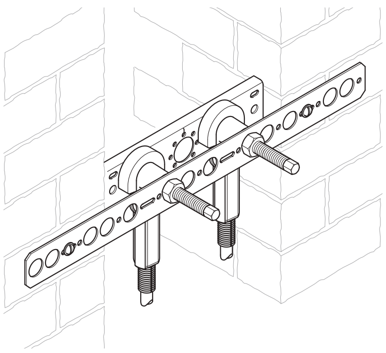


Figure 39: Installation with a mounting rail

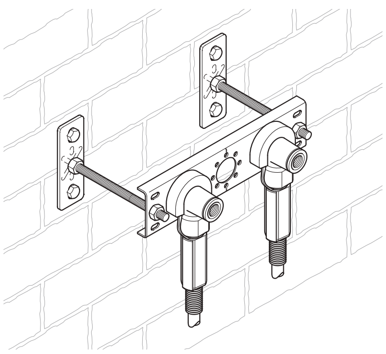


Figure 40: Installation in front of a duct

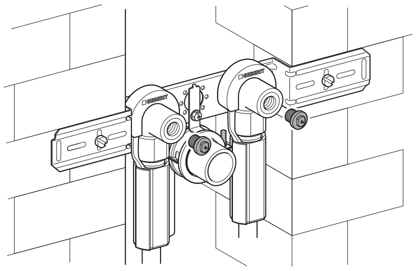


Figure 41: Connection for angle stop valves with a drain pipe bracket for a washbasin

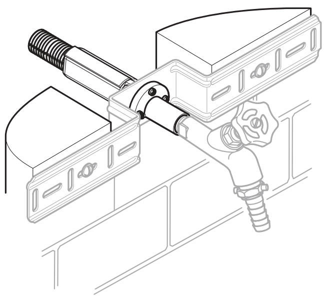


Figure 42: Tap connector, straight with outside tap

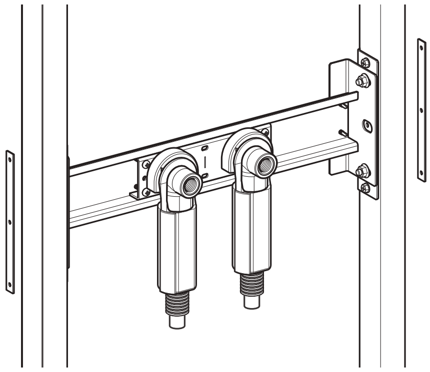


Figure 43: Installation in a lightweight wall with a Geberit Duofix crossbar for a wall-mounted tap, variable tap position

3.10 PIPEWORK

3.10.1 Processing temperature

Geberit Mepla system components can be processed at an ambient temperature of -10 to +60 °C.

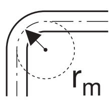
Battery-operated pressing tools can only be used in temperatures ranging from -10 to +50 °C.

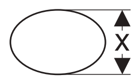
3.10.2 Bending Geberit Mepla system pipes

When bending the Geberit Mepla system pipes observe the following:

- Only pipes d16–50 may be bent.
- The inside of the bend should not be dented or compressed.
- The protective jacket must not be damaged.

The following table shows the minimum bending radius and the minimum oval diameter for pipes.





Smallest possible bending radius Minimum oval pipe diameter

	d [mm]							
	16	**20**	**26**	**32**	**40**	**50**	**63**	**75**
r_m [cm]	5.8	7.0	9.0	11.6	16.0	20.0	–[1]	–[1]
x [cm]	1.5	1.9	2.4	3.0	3.7	4.7	–[1]	–[1]

[1] Geberit Mepla system pipes d63 and d75 must not be bent. Use Geberit Mepla 90° and 45° elbows for changes in direction.

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

With Geberit bending tool

Geberit Mepla system pipes d16–32 can be bent with the Geberit handheld bending tool hydraulic. The Geberit bending die and the Geberit bending cheek must correspond to the outer pipe diameter d.

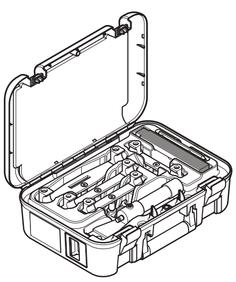


Figure 44: Geberit handheld bending tool, hydraulic, in case

By hand

Geberit Mepla system pipes d16–26 can be bent by hand.

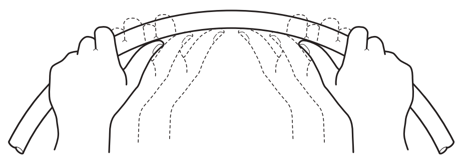


Figure 45: Bending by hand

Pipes which are bent by hand should not have any indentations on the surface or be compressed on the inside.

With Geberit external bending spring ML

Geberit system pipes ML in the dimensions of d16 and d20 can be bent with the Geberit external bending spring ML in order to avoid dents or compressions when bending by hand.

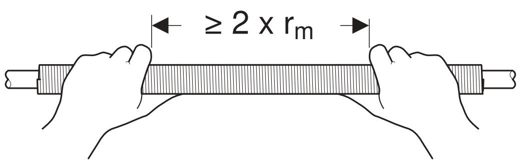
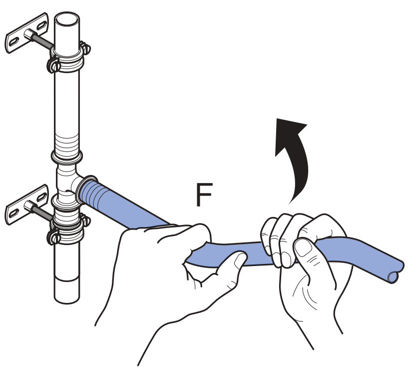


Figure 46: Bending by hand with the Geberit external bending spring ML

Geberit system pipes ML must not be bent using an internal bending spring because this can lead to damage on the inner pipe.

3.10.3 Subsequent bending of pressed pipes

When subsequently bending pressed pipes, the bending force must be absorbed by the counterpressure (F = anchor point) so that no bending force is directed towards the pressed joint.



3.11 PRESSING GEBERIT MEPLA SYSTEM PIPES

3.11.1 Pressing tools

A pressing tool is defined as a pressing tool with a pressing attachment inserted. Pressing jaws, adapter jaws and pressing collars are designated as pressing attachments.

Geberit pressing tools and pressing attachments are specifically designed for pressing Geberit system pipes and fittings. The use of Geberit pressing tools or pressing tools from other manufacturers recommended by Geberit together with original Geberit pressing attachments is a prerequisite for the additional Geberit warranty.

Pressing tools and pressing attachments

The suitable pressing attachment is inserted into the pressing tool for pressing the pipe and fitting.

The following pressing attachments are used depending on the pipe diameter:

- pressing jaws for pipe diameters ≤ d50
- pressing collars with adapter jaws for pipe diameters ≥ d50

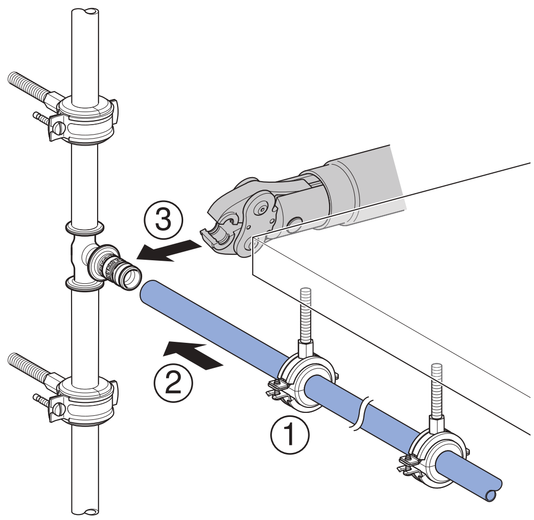
The pressing contour of the Geberit pressing jaws and pressing collars has been designed to suit the geometry of the Geberit pressfittings.

3.12 INSTALLATION RULES

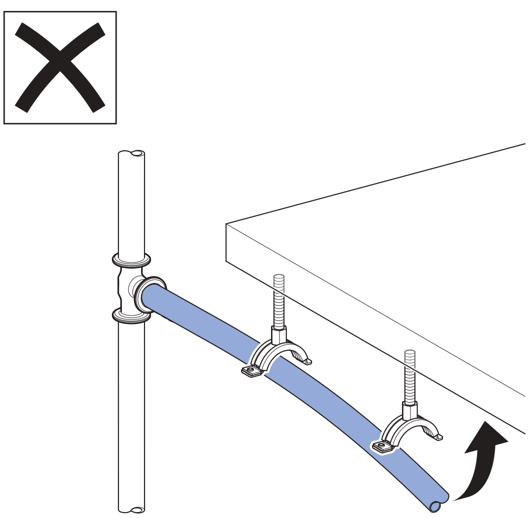
3.12.1 Basic laying process

The following sequence applies for the laying of Geberit pressing systems:

1. Fasten the pipes in sliding brackets.
2. Connect the pipes and pressfittings.
3. Press the pipes and pressfittings.



Pressed pipes must be kept tension-free during the installation (e.g. with pipe brackets).



3.12.2 Concealed laying

All concealed pipes must be thoroughly insulated from the building. The following system pipes can be used to this purpose:

- Geberit Mepla system pipes with insulation
- Geberit Mepla system pipes with a protective tube

Fastenings which are not sound-absorbing are to be fixed in place over the insulation or protective tube. In the area of pipe crossovers, the system pipes must be fixed in place because otherwise pressure surges may cause noise.

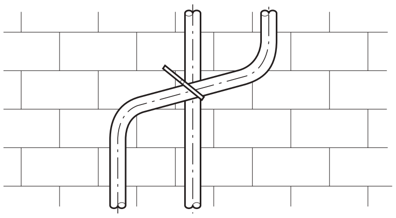


Figure 47: Fixing intersecting pipes

3.12.3 Laying through ceiling feed-throughs

Do not bend pipes which are routed through ceiling feed-throughs over edges as otherwise the pipe could kink.

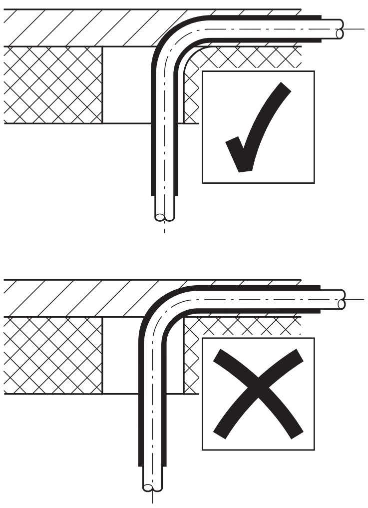


Figure 48: Laying pipes through a ceiling feed-through

3.13 INSTALLATION DIMENSIONS

3.13.1 Minimum dimensions for fitting combinations

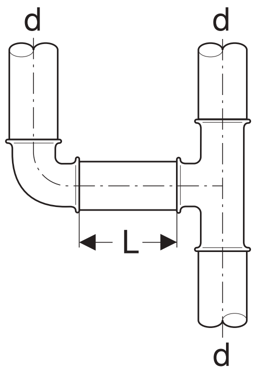


Table 25: Minimum pipe length between two fittings with a pressed joint

	d [mm]							
	16	20	26	32	40	50	63	75
L [cm]	5.5	6.0	6.9	7.9	9.1	10.3	15.0	19.0

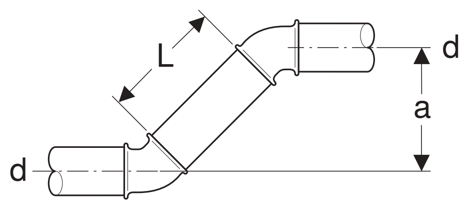


Table 26: Minimum pipe length and minimum distance between two 45° elbows

	d [mm]					
	26	32	40	50	63	75
L [cm]	6.9	7.9	9.1	10.3	15.0	19.0
a [cm]	7.1	8.1	9.5	10.8	14.6	17.5

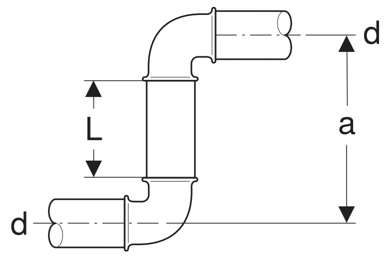
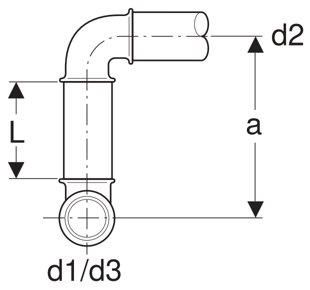


Table 27: Minimum pipe length and minimum distance between two 90° elbows

	d [mm]							
	16	20	26	32	40	50	63	75
L [cm]	5.5	6.0	6.9	7.9	9.1	10.3	15.0	19.0
a [cm]	9.1	9.8	11.5	13.3	15.7	18.1	25.6	30.9

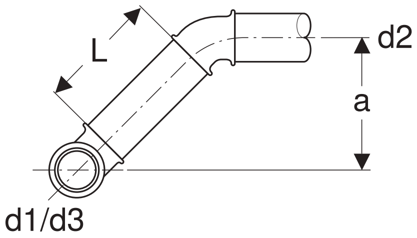


d1/d3 Through-flow

d2 Branch fitting

Table 28: Minimum pipe length and minimum distance between a T-piece and 90° elbow

d2 [mm]		**d1/d3 [mm]**							
		16	**20**	**26**	**32**	**40**	**50**	**63**	**75**
16	L [cm]	5.5	5.5	5.5	5.5	–	–	–	–
	a [cm]	9.5	9.5	9.9	10.2	–	–	–	–
20	L [cm]	6.0	6.0	6.0	6.0	6.0	–	–	–
	a [cm]	10.1	10.1	10.7	11.0	11.4	–	–	–
26	L [cm]	–	6.9	6.9	6.9	6.9	6.9	6.9	6.9
	a [cm]	–	11.4	11.4	11.8	12.2	13.2	14.1	14.4
32	L [cm]	–	–	7.9	7.9	7.9	7.9	7.9	7.9
	a [cm]	–	–	12.9	13.2	14.0	14.6	15.7	16.0
40	L [cm]	–	–	–	9.1	9.1	9.1	9.1	9.1
	a [cm]	–	–	–	15.7	16.2	16.8	17.8	18.2
50	L [cm]	–	–	–	–	–	10.3	10.3	10.3
	a [cm]	–	–	–	–	–	18.6	19.7	20.3
63	L [cm]	–	–	–	–	–	–	15.0	15.0
	a [cm]	–	–	–	–	–	–	25.5	26.3
75	L [cm]	–	–	–	–	–	–	–	19.0
	a [cm]	–	–	–	–	–	–	–	30.9



d1/d3 Through-flow

d2 Branch fitting

Table 29: Minimum pipe length and minimum distance between a T-piece and 45° elbow

d2 [mm]		d1/d3 [mm]						
		20	**26**	**32**	**40**	**50**	**63**	**75**
26	L [cm]	6.9	6.9	6.9	6.9	6.9	6.9	6.9
	a [cm]	7.6	7.5	7.8	8.1	8.8	9.5	9.9
32	L [cm]	–	7.9	7.9	7.9	7.9	7.9	7.9
	a [cm]	–	8.5	8.7	9.3	9.7	10.5	10.7
40	L [cm]	–	–	9.1	9.1	9.1	9.1	9.1
	a [cm]	–	–	10.1	10.5	10.9	11.6	11.9
50	L [cm]	–	–	–	–	10.3	10.3	10.3
	a [cm]	–	–	–	–	12.0	12.7	13.2
63	L [cm]	–	–	–	–	–	15.0	15.0
	a [cm]	–	–	–	–	–	16.3	16.8
75	L [cm]	–	–	–	–	–	–	19.7
	a [cm]	–	–	–	–	–	–	19.0

3.13.2 Pipe bracket spacing

Surface-mounted Geberit Mepla system pipes are fastened with pipe brackets. Insulated Geberit pipe brackets can be used to prevent the transmission of structure-borne sound.

The fastening distance between the individual pipe brackets on surface-mounted Geberit Mepla system pipes is 1–2.5 m, depending on the diameter.

No additional support shells are required when pipes are surface-mounted under the ceiling.

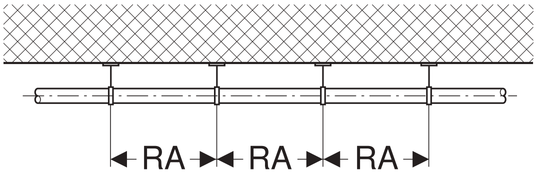


Figure 49: Horizontal pipe bracket spacings for Geberit Mepla system pipes

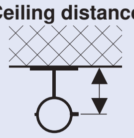
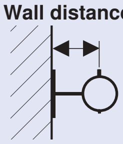
Dimension			Pipe bracket, art. no.	Pipe bracket spacing without support shell	Pipe bracket spacing with support shell	Load per pipe bracket[2]	Max. load per pipe bracket
DN	d [mm]	di [mm]		RA[1] [m]	RA [m]	[N]	[N]
12	16	11.5	601.851.26.1	1.0	1.5	2.4	800
15	20	15	601.852.26.1	1.0	1.5	3.6	800
20	26	20	601.853.26.1	1.5	2.0	9.2	800
25	32	26	601.854.26.1	2.0	–	18.9	800
32	40	33	601.855.26.1	2.0	–	29.0	800
40	50	42	601.856.26.1	2.0	–	44.5	1,000
50	63	54	601.858.26.1	2.5	–	85.0	1,000
62	75	65.8	601.859.26.1	2.5	–	120.8	1,000

1) Recommended by Geberit
2) Pipe filled with water, 10 °C

3.13.3 Thickness of the pipe fixation

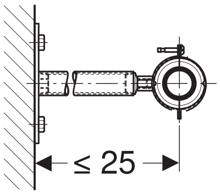
Pipe brackets are fastened to the wall or ceiling with threaded rods. The required thickness of the threaded rods for the fastening of sliding points must be chosen depending on the distance from the ceiling or wall.

