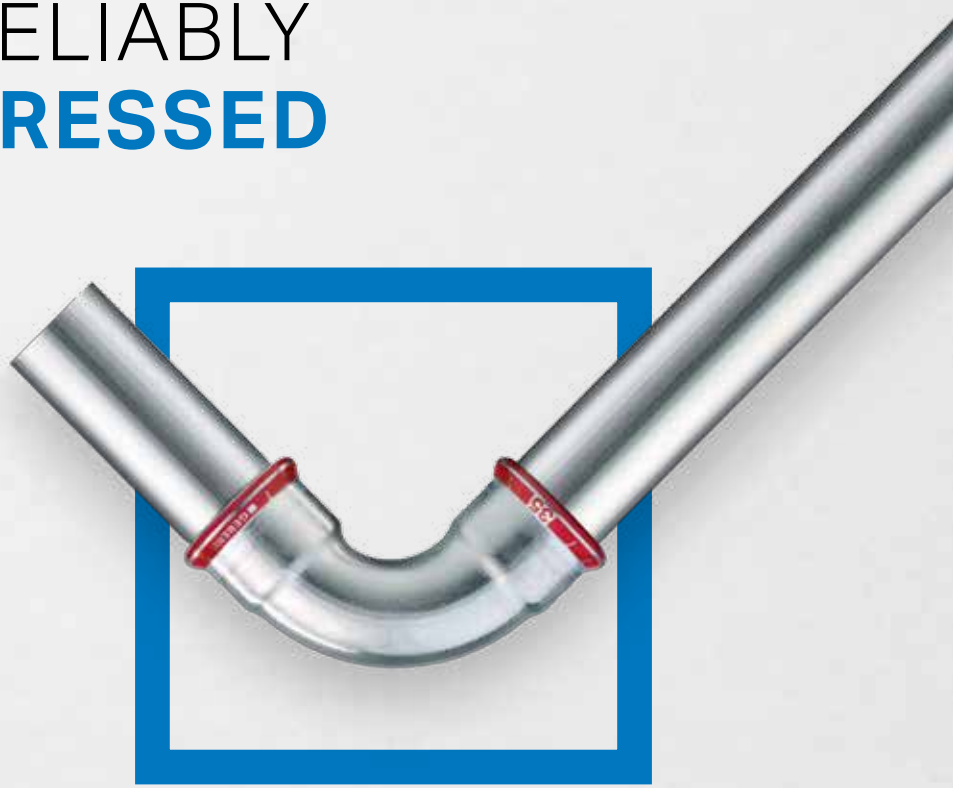
GEBERIT

CLOSED CIRCUITS

RELIABLY PRESSED



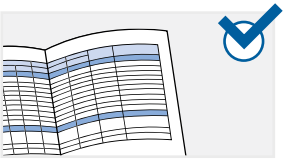
KNOW HOW INSTALLED

WITH A VISION **FOR LONGLASTING DURABILITY**

Application know-how is the guarantor of quality. Properly planned and installed, carbon steel has been impressive for almost 50 years thanks to its high level of cost-effectiveness and product quality. Corrosion can be prevented reliably by following a few simple rules when handling the tried-and tested product material.

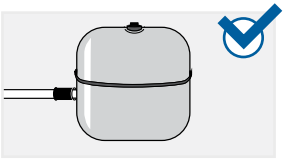
GOOD **PLANNING**

WHAT YOU SHOULD KNOW



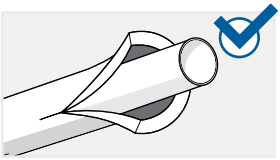
SUITABLE PIPING MATERIALS

Use the Geberit planning documents or the table in this brochure (pg. 12 and onwards) to determine the right materials for the application and medium in question.



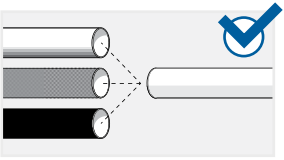
CLOSED SYSTEMS

Plan heating and cooling systems as a closed system with a closed expansion tank. Look out for continuous overpressure in the system. Ventilation should be possible in all parts of the system.



