Pipe systems

TECElogo

TECHNICAL INFORMATION

Issue: March 2020

Contents

System description

TECElogo is a universal installation system for potable water and heating installations. Composite pipes are available in dimensions 16 to 63. The connection system does not require any pressing tools. Handling requires just pipe cutters and a calibrator. The prepared pipe simply slots into the TECElogo connector and the connection is ready.

TECElogo offers:
- Connection without pressing tools
- High pressure and temperature resistance
- Hygienically flawless
- Flush-mounting possible
- Dimensionally stable, bend-resistant composite pipes
- Fittings can be disassembled and reused

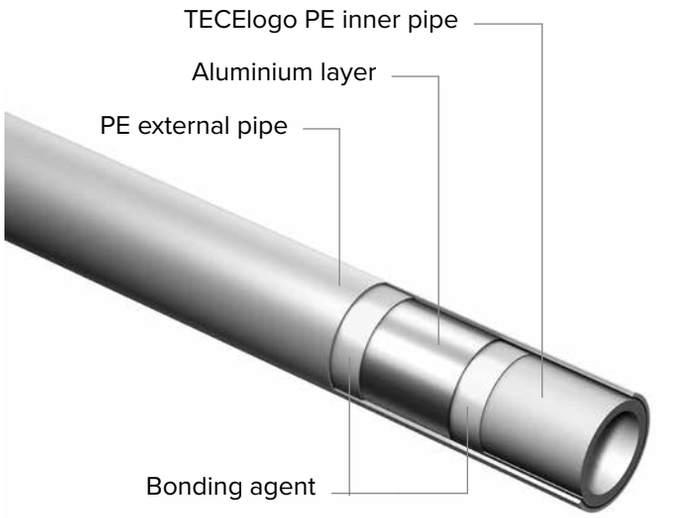
Advantages of TECElogo composite pipes:
- Universal pipe for potable water and heating installations
- Linear extension comparable to a metal pipe
- Visually appealing outer white layer
- Easy to lay, as it is resistant to bending and retains its shape
- Corrosion resistant
- Resistant to heating inhibitors
- External and internal monitoring
- DVGW certified
- Possible operating pressure 10 bar

TECElogo composite pipes can be used:
- In floor and flat distribution
- In cellars, rising pipes and surface-mounting
- In insulation in concealed areas
- In radiator connection
- For underfloor and wall heating, etc.

In rare cases, small bubbles may appear on the pipe surface of the TECElogo composite pipes during operation. These bubbles do not reduce the serviceability and are not critical.

TECElogo aluminium multilayer pipe

The TECElogo aluminium multilayer pipe is a pipe with a butt-welded aluminium layer and a potable water-compatible inner pipe made of thermally stabilised polyethylene. This combination of materials reduces the thermal length change and simultaneously makes the pipe dimensionally stable and bend-resistant.



Structure of the TECElogo aluminium multilayer pipe

Delivery forms:
- Dimensions 16–63 (16/20/25/32/40/50/63)
- Available as a roll (up to dim. 25) or rod
- in black corrugated sheath pipe (16/20/25) or
- as pre-insulated variants (16/20/25)

TECElogo PE-RT all-plastic pipe

Polymer multilayer composite pipe acc. to DIN EN 21003 for potable water and heating installations. Made of high-density polyethylene with increased temperature resistance. (PE-RT Type 2) oxygen-tight to DIN 4726 thanks to internal EVOH barrier layer.

Advantages of the TECElogo PE-RT all-plastic pipes
- Particularly flexible
- Oxygen barrier layer effectively protected by five-layer technology.
- Oxygen tight to DIN 4724
- Externally and self-monitored

Dimension 16 mm:
- Suitable for potable water installations according to application class 2 and 10 bar as per ISO 10508 for warm potable water
- Suitable for heating installations according to application class 5 and 6 bar as per ISO 10508

Dimensions 20 and 25
- Suitable for cold 10 bar potable water installations (PWC)
- Suitable for heating installations according to application class 5 and 6 bar as per ISO 10508

Fittings

Fittings made of red brass or silicon bronze, polyphenylsulphone (PPSU) and standard brass for heating installations are available for potable water and heating installations.

Metal fittings

As an internationally active system provider, TECE converts red brass products to the internationally standard material silicon bronze. The processing and material properties are equivalent, silicon bronze is slightly brighter than red brass in direct comparison. Mixed installations of red brass and silicon bronze are possible without restrictions. Both materials are listed in the evaluation principles for metallic materials in contact with potable water (Federal Environment Agency positive list). They therefore meet the requirements of § 17 para. 3 of the Potable Water Ordinance. The item numbers remain unchanged. Alternatively, fittings made of standard brass are available for the heating installation. Standard brass fittings are not approved by TECE for potable water installations.

Plastic fittings made of PPSU

The fitting made of high-performance plastic PPSU is corrosion-free and impact-resistant. It is equally suitable for potable water installations acc. to DIN EN 806 and heating installations.

Cleaners, paints and foams etc. may contain substances that can damage a PPSU fitting. Therefore, PPSU fittings must not be glued or painted. PPSU fittings must not come into contact with PUR foams. PUR foam should not be applied in the immediate vicinity of PPSU fittings. If necessary, you can check the suitability of PPSU to building or plaster products in the PPSU resistance list - see appendix “PPSU resistance list”.

TECElogo connection

A TECElogo connection is very compact and consists of just a few components:

1. Base body – material either:
   a) Universal red brass
   b) High-performance PPSU
   c) Special brass resistant to dezincification
2. Screw sleeve - made of fibre-reinforced polyamide
3. Clamping ring made of PPSU - holds the pipe safely on the base body
4. O-rings - ensure a permanently tight connection

Application limits

The TECElogo system is classified according to the application type. Suitable for potable water installations in accordance with application class 2 and for heating installations in accordance with application class 5. See also “Classification of operating conditions ISO 10508” table.

It has a lifespan of more than 50 years. The assessment is carried out using a standardised temperature group based on real operating temperatures.
The pipes are tested and DVGW certified with the TECElogo push-fit connections. They fulfil the requirements for class 2 (hot potable water) and class 5 (heat) in accordance with ISO 10508.

The following applies for TECElogo composite pipes:
- They must not be used in solar plants
- Suitable measures should be taken with solid fuel boilers to ensure that the temperatures permitted in accordance with ISO 10508 are not exceeded.
- No contact with open flames

TECElogo system pipes	PE-RT- Multilayer composite pipes				PE-Xc- Multilayer composite pipes							PE-RT- All-plastic pipes		
Pipe designation	PE-RT/Al/PE-RT				PE-Xc/Al/PE-RT							PE-RT		
Dimension	**16**	**20**	**25**	**32**	**16**	**20**	**25**	**32**	**40**	**50**	**63**	**16**	**20**	**25**
Delivery length – roll in m	100	100	50	25	100	100	50	--	--	--	--	100	100	50
Rods (m) (5 m/rod)	100	70	45	30	100	70	45	30	15	15	5	--	--	--
Field of application*	PWS, HSC, UFH*				PWS, HSC, UFH*							PWS, HSC, UFH*		
Application class/ operating pressure	2 / 10 bar; 5 / 10 bar				2 / 10 bar; 5 / 10 bar							2 / 10 bar; 5 / 10 bar	2 / 6 bar Potable water cold 10 bar; 5 / 10 bar	
Colour	White				White							silver		
Outside diameter in mm	16	20	25	32	16	20	25	32	40	50	63	16	20	25
Wall thickness in mm	2	2.25	2.5	3	2	2.25	2.5	3	4	4.5	6	2	2.25	2.5
Inside diameter in mm	12	15.5	20	26	12	15.5	20	26	32	41	51	12	15.5	20
Fitting insertion depth in mm	27	32	35	46	27	32	35	46	48	48	55	27	32	35
Available in corrugated sheath pipe	Yes			--	Yes			--				--		
Deliverable with insulation - 6 mm - 9 mm - 13 mm λ = 0.040 W/(m · K)	Yes Yes Yes			-- -- --	Yes Yes Yes			-- -- --				-- -- --		
Pipe weight empty in kg/m	0.10	0.14	0.20	0.26	0.10	0.14	0.21	0.33	0.53	0.79	1.22	0.08	0.12	0.17
Internal volume in dm^3/m	0.11	0.19	0.31	0.53	0.11	0.19	0.31	0.53	0.80	1.32	2.04	0.11	0.19	0.31
Pipe roughness in mm	0.007				0.007							0.007		
Thermal conductivity uninsulated in $W/(m^2K)$	0.41				0.43							0.35		
Coefficient of thermal expansion in mm/(mK)	0.026				0.026							0.2		
Minimum bending radius in mm - without bending spring - with bending spring	80 64	100 80	125 100	160 --	80 64	100 80	125 100	160 --	200 --	250 --	315 --	80 --	100 --	125 --

* PWS – potable water system; HSC – heating system connection; UFH – underfloor heating

Technical data of TECElogo aluminium multilayer pipes

Application class	Calculation temperature T_D °C	Operating period[b] for T_D Years [a]	T_{max} °C	Operating period for T_{max} Years	T_{mal} °C	Operating period for T_{mal} Hours	Typical application area
1 [a]	60	49	80	1	95	100	Hot water supply (60 °C)
2 [a]	70	49	80	1	95	100	Hot water supply (70 °C)
3 [c]	20	0.5	50	4.5	65	100	Low-temperature floor heating
	30	20					
	40	25					
4 [b]	20	2.5	70	2.5	100	100	Floor heating and low-temperature radiator connection
	40	20					
	60	25					
5 [b]	20	14	90	1	100	100	High-temperature radiator connection
	60	25					
	80	10					

T_D = Temperature for which the pipe system has been designed. T_{max} = Maximum temperature permitted for a short time
T_{mal} = Maximum possible temperature that may occur "occasionally" in the event of an accident (maximum 100 hours in 50 years)

[a] A state can select either class 1 or class 2 according to its national provisions.

[b] If more than one calculation temperature exists for an application class for the operating period and the related temperature, the corresponding times of the operating period must be added. "Plus cumulative" in the table implies a temperature group for the given temperature for an operating period (e.g. the temperature group for a period of 50 years for class 5 is made up as follows: 20°C over 14 years, followed by 60°C over 25 years, followed by 80°C over 10 years, followed by 90°C over 1 year, followed by 100°C over 100 hours).

[c] Only permitted if the temperature during a fault cannot exceed 65°C.

Classification of operating conditions (in accordance with ISO 10508)

Areas of application

Potable water installation

Potable water sets special requirements for an installation system. It's foodstuff and must not be negatively impacted by the installation system materials. The planning and implementation as well as the operation of the potable water installation must be carried out in accordance with the applicable laws, directives and standards. The fitter must ensure that they are installing a piping system that corresponds to the applicable recognised technical regulations. The TECElogo is DVGW certified and proven to be suitable for potable water installations.
The following components are available for potable water installations:

- Plastic fittings made of PPSU
- Metal fittings made of red brass/silicon bronze
- White composite pipes
- PE-Xc 5 S all-plastic pipes

All materials are recommended by DVGW and recognised across Europe. All metallic components of the TECEflex system that come into contact with potable water comply with the evaluation principles (as of 21/11/2018) of the German Federal Environment Agency (UBA) as per the 4MS material list (as of 05/01/2017).

Material selection

The fitter has satisfied their duty of care when they

- have presented the potable water analysis for the supply area of the building project to be constructed and have inspected the suitability of the TECElogo system,
- have assured themselves of the supplier's experience,
- if necessary, have received approval for TECElogo from TECE.

Water treatment measures

If water treatment measures such as water softening are to be used, it is essential that the potential change in the corrosion-chemical behaviour of the treated water on the potable water installation is assessed. Corrosion damage cannot be ruled out if water treatment systems are operated incorrectly. Therefore, to avoid corrosion damage, the individual situation must first be checked by an expert, for example the system manufacturer.