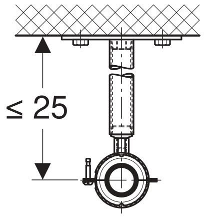
Table 30: Required thickness of the threaded rods for fastening sliding points to ceiling and walls

DN	d [mm]	Distance between pipe brackets [cm]								
		Ceiling distance 					Wall distance 			
		≤ 10	11–20	21–30	31–40	41–60	≤ 10	11–20	21–30	31–60
12	16	M8	M8	M8	M10	M10	M8	M10	M10	1/2"
15	20	M8	M8	M8	M10	M10	M8	M10	M10	1/2"
20	26	M8	M8	M10	M10	M10	M8	M10	1/2"	1/2"
25	32	M8	M10	M10	M10	1/2"	M8	M10	1/2"	1/2"
32	40	M8	M10	1/2"	1/2"	1/2"	M10	M10	1/2"	1/2"
40	50	M10	M10	1/2"	1/2"	1/2"	M10	M10	1/2"	1/2"
50	63	M10	M10	1/2"	1/2"	1/2"	M10	M10	1/2"	1/2"
65	75	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"

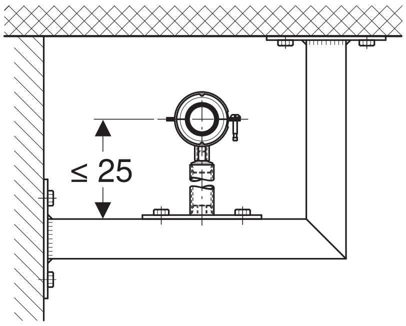
3.13.4 Wall or ceiling distance from anchor points

Anchor points up to a wall or ceiling distance of 25 cm must be implemented as a 1/2” pipe fixation.

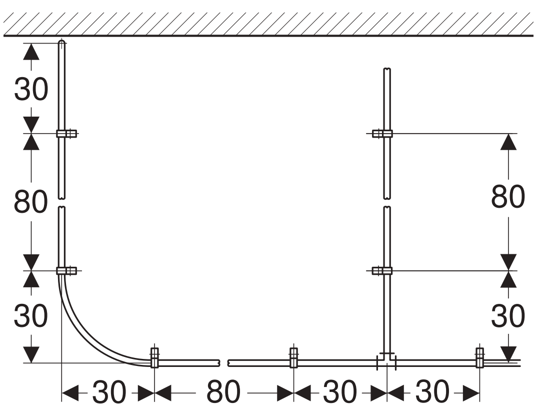




The installation of support fastenings is recommended for wall or ceiling distances over 25 cm.



3.13.5 Fastening distances of floor-mounted pipes



Distance between the pipe clips:	80 cm
Distance for fittings and bends:	30 cm

3.13.6 Fastening distances in a Geberit GIS prewall

In a Geberit GIS prewall, Geberit system pipes ML and PB are fastened with the Geberit GIS pipe clip for supply pipes, art. no. 461.070.00.1 at the following distances:

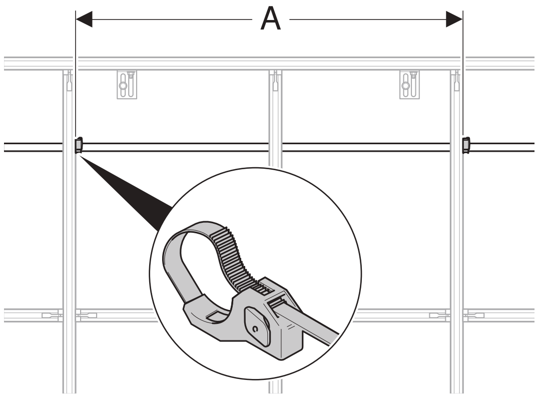


Table 31: fastening distance A in a Geberit GIS prewall

	Outer pipe diameter d [mm]		
	16	**20**	**25**
A [cm]	≤ 110	≤ 110	≤ 150

3.13.7 Fastening distances in a Geberit Duofix installation wall

In a Geberit Duofix installation wall, Geberit system pipes ML and PB are fastened with the Geberit Duofix clip for pipe fixation, art. no. 111.891.00.1, and the corresponding Geberit pipe bracket at the following distances:

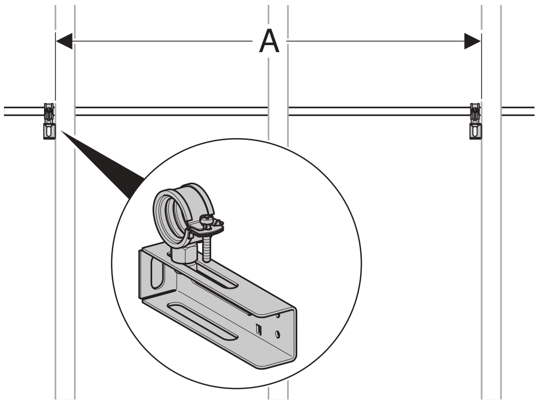


Table 32: fastening distance A in a Geberit Duofix installation wall

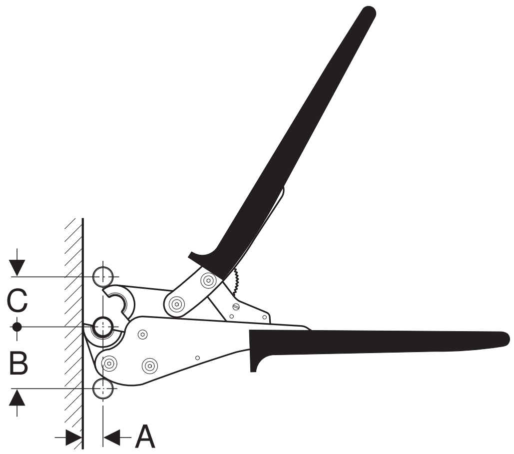
	Outer pipe diameter d [mm]		
	16	**20**	**25**
A [cm]	≤ 110	≤ 110	≤ 110

3.13.8 Space requirements for pressing

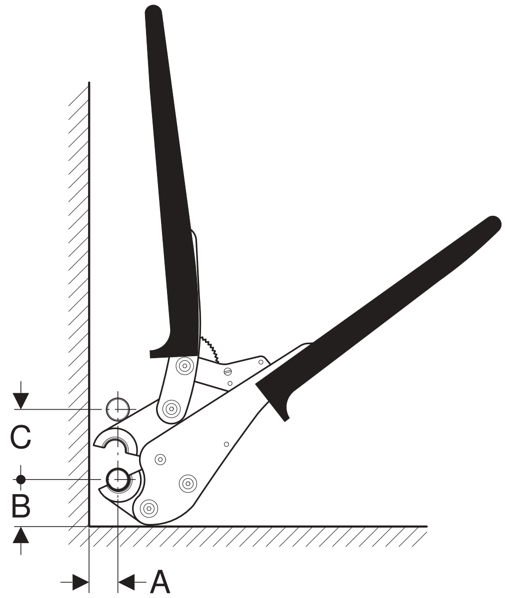
The Geberit Mepla system pipes must be installed in the building so that there is sufficient space for pressing.

The following tables show the space requirements when pressing with various Geberit pressing tools for mounting on a smooth wall and in a corner.

Space requirements when pressing with the Geberit Mepla hand-operated pressing tool



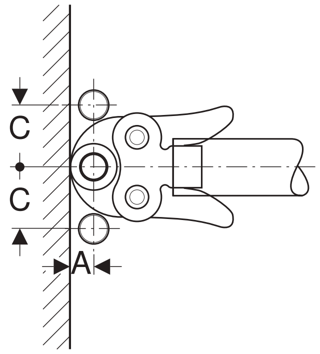
Space requirements for mounting on a smooth wall



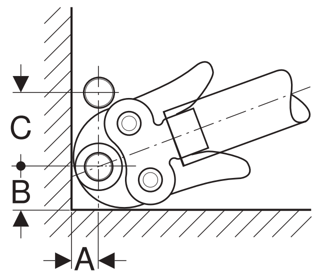
Space requirements for mounting in a corner

d [mm]	On a smooth wall			In a corner		
	A [cm]	B [cm]	C [cm]	A [cm]	B [cm]	C [cm]
16	1.5	3.8	4.2	1.9	3.0	5.0
20	1.6	4.2	4.4	2.1	3.1	5.5
26	1.9	4.7	5.3	2.3	3.3	6.2

Space requirements when pressing with an electrical pressing tool with Geberit Mepla pressing jaw compatibility [1]



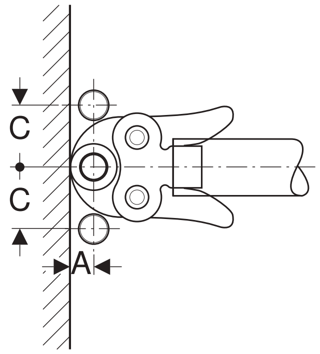
Space requirements for mounting on a smooth wall



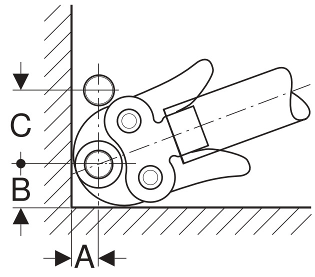
Space requirements for mounting in a corner

d [mm]	On a smooth wall		In a corner		
	A [cm]	C [cm]	A [cm]	B [cm]	C [cm]
16	1.5	3.5	1.8	2.8	5.5
20	1.7	4.2	2.0	3.3	5.5
26	2.0	4.8	2.2	3.5	6.0
32	2.5	5.5	2.6	3.8	6.6
40	2.9	6.8	3.0	4.6	7.4

Space requirements when pressing with an electrical pressing tool with Geberit Mepla pressing jaw compatibility [2]



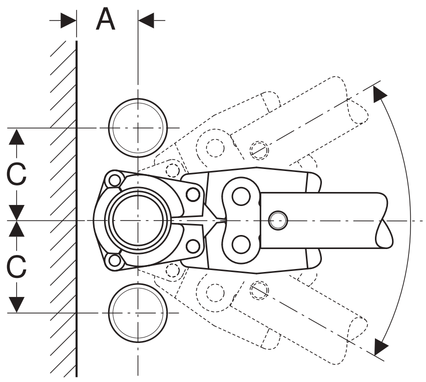
Space requirements for mounting on a smooth wall



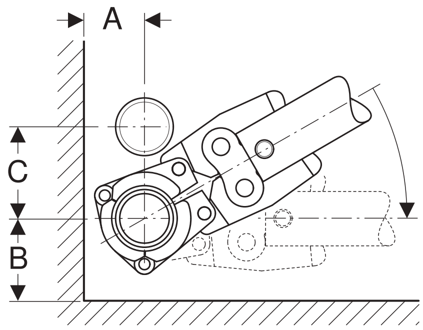
Space requirements for mounting in a corner

d [mm]	On a smooth wall		In a corner		
	A [cm]	C [cm]	A [cm]	B [cm]	C [cm]
16	1.6	4.4	1.9	3.1	7.8
20	1.9	4.8	2.2	3.4	8.1
26	2.1	5.4	2.3	3.7	8.8
32	2.7	6.2	3.0	4.5	9.6
40	3.1	7.3	3.7	5.1	10.4
50	4.0	9.5	4.1	6.0	11.0

Space requirements when pressing with an electrical pressing tool with a Geberit Mepla pressing collar



Space requirements for mounting on a smooth wall



Space requirements for mounting in a corner

d [mm]	On a smooth wall		In a corner		
	A [cm]	**C [cm]**	**A [cm]**	**B [cm]**	**C [cm]**
63	8.0	11.0	8.0	9.0	11.0
75	9.5	15.0	9.5	10.0	15.0

3.14 PRODUCING THE PRESSED JOINT

The Geberit Mepla system components must not be processed when ambient temperatures are below -10 °C. Pressing tools with a rechargeable battery must only be used in temperatures ranging from -10 – +50 °C.

The Geberit Mepla system tools are matched to the system requirements and must be used without exception.

The use of saws and other chip-producing tools which should be avoided when cutting the Geberit Mepla system pipes because chips can get trapped around the seal ring and cause leaks.

3.14.1 Processing the Geberit system pipe and pressfitting

⚠ CAUTION

Leaking connection

Aligning the pipes after pressing can cause leaking connections.

► Align the pipes before pressing.

ATTENTION

Damage to the pressing jaw due to use of incorrect diameters

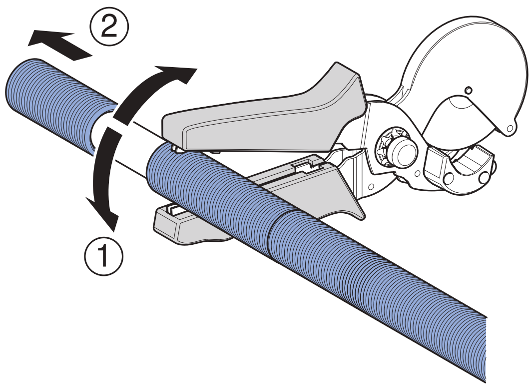
► The diameter of the pressing jaw must match the diameter of the pressfitting.

✓ System pipes and pressfittings are tension-free.

✓ The pipe or prefabricated elements are aligned.

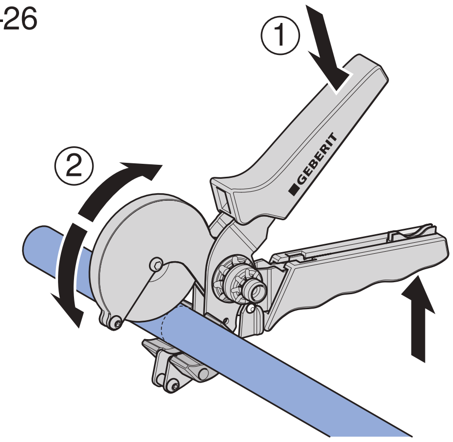
1 Determine the pipe length.

If necessary, cut the protective tube to length with the Geberit Mepla pliers.

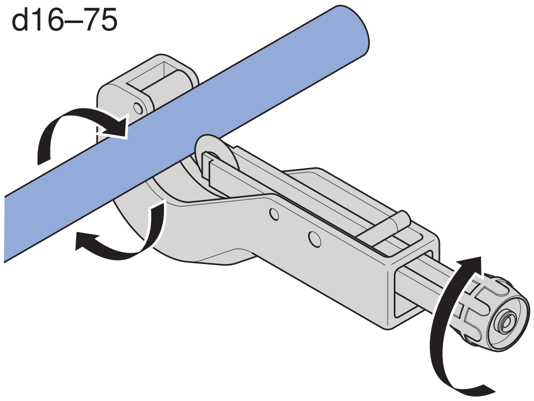


2 Cut the system pipe to length at a right angle.

d16–26

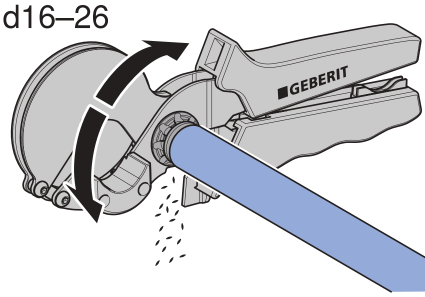


d16–75

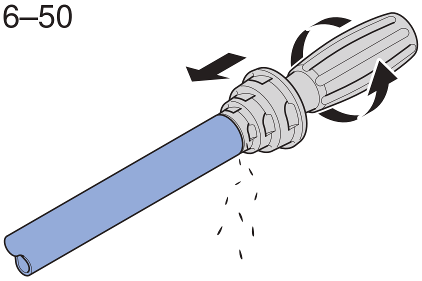


3 Calibrate and debur the pipe ends.

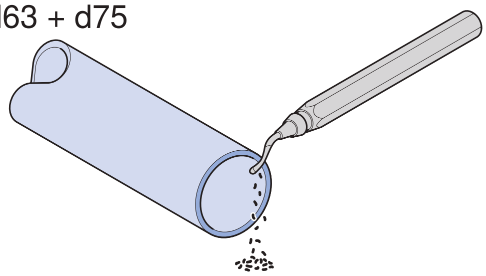
d16–26



d16–50



d63 + d75

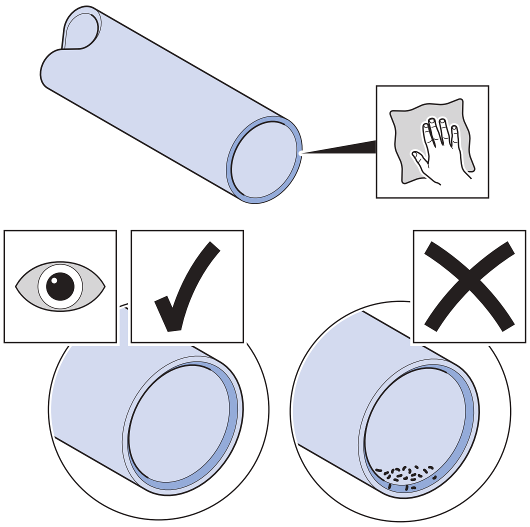


⚠ CAUTION

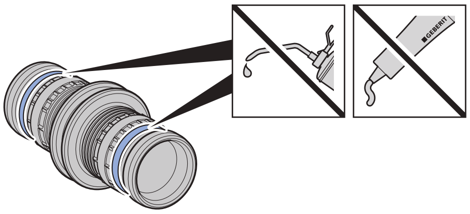
Leaking connection due to chips

► Remove chips from system pipe.