EFFECTIVE CORROSION PROTECTION

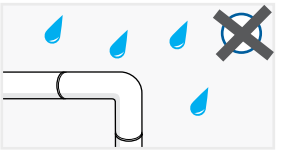
If condensation is expected (e.g. cooling pipes), plan a barrier against diffusion. At a minimum, it should consist of closed-cell insulation material and corrosion protection coating in accordance with BS 5970:2012 or worksheet AGI Q 151.



CAN BE COMBINED WITH OTHER METALLIC PRODUCT MATERIAL

Please consult Geberit directly should you be in doubt.

RULES YOU SHOULD FOLLOW

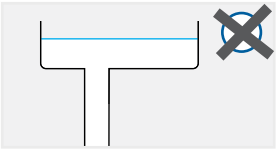


DO NOT INSTALL OUTSIDE OF THE BUILDING

Systems exposed to weather influences should be planned with suitable product materials from Geberit.

DO NOT INSTALL WITH COMBUSTIBLE GASES

Pipes made of carbon steel are not approved for this purpose. Use the pipes from Geberit that are intended specifically for gases.

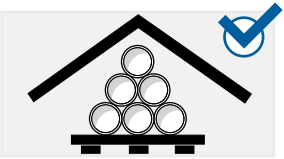


NO OPENLY VENTILATED SYSTEMS

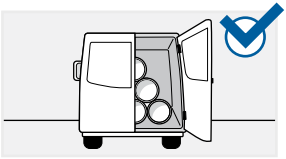
Additional oxygenation capacity increases the risk of corrosion.

PEACE OF MIND DURING **TRANSPORT AND STORAGE**

WHAT YOU SHOULD KNOW

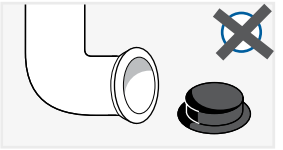


DRY AND CLEAN STORAGE
The storage of pipes and fittings made of carbon steel in a dry environment ensures the best material quality for subsequent processing. Avoid storing directly on the floor.

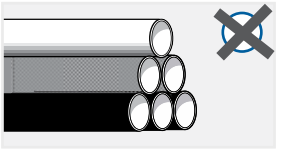


DRY TRANSPORT
For the transport use a closed or well covered means of transportation.

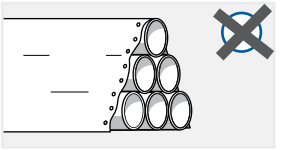
RULES YOU SHOULD FOLLOW



DO NOT REMOVE PROTECTIVE CAPS FROM THE FITTINGS TOO EARLY
Only remove the protective caps just before subsequent processing.



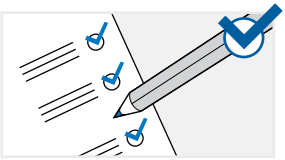
RISK OF CORROSION
Provided that pipes are stored in dry conditions, carbon steel can be stored in contact with other metals. If there is a chance of moisture, contact with other metals can speed up corrosion.



DO NOT COVER WITH PLASTIC FOIL
This increases the risk of condensation and thus corrosion.

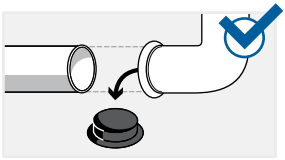
PROFESSIONAL **INSTALLATION**

WHAT YOU SHOULD KNOW



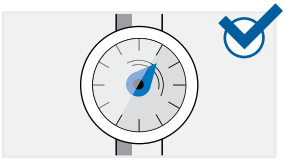
METHOD ACCORDING TO PLAN

Process pipes and fittings in accordance with specifications. Apply insulation and coatings according to a plan.



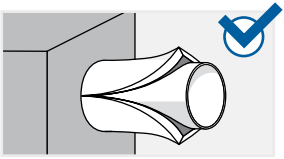
PROTECTED PRODUCT MATERIAL

Only remove protective caps immediately before use on the construction site. During longer installation work interruptions, use downward-facing bends to protect open ends from dirt. Do not put on protective caps, as this can lead to condensation in the pipes.