Measures for Legionella prophylaxis

Potable water installations must be planned, implemented and operated with special care in accordance with the applicable laws, directives and standards.

Disinfection of potable water installations

The suitability of the TECElogo system for potable water is confirmed by the DVGW certification. The components of the TECElogo system are made from materials recognised and valued across Europe. A properly planned, implemented and operated potable water installation is hygienically impeccable and in principle does not require any disinfection measures. Disinfection is only necessary in exceptional instances and only then to be carried out if there is an urgent requirement (contamination).

This is to be viewed as an immediate emergency measure in order to return the potable water installation to a usable state. The cause of the microbial contamination - e.g. construction fault or incorrect operation - must be eliminated. Preventive permanent or regular disinfection of a potable water installation is not permitted. Continuously added disinfection agents can have a significant effect on the lifespan of the potable water installation. Due to potential material impairments, no warranty can be provided for these cases.

Recurring or permanent water contamination is often caused by the installation or operation method. (Dead pipes, stagnation times, heating of the cold water or cooling of the hot water, etc.). In such cases, renovation or ensuring proper operation takes precedence over disinfection.

Connection to water heaters

Water heaters which are not approved for use with TECElogo in this document must be approved for connection with TECElogo by the respective manufacturer. The application limits of the TECElogo system must also be observed in the event of a malfunction.
Unregulated hot water boilers must not be connected directly. A metal pipe of at least 1 m must be installed between the TECElogo and the hot water boiler.

Gas instantaneous water heaters

Some gas instantaneous water heaters can generate impermissibly high pressures or temperatures in the event of a malfunction. They are not suitable for connection with plastic pipes. Connecting gas instantaneous water heaters with TECElogo requires the approval of the appliance manufacturer. You must observe the specifications of the appliance manufacturer.

Electric instantaneous water heaters

The electric instantaneous water heaters listed in the table are approved for connection with TECElogo:

Manufacturer	Description	Output in kW				Control/regulation
AEG	DDLE xx*	18	21	24	27	Electronic
CLAGE	DBX	18	21	24	27	Electronic
	BCX	18	21	24	--	Electronic
	DEX	18	21	24	27	Electronic
	DSX	18	21	24	27	Electronic
Junkers	ED xx*-2 S	18	21	24	--	Hydraulic
Siemens	Type DE xx* 415	18	21	24	27	Electronic
	Type DE xx* 515	18	21	24	27	Electronic
	Type DE xx* 555	18	21	24	27	Electronic
Stiebel Eltron	DEL xx* SL	18	21	24	27	Electronic
	DHE xx* SL	18	21	24	27	Electronic
Vaillant	e VED	18	21	24	27	Electronic
	e VED plus	18	21	24	27	Electronic
	e VED exclusive	18	21	24	27	Electronic

xx* Output (in kW) in the product designation

Solar hot water heating

TECElogo can be used to connect a solar system to a hot water heating system if technical measures ensure that the medium temperature is limited to 70°C. The application limits of the TECElogo system must be strictly observed.

Heating installation

The TECElogo system is suitable for the operating conditions of the high-temperature radiator connection of class 5 according to ISO 10508. Application class 5 reflects the operating conditions of a sliding heating operation over 50 years. See also “Operating parameters”
Constant heating operation.

If a heating installation is operated constantly with a flow temperature independent of the outdoor temperature, the flow temperature must not exceed 70°C. Higher flow temperatures affect the service life of the system.

Skirting systems

Only aluminium multilayer pipes are permitted for the installation of skirting systems. The flow temperature is limited to a maximum of 70°C.

Connection technology

TECElogo is a secure and quick push-fit system for composite pipes, making a connection with this is very simple:
1. Cut pipe to length,
2. Calibrate and chamfer,
3. Push it in - and you’re done.

The connection is sealed using two sturdy O-rings. The conical shape of the retaining claw makes it easier to slide the pipe in and prevents the connection from coming undone. It holds the pipe secure and tight, without damaging it.
The closed inspection window allows you to check the insertion depth and enables the fitter to be certain of a secure connection.

Handling

Important notes: TECElogo must be processed only with the accompanying system tools. Do not use tools that are not part of the system.

Do not connect TECElogo components with third-party pipes or fittings. A warranty claim can only be made for the possible applications outlined in the System Description.

TECE provides two toolsets. These system tools allow TECElogo connections for the dimensions 16 to 25 and 32 to 63 to be created and also released again.

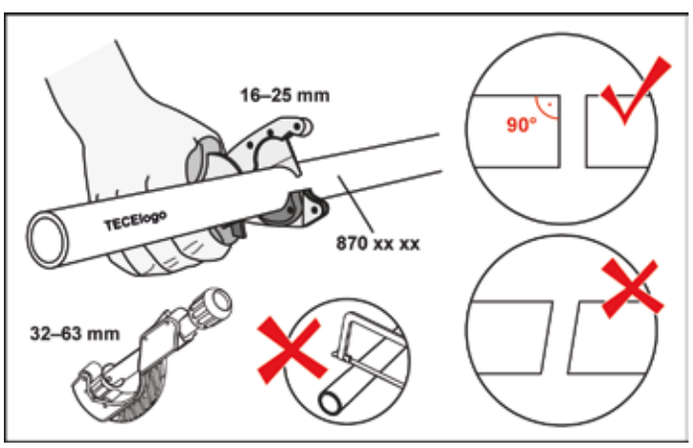
Tool for dim. 16–25:
- TECElogo pipe cutters (to dim. 25)
- TECElogo calibration and chamfering tools
- TECElogo disassembly tools

Tool for dim. 32–63:
- TECE pipe cutters (dim. 16–63)
- TECElogo calibration and chamfering tools
- TECElogo disassembly tools

Create connection

The following work steps must be followed to ensure a correct TECElogo connection:

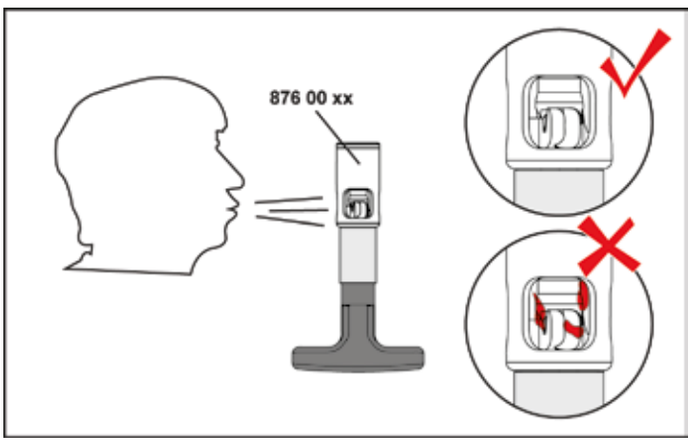
Cut pipe to length



For cutting a TECElogo pipe to length use TECE pipe cutters (item no. 8760002) for the smaller dimensions (up to 25), and use the TECE pipe cutter (order no. 8760008) for the larger dimensions (up to 63)
Cut the pipes at a right-angle. Do NOT use a saw or similar tools!

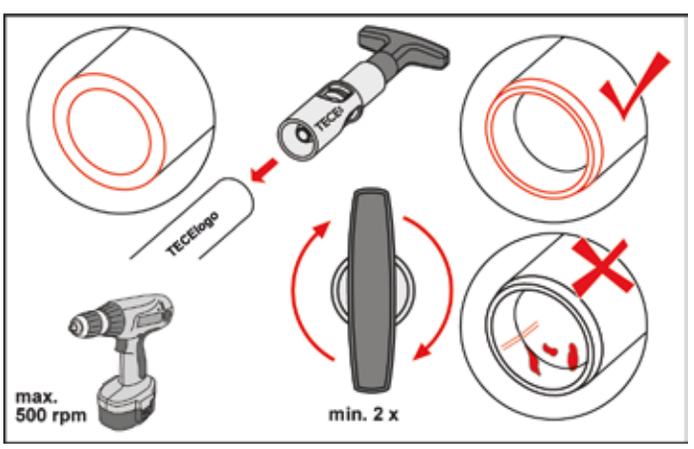
Note: TECElogo pipes must only be processed using the TECE system tools in perfect condition. In particular, the cutter or the cutting head must be sharp and burr-free - this/these can be replaced if necessary.

Clean calibrator



The TECElogo calibrator must be dirt-free. Clean the calibration and chamfering tool after every calibration (“blow free"). Residual shavings could otherwise be transferred into the sealing zone on the connector.

Calibrate and chamfer pipe



Place the calibration and chamfering tool matching the pipe dimensions (item no. 87600xx) on the end of a TECElogo pipe and turn clockwise multiple times.

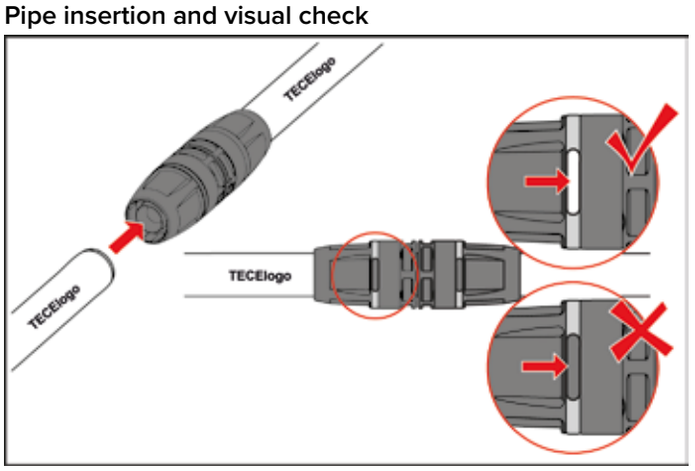
The pipe should then have - inside and out - an even chamfer and be burr-free. There must be no shavings left on the chamfer, which should be visually checked following calibration (see subsequent photos). In the event of damage (e.g. scratches), the damaged end must be cut off and the pipe recalibrated.

Correctly calibrated pipe

Incorrectly calibrated pipe

The pipe can also be calibrated using a cordless screwdriver. The number of revolutions here must not exceed 500 per minute (500 rpm) however (= level 1).

Pipe insertion and visual check



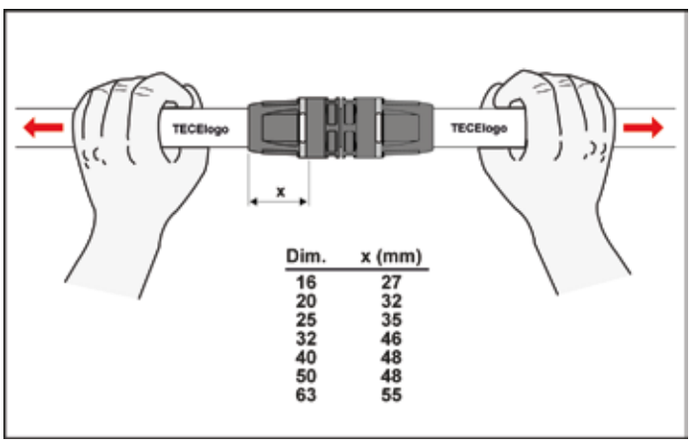
Check the fitting for dirt and clean or swap if necessary. To avoid dirt, do not remove the hygiene caps of the fitting until immediately before the push-fitting operation. Simply push the TECElogo pipe into the fitting until it reaches the stop.
The connection is only completed correctly once the pipe is visible in one of the inspection windows.

If a visual check via the inspection window is not possible (e.g. in poor lighting), mark the push-in depth on the pipe. The pipe must then be pushed in up to this marker.
The spacing between the markers to the pipe end depend on the dimensions of the pipe:

Dimension	Marker spacing in mm
16	27
20	32
25	35
32	46
40	48
50	48
63	55

Marker spacing from pipe end

Check the finished TECElogo push-fit connection by trying to pull it apart: You should not be able to pull the pipe from the fitting.