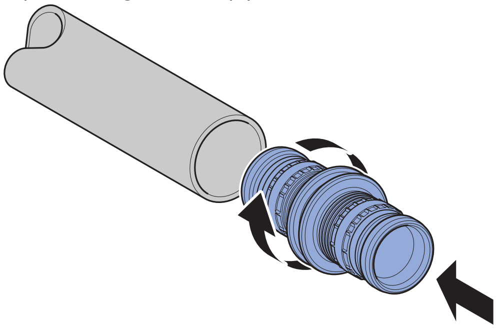
4 Clean the pipe ends.



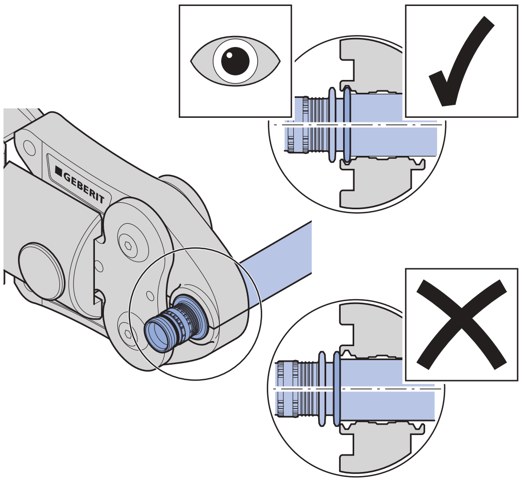
Pressfittings are lubricated at the factory. Never use any additional lubricant, as this could negatively affect the drinking water quality.



5 Clip the fitting onto the pipe.



6 Position the pressing jaw d16–50 mm on the positioning groove of the pressfitting and on the pipe and press.



Observe the operating instructions of the pressing tool and the user manual of the pressing attachments.

3.14.2 Pressing the pressed joint d16–26 using Geberit hand-operated pressing pliers

⚠ CAUTION

Leaking connection

Aligning the pipes after pressing can cause leaking connections.

► Align the pipes before pressing.

ATTENTION

Damage to the Geberit hand-operated pressing pliers due to the use of incorrect diameters

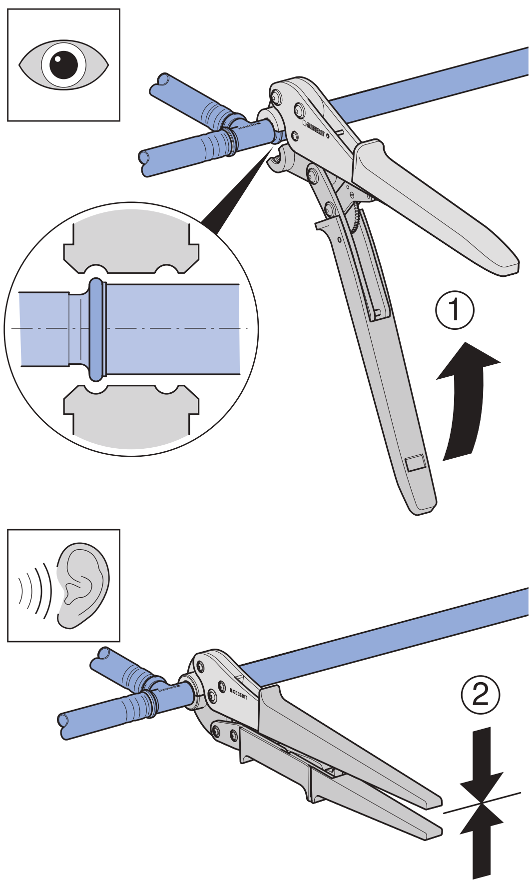
► The diameter of the hand-operated pressing pliers must match the diameter of the pressfitting.

✓ System pipes and pressfittings are tension-free.

✓ The pipe or prefabricated elements are aligned.

A permanent pressing operation is performed with the Geberit hand-operated pressing pliers. From a certain jaw position, the hand-operated pressing pliers can only be opened after the pressing operation has been completed.

► Position the hand-operated pressing pliers on the positioning groove of the pressfitting and on the pipe and push together.



⇨ The hand-operated pressing pliers automatically open after the pressing operation.

Observe the operating instructions of the Geberit hand-operated pressing pliers.

3.14.3 Pressing the pressed joint d63–75 using a Geberit pressing collar

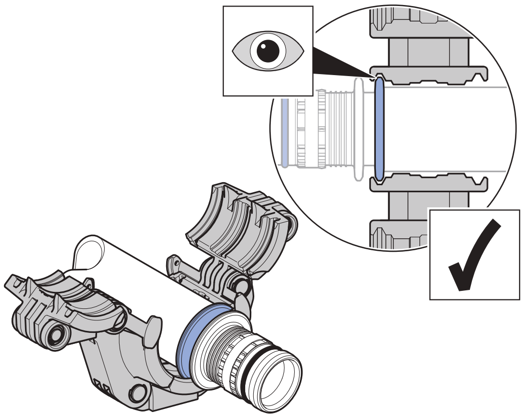
⚠ CAUTION

Leaking connection

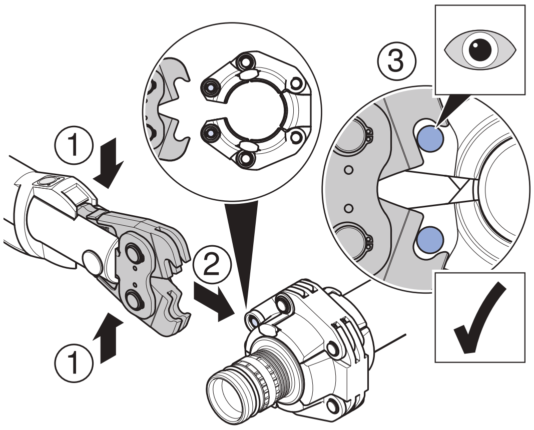
Aligning the pipes after pressing can cause leaking connections.

- ► Align the pipes before pressing.
- ✓ System pipes and pressfittings are tension-free.
- ✓ The pipe or prefabricated elements are aligned.

1 Position the pressing collar on the positioning groove of the pressfitting and on the pipe.



2 Connect the adapter jaw to the pressing collar and press.



Observe the operating instructions of the pressing tool and the user manual of the pressing attachments.

3.15 INITIAL COMMISSIONING FOLLOWING INSTALLATION

3.15.1 Pressure test

General pressure test

Unpressed and inadequately screwed connections can be identified by means of a pressure test before commissioning the system.

The contractor is obliged to carry out a pressure test before closing up the masonry slits, wall and ceiling openings, and (where applicable) before applying the screed or some other type of covering. The pressure test can be done on sections or on the complete system. A visual check must be carried out before the pressure test to check whether the system has been installed properly.

The pressure test consists of two steps in conditions similar to those during operation:

1. **leak test:** Checking the system for leaks. Unpressed and inadequately screwed connections can be identified in this way.
2. **load test:** Checking the system for the quality of the material and processing.

The commissioning of a system may only take place if the pressure test has been completed successfully. A successfully completed pressure test confirms to the customer that the pipe installation is leakproof and is to be documented with a test report.

Pressure test on drinking water installations

The pressure test checks the tightness of the pipe installation as well as the axial restraint of the connections. In principle, the local regulations and/or standards must always be taken into account during the pressure test.

When using hand-held pressure test pumps, for example, for the test version of the strength test with drinking water, it is important to ensure that the consumable used are hygienically perfect. One corresponding measure is the microfiltration of the test water before it is fed into the drinking water installation. The Geberit hygiene filter meets these requirements.

The performance of a pressure test is to be regarded as a binding component of the installation. The test must be documented, for example, using suitable protocol data.

Pressure test using drinking water

The following basic rules must be observed for the pressure test with drinking water:

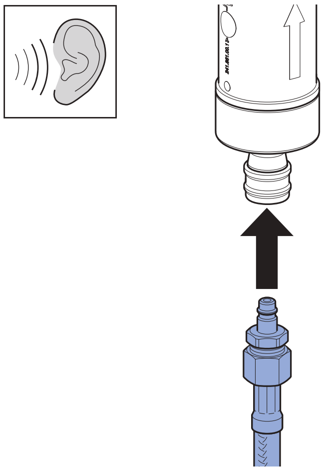
- The pressure test must be carried out directly before the commissioning for reasons of hygiene and chemical corrosion. If the commissioning is not carried out directly after the installation, the system must remain full and a water replacement of the entire drinking water installation must be carried out at regular intervals (at the latest after 7 days).
- Building heating must be provided for sub-zero ambient temperatures. Sub-zero temperatures do not warrant pressure testing with compressed air.
- Temperature compensation must be carried out so that the filling water can accommodate the ambient temperature. If the ambient temperature is higher than that of the filling water, the internal pressure rises due to the thermal expansion caused by the heating. Whereas, if the ambient temperature is lower than the temperature of the filling water, the internal pressure drops. A visual inspection must be carried out during the temperature compensation.
- The system must only be filled with hygienically perfect drinking water. If this is not possible, Geberit recommends using the Geberit hygiene filter.
- Pressure measuring or recording instruments must be installed at the lowest point of the drinking water installation.
- Pressure measuring instruments must be used for the pressure test, which clearly indicate changes in pressure of 0.1 bar.

Carrying out the pressure test with drinking water

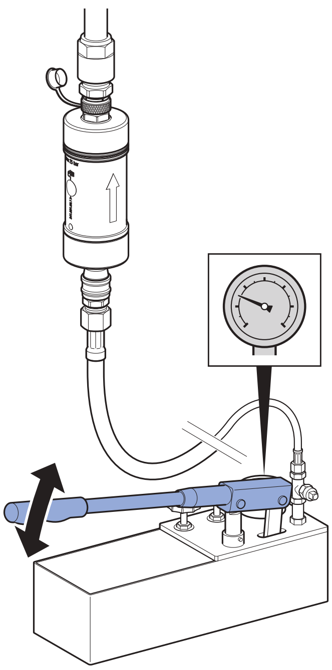
✓ The adapter (outlet threaded nipple) is mounted on the test pipe.
✓ The Geberit hygiene filter is connected to the test pipe.
✓ The pressure test pump receptacle is filled with drinking water.

1 Seal the pipe ends, sanitary appliance and tap connectors with pressure test plugs.

2 Connect the hose of the pressure test pump to the Geberit hygiene filter.



3 Connect the pressure test pump and pressure measuring instrument at the lowest point of the piping system to be tested through the Geberit hygiene filter.



4 Fill the piping system slowly with drinking water and ventilate.

5 Slowly build up the pressure to 3 bar and maintain for 60 minutes in order to compensate for the temperature.

6 Set the pressure to 3 bar and test for 30 minutes for the leak test.

⇨ The pressure must be at least 2.5 bar after 30 minutes. If the pressure is < 2.5 bar, there are leaks in the piping system.

7 Check the tightness and insertion depth of all connections if the pressure is < 2.5 bar. Fix leaks.

8 Repeat the leak test until no more leaks can be detected.

9 For the strength test of the piping system, relieve the pressure from the leak test, do not empty.

10 Slowly build up the pressure to at least 15 bar or 1.5 times the operating pressure and test for 30 minutes. A maximum pressure of 15 bar is admissible for pure plastic installations or mixed installations.

⇨ The pressure must be at least 12 bar after 30 minutes. If the pressure is < 12 bar, there are leaks in the piping system that must be inspected and fixed.

3.16 MAINTENANCE AND REPAIR

3.16.1 Maintaining Geberit pressing tools

The maintenance information are extracts from the operating instructions for the pressing tools. The complete operating instructions delivered with the device must always be taken into account when carrying out any work.

Cleaning and lubricating the Geberit pressing tool

ATTENTION

Damage to the device from moisture

► Never clean the pressing tool with water or other liquids.

⚠ WARNING

Risk of injury from switching on inadvertently

► Remove the rechargeable battery before starting any maintenance work on the pressing tool.

1 Disconnect the mains plug or remove the rechargeable battery.

2 Clean the roller drive, roller drive guide and retaining pin of the pressing tool.

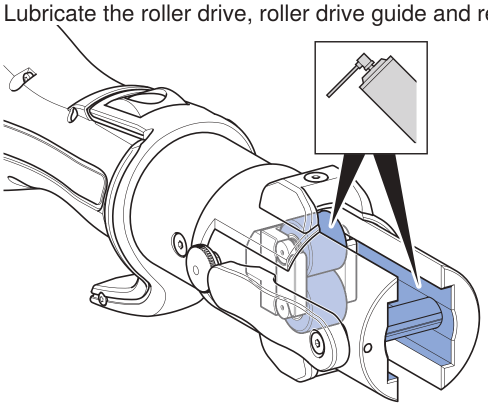
3 Use a brush to remove dirt.

⚠ CAUTION

Harmful substances

► Observe the safety notes of the lubricant used.

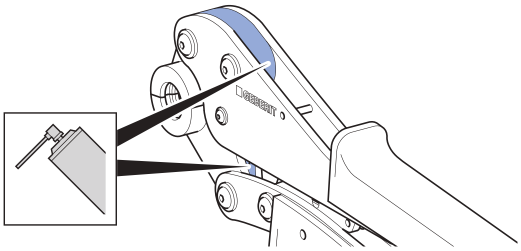
4 Lubricate the roller drive, roller drive guide and retaining pin with BRUNOX® Turbo-Spray®.



5 Wipe away excess lubricant using an absorbent cloth.

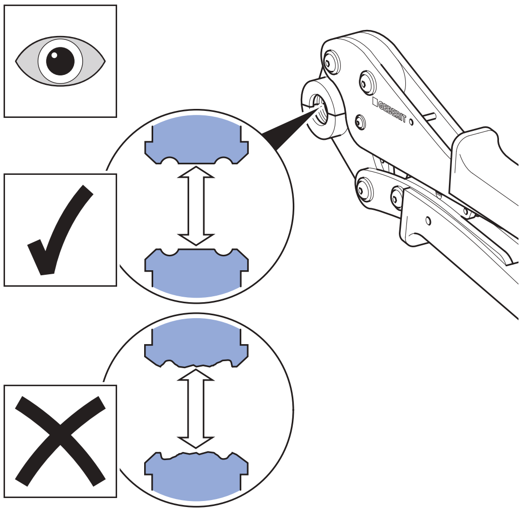
Cleaning and lubricating Geberit hand-operated pressing pliers

1 Lubricate marked positions with BRUNOX® Turbo-Spray®.



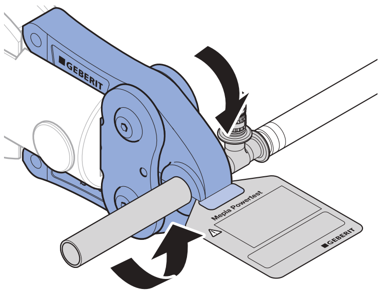
Do not use solvents or other liquids.

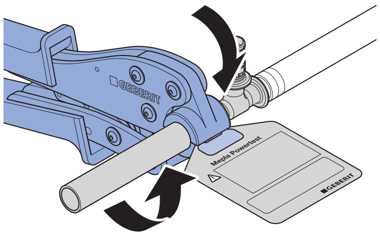
2 Check the pressing jaw contour for damage, cracks or other harm.

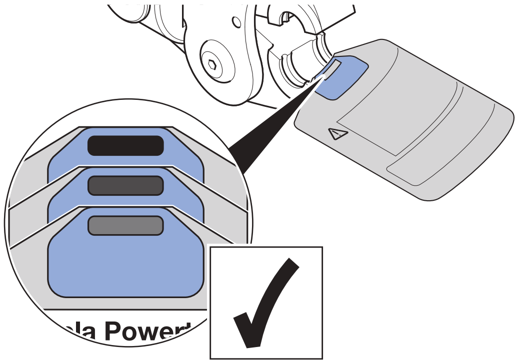


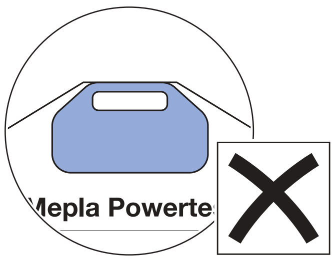
Geberit Mepla PowerTest for pressing attachments

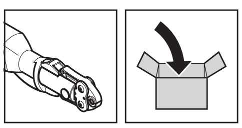
The Geberit Mepla PowerTest is used to determine damage and wear on the pressing jaws. The following figures explain how the test works.