RECOMMENDED PRESSURE TEST

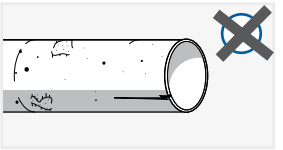
Geberit recommends testing with compressed air. When performing a pressure test with water, the recommended water quality should be used (see pg. 15). After removing the water from the system, replenish the operating medium as quickly as possible, within a week at most.



PROTECTION IN SCREEDS

Protect pipes laid in screeds with a barrier against diffusion in accordance with BS5970:2012 or worksheet AGI Q 151, with closed-cell insulation material and corrosion protection coating at a minimum.

RULES YOU SHOULD FOLLOW



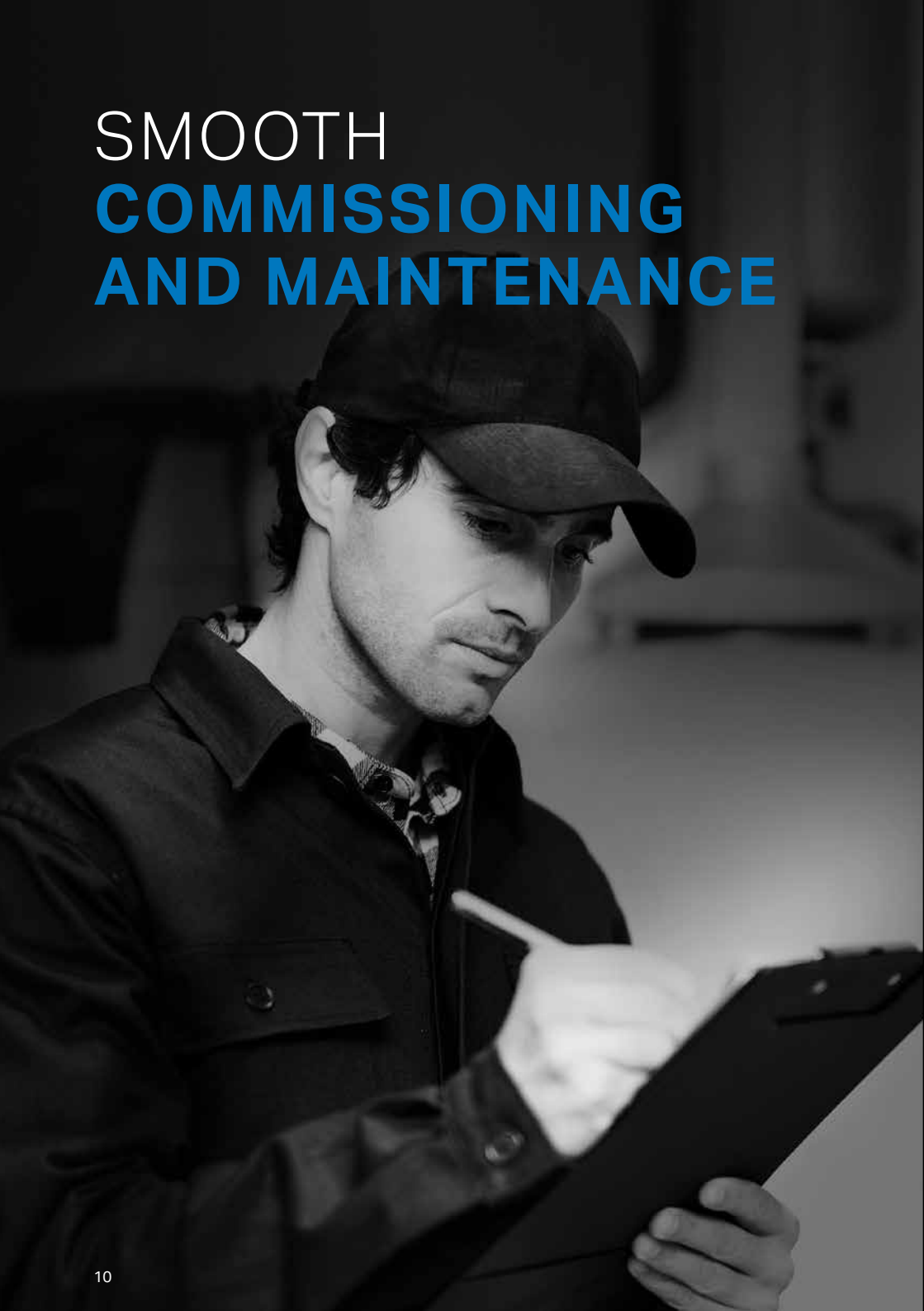
NO RUSTY PARTS

Do not use parts with visible red rust. Traces of white powder on the surfaces do not constitute a problem.

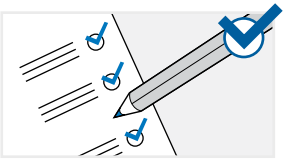
DO NOT USE ADDITIONAL LUBRICANT

The seal rings in the fittings are already pre-treated on delivery.

SMOOTH
COMMISSIONING AND MAINTENANCE



WHAT YOU SHOULD KNOW

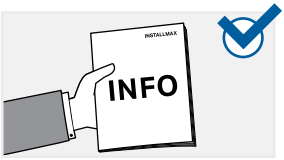


FILLING AS PER PLANNING

Fill the system once with the required water quality and leave it filled. Completely ventilate the system. Do not empty commissioned systems again.

EASY REFILLING WITH CLEAN MEDIA

If emptying of an already running system cannot be avoided, refilling should be performed as quickly as possible, within 24 hours at most. The time limit is shorter than the one stated for the initial pressure test as refilling may occur repeatedly over the lifetime of the system. Make sure you are using the approved water quality (see pg. 15).



IMPORTANT CUSTOMER INFORMATION AND TEST INTERVALS