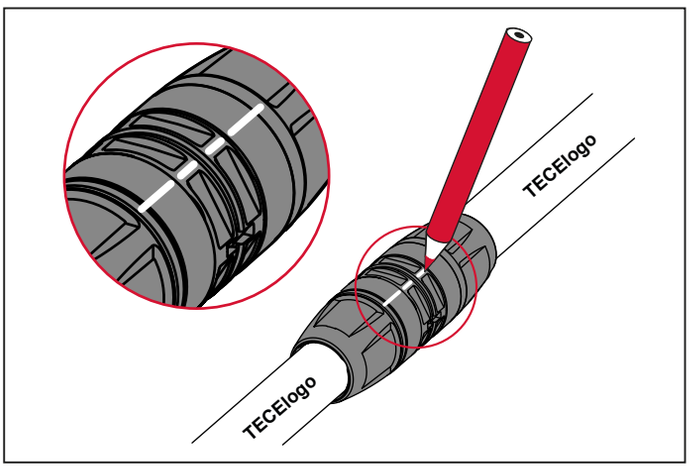
Undo connection and connect again

You can undo the TECElogo system connections if required. With new installations all disconnected parts can be reused. With connections that are only disconnected after a TECElogo installation has been connected, the used pipe ends and O-rings must be replaced but the fitting base body, screw sleeves and clamping rings can be reused, however. Additionally, only original TECElogo O-rings should be used - these are available as spare parts.

Note: Use only the disassembly tool of the TECElogo system for undoing and re-connecting.

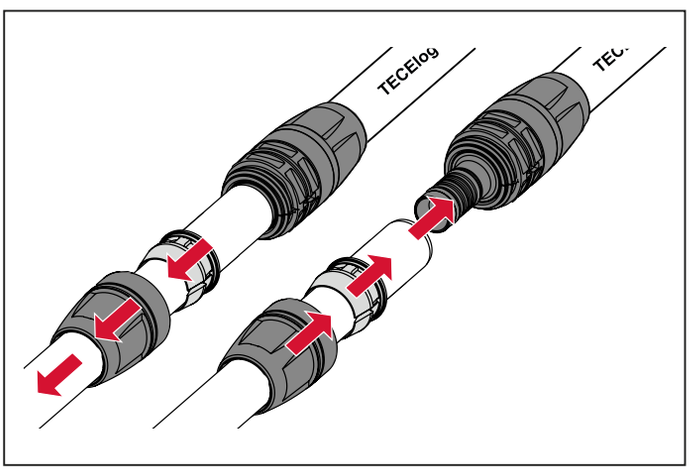
The following working steps are necessary in order to undo and re-establish a connection:

Mark and disconnect the screw sleeve



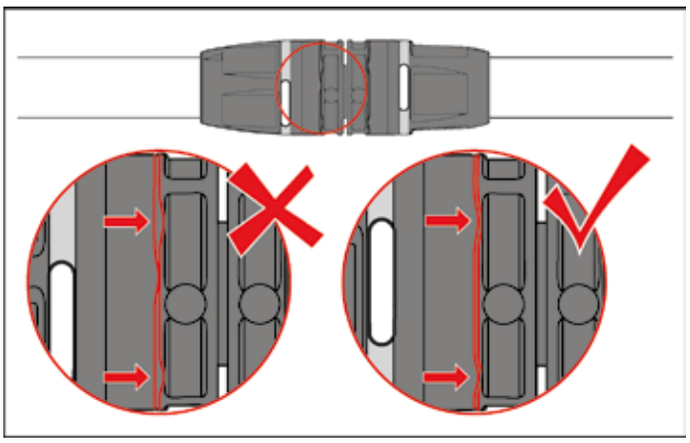
Before undoing a connection, make a continuous marking on the screw sleeve and threaded clip. Fix the fitting with the disassembly open-end wrench and unscrew the screw sleeve with the disassembly key.

Remove the fitting from the pipe and reattach



Now push back the screw sleeve and clamping ring and pull the pipe away from the fitting base body, then remove the clamping ring and screw sleeve from the pipe.
Before assembling the fitting, check the base body and remove any dirt or chips. A damaged O-ring must be replaced.

A. For new installation:
Place the clamping ring on the support with the conical end facing the pipe and tighten by hand with the screw sleeve. Now screw the screw sleeve on using the disassembly tools tightly enough that the screw sleeve noticeably “clicks” into the end position (see following picture) and the markers once again match.



B. After commissioning:
Slide the new O-rings onto the fitting. Place the clamping ring on the support with the conical end facing the pipe and tighten by hand with the screw sleeve. Now screw the screw sleeve on using the disassembly tools tightly enough that the screw sleeve noticeably “clicks” into the end position and the markers once again match.

The subsequent steps - cut, calibrate and chamfer pipe, push it in and conduct visual check - are carried out as outlined in the previous section “Create connection”.

Installation Guidelines

General notes

The following information should be considered when using TECElogo pipes.

All components of the TECElogo system must be checked for dirt or damage before installation. All components must be free of tension during installation and operation.
You must ensure adequate freedom of movement of the pipes, caused for example by thermal linear expansion. This can be achieved, for example, by using bending legs. Care must be taken that the fittings are not deformed in the process. This can be caused, among other things, by using pipe wrenches or excessive clamping in a vice. TECE recommends using spanners.

Threaded connections

Only use threads according to ISO 7-1, DIN EN 10226-1 or ISO 228 (Rp = cylindrical internal thread, R = conical external thread). When combining ISO 7-1 or DIN EN 10226-1 with threads according to ISO 228, the tolerance position must be checked for ease of movement by screwing the threads together first.

Only use approved sealants for potable water installations (e.g. DVGW-certified sealants). For threaded connections TECE recommends the use of hemp combined with a sealant paste approved for this purpose. Using too much hemp can cause damage to the internal and external threaded components. After tightening, the thread tips must still be visible. Care should be taken to ensure no hemp residue remains in the pipe system. If other thread sealants are used, the warranty must be assumed by the sealant manufacturer. Excessive tightening of the threaded connection can cause damage to the components.

Flat-sealing screw connections

For the TECElogo flat-sealing screw connections, only use counterparts with the matching G thread. A seal suitable for the application must be used. If the screw connection is loosened, the sealing surfaces must be checked when reconnecting and the seal should be replaced if necessary.

Processing temperatures

The TECElogo system can be processed within a temperature range from - 10°C to a maximum of + 50°C. With lower temperatures, the ends of the pipe should be warmed up until “lukewarm”. The use of open flames is also prohibited!

Coating of fittings

Fittings and pressure sleeves must generally be protected from contact with masonry, cement, plaster, screed, aggressive media and other materials and substances that cause corrosion. The components must be completely water- and vapour-tight.

Only use sealants, insulation, protection and adhesive tapes, thread sealing adhesives and fluxes for the installation that have been approved by the respective manufacturer for the material PPSU. Avoid contact between installation foams and components of the TECElogo system. If construction foams are used near to the installation, the PPSU fittings must be wrapped in an air- and vapour-tight protective tape.

The components of the TECElogo system must be protected from dirt, drilling dust, mortar, oils, grease and adhesives. Avoid all contact with water-soluble and non-water-soluble paints and solvents of any kind.

Kinks and deformities

If a kink or deformation should occur in a TECElogo pipe due to improper processing or unfavourable construction site situations, this spot must be repaired; if necessary, an angle or bend fitting must be used for narrow radii.

Protection against UV radiation

UV radiation over a longer period of time damages the TECElogo pipes. The pipe packaging offers sufficient protection against UV radiation but is not weather-proof. The pipes should therefore not be stored outdoors. On site, the pipes should not be exposed to sunlight for unnecessary amounts of time. They should be protected against UV light where necessary. TECElogo pipes laid in the open must be protected against sunlight in a black corrugated pipe.

Laying TECElogo pipes in the ground

Pipes from TECElogo can be laid in the ground under the following conditions:

- Gas pipes may only be laid in the ground within the scope of the GSIUR.
- The pipelines must be laid in a sand bed.
- The pipelines must be covered in enough fine-grained sand that there is no risk of damage to the pipe from the later application of the filling material.
- Pipelines laid in the ground must not be affected by traffic loads.
- The fittings and the pressure sleeves must be protected from direct contact with soil using suitable anti-corrosion agents.
- Wall bushings in soil must be suitable for plastic piping and the pipe secured against removal. They must be installed according to the applicable technical rulings and provisions.

Laying pipes on bitumen sheets

TECElogo pipes must be completely dried before being laid on bitumen sheets or coatings containing solvents. The manufacturer's setting times must be observed. The fittings must be wrapped with a protective tape to make them water- and vapour-tight.

Arrangement of pipelines

If cold and hot water pipes are laid on top of one another, the pipes carrying hot water must be laid above the cold water line.

Potential equalisation

TECElogo composite pipes may not be used as earthing conductors for electrical systems in accordance with VDE 0100.
This means metal pipe installations exchanged in part for a pipe from the TECElogo range (e.g. during renovations) should be checked for correct earthing.

Laying in areas at risk of frost

Freezing of the pipes must be avoided at all costs. In areas at risk of frost, insulation alone is not sufficient as frost protection. The pipes must be equipped with heat tracing, for example. Pipes that do not contain potable water can be protected with suitable antifreeze.
Inhibitors, antifreeze or other additives can damage the TECElogo pipes. Approval from the respective manufacturer of the additive is required.

In general, the following concentrations apply for antifreeze agents:

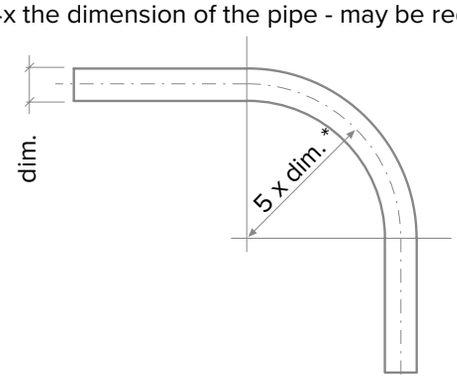
- Ethyl glycol (Antifrogen N): May be used up to a maximum concentration of 50%. TECE recommends restricting the concentration to 35%. A concentration of 50 % Antifrogen N corresponds to frost protection down to a temperature of -38 °C. A concentration of 35 % Antifrogen N corresponds to frost protection down to -22 °C. If Antifrogen N is dosed above 50%, the frost protection effect is reversed. Slurry ice forms at temperatures below -25 °C.
- Propylene glycol: May be used up to a concentration of maximum 25%. Propylene glycol is primarily used in the foodstuffs industry. A concentration of 25% corresponds to frost resistance down to -10°C.

Heat tracings

Heat tracings as well as self-regulating heater bands approved by manufacturers for plastic piping systems in the sanitary sector can be used for TECElogo. To ensure optimum heat transfer the heating bands are attached to the TECElogo installation pipe across their full surface using broad aluminium adhesive strips. The manufacturer's instructions should be followed.

Bending radii

TECElogo composite pipes can be bent by hand up to dimension 25, but commercially available bending tools must be used from dimension 32.
The pipes can be bent in the neutral phase with a minimal bending radius - in principle corresponding to 5x the dimension of the pipe - to avoid buckling and kinks. If bending springs are used during the installation of TECElogo pipes (up to dim. 25) then the minimal bending radius - to 4x the dimension of the pipe - may be reduced:



* without bending spring, with bending spring 5 x dim.