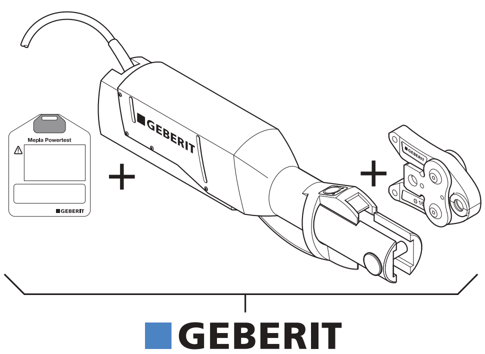


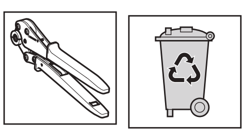


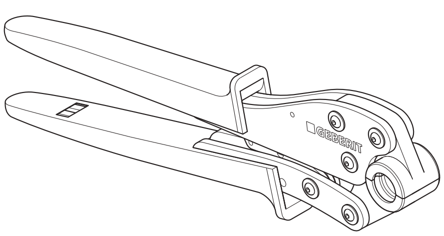












3.17 CALCULATION TABLES

3.17.1 Pressure loss for Geberit Mepla, drinking water

Pressure loss for Geberit Mepla system pipes ML, drinking water 10 °C

Medium:	water
Temperature:	10 °C
Density:	999.70 kg/m³
Viscosity:	0.00131 Pa•s
Surface roughness:	0.007 mm

The pressure loss values are shown in the diagram or in the Geberit pressure loss tables.

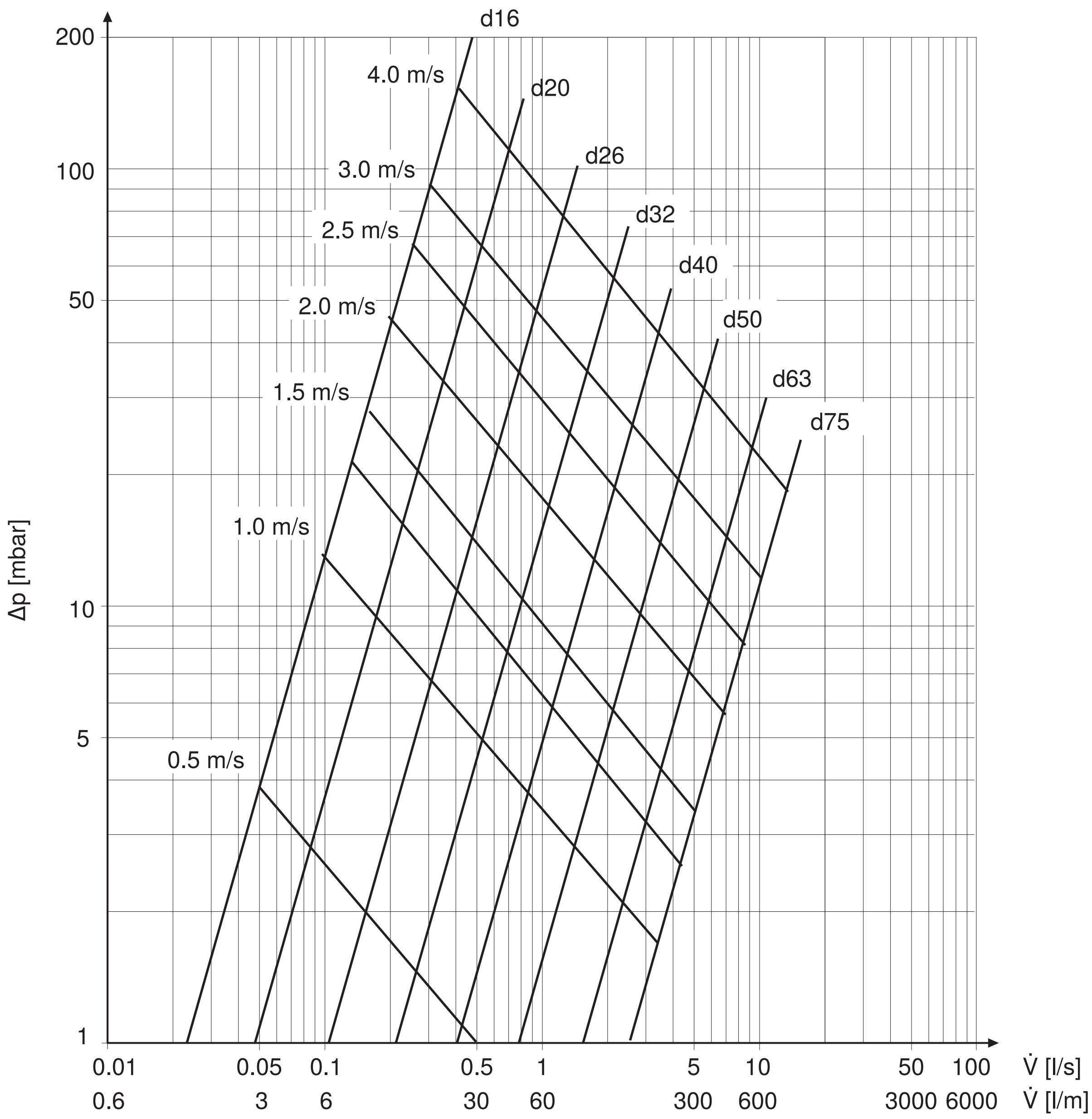


Table 33: Pressure loss for Geberit Mepla system pipes, drinking water 10 °C, d16–32

d [mm]	16		20		26		32	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
0.01	0.10	0.24	0.06	0.07	0.03	0.02	0.02	0.00
0.02	0.19	0.79	0.11	0.22	0.06	0.06	0.04	0.02
0.03	0.29	1.62	0.17	0.46	0.10	0.12	0.06	0.03
0.04	0.39	2.67	0.23	0.76	0.13	0.19	0.08	0.06
0.05	0.48	3.95	0.28	1.12	0.16	0.29	0.09	0.08
0.06	0.58	5.43	0.34	1.54	0.19	0.39	0.11	0.11
0.07	0.67	7.12	0.40	2.01	0.22	0.51	0.13	0.15
0.08	0.77	8.99	0.45	2.55	0.25	0.65	0.15	0.19
0.09	0.87	11.05	0.51	3.13	0.29	0.80	0.17	0.23
0.10	0.96	13.29	0.57	3.76	0.32	0.96	0.19	0.28
0.15	1.44	27.01	0.85	7.65	0.48	1.95	0.28	0.56
0.20	1.93	44.69	1.13	12.65	0.64	3.23	0.38	0.93
0.25	2.41	66.04	1.41	18.69	0.80	4.77	0.47	1.37
0.30	2.89	90.86	1.70	25.72	0.95	6.56	0.57	1.89
0.35	3.37	119.0	1.98	33.7	1.11	8.6	0.66	2.5
0.40	3.85	150.3	2.26	42.6	1.27	10.9	0.75	3.1
0.45	4.33	184.7	2.55	52.3	1.43	13.3	0.85	3.8
0.50	4.81	222.1	2.83	62.9	1.59	16.0	0.94	4.6
0.55	5.30	262.5	3.11	74.3	1.75	18.9	1.04	5.4
0.60	5.78	305.6	3.40	86.5	1.91	22.1	1.13	6.3
0.65	6.26	351.6	3.68	99.5	2.07	25.4	1.22	7.3
0.70	6.74	400.3	3.96	113.3	2.23	28.9	1.32	8.3
0.75	7.22	451.6	4.24	127.8	2.39	32.6	1.41	9.4
0.80	7.70	505.6	4.53	143.1	2.55	36.5	1.51	10.5
0.85	8.18	562.2	4.81	159.1	2.71	40.6	1.60	11.7
0.90	8.66	621.4	5.09	175.9	2.86	44.9	1.70	12.9
0.95	9.15	683.0	5.38	193.3	3.02	49.3	1.79	14.2
1.00	9.63	747.2	5.66	211.5	3.18	53.9	1.88	15.5
1.05	10.11	813.8	5.94	230.3	3.34	58.7	1.98	16.9
1.10	10.59	882.8	6.22	249.9	3.50	63.7	2.07	18.3
1.15	11.07	954.2	6.51	270.1	3.66	68.9	2.17	19.8
1.20	11.55	1028.0	6.79	291.0	3.82	74.2	2.26	21.3
1.25	12.03	1104.1	7.07	312.5	3.98	79.7	2.35	22.9
1.30	12.52	1182.56	7.36	334.74	4.14	85.36	2.45	24.55
1.35	13.00	1263.30	7.64	357.59	4.30	91.19	2.54	26.22
1.40	13.48	1346.32	7.92	381.09	4.46	97.18	2.64	27.95
1.45	13.96	1431.58	8.21	405.23	4.62	103.33	2.73	29.72
1.50	14.44	1519.09	8.49	430.00	4.77	109.65	2.83	31.53
1.55	14.92	1608.81	8.77	455.39	4.93	116.13	2.92	33.40
1.60	15.40	1700.72	9.05	481.41	5.09	122.76	3.01	35.30
1.65	15.89	1794.82	9.34	508.04	5.25	129.55	3.11	37.26
1.70	16.37	1891.07	9.62	535.29	5.41	136.50	3.20	39.26
1.75	16.85	1989.48	9.90	563.15	5.57	143.60	3.30	41.30
1.80	17.33	2090.02	10.19	591.60	5.73	150.86	3.39	43.39
1.85	17.81	2192.67	10.47	620.66	5.89	158.27	3.48	45.52
1.90	18.29	2297.43	10.75	650.31	6.05	165.83	3.58	47.69
1.95	18.77	2404.27	11.03	680.56	6.21	173.54	3.67	49.91
2.00	19.26	2513.19	11.32	711.39	6.37	181.40	3.77	52.17
2.05	19.74	2624.17	11.60	742.80	6.53	189.42	3.86	54.47

d [mm]	16		20		26		32	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
2.10	20.22	2737.20	11.88	774.80	6.68	197.57	3.96	56.82
2.15	20.70	2852.27	12.17	807.37	6.84	205.88	4.05	59.21
2.20	21.18	2969.36	12.45	840.51	7.00	214.33	4.14	61.64
2.25	21.66	3088.46	12.73	874.23	7.16	222.93	4.24	64.11
2.30	22.14	3209.57	13.02	908.51	7.32	231.67	4.33	66.63
2.35	22.62	3332.67	13.30	943.35	7.48	240.55	4.43	69.18
2.40	23.11	3457.74	13.58	978.75	7.64	249.58	4.52	71.78
2.45	23.59	3584.79	13.86	1014.72	7.80	258.75	4.61	74.41
2.50	24.07	3713.80	14.15	1051.23	7.96	268.07	4.71	77.09
2.55	24.55	3844.75	14.43	1088.30	8.12	277.52	4.80	79.81
2.60	25.03	3977.65	14.71	1125.92	8.28	287.11	4.90	82.57
2.65	25.51	4112.48	15.00	1164.08	8.44	296.84	4.99	85.37
2.70	25.99	4249.22	15.28	1202.79	8.59	306.71	5.09	88.21
2.75	26.48	4387.89	15.56	1242.04	8.75	316.72	5.18	91.08
2.80	26.96	4528.45	15.84	1281.83	8.91	326.87	5.27	94.00
2.85	27.44	4670.91	16.13	1322.16	9.07	337.15	5.37	96.96
2.90	27.92	4815.26	16.41	1363.02	9.23	347.57	5.46	99.96
2.95	28.40	4961.48	16.69	1404.41	9.39	358.12	5.56	102.99
3.00	28.88	5109.58	16.98	1446.33	9.55	368.81	5.65	106.07
3.05	29.36	5259.54	17.26	1488.77	9.71	379.64	5.74	109.18
3.10	29.85	5411.35	17.54	1531.75	9.87	390.60	5.84	112.33
3.15	30.33	5565.02	17.83	1575.24	10.03	401.69	5.93	115.52
3.20	30.81	5720.52	18.11	1619.26	10.19	412.91	6.03	118.75
3.25	31.29	5877.86	18.39	1663.80	10.35	424.27	6.12	122.01
3.30	31.77	6037.02	18.67	1708.85	10.50	435.76	6.22	125.32
3.35	32.25	6198.00	18.96	1754.42	10.66	447.38	6.31	128.66
3.40	32.73	6360.79	19.24	1800.50	10.82	459.13	6.40	132.04
3.45	33.21	6525.39	19.52	1847.09	10.98	471.01	6.50	135.46
3.50	33.70	6691.79	19.81	1894.19	11.14	483.02	6.59	138.91
3.55	34.18	6859.98	20.09	1941.80	11.30	495.16	6.69	142.40
3.60	34.66	7029.95	20.37	1989.91	11.46	507.43	6.78	145.93
3.65	35.14	7201.71	20.65	2038.53	11.62	519.83	6.87	149.50
3.70	35.62	7375.24	20.94	2087.65	11.78	532.35	6.97	153.10
3.75	36.10	7550.54	21.22	2137.27	11.94	545.00	7.06	156.74
3.80	36.58	7727.59	21.50	2187.39	12.10	557.78	7.16	160.41
3.85	37.07	7906.41	21.79	2238.00	12.25	570.69	7.25	164.12
3.90	37.55	8086.97	22.07	2289.11	12.41	583.73	7.35	167.87
3.95	38.03	8269.28	22.35	2340.72	12.57	596.88	7.44	171.66
4.00	38.51	8453.33	22.64	2392.82	12.73	610.17	7.53	175.48
4.05	38.99	8639.12	22.92	2445.40	12.89	623.58	7.63	179.33
4.10	39.47	8826.63	23.20	2498.48	13.05	637.11	7.72	183.23
4.15	39.95	9015.86	23.48	2552.05	13.21	650.77	7.82	187.15
4.20	40.44	9206.81	23.77	2606.10	13.37	664.56	7.91	191.12
4.25	40.92	9399.48	24.05	2660.63	13.53	678.46	8.00	195.12
4.30	41.40	9593.85	24.33	2715.65	13.69	692.49	8.10	199.15
4.35	41.88	9789.92	24.62	2771.15	13.85	706.65	8.19	203.22
4.40	42.36	9987.69	24.90	2827.13	14.01	720.92	8.29	207.33
4.45	42.84	10187.16	25.18	2883.60	14.16	735.32	8.38	211.47
4.50	43.32	10388.31	25.46	2940.53	14.32	749.84	8.48	215.64
4.55	43.81	10591.15	25.75	2997.95	14.48	764.48	8.57	219.85

d [mm]	16		20		26		32	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
4.60	44.29	10795.66	26.03	3055.84	14.64	779.24	8.66	224.10
4.65	44.77	11001.85	26.31	3114.20	14.80	794.12	8.76	228.38
4.70	45.25	11209.71	26.60	3173.04	14.96	809.13	8.85	232.69
4.75	45.73	11419.23	26.88	3232.35	15.12	824.25	8.95	237.04
4.80	46.21	11630.41	27.16	3292.13	15.28	839.49	9.04	241.43
4.85	46.69	11843.25	27.45	3352.37	15.44	854.86	9.13	245.85
4.90	47.17	12057.75	27.73	3413.09	15.60	870.34	9.23	250.30
4.95	47.66	12273.89	28.01	3474.27	15.76	885.94	9.32	254.78

As a rule, the values highlighted in blue do not occur in drinking water installations.