Inform the operator about the issues relating to corrosion such as unplanned room usage, maximum humidity, use of additives, etc. Refer to the recommended test intervals as per BSRIA recommendations. Arrange an appointment with the operator or maintenance manager immediately.

RULES YOU SHOULD FOLLOW

NO UNSUITABLE ADDITIVES

The respective manufacturer's instructions must be taken into account with regard to suitability and dosage when using water additives or inhibitors.

RECOMMENDED APPLICATIONS FOR GEBERIT MAPRESS CARBON STEEL

Application purposes	Operating temperature	Maximum operating pressure	Pipes		
			Carbon steel, outside zincplated	Carbon steel, with polypropylene jacketing (outside)	Carbon steel, inside and outside zincplated
Liquid media					
For heating water	0–100 °C	16 bar / 1 600 kPa	✓[2]	✓[2]	
For cooling water without anti-freeze agent	0–100 °C	16 bar / 1 600 kPa	✓[2]	✓[2]	
For cooling water with antifreeze agent	-30 bis +40 °C	16 bar / 1 600 kPa	✓[2]	✓[2]	
For remote network heating water ≤ 120 °C≤ 120 °C	0–120 °C	16 bar / 1 600 kPa	✓[2]		
For remote network heating water ≤ 140 °C	0–140 °C	16 bar / 1 600 kPa	✓[2]		
For extinguishing water ("wet")	0–70 °C	16 bar / 1 600 kPa			✓
For sprinklers ("wet")	0–70 °C	16 / 12 / 10 bar 1 600 / 1 200 / 1 000 kPa			✓[4]
For thermal medium (solar)	-25 bis +220 °C[1]	10 bar / 1 000 kPa	✓[2]		
For mineral oils	Upon request	Upon request	✓		
For fuels	Upon request	Upon request	✓		
Gaseous media					
For compressed air (oil purity class 0–3)	0–00 °C	25 / 16 / 12 bar 2 500 / 1 600 / 1 200 kPa	✓[3]	✓[3]	✓[3]
For compressed air (oil purity class 0–X)	0–100 °C	25 / 16 / 12 bar 2 500 / 1 600 / 1 200 kPa	✓[3]	✓[3]	✓[3]
For inert gases (e.g. nitrogen)	Upon request	Upon request	Upon request		