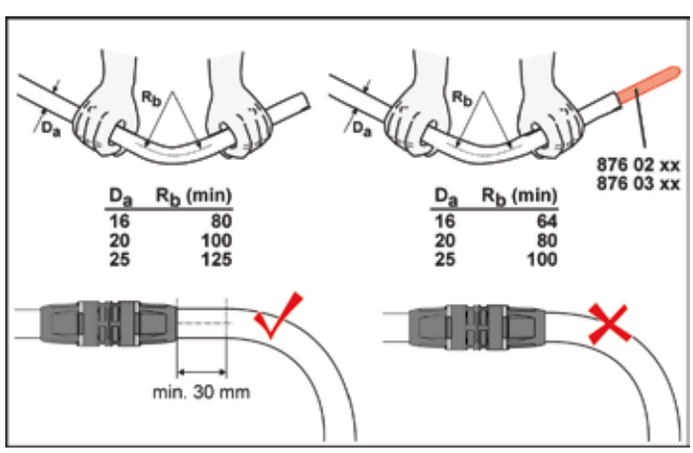
Minimal bending radius of TECElogo composite pipes

Dimension	Minimum bending radius in mm	
	without bending spring	with bending spring
16	80	64
20	100	80
25	125	100
32	160	--
40	200	--
50	250	--
63	315	--

Bending radii of TECElogo pipes

Alternatively, pipes with dimensions larger than 20 mm can be bent with the TECE bending tools:

- Dim. 16 - 32 mm item no. 720222
- Dim. 40 - 63 mm item no. 720223



Bending radii without bending springs (left) and using bending springs (right)

Pipes that have already been push-fitted should not be subsequently bent. If you need to do this, make sure that the pipe has been pushed onto the fitting straight and without tension. Tension can lead to leaks.

Thermal length changes

Materials expand when heated and contract when cooling down. The systemic, huge temperature differences mean that the lines in hot water and heating installations must be attached such that the length extension in elbows or special compensating elbows can be balanced out.

Detecting thermal length changes

Thermal length changes are detected using the following formula:

$\Delta l = \alpha \cdot l \cdot \Delta t$

Δl Thermal length change of the pipe in mm
α Expansion coefficient of the TECElogo pipes
l Initial length of the pipe in m; this is the difference between the installation temperature and the maximum possible operating temperature. Among other things, thermal disinfection must be taken into account here.
Δt Temperature difference in K*; this is the difference between the installation temperature and the maximum possible operating temperature. Among other things, thermal disinfection must be taken into account here.

* K = Kelvin is the SI base unit of temperature and relates to absolute zero.
(0 °C = 273.16 K)

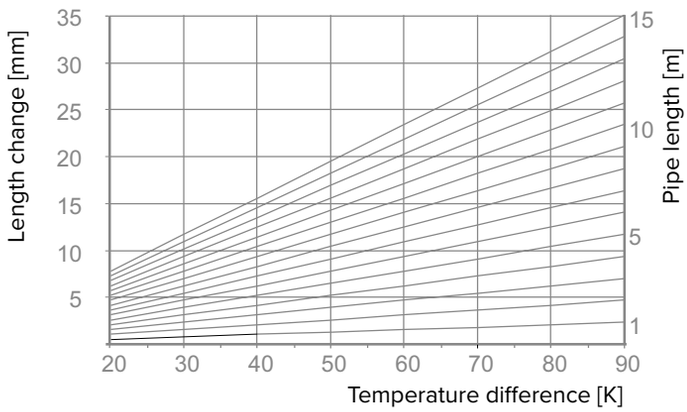
Expansion coefficient of the TECElogo pipes:
Composite pipes α = 0.026 mm/(mK)

Example: A 12 metre-long TECElogo heating line made of composite pipe is installed at 5 °C in winter. Operating conditions can lead to a temperature of 70 °C.

l 12 m
Δt 70 K - 5 K = 65 K
α 0.026 mm/mK
Δl = 0.026 mm/mK · 12 m · 65 K = 20.28 mm

The result: The pipe will expand by approx. 20 mm. The expansion must be compensated for via structural conditions.

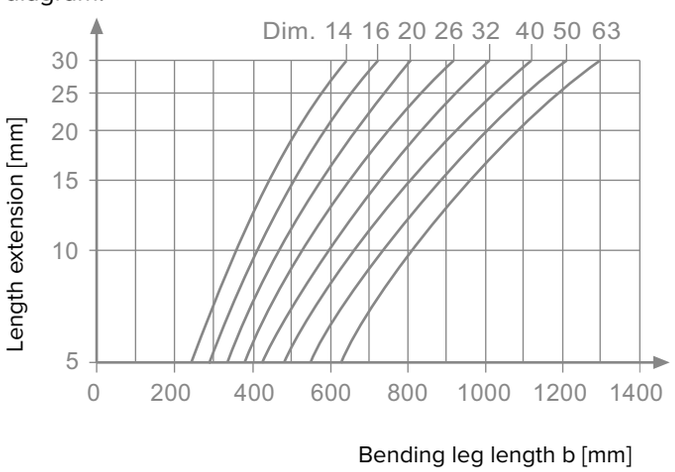
Alternatively, the thermal length extension can be found in the following diagram.



Thermal length extension for TECElogo composite pipes

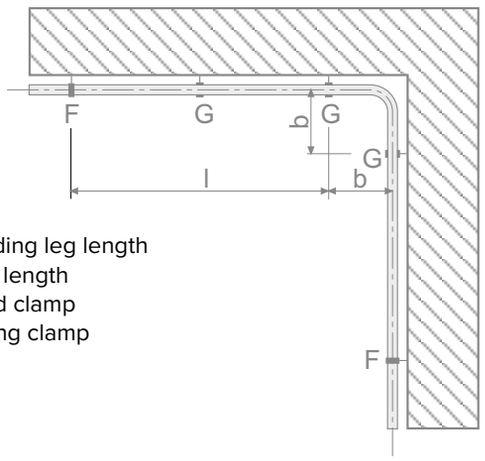
Determining the length of the bending leg

The bending leg length (b) can be found in the following diagram:



Bending leg length for TECElogo pipes

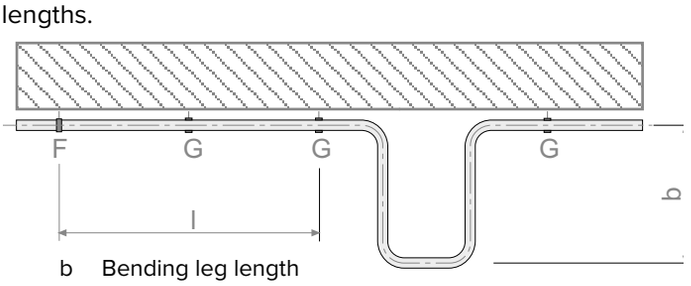
The pipe lengths to be observed can be limited by means of fixed and sliding clamps.



b Bending leg length
l Pipe length
F Fixed clamp
G Sliding clamp

Compensation of thermal linear extension in a direction change

Sometimes, the planned pipe layout does not offer sufficient room for movement for the inclusion of thermal linear extension. In this case, compensating bends should be included in the plan that take into account the bending leg lengths.



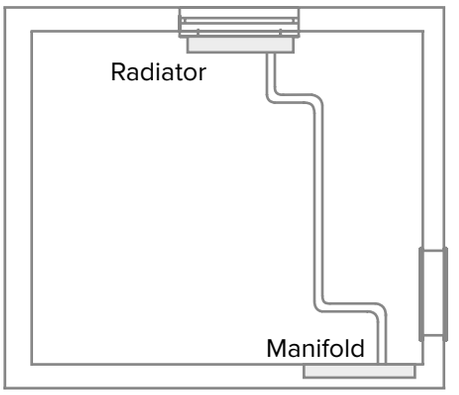
b Bending leg length
l Pipe length
F Fixed clamp
G Sliding clamp

Compensation of thermal linear extension in an extension loop

Example: The pipe length extension in the aforementioned example is approx. 20 mm. The bending leg length b can be found in the aforementioned diagram. For a TECElogo pipe with a dimension of 20 mm this results in a value of 670 mm. If a sliding clamp of at least 670 mm is fitted to the elbow then no additional compensating elbow is required.

Special installation notes for linear extension

- Take care to ensure sufficient “room to manoeuvre” when connecting radiators from the floor or wall in order to include linear extension.
- The connection should always be guided to the radiators in an elbow design.
- TECElogo fittings should be installed tension-free. If necessary, suitable attachments should be arranged to decouple the fittings from the influence of the length extension.



Example installation taking into account linear extension

Pipe mounting

TECElogo pipes must only be fastened with pipe clamps approved for the respective application. Commercially available wall plugs can be used to attach clamps as long as they are used on components with sufficient mechanical stability. The TECElogo pipelines may not be attached to other lines.

Pipe clamps

Pipe clamps with the following properties must be used to fasten the TECElogo pipes:

- Suitable for plastic pipes
- Adapted to the size of the TECElogo pipes
- Burr-free, to prevent damage to the pipes

Routing of TECElogo pipes

The routing of TECElogo installation lines must comply with the recognised rules of engineering. The quality of the potable water must not be negatively affected by the pipe routing.

TECElogo pipes on plaster

The type and spacing of the fastening depend on the construction conditions on site. The fixing of the pipelines should be carried out using static perspectives taking into consideration the filled and insulated pipes according to the recognised rules of engineering.

TECElogo dim.	Installation spacing in m
16	1
20	1.15
25	1.3
32	1.5
40	1.8
50	2.0
63	2.0

Installation spacing for TECElogo lines installed on plaster

TECElogo dim.	Pipe weight filled in kg/m
16	0.21
20	0.34
25	0.52
32	0.86
40	1.33
50	2.09
63	3.26

Pipe masses TECElogo

The pipes must be routed in such a way that moisture and dripping or condensation water from other fixtures cannot affect them.

Concealed TECElogo pipes

Depending on the wall composition or quality of the masonry, the thermal length extension of a concealed TECElogo composite pipe can cause damage to the wall. TECE therefore recommends that all concealed TECElogo composite pipes be fitted with pipe insulation. The pre-insulated TECElogo pipes fulfil this requirement.
Alternatively, if no thermal insulation is required, the composite pipes can be laid in corrugated sheath pipes. These pipes are also part of the TECElogo range.
TECElogo fittings must always be protected from contact with the wall structure, plasterboard, cement, screed, rapid binders or similar materials using suitable coverings. The cover must ensure that no construction moisture can reach the fitting. Direct contact with the structural shell must be avoided at all costs owing to the sound insulation requirements in accordance with DIN 4109 and VDI 4100.

TECElogo pipes in concrete or screed

The pipes are solidly enclosed by concrete or screed so that the linear extension of the pipe material occurs on the inside. Special measures to include thermal linear extension are unnecessary in this instance. If the pipes are laid in the insulation layer between concrete and screed, however, they should be arranged in such a way that the expected linear extension is compensated by the insulation or a pipe layout inside the elbow.
Heat insulation and impact sound requirements must be met. The corresponding standards and guidelines must be adhered to. It is therefore advisable to install the TECElogo pipes in a suitable levelling course. The additional installation height must be considered during planning. The fittings must be protected against corrosion.
TECElogo pipes installed on bare floor surfaces or in concrete ceilings should be installed at a maximum spacing of one metre. It should be ensured that the TECElogo pipes installed on bare floor surfaces are not damaged by ladders, equipment, wheelbarrows, constant impacts or similar things. The pipelines must be inspected immediately before the screed is laid.

TECElogo pipes routed through movement joints

If pipelines are routed through building expansion joints, these must be laid in corrugated sheath pipes. The corrugated sheath pipe must sit at least 25 cm above the movement joint on all sides. Thermal insulation with a wall thickness of at least 6 mm may be used as an alternative to corrugated piping.

Piperun in floor structures

For the planning and execution of pipelines in floor constructions, the screed laying trade has described in the guideline "Pipes, cables and cable ducts on raw ceilings" how a routing is to be carried out: “Pipelines in the floor assembly must be installed free of junctions, in straight lines as well as axially parallel and parallel to the wall. Even during the planning stage, heating and drinking water pipes should be given priority over electrical lines and empty conduits."