Table 34: Pressure loss for Geberit Mepla system pipes, drinking water 10 °C, d40–75

d [mm]	40		50		63		75	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.01	0.01	0.00	0.01	0.00	0.01	0.00
0.03	0.04	0.01	0.02	0.00	0.01	0.00	0.01	0.00
0.04	0.05	0.02	0.03	0.01	0.02	0.00	0.01	0.00
0.05	0.06	0.03	0.04	0.01	0.02	0.00	0.01	0.00
0.06	0.07	0.04	0.04	0.01	0.03	0.00	0.02	0.00
0.07	0.08	0.05	0.05	0.02	0.03	0.00	0.02	0.00
0.08	0.09	0.06	0.06	0.02	0.03	0.01	0.02	0.00
0.09	0.11	0.07	0.06	0.02	0.04	0.01	0.03	0.00
0.10	0.12	0.09	0.07	0.03	0.04	0.01	0.03	0.00
0.15	0.18	0.18	0.11	0.06	0.07	0.02	0.04	0.01
0.20	0.23	0.30	0.14	0.10	0.09	0.03	0.06	0.01
0.25	0.29	0.44	0.18	0.14	0.11	0.04	0.07	0.02
0.30	0.35	0.61	0.22	0.19	0.13	0.06	0.09	0.02
0.35	0.41	0.8	0.25	0.3	0.15	0.1	0.10	0.0
0.40	0.47	1.0	0.29	0.3	0.17	0.1	0.12	0.0
0.45	0.53	1.2	0.32	0.4	0.20	0.1	0.13	0.0
0.50	0.58	1.5	0.36	0.5	0.22	0.1	0.15	0.1
0.55	0.64	1.8	0.40	0.6	0.24	0.2	0.16	0.1
0.60	0.70	2.0	0.43	0.7	0.26	0.2	0.18	0.1
0.65	0.76	2.4	0.47	0.7	0.28	0.2	0.19	0.1
0.70	0.82	2.7	0.51	0.9	0.31	0.3	0.21	0.1
0.75	0.88	3.0	0.54	1.0	0.33	0.3	0.22	0.1
0.80	0.94	3.4	0.58	1.1	0.35	0.3	0.24	0.1
0.85	0.99	3.8	0.61	1.2	0.37	0.4	0.25	0.1
0.90	1.05	4.2	0.65	1.3	0.39	0.4	0.26	0.2
0.95	1.11	4.6	0.69	1.5	0.41	0.4	0.28	0.2
1.00	1.17	5.0	0.72	1.6	0.44	0.5	0.29	0.2
1.05	1.23	5.4	0.76	1.7	0.46	0.5	0.31	0.2
1.10	1.29	5.9	0.79	1.9	0.48	0.6	0.32	0.2
1.15	1.34	6.4	0.83	2.0	0.50	0.6	0.34	0.2
1.20	1.40	6.9	0.87	2.2	0.52	0.7	0.35	0.3
1.25	1.46	7.4	0.90	2.3	0.55	0.7	0.37	0.3
1.30	1.52	7.91	0.94	2.52	0.57	0.76	0.38	0.30
1.35	1.58	8.45	0.97	2.69	0.59	0.81	0.40	0.32

d [mm]	40		50		63		75	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
1.40	1.64	9.01	1.01	2.86	0.61	0.87	0.41	0.34
1.45	1.70	9.58	1.05	3.05	0.63	0.92	0.43	0.37
1.50	1.75	10.16	1.08	3.23	0.65	0.98	0.44	0.39
1.55	1.81	10.76	1.12	3.42	0.68	1.04	0.46	0.41
1.60	1.87	11.38	1.15	3.62	0.70	1.10	0.47	0.43
1.65	1.93	12.01	1.19	3.82	0.72	1.16	0.49	0.46
1.70	1.99	12.65	1.23	4.02	0.74	1.22	0.50	0.48
1.75	2.05	13.31	1.26	4.23	0.76	1.28	0.51	0.51
1.80	2.10	13.98	1.30	4.45	0.79	1.35	0.53	0.53
1.85	2.16	14.67	1.34	4.67	0.81	1.41	0.54	0.56
1.90	2.22	15.37	1.37	4.89	0.83	1.48	0.56	0.59
1.95	2.28	16.08	1.41	5.12	0.85	1.55	0.57	0.61
2.00	2.34	16.81	1.44	5.35	0.87	1.62	0.59	0.64
2.05	2.40	17.55	1.48	5.58	0.90	1.69	0.60	0.67
2.10	2.46	18.31	1.52	5.82	0.92	1.77	0.62	0.70
2.15	2.51	19.08	1.55	6.07	0.94	1.84	0.63	0.73
2.20	2.57	19.86	1.59	6.32	0.96	1.91	0.65	0.76
2.25	2.63	20.66	1.62	6.57	0.98	1.99	0.66	0.79
2.30	2.69	21.47	1.66	6.83	1.00	2.07	0.68	0.82
2.35	2.75	22.29	1.70	7.09	1.03	2.15	0.69	0.85
2.40	2.81	23.13	1.73	7.36	1.05	2.23	0.71	0.88
2.45	2.86	23.98	1.77	7.63	1.07	2.31	0.72	0.92
2.50	2.92	24.84	1.80	7.90	1.09	2.39	0.74	0.95
2.55	2.98	25.72	1.84	8.18	1.11	2.48	0.75	0.98
2.60	3.04	26.61	1.88	8.46	1.14	2.56	0.76	1.02
2.65	3.10	27.51	1.91	8.75	1.16	2.65	0.78	1.05
2.70	3.16	28.42	1.95	9.04	1.18	2.74	0.79	1.09
2.75	3.22	29.35	1.98	9.34	1.20	2.83	0.81	1.12
2.80	3.27	30.29	2.02	9.63	1.22	2.92	0.82	1.16
2.85	3.33	31.24	2.06	9.94	1.24	3.01	0.84	1.19
2.90	3.39	32.21	2.09	10.24	1.27	3.11	0.85	1.23
2.95	3.45	33.19	2.13	10.56	1.29	3.20	0.87	1.27
3.00	3.51	34.18	2.17	10.87	1.31	3.29	0.88	1.31
3.05	3.57	35.18	2.20	11.19	1.33	3.39	0.90	1.34
3.10	3.62	36.20	2.24	11.51	1.35	3.49	0.91	1.38
3.15	3.68	37.23	2.27	11.84	1.38	3.59	0.93	1.42
3.20	3.74	38.27	2.31	12.17	1.40	3.69	0.94	1.46
3.25	3.80	39.32	2.35	12.51	1.42	3.79	0.96	1.50
3.30	3.86	40.38	2.38	12.84	1.44	3.89	0.97	1.54
3.35	3.92	41.46	2.42	13.19	1.46	4.00	0.99	1.58
3.40	3.98	42.55	2.45	13.53	1.48	4.10	1.00	1.63
3.45	4.03	43.65	2.49	13.88	1.51	4.21	1.01	1.67
3.50	4.09	44.76	2.53	14.24	1.53	4.32	1.03	1.71
3.55	4.15	45.89	2.56	14.59	1.55	4.42	1.04	1.75
3.60	4.21	47.02	2.60	14.96	1.57	4.53	1.06	1.80
3.65	4.27	48.17	2.63	15.32	1.59	4.64	1.07	1.84
3.70	4.33	49.33	2.67	15.69	1.62	4.76	1.09	1.89
3.75	4.38	50.51	2.71	16.06	1.64	4.87	1.10	1.93
3.80	4.44	51.69	2.74	16.44	1.66	4.98	1.12	1.98
3.85	4.50	52.89	2.78	16.82	1.68	5.10	1.13	2.02

d [mm]	40		50		63		75	
$\dot{V}$ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
3.90	4.56	54.10	2.81	17.21	1.70	5.21	1.15	2.07
3.95	4.62	55.31	2.85	17.59	1.72	5.33	1.16	2.11
4.00	4.68	56.55	2.89	17.98	1.75	5.45	1.18	2.16
4.05	4.74	57.79	2.92	18.38	1.77	5.57	1.19	2.21
4.10	4.79	59.04	2.96	18.78	1.79	5.69	1.21	2.26
4.15	4.85	60.31	3.00	19.18	1.81	5.81	1.22	2.30
4.20	4.91	61.59	3.03	19.59	1.83	5.94	1.24	2.35
4.25	4.97	62.87	3.07	20.00	1.86	6.06	1.25	2.40
4.30	5.03	64.18	3.10	20.41	1.88	6.19	1.26	2.45
4.35	5.09	65.49	3.14	20.83	1.90	6.31	1.28	2.50
4.40	5.14	66.81	3.18	21.25	1.92	6.44	1.29	2.55
4.45	5.20	68.14	3.21	21.67	1.94	6.57	1.31	2.60
4.50	5.26	69.49	3.25	22.10	1.96	6.70	1.32	2.66
4.55	5.32	70.85	3.28	22.53	1.99	6.83	1.34	2.71
4.60	5.38	72.21	3.32	22.97	2.01	6.96	1.35	2.76
4.65	5.44	73.59	3.36	23.41	2.03	7.09	1.37	2.81
4.70	5.50	74.98	3.39	23.85	2.05	7.23	1.38	2.87
4.75	5.55	76.39	3.43	24.30	2.07	7.36	1.40	2.92
4.80	5.61	77.80	3.46	24.74	2.10	7.50	1.41	2.97
4.85	5.67	79.22	3.50	25.20	2.12	7.64	1.43	3.03
4.90	5.73	80.66	3.54	25.65	2.14	7.78	1.44	3.08
4.95	5.79	82.10	3.57	26.11	2.16	7.91	1.46	3.14
5.00	5.85	83.56	3.61	26.58	2.18	8.05	1.47	3.19
5.05	5.90	85.03	3.65	27.04	2.21	8.20	1.49	3.25
5.10	5.96	86.51	3.68	27.51	2.23	8.34	1.50	3.31
5.15	6.02	88.00	3.72	27.99	2.25	8.48	1.51	3.36
5.20	6.08	89.50	3.75	28.46	2.27	8.63	1.53	3.42
5.25	6.14	91.01	3.79	28.95	2.29	8.77	1.54	3.48
5.30	6.20	92.53	3.83	29.43	2.31	8.92	1.56	3.54
5.35	6.26	94.06	3.86	29.92	2.34	9.07	1.57	3.59
5.40	6.31	95.61	3.90	30.41	2.36	9.22	1.59	3.65
5.45	6.37	97.16	3.93	30.90	2.38	9.37	1.60	3.71
5.50	6.43	98.73	3.97	31.40	2.40	9.52	1.62	3.77
5.55	6.49	100.30	4.01	31.90	2.42	9.67	1.63	3.83
5.60	6.55	101.89	4.04	32.41	2.45	9.82	1.65	3.89
5.65	6.61	103.49	4.08	32.91	2.47	9.98	1.66	3.96
5.70	6.66	105.09	4.11	33.43	2.49	10.13	1.68	4.02
5.75	6.72	106.71	4.15	33.94	2.51	10.29	1.69	4.08
5.80	6.78	108.34	4.19	34.46	2.53	10.44	1.71	4.14
5.85	6.84	109.98	4.22	34.98	2.55	10.60	1.72	4.20
5.90	6.90	111.63	4.26	35.51	2.58	10.76	1.74	4.27
5.95	6.96	113.29	4.29	36.03	2.60	10.92	1.75	4.33
6.00	7.02	114.96	4.33	36.57	2.62	11.08	1.76	4.39
6.05	7.07	116.65	4.37	37.10	2.64	11.24	1.78	4.46
6.10	7.13	118.34	4.40	37.64	2.66	11.41	1.79	4.52
6.15	7.19	120.04	4.44	38.18	2.69	11.57	1.81	4.59
6.20	7.25	121.75	4.48	38.72	2.71	11.74	1.82	4.65
6.25	7.31	123.48	4.51	39.27	2.73	11.90	1.84	4.72
6.30	7.37	125.21	4.55	39.82	2.75	12.07	1.85	4.79
6.35	7.42	126.96	4.58	40.38	2.77	12.24	1.87	4.85

d [mm]	**40**		**50**		**63**		**75**	
V̇ [l/s]	**v [m/s]**	**Δp [mbar/m]**	**v [m/s]**	**Δp [mbar/m]**	**v [m/s]**	**Δp [mbar/m]**	**v [m/s]**	**Δp [mbar/m]**
6.40	7.48	128.71	4.62	40.94	2.79	12.41	1.88	4.92
6.45	7.54	130.47	4.66	41.50	2.82	12.58	1.90	4.99
6.50	7.60	132.25	4.69	42.06	2.84	12.75	1.91	5.05
6.55	7.66	134.04	4.73	42.63	2.86	12.92	1.93	5.12
6.60	7.72	135.83	4.76	43.20	2.88	13.09	1.94	5.19
6.65	7.78	137.64	4.80	43.78	2.90	13.27	1.96	5.26
6.70	7.83	139.45	4.84	44.35	2.93	13.44	1.97	5.33
6.75	7.89	141.28	4.87	44.94	2.95	13.62	1.99	5.40
6.80	7.95	143.12	4.91	45.52	2.97	13.80	2.00	5.47
6.85	8.01	144.96	4.94	46.11	2.99	13.97	2.01	5.54
6.90	8.07	146.82	4.98	46.70	3.01	14.15	2.03	5.61
6.95	8.13	148.69	5.02	47.29	3.03	14.33	2.04	5.68
7.00	8.18	150.56	5.05	47.89	3.06	14.51	2.06	5.75
7.05	8.24	152.45	5.09	48.49	3.08	14.70	2.07	5.83
7.10	8.30	154.35	5.12	49.09	3.10	14.88	2.09	5.90
7.15	8.36	156.25	5.16	49.70	3.12	15.06	2.10	5.97
7.20	8.42	158.17	5.20	50.31	3.14	15.25	2.12	6.05
7.25	8.48	160.10	5.23	50.92	3.17	15.43	2.13	6.12
7.30	8.54	162.04	5.27	51.54	3.19	15.62	2.15	6.19
7.35	8.59	163.98	5.31	52.16	3.21	15.81	2.16	6.27
7.40	8.65	165.94	5.34	52.78	3.23	16.00	2.18	6.34
7.45	8.71	167.91	5.38	53.40	3.25	16.19	2.19	6.42
7.50	8.77	169.88	5.41	54.03	3.27	16.38	2.21	6.49
7.55	8.83	171.87	5.45	54.67	3.30	16.57	2.22	6.57
7.60	8.89	173.87	5.49	55.30	3.32	16.76	2.23	6.65
7.65	8.94	175.87	5.52	55.94	3.34	16.95	2.25	6.72
7.70	9.00	177.89	5.56	56.58	3.36	17.15	2.26	6.80
7.75	9.06	179.92	5.59	57.22	3.38	17.34	2.28	6.88
7.80	9.12	181.95	5.63	57.87	3.41	17.54	2.29	6.95
7.85	9.18	184.00	5.67	58.52	3.43	17.74	2.31	7.03
7.90	9.24	186.06	5.70	59.18	3.45	17.94	2.32	7.11
7.95	9.29	188.12	5.74	59.83	3.47	18.13	2.34	7.19
8.00	9.35	190.20	5.77	60.49	3.49	18.33	2.35	7.27
8.05	9.41	192.28	5.81	61.16	3.51	18.54	2.37	7.35
8.10	9.47	194.38	5.85	61.82	3.54	18.74	2.38	7.43
8.15	9.53	196.48	5.88	62.49	3.56	18.94	2.40	7.51
8.20	9.59	198.60	5.92	63.17	3.58	19.14	2.41	7.59
8.25	9.65	200.72	5.95	63.84	3.60	19.35	2.43	7.67
8.30	9.70	202.85	5.99	64.52	3.62	19.55	2.44	7.75
8.35	9.76	205.00	6.03	65.20	3.65	19.76	2.46	7.83
8.40	9.82	207.15	6.06	65.89	3.67	19.97	2.47	7.92
8.45	9.88	209.31	6.10	66.57	3.69	20.18	2.48	8.00
8.50	9.94	211.49	6.14	67.26	3.71	20.39	2.50	8.08
8.55	10.00	213.67	6.17	67.96	3.73	20.60	2.51	8.17
8.60	10.05	215.86	6.21	68.66	3.76	20.81	2.53	8.25
8.65	10.11	218.06	6.24	69.36	3.78	21.02	2.54	8.33
8.70	10.17	220.27	6.28	70.06	3.80	21.23	2.56	8.42
8.75	10.23	222.49	6.32	70.76	3.82	21.45	2.57	8.50
8.80	10.29	224.72	6.35	71.47	3.84	21.66	2.59	8.59
8.85	10.35	226.96	6.39	72.19	3.86	21.88	2.60	8.67

d [mm]	40		50		63		75	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
8.90	10.41	229.21	6.42	72.90	3.89	22.10	2.62	8.76
8.95	10.46	231.47	6.46	73.62	3.91	22.31	2.63	8.85
9.00	10.52	233.73	6.50	74.34	3.93	22.53	2.65	8.93
9.05	10.58	236.01	6.53	75.07	3.95	22.75	2.66	9.02
9.10	10.64	238.30	6.57	75.79	3.97	22.97	2.68	9.11
9.15	10.70	240.59	6.60	76.52	4.00	23.19	2.69	9.20
9.20	10.76	242.90	6.64	77.26	4.02	23.42	2.71	9.28
9.25	10.81	245.21	6.68	77.99	4.04	23.64	2.72	9.37
9.30	10.87	247.54	6.71	78.73	4.06	23.86	2.73	9.46
9.35	10.93	249.87	6.75	79.47	4.08	24.09	2.75	9.55
9.40	10.99	252.21	6.78	80.22	4.10	24.31	2.76	9.64
9.45	11.05	254.57	6.82	80.97	4.13	24.54	2.78	9.73
9.50	11.11	256.93	6.86	81.72	4.15	24.77	2.79	9.82
9.55	11.17	259.30	6.89	82.47	4.17	25.00	2.81	9.91
9.60	11.22	261.68	6.93	83.23	4.19	25.23	2.82	10.00
9.65	11.28	264.07	6.97	83.99	4.21	25.46	2.84	10.09
9.70	11.34	266.47	7.00	84.75	4.24	25.69	2.85	10.18
9.75	11.40	268.88	7.04	85.52	4.26	25.92	2.87	10.28
9.80	11.46	271.30	7.07	86.29	4.28	26.15	2.88	10.37
9.85	11.52	273.72	7.11	87.06	4.30	26.39	2.90	10.46
9.90	11.57	276.16	7.15	87.83	4.32	26.62	2.91	10.55
9.95	11.63	278.60	7.18	88.61	4.34	26.86	2.93	10.65
10.00	11.69	281.06	7.22	89.39	4.37	27.09	2.94	10.74
10.05	11.75	283.52	7.25	90.18	4.39	27.33	2.96	10.84
10.10	11.81	286.00	7.29	90.96	4.41	27.57	2.97	10.93
10.15	11.87	288.48	7.33	91.75	4.43	27.81	2.98	11.03
10.20	11.93	290.97	7.36	92.55	4.45	28.05	3.00	11.12
10.25	11.98	293.47	7.40	93.34	4.48	28.29	3.01	11.22
10.30	12.04	295.98	7.43	94.14	4.50	28.53	3.03	11.31
10.35	12.10	298.50	7.47	94.94	4.52	28.77	3.04	11.41
10.40	12.16	301.03	7.51	95.74	4.54	29.02	3.06	11.50
10.45	12.22	303.56	7.54	96.55	4.56	29.26	3.07	11.60
10.50	12.28	306.11	7.58	97.36	4.58	29.51	3.09	11.70
10.55	12.33	308.67	7.61	98.17	4.61	29.75	3.10	11.80
10.60	12.39	311.23	7.65	98.99	4.63	30.00	3.12	11.89
10.65	12.45	313.80	7.69	99.81	4.65	30.25	3.13	11.99
10.70	12.51	316.39	7.72	100.63	4.67	30.50	3.15	12.09
10.75	12.57	318.98	7.76	101.45	4.69	30.75	3.16	12.19
10.80	12.63	321.58	7.80	102.28	4.72	31.00	3.18	12.29
10.85	12.69	324.19	7.83	103.11	4.74	31.25	3.19	12.39
10.90	12.74	326.81	7.87	103.94	4.76	31.50	3.21	12.49
10.95	12.80	329.44	7.90	104.78	4.78	31.76	3.22	12.59
11.00	12.86	332.07	7.94	105.62	4.80	32.01	3.23	12.69

As a rule, the values highlighted in blue do not occur in drinking water installations.