✓ Application purpose is generally admissible, if the defined additional requirements are fulfilled according to the footnotes
[1] Service life with collector downtime: 200 h/a at 180 °C, 60 h/a at 200 °C, overall 500 h/service life at 220 °C
[2] Exclusively closed systems
[3] 25 bar/2500 kPa for d12–28, 16 bar/1600 kPa for d35–54, 12 bar/1200 kPa for d66.7–108
[4] 16 bar/1600 kPa for d22–54, 12 bar/1200 kPa for d66.7–76.1, 10 bar/1000 kPa for d88.9–108
[5] Only use authorised inhibitors
[6] Only use authorised antifreeze agent

Fittings		Seal rings		Flat gaskets for screw connections			Flange gaskets
Carbon steel, outside zincplated	Brass	CIIR, black	FKM, blue	EPDM, black	FPM, green	Centellen® R 3825	Centellen® 3822
✓[2]	✓[2]	✓[5]		✓[5]			✓
✓[2]	✓[2]	✓		✓			✓
✓[2]	✓[2]	✓[6]				✓	✓
✓[2]	✓[2]	✓[5]			✓[5]	✓	✓
✓[2]	✓[2]		✓[5]			✓	✓
✓		✓		✓			✓
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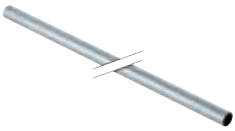
✓	✓		✓		✓		✓
✓	✓		✓		✓		✓
✓	✓		✓[8]		✓[8]		✓[8]
✓	✓	✓[7]		✓[7]			✓
✓	✓		✓[7]		✓[7]		✓
Upon request	Upon request	✓		✓			✓

[7] Oil purity class according to ISO 8573-1:2010E; details about moisture and particles can be found in the technical information in "Geberit Piping Systems for Compressed Air Installations".
[8] After approval by Geberit

SELECTION OF PRODUCT MATERIAL FOR SYSTEM PIPE

Geberit Mapress Carbon Steel system pipe, outside zinc-plated



d12–d108

- For heating water, cooling water and remote heating systems
- For compressed air systems 2)
- For systems with mineral oils or fuels

Geberit Mapress Carbon Steel system pipe, plastic jacketed

d12–d54

- For a visually discreet exposed installation
- For installations that need corrosion protection from outside

Geberit Mapress Carbon Steel system pipe inside and outside zinc-plated

d15–d108

- For sprinklers and fire extinguishing systems
- For compressed air systems with increased residual water content1)
- For wet sprinkler systems

[1] Residual water content class 0–6 according to ISO 8573-1:2010

[2] Residual water content class 0–4 according to ISO 8573-1:2010

WATER QUALITY FOR HEATING SYSTEMS

Drinking water can usually be used for filling and top-up water for heating systems. Since the water alkalises on its own, the pH value of the heating water will fall in the specified range after just a few weeks in operation.

In general, the water used must meet the following quality requirements in order not to cause corrosion in Geberit Mapress Carbon Steel piping systems.

Table 2: Water quality reference values

	Low-saline	Saline
Electrical conductivity (at 25 °C)	< 100 µS/cm	100–1 500 µS/cm
pH value (at 25 °C)	7,0–8,5 (commissioning) 8,2–10,0 (>3 months operation)[1]	
Oxygen content	< 0,1 mg/l	< 0,02 mg/l
Appearance	Free from sedimenting substances	
Suspended matter	< 90 mg/l[2]	
ron	< 15 mg/l[2]	

[1] Due to initial chemical processes, the pH value rises in a carbon steel installation in the first few weeks of operation and then levels off

AFFECTING THE WATER QUALITY

Properly constructed and operated heating systems have an oxygen content of < 0.1 mg/l in the water. Oxygen content values of around 0.1 mg/l or above indicate deficiencies which can lead to corrosion.

If the defined water quality is not available, the required water quality can be achieved with chemical additives for oxygen binding. The effectiveness of the additive used should be monitored by measuring the oxygen content.

RELATED DOCUMENTS

For information on the pressure test, see the "TI Pressure Test for Geberit Piping Systems" document at **www.geberit.com.sg**

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