- The pipelines in a pipe route must be grouped together as tightly as possible.
- The maximum route width of parallel pipelines including pipe insulation is 30 cm.
- The space between the individual lines should adhere to a minimum distance of 20 cm. The minimum distance of a pipe to a wall is 20 cm.
- The dimensions given above should be adhered to as closely as possible next to manifold housings.

- Around the door the distance from the door jamb should be a minimum of 10 cm.

Pipes of different thicknesses or other fittings within the routing must be balanced to create an even surface for the impact sound insulation.

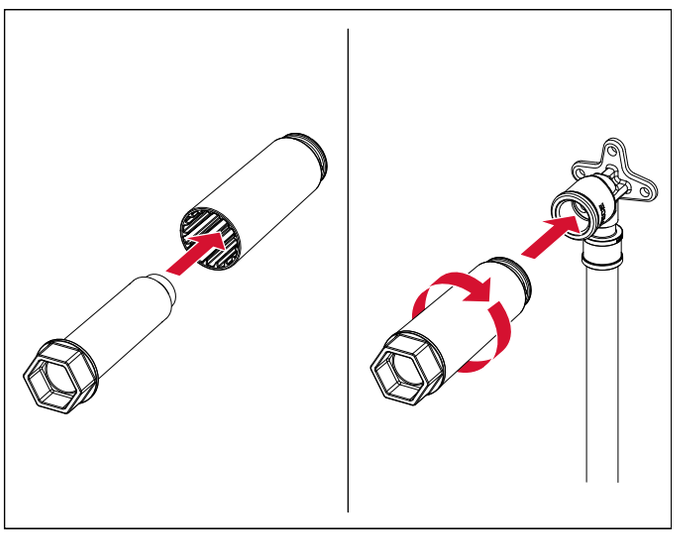
Sound insulation

The noise behaviour of a potable water heating installation in relation to the building structure should be taken into consideration during the planning and implementation. It is essential to observe the relevant local standards and requirements when planning, implementing and operating the systems.

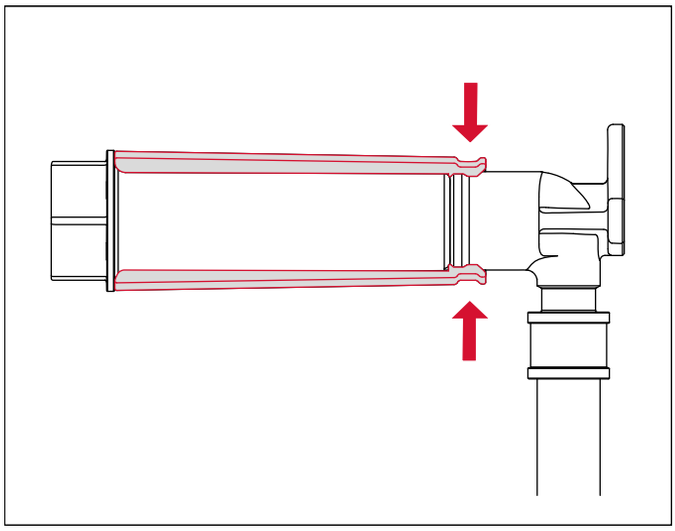
Sealing of fitting connections with simultaneous sound insulation of the connections from the building structure.

TECE recommends using the Seal System sealing sleeve in conjunction with the TECE sound insulation box for installing fitting connections. The sound insulation box is equipped with a special mounting for the sealing sleeve and ensures safe decoupling of the building from the wall bushing. The TECElogo range offers pre-assembled units with different wall discs and matching sound insulation boxes. This therefore guarantees a mechanically safe installation.

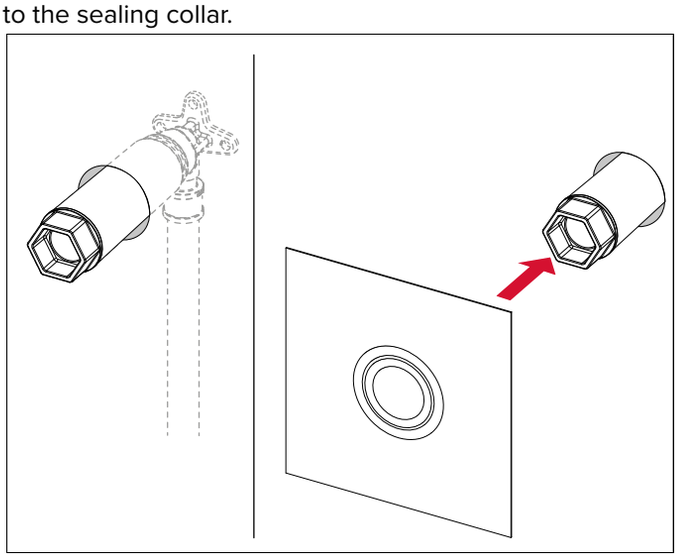
The installation is carried out in the following steps:
The sealing sleeve slides onto the wall disc when the protective plug is screwed in and forms a seal from the outside.



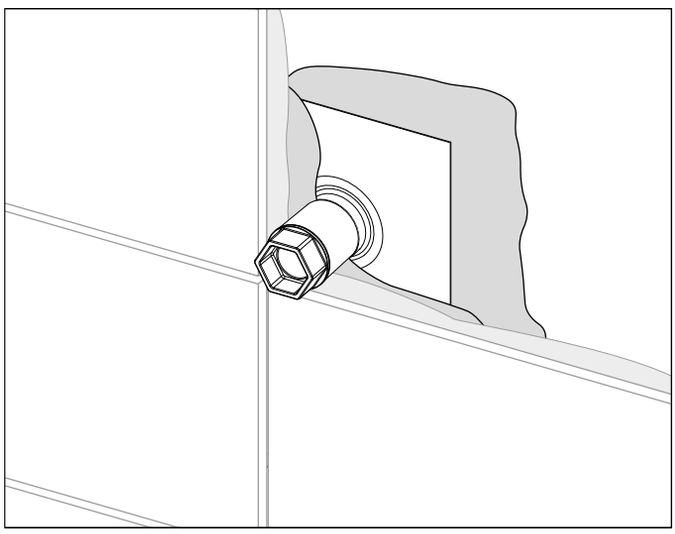
The sealing sleeve fits securely into the receptacle of the sound insulation box.



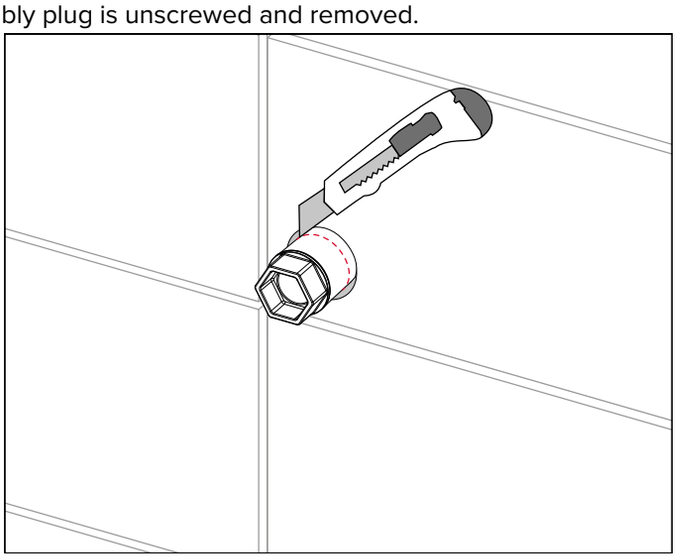
The sealing sleeve is pulled over the plug and fits closely to the sealing collar.

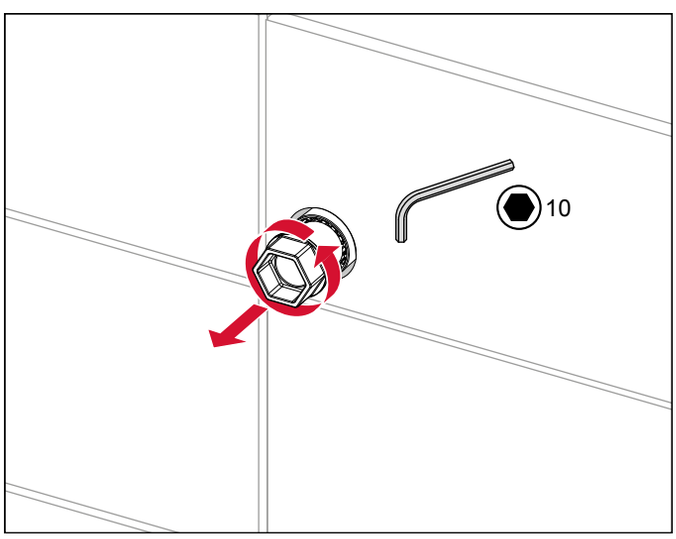


Next, the sealing sleeve is embedded in the sealing level and the wall is finished.

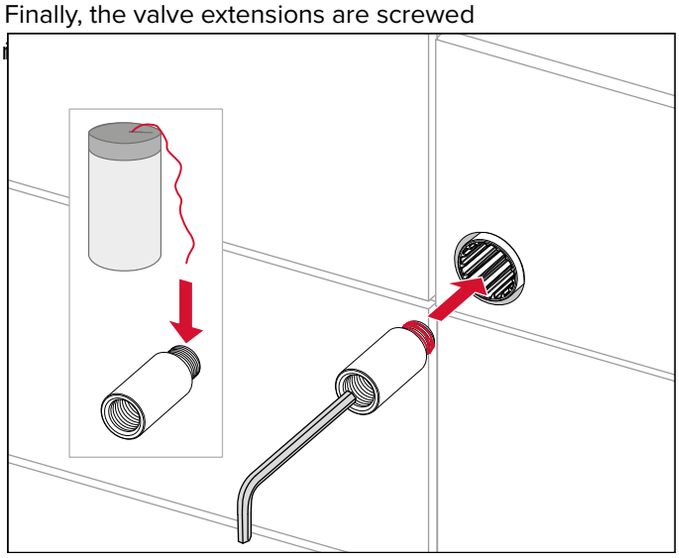


Prior to the assembly of the fitting, the sealing sleeve is shortened to be flush to the wall and the reusable assembly plug is unscrewed and removed.





Finally, the valve extensions are screwed



Fire protection

When using TECEflex installations, the applicable local laws and standards must be observed and complied with.

Planning and Design

The TECElogo system can be used for potable water and heating installations. Every application places special requirements on the installation system. This must be given special attention during planning.

Insulation of potable water and heating pipelines

Insulation of pipelines, fittings and apparatus must, among other things, fulfil requirements with regard to heat dissipation, heat absorption, acoustic decoupling, corrosion protection, fire protection and, if necessary, the absorption of thermal linear expansion. The insulation must be chosen according to the respective application.
No insulation materials may be used that could trigger chemical corrosion or contact corrosion on fittings, valves or pipelines.

Insulation against frost

Any water-bearing pipelines routed through areas at risk of frost must be insulated. If there is prolonged stagnation, the pipes can freeze despite the insulation. Heat tracing must be used here if necessary.

Insulation of cold water pipes

Potable water systems carrying cold water must be protected against heating in accordance with DIN 1988-200. Under normal operating conditions and pipe routings in residential construction, the values for minimum insulation thicknesses listed in the following table apply as guide values. In case of longer stagnation periods, even insulation cannot provide a permanent guarantee against heating. The structural conditions must be checked and, if necessary, the insulation thicknesses must be increased.