Pressure loss for Geberit Mepla system pipes ML, drinking water 65°C

Medium:	water
Temperature:	65°C
Density:	980 kg/m^3
Viscosity:	0.00043 Pa•s
Surface roughness:	0.007 mm

The pressure loss values are shown in the diagram or in the Geberit pressure loss tables.

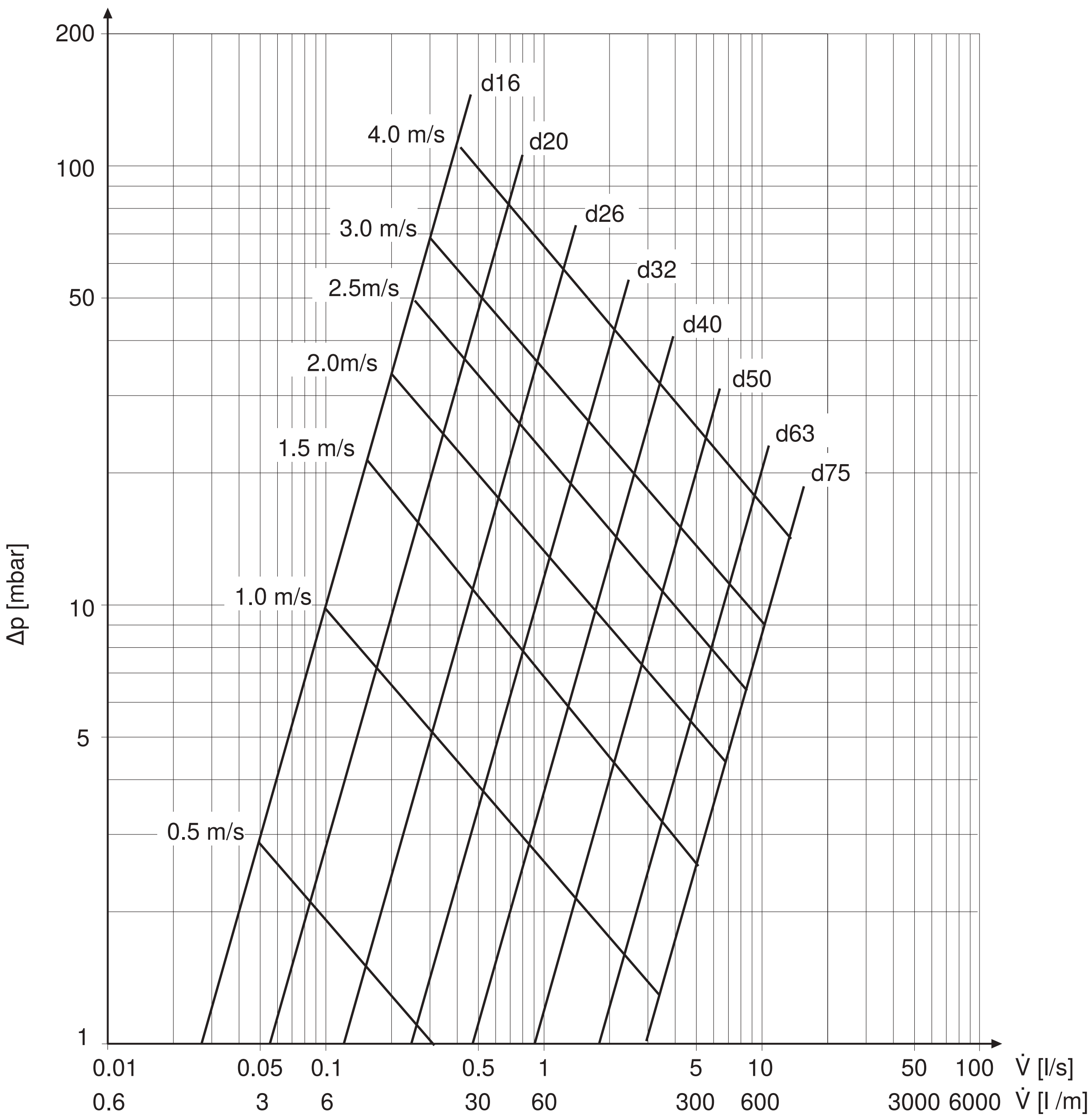


Table 35: Pressure loss for Geberit Mepla system pipes, drinking water 65 °C, d16–32

d [mm]	16		20		26		32	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
0.01	0.10	0.18	0.06	0.05	0.03	0.01	0.02	0.00
0.02	0.19	0.59	0.11	0.17	0.06	0.04	0.04	0.01
0.03	0.29	1.21	0.17	0.34	0.10	0.09	0.06	0.03
0.04	0.39	2.00	0.23	0.57	0.13	0.14	0.08	0.04
0.05	0.48	2.96	0.28	0.84	0.16	0.21	0.09	0.06
0.06	0.58	4.07	0.34	1.15	0.19	0.29	0.11	0.08
0.07	0.67	5.33	0.40	1.51	0.22	0.38	0.13	0.11
0.08	0.77	6.73	0.45	1.90	0.25	0.49	0.15	0.14
0.09	0.87	8.27	0.51	2.34	0.29	0.60	0.17	0.17
0.10	0.96	9.94	0.57	2.81	0.32	0.72	0.19	0.21
0.15	1.44	20.22	0.85	5.72	0.48	1.46	0.28	0.42
0.20	1.93	33.45	1.13	9.47	0.64	2.41	0.38	0.69
0.25	2.41	49.43	1.41	13.99	0.80	3.57	0.47	1.03
0.30	2.89	68.00	1.70	19.25	0.95	4.91	0.57	1.41
0.35	3.37	89.1	1.98	25.2	1.11	6.4	0.66	1.8
0.40	3.85	112.5	2.26	31.8	1.27	8.1	0.75	2.3
0.45	4.33	138.3	2.55	39.1	1.43	10.0	0.85	2.9
0.50	4.81	166.3	2.83	47.1	1.59	12.0	0.94	3.5
0.55	5.30	196.4	3.11	55.6	1.75	14.2	1.04	4.1
0.60	5.78	228.7	3.40	64.7	1.91	16.5	1.13	4.7
0.65	6.26	263.1	3.68	74.5	2.07	19.0	1.22	5.5
0.70	6.74	299.6	3.96	84.8	2.23	21.6	1.32	6.2
0.75	7.22	338.0	4.24	95.7	2.39	24.4	1.41	7.0
0.80	7.70	378.4	4.53	107.1	2.55	27.3	1.51	7.9
0.85	8.18	420.8	4.81	119.1	2.71	30.4	1.60	8.7
0.90	8.66	465.0	5.09	131.6	2.86	33.6	1.70	9.7
0.95	9.15	511.2	5.38	144.7	3.02	36.9	1.79	10.6
1.00	9.63	559.2	5.66	158.3	3.18	40.4	1.88	11.6
1.05	10.11	609.1	5.94	172.4	3.34	44.0	1.98	12.6
1.10	10.59	660.7	6.22	187.0	3.50	47.7	2.07	13.7
1.15	11.07	714.2	6.51	202.2	3.66	51.5	2.17	14.8
1.20	11.55	769.4	6.79	217.8	3.82	55.5	2.26	16.0
1.25	12.03	826.4	7.07	233.9	3.98	59.6	2.35	17.2
1.30	12.52	885.06	7.36	250.53	4.14	63.88	2.45	18.37
1.35	13.00	945.49	7.64	267.63	4.30	68.25	2.54	19.63
1.40	13.48	1007.62	7.92	285.22	4.46	72.73	2.64	20.92
1.45	13.96	1071.44	8.21	303.28	4.62	77.34	2.73	22.24
1.50	14.44	1136.93	8.49	321.82	4.77	82.06	2.83	23.60
1.55	14.92	1204.07	8.77	340.83	4.93	86.91	2.92	24.99
1.60	15.40	1272.87	9.05	360.30	5.09	91.88	3.01	26.42
1.65	15.89	1343.29	9.34	380.23	5.25	96.96	3.11	27.88
1.70	16.37	1415.33	9.62	400.63	5.41	102.16	3.20	29.38
1.75	16.85	1488.98	9.90	421.47	5.57	107.48	3.30	30.91
1.80	17.33	1564.23	10.19	442.77	5.73	112.91	3.39	32.47
1.85	17.81	1641.06	10.47	464.52	5.89	118.45	3.48	34.07
1.90	18.29	1719.46	10.75	486.71	6.05	124.11	3.58	35.69
1.95	18.77	1799.42	11.03	509.35	6.21	129.88	3.67	37.35
2.00	19.26	1880.94	11.32	532.42	6.37	135.77	3.77	39.05
2.05	19.74	1964.00	11.60	555.93	6.53	141.76	3.86	40.77

d [mm]	**16**		**20**		**26**		**32**	
$\dot{V}$ [l/s]	**v [m/s]**	**Δp [mbar/m]**	**v [m/s]**	**Δp [mbar/m]**	**v [m/s]**	**Δp [mbar/m]**	**v [m/s]**	**Δp [mbar/m]**
2.10	20.22	2048.60	11.88	579.88	6.68	147.87	3.96	42.53
2.15	20.70	2134.72	12.17	604.26	6.84	154.09	4.05	44.31
2.20	21.18	2222.35	12.45	629.06	7.00	160.41	4.14	46.13
2.25	21.66	2311.49	12.73	654.29	7.16	166.85	4.24	47.98
2.30	22.14	2402.13	13.02	679.95	7.32	173.39	4.33	49.86
2.35	22.62	2494.26	13.30	706.03	7.48	180.04	4.43	51.78
2.40	23.11	2587.87	13.58	732.53	7.64	186.79	4.52	53.72
2.45	23.59	2682.96	13.86	759.44	7.80	193.66	4.61	55.69
2.50	24.07	2779.51	14.15	786.77	7.96	200.63	4.71	57.70
2.55	24.55	2877.52	14.43	814.52	8.12	207.70	4.80	59.73
2.60	25.03	2976.98	14.71	842.67	8.28	214.88	4.90	61.80
2.65	25.51	3077.89	15.00	871.23	8.44	222.16	4.99	63.89
2.70	25.99	3180.24	15.28	900.20	8.59	229.55	5.09	66.02
2.75	26.48	3284.01	15.56	929.58	8.75	237.04	5.18	68.17
2.80	26.96	3389.22	15.84	959.36	8.91	244.64	5.27	70.35
2.85	27.44	3495.84	16.13	989.54	9.07	252.33	5.37	72.57
2.90	27.92	3603.87	16.41	1020.12	9.23	260.13	5.46	74.81
2.95	28.40	3713.31	16.69	1051.10	9.39	268.03	5.56	77.08
3.00	28.88	3824.15	16.98	1082.47	9.55	276.03	5.65	79.38
3.05	29.36	3936.38	17.26	1114.24	9.71	284.13	5.74	81.71
3.10	29.85	4050.01	17.54	1146.40	9.87	292.33	5.84	84.07
3.15	30.33	4165.01	17.83	1178.96	10.03	300.63	5.93	86.46
3.20	30.81	4281.40	18.11	1211.90	10.19	309.03	6.03	88.87
3.25	31.29	4399.15	18.39	1245.23	10.35	317.53	6.12	91.32
3.30	31.77	4518.27	18.67	1278.95	10.50	326.13	6.22	93.79
3.35	32.25	4638.75	18.96	1313.05	10.66	334.83	6.31	96.29
3.40	32.73	4760.59	19.24	1347.54	10.82	343.62	6.40	98.82
3.45	33.21	4883.78	19.52	1382.41	10.98	352.52	6.50	101.38
3.50	33.70	5008.32	19.81	1417.66	11.14	361.50	6.59	103.96
3.55	34.18	5134.20	20.09	1453.29	11.30	370.59	6.69	106.58
3.60	34.66	5261.41	20.37	1489.30	11.46	379.77	6.78	109.22
3.65	35.14	5389.96	20.65	1525.69	11.62	389.05	6.87	111.89
3.70	35.62	5519.83	20.94	1562.45	11.78	398.43	6.97	114.58
3.75	36.10	5651.03	21.22	1599.59	11.94	407.90	7.06	117.31
3.80	36.58	5783.55	21.50	1637.10	12.10	417.46	7.16	120.06
3.85	37.07	5917.38	21.79	1674.98	12.25	427.12	7.25	122.83
3.90	37.55	6052.52	22.07	1713.24	12.41	436.88	7.35	125.64
3.95	38.03	6188.96	22.35	1751.86	12.57	446.72	7.44	128.47
4.00	38.51	6326.71	22.64	1790.85	12.73	456.67	7.53	131.33
4.05	38.99	6465.75	22.92	1830.21	12.89	466.70	7.63	134.22
4.10	39.47	6606.09	23.20	1869.93	13.05	476.83	7.72	137.13
4.15	39.95	6747.72	23.48	1910.02	13.21	487.06	7.82	140.07
4.20	40.44	6890.63	23.77	1950.47	13.37	497.37	7.91	143.04
4.25	40.92	7034.83	24.05	1991.29	13.53	507.78	8.00	146.03
4.30	41.40	7180.30	24.33	2032.47	13.69	518.28	8.10	149.05
4.35	41.88	7327.05	24.62	2074.01	13.85	528.87	8.19	152.10
4.40	42.36	7475.07	24.90	2115.91	14.01	539.56	8.29	155.17
4.45	42.84	7624.35	25.18	2158.16	14.16	550.33	8.38	158.27
4.50	43.32	7774.90	25.46	2200.78	14.32	561.20	8.48	161.39
4.55	43.81	7926.71	25.75	2243.75	14.48	572.16	8.57	164.54

d [mm]	16		20		26		32	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
4.60	44.29	8079.77	26.03	2287.07	14.64	583.21	8.66	167.72
4.65	44.77	8234.09	26.31	2330.76	14.80	594.34	8.76	170.93
4.70	45.25	8389.65	26.60	2374.79	14.96	605.57	8.85	174.15
4.75	45.73	8546.47	26.88	2419.18	15.12	616.89	8.95	177.41
4.80	46.21	8704.52	27.16	2463.92	15.28	628.30	9.04	180.69
4.85	46.69	8863.82	27.45	2509.01	15.44	639.80	9.13	184.00
4.90	47.17	9024.35	27.73	2554.45	15.60	651.39	9.23	187.33
4.95	47.66	9186.12	28.01	2600.24	15.76	663.06	9.32	190.69

As a rule, the values highlighted in blue do not occur in drinking water installations.

Table 36: Pressure loss for Geberit Mepla system pipes, drinking water 65 °C, d40–75

d [mm]	40		50		63		75	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.00
0.03	0.04	0.01	0.02	0.00	0.01	0.00	0.01	0.00
0.04	0.05	0.01	0.03	0.00	0.02	0.00	0.01	0.00
0.05	0.06	0.02	0.04	0.01	0.02	0.00	0.01	0.00
0.06	0.07	0.03	0.04	0.01	0.03	0.00	0.02	0.00
0.07	0.08	0.04	0.05	0.01	0.03	0.00	0.02	0.00
0.08	0.09	0.05	0.06	0.01	0.03	0.00	0.02	0.00
0.09	0.11	0.06	0.06	0.02	0.04	0.01	0.03	0.00
0.10	0.12	0.07	0.07	0.02	0.04	0.01	0.03	0.00
0.15	0.18	0.14	0.11	0.04	0.07	0.01	0.04	0.01
0.20	0.23	0.22	0.14	0.07	0.09	0.02	0.06	0.01
0.25	0.29	0.33	0.18	0.11	0.11	0.03	0.07	0.01
0.30	0.35	0.45	0.22	0.14	0.13	0.04	0.09	0.02
0.35	0.41	0.6	0.25	0.2	0.15	0.1	0.10	0.0
0.40	0.47	0.8	0.29	0.2	0.17	0.1	0.12	0.0
0.45	0.53	0.9	0.32	0.3	0.20	0.1	0.13	0.0
0.50	0.58	1.1	0.36	0.4	0.22	0.1	0.15	0.0
0.55	0.64	1.3	0.40	0.4	0.24	0.1	0.16	0.1
0.60	0.70	1.5	0.43	0.5	0.26	0.1	0.18	0.1
0.65	0.76	1.8	0.47	0.6	0.28	0.2	0.19	0.1
0.70	0.82	2.0	0.51	0.6	0.31	0.2	0.21	0.1
0.75	0.88	2.3	0.54	0.7	0.33	0.2	0.22	0.1
0.80	0.94	2.5	0.58	0.8	0.35	0.2	0.24	0.1
0.85	0.99	2.8	0.61	0.9	0.37	0.3	0.25	0.1
0.90	1.05	3.1	0.65	1.0	0.39	0.3	0.26	0.1
0.95	1.11	3.4	0.69	1.1	0.41	0.3	0.28	0.1
1.00	1.17	3.7	0.72	1.2	0.44	0.4	0.29	0.2
1.05	1.23	4.1	0.76	1.3	0.46	0.4	0.31	0.2
1.10	1.29	4.4	0.79	1.4	0.48	0.4	0.32	0.2
1.15	1.34	4.8	0.83	1.5	0.50	0.5	0.34	0.2
1.20	1.40	5.1	0.87	1.6	0.52	0.5	0.35	0.2
1.25	1.46	5.5	0.90	1.8	0.55	0.5	0.37	0.2
1.30	1.52	5.92	0.94	1.88	0.57	0.57	0.38	0.24
1.35	1.58	6.32	0.97	2.01	0.59	0.61	0.40	0.26

d [mm]	40		50		63		75	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
1.40	1.64	6.74	1.01	2.14	0.61	0.65	0.41	0.28
1.45	1.70	7.17	1.05	2.28	0.63	0.69	0.43	0.29
1.50	1.75	7.61	1.08	2.42	0.65	0.73	0.44	0.31
1.55	1.81	8.05	1.12	2.56	0.68	0.78	0.46	0.33
1.60	1.87	8.51	1.15	2.71	0.70	0.82	0.47	0.35
1.65	1.93	8.99	1.19	2.86	0.72	0.87	0.49	0.37
1.70	1.99	9.47	1.23	3.01	0.74	0.91	0.50	0.39
1.75	2.05	9.96	1.26	3.17	0.76	0.96	0.51	0.41
1.80	2.10	10.46	1.30	3.33	0.79	1.01	0.53	0.43
1.85	2.16	10.98	1.34	3.49	0.81	1.06	0.54	0.45
1.90	2.22	11.50	1.37	3.66	0.83	1.11	0.56	0.47
1.95	2.28	12.04	1.41	3.83	0.85	1.16	0.57	0.49
2.00	2.34	12.58	1.44	4.00	0.87	1.21	0.59	0.51
2.05	2.40	13.14	1.48	4.18	0.90	1.27	0.60	0.54
2.10	2.46	13.70	1.52	4.36	0.92	1.32	0.62	0.56
2.15	2.51	14.28	1.55	4.54	0.94	1.38	0.63	0.58
2.20	2.57	14.87	1.59	4.73	0.96	1.43	0.65	0.61
2.25	2.63	15.46	1.62	4.92	0.98	1.49	0.66	0.63
2.30	2.69	16.07	1.66	5.11	1.00	1.55	0.68	0.66
2.35	2.75	16.68	1.70	5.31	1.03	1.61	0.69	0.68
2.40	2.81	17.31	1.73	5.51	1.05	1.67	0.71	0.71
2.45	2.86	17.95	1.77	5.71	1.07	1.73	0.72	0.73
2.50	2.92	18.59	1.80	5.91	1.09	1.79	0.74	0.76
2.55	2.98	19.25	1.84	6.12	1.11	1.86	0.75	0.79
2.60	3.04	19.91	1.88	6.33	1.14	1.92	0.76	0.81
2.65	3.10	20.59	1.91	6.55	1.16	1.98	0.78	0.84
2.70	3.16	21.27	1.95	6.77	1.18	2.05	0.79	0.87
2.75	3.22	21.97	1.98	6.99	1.20	2.12	0.81	0.90
2.80	3.27	22.67	2.02	7.21	1.22	2.19	0.82	0.93
2.85	3.33	23.38	2.06	7.44	1.24	2.25	0.84	0.96
2.90	3.39	24.11	2.09	7.67	1.27	2.32	0.85	0.98
2.95	3.45	24.84	2.13	7.90	1.29	2.39	0.87	1.01
3.00	3.51	25.58	2.17	8.14	1.31	2.47	0.88	1.05
3.05	3.57	26.33	2.20	8.37	1.33	2.54	0.90	1.08
3.10	3.62	27.09	2.24	8.62	1.35	2.61	0.91	1.11
3.15	3.68	27.86	2.27	8.86	1.38	2.69	0.93	1.14
3.20	3.74	28.64	2.31	9.11	1.40	2.76	0.94	1.17
3.25	3.80	29.43	2.35	9.36	1.42	2.84	0.96	1.20
3.30	3.86	30.22	2.38	9.61	1.44	2.91	0.97	1.23
3.35	3.92	31.03	2.42	9.87	1.46	2.99	0.99	1.27
3.40	3.98	31.84	2.45	10.13	1.48	3.07	1.00	1.30
3.45	4.03	32.67	2.49	10.39	1.51	3.15	1.01	1.33
3.50	4.09	33.50	2.53	10.66	1.53	3.23	1.03	1.37
3.55	4.15	34.34	2.56	10.92	1.55	3.31	1.04	1.40
3.60	4.21	35.19	2.60	11.19	1.57	3.39	1.06	1.44
3.65	4.27	36.05	2.63	11.47	1.59	3.48	1.07	1.47
3.70	4.33	36.92	2.67	11.74	1.62	3.56	1.09	1.51
3.75	4.38	37.80	2.71	12.02	1.64	3.64	1.10	1.54
3.80	4.44	38.69	2.74	12.30	1.66	3.73	1.12	1.58
3.85	4.50	39.58	2.78	12.59	1.68	3.82	1.13	1.62

d [mm]	40		50		63		75	
$\dot{V}$ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
3.90	4.56	40.49	2.81	12.88	1.70	3.90	1.15	1.65
3.95	4.62	41.40	2.85	13.17	1.72	3.99	1.16	1.69
4.00	4.68	42.32	2.89	13.46	1.75	4.08	1.18	1.73
4.05	4.74	43.25	2.92	13.76	1.77	4.17	1.19	1.77
4.10	4.79	44.19	2.96	14.05	1.79	4.26	1.21	1.81
4.15	4.85	45.14	3.00	14.36	1.81	4.35	1.22	1.84
4.20	4.91	46.09	3.03	14.66	1.83	4.44	1.24	1.88
4.25	4.97	47.06	3.07	14.97	1.86	4.54	1.25	1.92
4.30	5.03	48.03	3.10	15.28	1.88	4.63	1.26	1.96
4.35	5.09	49.01	3.14	15.59	1.90	4.72	1.28	2.00
4.40	5.14	50.00	3.18	15.90	1.92	4.82	1.29	2.04
4.45	5.20	51.00	3.21	16.22	1.94	4.92	1.31	2.08
4.50	5.26	52.01	3.25	16.54	1.96	5.01	1.32	2.12
4.55	5.32	53.02	3.28	16.86	1.99	5.11	1.34	2.17
4.60	5.38	54.05	3.32	17.19	2.01	5.21	1.35	2.21
4.65	5.44	55.08	3.36	17.52	2.03	5.31	1.37	2.25
4.70	5.50	56.12	3.39	17.85	2.05	5.41	1.38	2.29
4.75	5.55	57.17	3.43	18.18	2.07	5.51	1.40	2.34
4.80	5.61	58.23	3.46	18.52	2.10	5.61	1.41	2.38
4.85	5.67	59.29	3.50	18.86	2.12	5.72	1.43	2.42
4.90	5.73	60.37	3.54	19.20	2.14	5.82	1.44	2.47
4.95	5.79	61.45	3.57	19.54	2.16	5.92	1.46	2.51
5.00	5.85	62.54	3.61	19.89	2.18	6.03	1.47	2.55
5.05	5.90	63.64	3.65	20.24	2.21	6.13	1.49	2.60
5.10	5.96	64.74	3.68	20.59	2.23	6.24	1.50	2.64
5.15	6.02	65.86	3.72	20.95	2.25	6.35	1.51	2.69
5.20	6.08	66.98	3.75	21.30	2.27	6.46	1.53	2.74
5.25	6.14	68.11	3.79	21.66	2.29	6.57	1.54	2.78
5.30	6.20	69.25	3.83	22.03	2.31	6.68	1.56	2.83
5.35	6.26	70.40	3.86	22.39	2.34	6.79	1.57	2.88
5.40	6.31	71.55	3.90	22.76	2.36	6.90	1.59	2.92
5.45	6.37	72.72	3.93	23.13	2.38	7.01	1.60	2.97
5.50	6.43	73.89	3.97	23.50	2.40	7.12	1.62	3.02
5.55	6.49	75.07	4.01	23.88	2.42	7.24	1.63	3.07
5.60	6.55	76.26	4.04	24.25	2.45	7.35	1.65	3.12
5.65	6.61	77.45	4.08	24.63	2.47	7.47	1.66	3.16
5.70	6.66	78.66	4.11	25.02	2.49	7.58	1.68	3.21
5.75	6.72	79.87	4.15	25.40	2.51	7.70	1.69	3.26
5.80	6.78	81.09	4.19	25.79	2.53	7.82	1.71	3.31
5.85	6.84	82.31	4.22	26.18	2.55	7.93	1.72	3.36
5.90	6.90	83.55	4.26	26.57	2.58	8.05	1.74	3.41
5.95	6.96	84.79	4.29	26.97	2.60	8.17	1.75	3.46
6.00	7.02	86.04	4.33	27.37	2.62	8.29	1.76	3.52
6.05	7.07	87.30	4.37	27.77	2.64	8.42	1.78	3.57
6.10	7.13	88.57	4.40	28.17	2.66	8.54	1.79	3.62
6.15	7.19	89.84	4.44	28.57	2.69	8.66	1.81	3.67
6.20	7.25	91.12	4.48	28.98	2.71	8.78	1.82	3.72
6.25	7.31	92.41	4.51	29.39	2.73	8.91	1.84	3.78
6.30	7.37	93.71	4.55	29.81	2.75	9.03	1.85	3.83
6.35	7.42	95.02	4.58	30.22	2.77	9.16	1.87	3.88

d [mm]	40		50		63		75	
$\dot{V}$ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
6.40	7.48	96.33	4.62	30.64	2.79	9.29	1.88	3.94
6.45	7.54	97.65	4.66	31.06	2.82	9.41	1.90	3.99
6.50	7.60	98.98	4.69	31.48	2.84	9.54	1.91	4.04
6.55	7.66	100.32	4.73	31.91	2.86	9.67	1.93	4.10
6.60	7.72	101.66	4.76	32.33	2.88	9.80	1.94	4.15
6.65	7.78	103.01	4.80	32.76	2.90	9.93	1.96	4.21
6.70	7.83	104.37	4.84	33.20	2.93	10.06	1.97	4.26
6.75	7.89	105.74	4.87	33.63	2.95	10.19	1.99	4.32
6.80	7.95	107.11	4.91	34.07	2.97	10.33	2.00	4.38
6.85	8.01	108.49	4.94	34.51	2.99	10.46	2.01	4.43
6.90	8.07	109.88	4.98	34.95	3.01	10.59	2.03	4.49
6.95	8.13	111.28	5.02	35.39	3.03	10.73	2.04	4.55
7.00	8.18	112.69	5.05	35.84	3.06	10.86	2.06	4.60
7.05	8.24	114.10	5.09	36.29	3.08	11.00	2.07	4.66
7.10	8.30	115.52	5.12	36.74	3.10	11.14	2.09	4.72
7.15	8.36	116.95	5.16	37.20	3.12	11.27	2.10	4.78
7.20	8.42	118.38	5.20	37.65	3.14	11.41	2.12	4.84
7.25	8.48	119.82	5.23	38.11	3.17	11.55	2.13	4.90
7.30	8.54	121.27	5.27	38.57	3.19	11.69	2.15	4.95
7.35	8.59	122.73	5.31	39.04	3.21	11.83	2.16	5.01
7.40	8.65	124.19	5.34	39.50	3.23	11.97	2.18	5.07
7.45	8.71	125.67	5.38	39.97	3.25	12.11	2.19	5.13
7.50	8.77	127.15	5.41	40.44	3.27	12.26	2.21	5.19
7.55	8.83	128.63	5.45	40.91	3.30	12.40	2.22	5.26
7.60	8.89	130.13	5.49	41.39	3.32	12.54	2.23	5.32
7.65	8.94	131.63	5.52	41.87	3.34	12.69	2.25	5.38
7.70	9.00	133.14	5.56	42.35	3.36	12.83	2.26	5.44
7.75	9.06	134.66	5.59	42.83	3.38	12.98	2.28	5.50
7.80	9.12	136.18	5.63	43.31	3.41	13.13	2.29	5.56
7.85	9.18	137.71	5.67	43.80	3.43	13.28	2.31	5.63
7.90	9.24	139.25	5.70	44.29	3.45	13.42	2.32	5.69
7.95	9.29	140.80	5.74	44.78	3.47	13.57	2.34	5.75
8.00	9.35	142.35	5.77	45.28	3.49	13.72	2.35	5.82
8.05	9.41	143.91	5.81	45.77	3.51	13.87	2.37	5.88
8.10	9.47	145.48	5.85	46.27	3.54	14.02	2.38	5.94
8.15	9.53	147.05	5.88	46.77	3.56	14.18	2.40	6.01
8.20	9.59	148.63	5.92	47.27	3.58	14.33	2.41	6.07
8.25	9.65	150.22	5.95	47.78	3.60	14.48	2.43	6.14
8.30	9.70	151.82	5.99	48.29	3.62	14.64	2.44	6.20
8.35	9.76	153.43	6.03	48.80	3.65	14.79	2.46	6.27
8.40	9.82	155.04	6.06	49.31	3.67	14.95	2.47	6.33
8.45	9.88	156.66	6.10	49.83	3.69	15.10	2.48	6.40
8.50	9.94	158.28	6.14	50.34	3.71	15.26	2.50	6.47
8.55	10.00	159.91	6.17	50.86	3.73	15.42	2.51	6.53
8.60	10.05	161.55	6.21	51.38	3.76	15.57	2.53	6.60
8.65	10.11	163.20	6.24	51.91	3.78	15.73	2.54	6.67
8.70	10.17	164.86	6.28	52.43	3.80	15.89	2.56	6.73
8.75	10.23	166.52	6.32	52.96	3.82	16.05	2.57	6.80
8.80	10.29	168.19	6.35	53.49	3.84	16.21	2.59	6.87
8.85	10.35	169.86	6.39	54.03	3.86	16.37	2.60	6.94

d [mm]	40		50		63		75	
V̇ [l/s]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]	v [m/s]	Δp [mbar/m]
8.90	10.41	171.55	6.42	54.56	3.89	16.54	2.62	7.01
8.95	10.46	173.24	6.46	55.10	3.91	16.70	2.63	7.08
9.00	10.52	174.93	6.50	55.64	3.93	16.86	2.65	7.15
9.05	10.58	176.64	6.53	56.18	3.95	17.03	2.66	7.22
9.10	10.64	178.35	6.57	56.73	3.97	17.19	2.68	7.29
9.15	10.70	180.07	6.60	57.27	4.00	17.36	2.69	7.36
9.20	10.76	181.79	6.64	57.82	4.02	17.52	2.71	7.43
9.25	10.81	183.52	6.68	58.37	4.04	17.69	2.72	7.50
9.30	10.87	185.26	6.71	58.92	4.06	17.86	2.73	7.57
9.35	10.93	187.01	6.75	59.48	4.08	18.03	2.75	7.64
9.40	10.99	188.76	6.78	60.04	4.10	18.20	2.76	7.71
9.45	11.05	190.53	6.82	60.60	4.13	18.37	2.78	7.78
9.50	11.11	192.29	6.86	61.16	4.15	18.54	2.79	7.86
9.55	11.17	194.07	6.89	61.72	4.17	18.71	2.81	7.93
9.60	11.22	195.85	6.93	62.29	4.19	18.88	2.82	8.00
9.65	11.28	197.64	6.97	62.86	4.21	19.05	2.84	8.07
9.70	11.34	199.43	7.00	63.43	4.24	19.23	2.85	8.15
9.75	11.40	201.24	7.04	64.00	4.26	19.40	2.87	8.22
9.80	11.46	203.04	7.07	64.58	4.28	19.57	2.88	8.29
9.85	11.52	204.86	7.11	65.16	4.30	19.75	2.90	8.37
9.90	11.57	206.68	7.15	65.74	4.32	19.92	2.91	8.44
9.95	11.63	208.51	7.18	66.32	4.34	20.10	2.93	8.52
10.00	11.69	210.35	7.22	66.90	4.37	20.28	2.94	8.59
10.05	11.75	212.20	7.25	67.49	4.39	20.46	2.96	8.67
10.10	11.81	214.05	7.29	68.08	4.41	20.63	2.97	8.74
10.15	11.87	215.90	7.33	68.67	4.43	20.81	2.98	8.82
10.20	11.93	217.77	7.36	69.26	4.45	20.99	3.00	8.90
10.25	11.98	219.64	7.40	69.86	4.48	21.17	3.01	8.97
10.30	12.04	221.52	7.43	70.46	4.50	21.35	3.03	9.05
10.35	12.10	223.40	7.47	71.06	4.52	21.54	3.04	9.13
10.40	12.16	225.30	7.51	71.66	4.54	21.72	3.06	9.20
10.45	12.22	227.20	7.54	72.26	4.56	21.90	3.07	9.28
10.50	12.28	229.10	7.58	72.87	4.58	22.09	3.09	9.36
10.55	12.33	231.01	7.61	73.48	4.61	22.27	3.10	9.44
10.60	12.39	232.93	7.65	74.09	4.63	22.45	3.12	9.52
10.65	12.45	234.86	7.69	74.70	4.65	22.64	3.13	9.59
10.70	12.51	236.79	7.72	75.31	4.67	22.83	3.15	9.67
10.75	12.57	238.73	7.76	75.93	4.69	23.01	3.16	9.75
10.80	12.63	240.68	7.80	76.55	4.72	23.20	3.18	9.83
10.85	12.69	242.63	7.83	77.17	4.74	23.39	3.19	9.91
10.90	12.74	244.59	7.87	77.79	4.76	23.58	3.21	9.99
10.95	12.80	246.56	7.90	78.42	4.78	23.77	3.22	10.07
11.00	12.86	248.53	7.94	79.05	4.80	23.96	3.23	10.15

As a rule, the values highlighted in blue do not occur in drinking water installations.