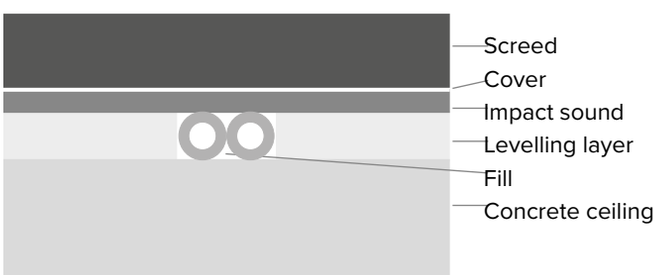
Example: Shafts or pre-walls can heat up significantly as a result of heating pipes. The potable water must be specially protected here. It may make sense to structurally divide a shaft in order to physically separate the drinking water pipes from the hot pipes. Hot pipes should be routed as far up as possible in pre-walls or shafts. The cold water pipe is routed at the bottom of the pre-wall. This arrangement creates a stable temperature stratification within the pre-wall and heat transport via convection is avoided. If there is a risk of moisture penetrating the insulation materials, such as in the case of cold water pipes due to condensation, diffusion-tight insulation must be used. The potable water pipes must be laid at a sufficient distance from pipes that are hot. Installation on warm components, such as a chimney or in a heated wall, must be avoided.
The TECElogo range offers pre-insulated pipes with 9 and 13 mm insulation thickness. Cold water pipes must be protected against condensation. Condensation protection can be dispensed with if no adverse effects on the structural shell or installations are to be expected. Depending on the temperature and the moisture content of the ambient air, pipes must be insulated in such a way that condensation is prevented.
Pipes in contact with the structural shell (e.g. laid under plaster, in screed constructions or within pre-wall technology) must at least be TECElogo pipes laid in a in corrugated pipe. Additional protection against condensation by insulation is not required here. The information in the table above can also be used for protection against condensation on the outer insulation surface, assuming a potable water temperature of 10°C.

Insulation of hot water and heat distribution pipes

Pipes carrying hot water must be protected against heat emission.

Insulation of pipes in the floor construction

If installation pipes are laid on the raw concrete ceiling, a suitable levelling layer up to the height of the upper edge of the pipe, including pipe insulation, must be installed. The impact sound insulation can then be laid on top of this.



Installation example of a TECElogo pipe in the floor

The insulation boards are laid up to the pipes. The spaces in between must be filled with a suitable fill. The impact sound insulation can be laid on this construction. EPS insulation type DR 30-2 is suitable, for example. Make sure that only one impact sound layer is used. In order to minimise thermal bridges, the insulation materials must be applied joint-tight.

Dimensioning of potable water systems

The relevant regulations and laws must be observed for the planning and installation of potable water systems.

Pos.	Moulded part	Dimension						
		16	20	25	32	40	50	63
1	Pipe	2.3	1.6	1.3	0.9	0.7	0.7	0.6
2	Coupling	3.9	3.6	1.2	3.4	2.0	0.9	0.8
3	Reduc. coupling (1 dimension)	–	3.9	3.7	1.7	3.6	2.0	1.8
4	Elbow 90 °C	22.8	14.6	7.0	13.7	7.9	5.5	5.6
5	T-piece equal - Passage	4.4	4.5	1.5	4.0	2.2	1.1	1.0
6	T-piece equal – Outlet	13.9	14.7	6.9	13.4	7.9	5.3	5.8
7	T-piece equal – Manifold	15.2	15.1	7.6	14.1	8.2	6.0	5.9

Zeta values [ ] for TECElogo moulded parts (where v=2 m/s)

Pos.	Moulded part	Dimension						
		16	20	25	32	40	50	63
1	Pipe	1.0	1.0	1.0	1.0	1.0	1.0	1.3
2	Coupling	1.7	2.3	0.9	3.8	2.9	1.3	1.7
3	Reduc. coupling (1 dimension)	–	2.4	2.8	1.9	5.1	2.9	3.9
4	Elbow 90 °C	9.9	9.1	5.4	15.2	11.3	7.9	12.2
5	T-piece equal - Passage	1.9	2.8	1.2	4.4	3.1	1.6	2.2
6	T-piece equal – Outlet	6.0	9.2	5.3	14.9	11.3	7.6	12.6
7	T-piece equal – Manifold	6.6	9.4	5.8	15.7	11.7	8.6	12.8

Equivalent pipe lengths [m] for TECElogo moulded parts (where v=2 m/s)

Pressure loss tables in the potable water installation – Dimensions 16/20/25 mm

TECElogo composite pipes – Pressure losses due to pipe friction in potable water lines									
Water speed	Dim. 16			Dim. 20			Dim. 25		
	V	m	R	V	m	R	V	m	R
			hPa/m			hPa/m			hPa/m
m/s	l/s	kg/h	mbar/m	l/s	kg/h	mbar/m	l/s	kg/h	mbar/m
0.10	0.011	40.7	0.3	0.019	67.9	0.2	0.031	113.1	0.1
0.20	0.023	81.4	0.6	0.038	135.9	0.6	0.063	226.2	0.4
0.30	0.034	122.1	1.7	0.057	203.8	1.2	0.094	339.3	0.9
0.40	0.045	162.9	2.8	0.075	271.7	2.0	0.126	452.4	1.4
0.50	0.057	203.6	4.1	0.094	339.6	2.9	0.157	565.5	2.1
0.60	0.068	244.3	5.6	0.113	407.6	4.0	0.188	678.6	2.9
0.70	0.079	285.0	7.3	0.132	475.5	5.2	0.220	791.7	3.8
0.80	0.090	325.7	9.2	0.151	543.4	6.6	0.251	904.8	4.8
0.90	0.102	366.4	11.2	0.170	611.4	8.1	0.283	1017.9	5.9
1.00	0.113	407.2	13.5	0.189	679.3	9.8	0.314	1131.0	7.1
1.10	0.124	447.9	16.0	0.208	747.2	11.6	0.346	1244.1	8.4
1.20	0.136	488.6	18.6	0.226	815.1	13.5	0.377	1357.2	9.8
1.30	0.147	529.3	21.4	0.245	883.1	15.5	0.408	1470.3	11.3
1.40	0.158	570.0	24.4	0.264	951.0	17.7	0.440	1583.4	12.9
1.50	0.170	610.7	27.6	0.283	1018.9	20.0	0.471	1696.5	14.5
1.60	0.181	651.4	31.0	0.302	1086.9	22.4	0.503	1809.6	16.3
1.70	0.192	692.2	34.5	0.321	1154.8	25.0	0.534	1922.7	18.2
1.80	0.204	732.9	38.2	0.340	1222.7	27.7	0.565	2035.8	20.1
1.90	0.215	773.6	42.0	0.359	1290.7	30.5	0.597	2148.8	22.2
2.00	0.226	814.3	46.0	0.377	1358.6	33.4	0.628	2261.9	24.3
2.10	0.238	855.0	50.2	0.396	1426.5	36.4	0.660	2375.0	26.5
2.20	0.249	895.7	54.6	0.415	1494.4	39.6	0.691	2488.1	28.8
2.30	0.260	936.4	59.1	0.434	1562.4	42.9	0.723	2601.2	31.2
2.40	0.271	977.2	63.8	0.453	1630.3	46.3	0.754	2714.3	33.7
2.50	0.283	1017.9	68.6	0.472	1698.2	49.8	0.785	2827.4	36.3
2.60	0.294	1058.6	73.6	0.491	1766.2	53.5	0.817	2940.5	39.0
2.70	0.305	1099.3	78.8	0.509	1834.1	57.2	0.848	3053.6	41.7
2.80	0.317	1140.0	84.1	0.528	1902.0	61.1	0.880	3166.7	44.6
2.90	0.328	1180.7	89.6	0.547	1969.9	65.1	0.911	3279.8	47.5
3.00	0.339	1221.5	95.3	0.566	2037.9	69.2	0.942	3392.9	50.5
3.10	0.351	1262.2	101.1	0.585	2105.8	73.5	0.974	3506.0	53.6
3.20	0.362	1302.9	107.0	0.604	2173.7	77.8	1.005	3619.1	56.8
3.30	0.373	1343.6	113.1	0.623	2241.7	82.3	1.037	3732.2	60.0
3.40	0.385	1384.3	119.4	0.642	2309.6	86.9	1.068	3845.3	63.4
3.50	0.396	1425.0	125.9	0.660	2377.5	91.6	1.100	3958.4	66.8
3.60	0.407	1465.7	132.5	0.679	2445.4	96.4	1.131	4071.5	70.3
3.70	0.418	1506.5	139.2	0.698	2513.4	101.3	1.162	4184.6	73.9
3.80	0.430	1547.2	146.1	0.717	2581.3	106.3	1.194	4297.7	77.6
3.90	0.441	1587.9	153.2	0.736	2649.2	111.5	1.225	4410.8	81.4
4.00	0.452	1628.6	160.4	0.755	2717.2	116.7	1.257	4523.9	85.2
4.10	0.464	1669.3	167.8	0.774	2785.1	122.1	1.288	4637.0	89.1
4.20	0.475	1710.0	175.3	0.793	2853.0	127.6	1.319	4750.1	93.2
4.30	0.486	1750.7	183.0	0.811	2921.0	133.2	1.351	4863.2	97.3
4.40	0.498	1791.5	190.8	0.830	2988.9	138.9	1.382	4976.3	101.4
4.50	0.509	1832.2	198.8	0.849	3056.8	144.7	1.414	5089.4	105.7
4.60	0.520	1872.9	206.9	0.868	3124.7	150.7	1.445	5202.5	110.0
4.70	0.532	1913.6	215.2	0.887	3192.7	156.7	1.477	5315.6	114.5
4.80	0.543	1954.3	223.7	0.906	3260.6	162.9	1.508	5428.7	119.0
4.90	0.554	1995.0	232.3	0.925	3328.5	169.2	1.539	5541.8	123.6
5.00	0.565	2035.8	241.0	0.943	3396.5	175.5	1.571	5654.9	128.2

Pressure loss tables in the potable water installation – Dimensions 32/40/50/63 mm

TECElogo composite pipes – Pressure losses due to pipe friction in potable water lines												
Water speed	Dim. 32			Dim. 40			Dim. 50			Dim. 63		
	V	m	R	V	m	R	V	m	R	V	m	R
			hPa/m			hPa/m			hPa/m			hPa/m
m/s	l/s	kg/h	mbar/m	l/s	kg/h	mbar/m	l/s	kg/h	mbar/m	l/s	kg/h	mbar/m
0.10	0.053	191.1	0.1	0.080	289.5	0.1	0.132	475.3	0.1	0.204	735.4	0.0
0.15	0.080	286.7	0.2	0.121	434.3	0.1	0.198	712.9	0.1	0.306	1103.1	0.1
0.20	0.106	382.3	0.3	0.161	579.1	0.2	0.264	950.6	0.2	0.409	1470.8	0.1
0.25	0.133	477.8	0.5	0.201	723.8	0.3	0.330	1188.2	0.3	0.511	1838.5	0.2
0.30	0.159	573.4	0.6	0.241	868.6	0.5	0.396	1425.9	0.3	0.613	2206.2	0.3
0.35	0.186	669.0	0.8	0.281	1013.4	0.6	0.462	1663.5	0.5	0.715	2574.0	0.3
0.40	0.212	764.5	1.0	0.322	1158.1	0.8	0.528	1901.2	0.6	0.817	2941.7	0.4
0.45	0.239	860.1	1.3	0.362	1302.9	1.0	0.594	2138.8	0.7	0.919	3309.4	0.5
0.50	0.265	955.7	1.5	0.402	1447.6	1.2	0.660	2376.5	0.8	1.021	3677.1	0.6
0.55	0.292	1051.2	1.8	0.442	1592.4	1.4	0.726	2614.1	1.0	1.124	4044.8	0.8
0.60	0.319	1146.8	2.1	0.483	1737.2	1.6	0.792	2851.7	1.2	1.226	4412.5	0.9
0.65	0.345	1242.4	2.4	0.523	1881.9	1.8	0.858	3089.4	1.3	1.328	4780.2	1.0
0.70	0.372	1337.9	2.7	0.563	2026.7	2.1	0.924	3327.0	1.5	1.430	5147.9	1.2
0.75	0.398	1433.5	3.1	0.603	2171.5	2.4	0.990	3564.7	1.7	1.532	5515.6	1.3
0.80	0.425	1529.1	3.4	0.643	2316.2	2.6	1.056	3802.3	1.9	1.634	5883.3	1.5
0.85	0.451	1624.6	3.8	0.684	2461.0	2.9	1.122	4040.0	2.2	1.736	6251.0	1.7
0.90	0.478	1720.2	4.2	0.724	2605.8	3.3	1.188	4277.6	2.4	1.839	6618.7	1.8
0.95	0.504	1815.8	4.7	0.764	2750.5	3.6	1.254	4515.3	2.6	1.941	6986.4	2.0
1.00	0.531	1911.3	5.1	0.804	2895.3	3.9	1.320	4752.9	2.9	2.043	7354.2	2.2
1.05	0.557	2006.9	5.6	0.844	3040.1	4.3	1.386	4990.6	3.2	2.145	7721.9	2.4
1.20	0.637	2293.6	7.0	0.965	3474.4	5.4	1.584	5703.5	4.0	2.451	8825.0	3.1
1.30	0.690	2484.7	8.1	1.046	3763.9	6.3	1.716	6178.8	4.6	2.656	9560.4	3.5
1.43	0.761	2739.6	9.7	1.153	4149.9	7.5	1.892	6812.5	5.5	2.928	10541.0	4.2
1.50	0.796	2867.0	10.5	1.206	4342.9	8.1	1.980	7129.4	6.0	3.064	11031.2	4.6
1.60	0.849	3058.2	11.8	1.287	4632.5	9.1	2.112	7604.7	6.7	3.269	11766.6	5.1
1.70	0.903	3249.3	13.1	1.367	4922.0	10.1	2.244	8080.0	7.5	3.473	12502.1	5.7
1.80	0.956	3440.4	14.5	1.448	5211.5	11.2	2.376	8555.2	8.3	3.677	13237.5	6.3
1.90	1.009	3631.6	16.0	1.528	5501.1	12.4	2.508	9030.5	9.1	3.881	13972.9	7.0
2.00	1.062	3822.7	17.6	1.608	5790.6	13.6	2.641	9505.8	10.0	4.086	14708.3	7.7
2.10	1.115	4013.8	19.2	1.689	6080.1	14.8	2.773	9981.1	11.0	4.290	15443.7	8.4
2.20	1.168	4205.0	20.8	1.769	6369.6	16.1	2.905	10456.4	11.9	4.494	16179.1	9.1
2.30	1.221	4396.1	22.6	1.850	6659.2	17.5	3.037	10931.7	12.9	4.698	16914.6	9.9
2.40	1.274	4587.2	24.4	1.930	6948.7	18.9	3.169	11407.0	13.9	4.903	17650.0	10.7
2.50	1.327	4778.4	26.3	2.011	7238.2	20.3	3.301	11882.3	15.0	5.107	18385.4	11.5
2.60	1.380	4969.5	28.2	2.091	7527.8	21.8	3.433	12357.6	16.1	5.311	19120.8	12.4
2.70	1.434	5160.6	30.2	2.171	7817.3	23.4	3.565	12832.9	17.3	5.516	19856.2	13.2
2.80	1.487	5351.8	32.2	2.252	8106.8	25.0	3.697	13308.2	18.5	5.720	20591.6	14.2
2.90	1.540	5542.9	34.4	2.332	8396.3	26.6	3.829	13783.5	19.7	5.924	21327.0	15.1
3.00	1.593	5734.0	36.5	2.413	8685.9	28.3	3.961	14258.7	20.9	6.128	22062.5	16.0
3.60	1.911	6880.8	50.9	2.895	10423.1	39.5	4.753	17110.5	29.2	7.354	26475.0	22.4
4.00	2.124	7645.4	61.7	3.217	11581.2	47.9	5.281	19011.7	35.4	8.171	29416.6	27.2
4.60	2.442	8792.2	79.8	3.700	13318.3	61.9	6.073	21863.4	45.8	9.397	33829.1	35.2
5.00	2.655	9556.7	93.0	4.021	14476.5	72.2	6.601	23764.6	53.4	10.214	36770.8	41.0

Pressure loss tables for the heating installation – Dimensions 16/20/25 mm

TECElogo composite pipes – Pressure loss due to pipe friction in the heating installation										
Connection capacity (W)				Mass flux	Dim. 16		Dim. 20		Dim. 25	
					v	R	v	R	v	R
Spread (K)						hPa/m		hPa/m		hPa/m
20 K	15 K	10 K	5 K	kg/h	m/s	mbar/m	m/s	mbar/m	m/s	mbar/m
200	150	100	50	8.60	0.02	0.06				
300	225	150	75	12.90	0.03	0.09				
400	300	200	100	17.20	0.04	0.12				
600	450	300	150	25.80	0.06	0.18				
800	600	400	200	34.39	0.08	0.25				
1000	750	500	250	42.99	0.11	0.31				
1200	900	600	300	51.59	0.13	0.37				
1400	1050	700	350	60.19	0.15	0.43				
1600	1200	800	400	68.79	0.17	0.49				
1800	1350	900	450	77.39	0.19	0.55				
2000	1500	1000	500	85.98	0.21	0.61	0.13	0.22		
2300	1725	1150	575	98.88	0.24	0.71	0.15	0.25		
2800	2100	1400	700	120.38	0.30	1.65	0.18	0.31		
3000	2250	1500	750	128.98	0.32	1.86	0.19	0.33		
3500	2625	1750	875	150.47	0.37	2.42	0.22	0.72		
4000	3000	2000	1000	171.97	0.42	3.04	0.25	0.91	0.15	0.27
4500	3375	2250	1125	193.47	0.48	3.72	0.28	1.11	0.17	0.33
5000	3750	2500	1250	214.96	0.53	4.46	0.32	1.33	0.19	0.40
5500	4125	2750	1375	236.46	0.58	5.26	0.35	1.56	0.21	0.47
6000	4500	3000	1500	257.95	0.63	6.11	0.38	1.82	0.23	0.55
6500	4875	3250	1625	279.45	0.69	7.02	0.41	2.08	0.25	0.63
7000	5250	3500	1750	300.95	0.74	7.98	0.44	2.37	0.27	0.71
7500	5625	3750	1875	322.44	0.79	9.00	0.47	2.67	0.29	0.80
8000	6000	4000	2000	343.94	0.85	10.07	0.51	2.98	0.30	0.89
8500	6375	4250	2125	365.43	0.90	11.20	0.54	3.31	0.32	0.99
9000	6750	4500	2250	386.93	0.95	12.37	0.57	3.66	0.34	1.09
9500	7125	4750	2375	408.43	1.00	13.60	0.60	4.02	0.36	1.20
10000	7500	5000	2500	429.92			0.63	4.39	0.38	1.31
10500	7875	5250	2625	451.42			0.66	4.78	0.40	1.42
11000	8250	5500	2750	472.91			0.70	5.18	0.42	1.54
11500	8625	5750	2875	494.41			0.73	5.60	0.44	1.67
12500	9375	6250	3125	537.40			0.79	6.48	0.48	1.93
13000	9750	6500	3250	558.90			0.82	6.94	0.49	2.06
14000	10500	7000	3500	601.89			0.89	7.90	0.53	2.35
15000	11250	7500	3750	644.88					0.57	2.65
16000	12000	8000	4000	687.88					0.61	2.96
17000	12750	8500	4250	730.87					0.65	3.29
18000	13500	9000	4500	773.86					0.68	3.64
19000	14250	9500	4750	816.85					0.72	4.00
20000	15000	10000	5000	859.85					0.76	4.37
22000	16500	11000	5500	945.83					0.84	5.17

Pressure loss tables for the heating installation – Dimensions 32/40/50/63 mm (part 1)

TECElogo composite pipes – Pressure loss due to pipe friction in the heating installation												
Connection capacity (W)				Mass flux	Dim. 32		Dim. 40		Dim. 50		Dim. 63	
					v	R	v	R	v	R	v	R
Spread (K)						hPa/m		hPa/m		hPa/m		hPa/m
20 K	15 K	10 K	5 K	kg/h	m/s	mbar/m	m/s	mbar/m	m/s	mbar/m	m/s	mbar/m
7000	5250	3500	1750	300.95	0.18	0.30						
7500	5625	3750	1875	322.44	0.20	0.34						
8000	6000	4000	2000	343.94	0.21	0.38						
8500	6375	4250	2125	365.43	0.22	0.42						
9000	6750	4500	2250	386.93	0.24	0.46						
9500	7125	4750	2375	408.43	0.25	0.51						
10000	7500	5000	2500	429.92	0.26	0.55						
10500	7875	5250	2625	451.42	0.28	0.60						
11000	8250	5500	2750	472.91	0.29	0.65	0.16	0.17				
11500	8625	5750	2875	494.41	0.30	0.70	0.17	0.18				
12500	9375	6250	3125	537.40	0.33	0.81	0.19	0.21				
13000	9750	6500	3250	558.90	0.34	0.87	0.19	0.22				
14000	10500	7000	3500	601.89	0.37	0.99	0.21	0.25				
15000	11250	7500	3750	644.88	0.40	1.11	0.22	0.28				
16000	12000	8000	4000	687.88	0.42	1.24	0.24	0.32				
17000	12750	8500	4250	730.87	0.45	1.38	0.25	0.35				
18000	13500	9000	4500	773.86	0.48	1.53	0.27	0.39				
19000	14250	9500	4750	816.85	0.50	1.68	0.28	0.43				
20000	15000	10000	5000	859.85	0.53	1.84	0.30	0.47				
22000	16500	11000	5500	945.83	0.58	2.17	0.33	0.55				
24000	18000	12000	6000	1031.81	0.63	2.52	0.36	0.64				
26000	19500	13000	6500	1117.80	0.69	2.90	0.39	0.74				
28000	21000	14000	7000	1203.78	0.74	3.31	0.42	0.84				
30000	22500	15000	7500	1289.77	0.79	3.73	0.45	0.95	0.27	0.29		
32000	24000	16000	8000	1375.75	0.85	4.19	0.48	1.06	0.29	0.33		
34000	25500	17000	8500	1461.74	0.90	4.66	0.51	1.18	0.31	0.36		
36000	27000	18000	9000	1547.72	0.95	5.15	0.53	1.30	0.33	0.40		
38000	28500	19000	9500	1633.71	1.00	5.67	0.56	1.43	0.34	0.44		
40000	30000	20000	10000	1719.69			0.59	1.57	0.36	0.48		
42000	31500	21000	10500	1805.67			0.62	1.71	0.38	0.52		
44000	33000	22000	11000	1891.66			0.65	1.85	0.40	0.57		
46000	34500	23000	11500	1977.64			0.68	2.01	0.42	0.62		
48000	36000	24000	12000	2063.63			0.71	2.16	0.43	0.66	0.28	0.23
50000	37500	25000	12500	2149.61			0.74	2.32	0.45	0.71	0.29	0.25
52000	39000	26000	13000	2235.60			0.77	2.49	0.47	0.76	0.30	0.27
54000	40500	27000	13500	2321.58			0.80	2.66	0.49	0.81	0.32	0.29
56000	42000	28000	14000	2407.57			0.83	2.84	0.51	0.87	0.33	0.31
58000	43500	29000	14500	2493.55			0.86	3.02	0.52	0.92	0.34	0.33
60000	45000	30000	15000	2579.54			0.89	3.21	0.54	0.98	0.35	0.35
62000	46500	31000	15500	2665.52			0.92	3.40	0.56	1.04	0.36	0.37
64000	48000	32000	16000	2751.50			0.95	3.60	0.58	1.10	0.37	0.39
66000	49500	33000	16500	2837.49			0.98	3.80	0.60	1.16	0.39	0.41
68000	51000	34000	17000	2923.47			1.01	4.00	0.62	1.22	0.40	0.43
70000	52500	35000	17500	3009.46			1.04	4.22	0.63	1.29	0.41	0.45
72000	54000	36000	18000	3095.44			1.07	4.43	0.65	1.35	0.42	0.48
76000	57000	38000	19000	3267.41					0.69	1.49	0.44	0.52
80000	60000	40000	20000	3439.38					0.72	1.63	0.47	0.57
84000	63000	42000	21000	3611.35					0.76	1.78	0.49	0.63
88000	66000	44000	22000	3783.32					0.80	1.93	0.51	0.68
92000	69000	46000	23000	3955.29					0.83	2.09	0.54	0.73
96000	72000	48000	24000	4127.26					0.87	2.25	0.56	0.79
100000	75000	50000	25000	4299.23					0.90	2.42	0.58	0.85
104000	78000	52000	26000	4471.20					0.94	2.59	0.61	0.91
108000	81000	54000	27000	4643.16					0.98	2.77	0.63	0.98
112000	84000	56000	28000	4815.13					1.01	2.96	0.65	1.04
116000	87000	58000	29000	4987.10					1.05	3.15	0.68	1.11
120000	90000	60000	30000	5159.07					1.09	3.35	0.70	1.18