Pressure loss diagram with a Unico® water meter

The European Measurement Instruments Directive (MID) stipulates the following definitions of flow rates within the framework of the conformity assessment procedure for water meters:

Short description and definition according to the European Measurement Instruments Directive 2014/32/EU		**Short description before 2006**
Q_1	The lowest flow rate at which the water meter provides indications that satisfy the requirements concerning the error limits.	Q_{min}
Q_2	The transitional flow rate is the flow rate value, which lies between the continuous flow rate and the minimum flow rate and divides the flow rate area into two zones, the upper and lower load area, for which different error limits apply in each case.	Q_t
Q_3	The largest flow rate at which the water meter works satisfactorily under normal conditions, i.e. under steady or changing flow conditions.	Q_n
Q_4	The overload flow rate is the largest flow rate at which the counter works satisfactorily for a short period of time without adverse effects.	Q_{max}

The Unico® water meter achieves the following flow rates under the operating conditions described in the directive:

Q_1 [l/s]	**Q_2 [l/s]**	**Q_3 [m³/s]**	**Q_4 [m³/s]**
25	40	2.5	3.125

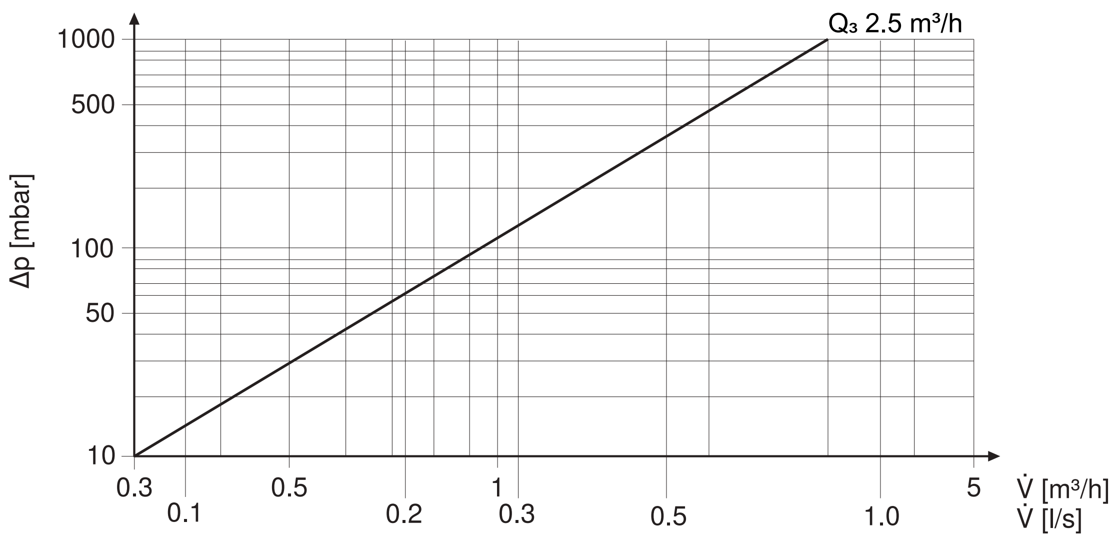
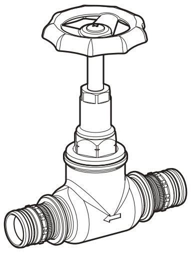


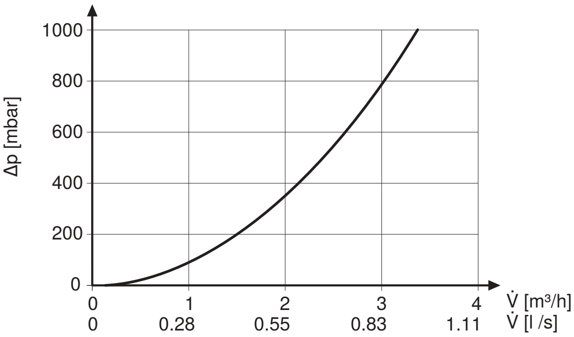
Figure 50: Pressure loss diagram with a Unico® water meter

Pressure loss diagrams for Geberit pipe valve fittings

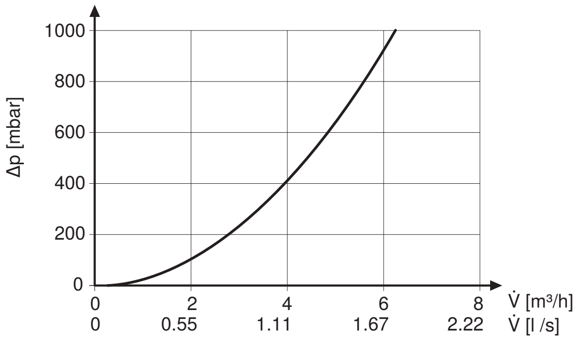
Geberit straight seat valves with Mepla pressing connections



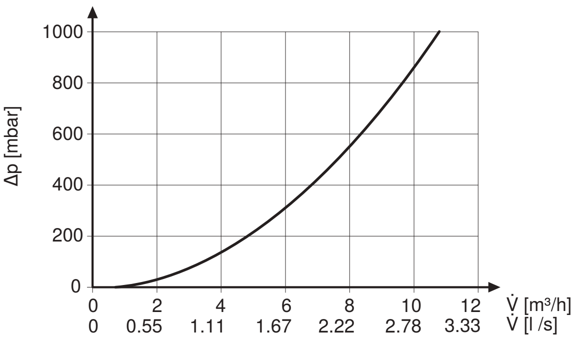
DN 15/d20



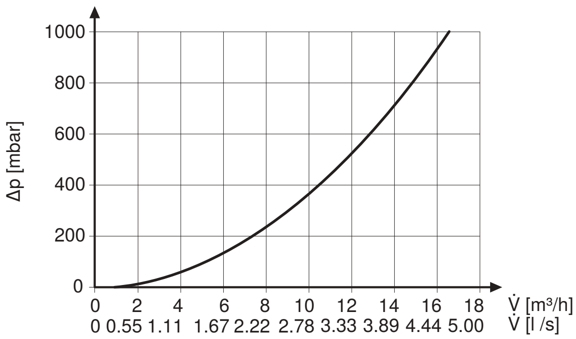
DN 20/d26



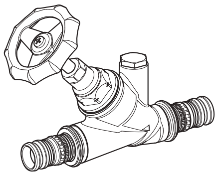
DN 25/d32



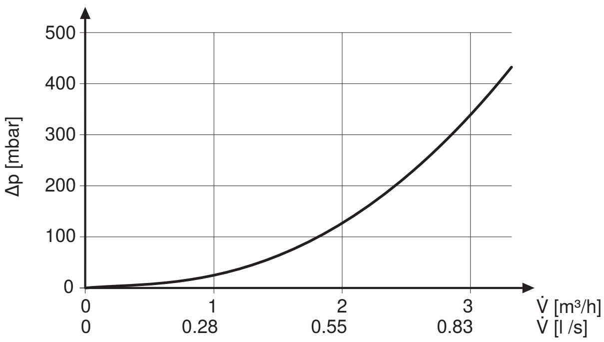
DN 32/d40



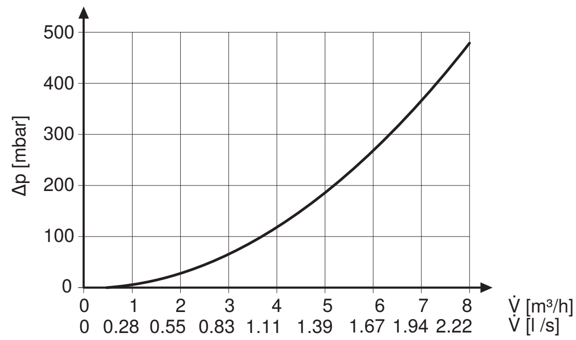
Geberit angle-seat valves with Mepla pressing connections



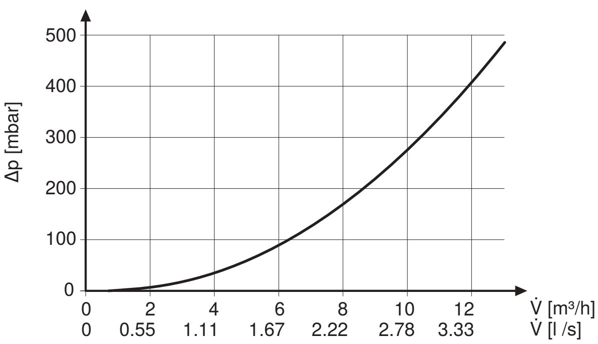
DN 15/d20



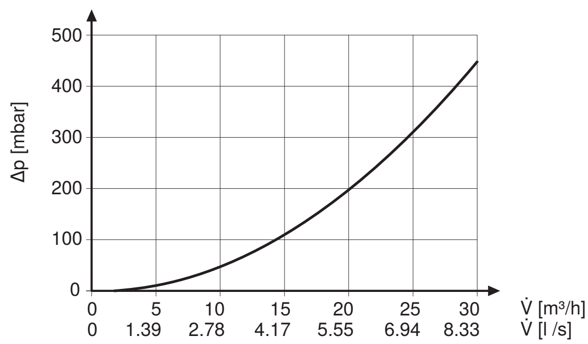
DN 20/d26



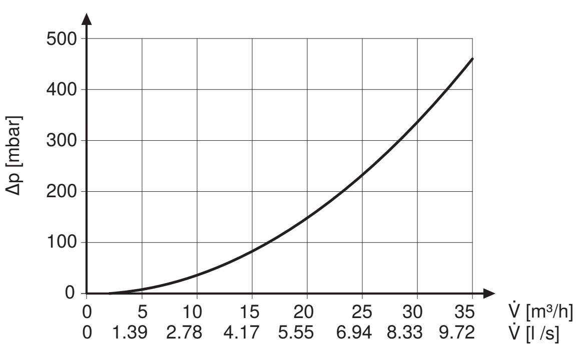
DN 25/d32



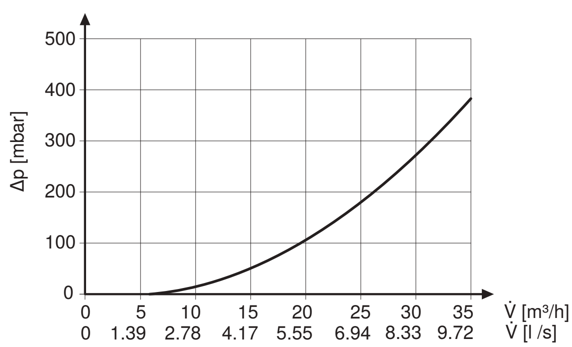
DN 32/d40



DN 40/d50



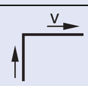
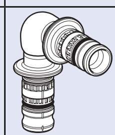
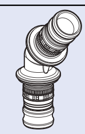
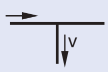
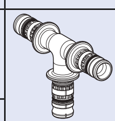
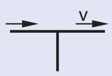
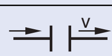
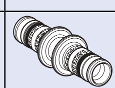
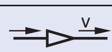
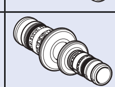
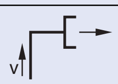
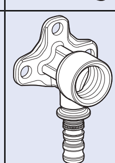
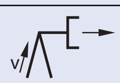
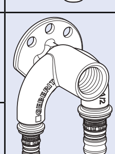
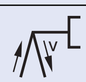
DN 50/d63



Pressure loss coefficients for individual resistances

The pressure loss coefficients were determined based on SVGW (SN EN 1267) and DVGW (W 575) specifications.

Table 37: Pressure loss coeffcient ζ (zeta value) for Geberit Mepla

			d [mm]							
			16	20	26	32	40	50	63	75
Bended pipe section			0,23	0,19	0,17	0,15	0,14	0,14	– [1]	– [1]
Elbow 90° (W90)			15	9.9	7	4.7	4.3	4	4.1	5.3
Elbow 45° (W45)			–	–	2.9	1.9	1.6	1.3	1.9	2.2
T-piece[2] Branch fitting (TA)			15	9	7	4.7	4.3	4	4.1	5.3
T-piece[2] Through-flow (TD)			4.8	2.6	1.4	1	0.9	0.6	0.9	1.1
Coupling (K)			4.1	2.3	1.3	0.8	0.6	0.5	0.7	0.9
Reducer (RED)			20/16 2.8	26/20 1.8	32/26 1.3	40/32 0.8	50/40 0.6	63/50 0.4	75/63 0.6	–
Elbow tap connector 90° 1/2″ (WS)			6.7	3.2	–	–	–	–	–	–
Elbow tap connector 90° 3/4″ (WS)			–	4.0	2.8	–	–	–	–	–
Double elbow tap connector 90° 1/2″ Branch fitting (WSA)			7.9	5	–	–	–	–	–	–
Double elbow tap connector 90° 1/2″ Through-flow (WSD)			10.7	5.5	–	–	–	–	–	–

v The symbol v marks the reference cross-section.

→ The arrow marks the cross-sections flowed through during the measurement.

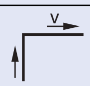
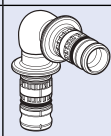
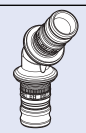
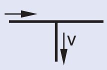
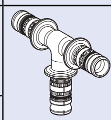
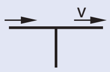
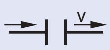
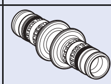
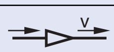
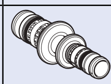
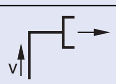
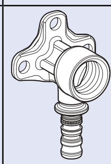
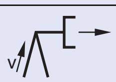
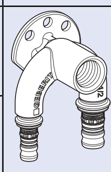
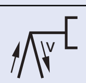
1) Geberit Mepla system pipes d63 and d75mm must not be bent. Use Geberit Mepla 90° and 45° elbows for changes in direction.

2) In the case of reduced T-pieces, the resistance value of the equal T-piece is set to the smallest dimension of the reduced T-piece for the flow path to be calculated.

Equivalent pipe length, individual resistances

The equivalent pipe lengths were determined based on SVGW (SN EN 1267) and DVGW (W 575) specifications.

Table 38: Equivalent pipe length in metres for Geberit Mepla system pipes, bent, fittings and valves

			d [mm]							
			16	**20**	**26**	**32**	**40**	**50**	**63**	**75**
Bended pipe section			0,1	0,1	0,1	0,2	0,3	0,3	– [1)]	– [1)]
Elbow 90°(W90)			6.5	5.5	6.1	5.7	6.9	8.7	12.1	19.6
Elbow 45° (W45)			–	–	2.5	2.3	2.6	2.8	5.6	8.1
T-piece Branch fitting (TA)			6.5	5.5	6.1	5.7	6.9	8.7	12.1	19.6
T-piece Through-flow (TD)			2.1	1.6	1.2	1.2	1.5	1.3	2.6	4.1
Coupling (K)			1.8	1.4	1.1	1	1	1.1	2.1	3.3
Reducer (RED)			20/16 1.2	26/20 1.1	32/26 1.1	40/32 1.0	50/40 1.0	63/50 0.9	75/63 1.8	–
Elbow tap connector 90° 1/2″ (WS)			2.9	1.9	–	–	–	–	–	–
Elbow tap connector 90° 3/4″ (WS)			–	2.4	2.4	–	–	–	–	–
Double elbow tap connector 90° 1/2″ Branch fitting (WSA)			3.4	3.0	–	–	–	–	–	–
Double elbow tap connector 90° 1/2″ Through-flow (WSD)			4.7	2.4	–	–	–	–	–	–

1) Geberit Mepla system pipes d63 and d75 must not be bent. Use Geberit Mepla 90° and 45° elbows for changes in direction.

v The symbol v marks the reference cross-section.

The arrow marks the cross-sections flowed through during the measurement.

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