Pressure loss tables for the heating installation – Dimensions 32/40/50/63 mm (part 2)

TECElogo composite pipes – Pressure loss due to pipe friction in the heating installation												
Connection capacity (W)				Mass flux	Dim. 32		Dim. 40		Dim. 50		Dim. 63	
					v	R	v	R	v	R	v	R
Spread (K)						hPa/m		hPa/m		hPa/m		hPa/m
20 K	15 K	10 K	5 K	kg/h	m/s	mbar/m	m/s	mbar/m	m/s	mbar/m	m/s	mbar/m
124000	93000	62000	31000	5331.04							0.73	1.25
128000	96000	64000	32000	5503.01							0.75	1.32
132000	99000	66000	33000	5674.98							0.77	1.39
136000	102000	68000	34000	5846.95							0.80	1.47
140000	105000	70000	35000	6018.92							0.82	1.55
144000	108000	72000	36000	6190.89							0.84	1.63
148000	111000	74000	37000	6362.85							0.87	1.71
152000	114000	76000	38000	6534.82							0.89	1.79
156000	117000	78000	39000	6706.79							0.91	1.87
160000	120000	80000	40000	6878.76							0.94	1.96
164000	123000	82000	41000	7050.73							0.96	2.05
168000	126000	84000	42000	7222.70							0.98	2.14
172000	129000	86000	43000	7394.67							1.01	2.23
176000	132000	88000	44000	7566.64							1.03	2.33
180000	135000	90000	45000	7738.61							1.05	2.42
184000	138000	92000	46000	7910.58							1.08	2.52
188000	141000	94000	47000	8082.55							1.10	2.62
192000	144000	96000	48000	8254.51							1.12	2.72
196000	147000	98000	49000	8426.48							1.15	2.82
200000	150000	100000	50000	8598.45							1.17	2.92

Rinsing potable water systems

Provided that it is ensured during assembly that no impurities are introduced into the pipe installation, thorough flushing of the TECElogo pipes is sufficient.

Pressure test of potable water systems

The successful performance and documentation of a pressure test is a prerequisite for any claims under the TECE warranty.
For drinking water installations, a pressure test must be carried out in accordance with DIN EN 806-4. Before the pressure test is performed it should be ensured that all components in the installation are freely accessible and visible in order to be able to localise incorrectly installed fittings. If the pipe system remains unfilled following a pressure test (e.g. because a regular water replacement cannot be guaranteed at the latest after 72 hours), it is recommended that a pressure test be performed using compressed air or inert gases.
Regardless of the test medium, statements about the tightness of the system cannot be derived from the test pressure curve alone. In addition, the tightness of the system must be checked by a visual inspection of uncovered pipes. For this purpose, a visual inspection, supported by leak detection agents if necessary, should be carried out to locate fine leaks.

Use of leak detectors

Only use leak detectors (e.g. foam building agents) with a current DVGW certification that are also approved by their respective manufacturers for use with the material PPSU, polyamide and polyketone.

Please note:

For hygiene reasons, TECE recommends carrying out a leak test with oil-free compressed air or inert gas in a leak test with potable water.

Heating systems

A heating installation must be rinsed thoroughly prior to commissioning to remove metallic residues or liquids. The leak test is carried out the same way as the leak test for potable water installations. However, here the test pressure must be 1.3 x the operating pressure.

Documentation

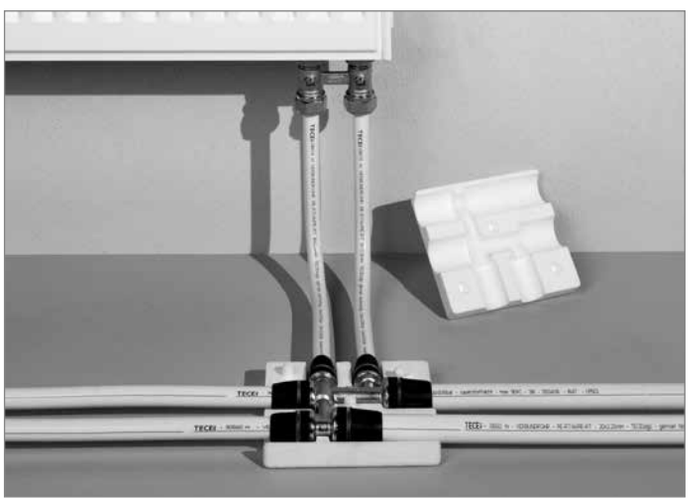
The inspections must be documented in a suitable manner and, if necessary, in accordance with local guidelines and laws.

Radiator connection

The TECElogo system offers a comprehensive range of fittings for efficient radiator connection for the most common building site situations.

Cross-fitting

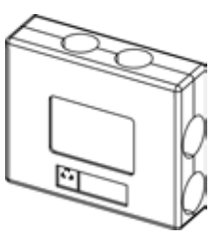
The cross-fitting allows the splitting of the flow and return lines from two main lines running parallel to one another. The installation height of the fittings with insulation box is just 35 mm.



Radiator connection with cross-fitting

The use of cross-fittings not only saves assembly time but also negates the risk of damage to crossed pipes from wheelbarrows, crushings or similar.

Cross-fitting
(item no. 874 01 01/...02/...03)



Protective box
(item no. 874 01 00)

Connection from the floor

Radiators can be connected directly from the screed with the TECElogo composite pipe. The length extension of the pipe must be compensated to avoid “popping sounds”. The pipes should therefore be equipped with an insulating tubing of at least 6 mm thick.

It is also recommended that a protective cuff be placed around the visible parts of the pipe. This avoids damage to the pipes e.g. via vacuuming.
TECElogo composite pipes must be guided from the screed with the help of a pipe bend guide.

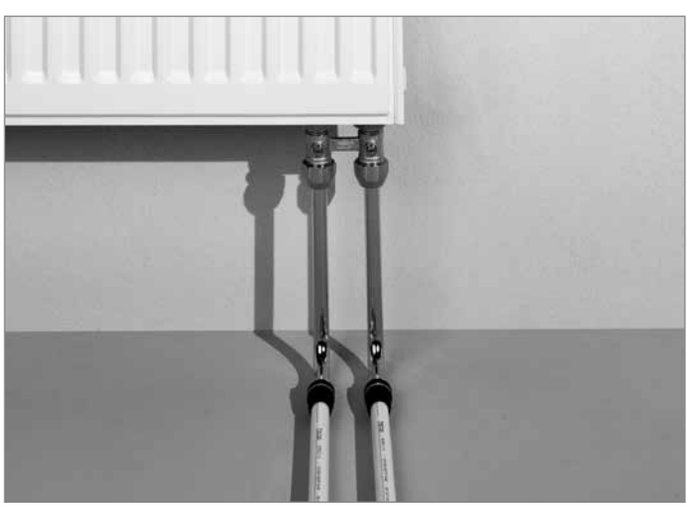
Radiator connection with mounting tees/elbows

The TECElogo range offers assembly tees made of nickel-plated copper for more demanding requirements. The elbow shape means a radiator can be connected using flow and return lines running parallel to one another.

Radiator connection with radiator mounting tee

The nickel-plated copper pipes are connected to the radiator valve block via a pinch screw connection.

Alternatively, if the flow and return lines do not run along the bottom of the radiator, the radiator mounting elbows made of nickel-plated copper can be used.



Radiator connection with radiator mounting elbow

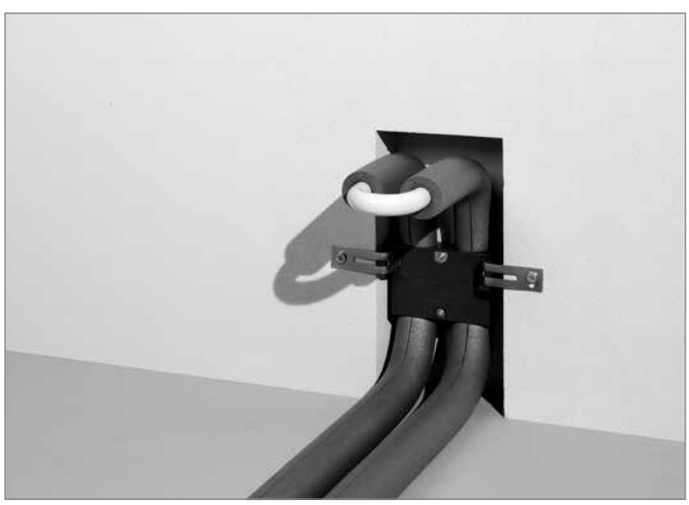
Connection from the wall

The special bending properties of the TECElogo composite pipe make it possible to connect the radiator directly from the wall. The chase in the wall must be able to accommodate the minimum bending radii of TECElogo pipes.

Radiator connection from the wall

Connection from the wall with mounting module

The radiator mounting module can be equipped with pre-insulated pipes for optimum connection from the wall. A further feature is the especially tight radii of the TECElogo pipes.

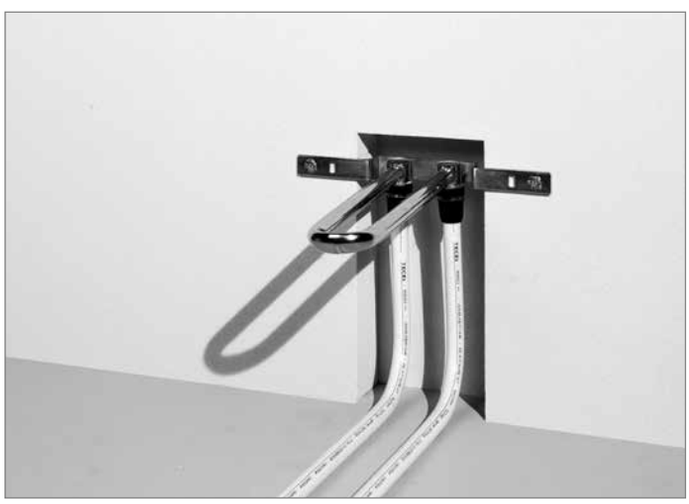


Radiator connection with mounting module - ready for pressure test

Radiator connection with mounting module - connected to the valve block

Radiator connection using the radiator mounting fitting for compact radiators from the wall

The radiator mounting fitting is equipped with sturdy fastening clips for secure fixing in the wall chase. TECElogo connection technology lets you connect pipes directly in the wall chase.



Radiator connection with radiator mounting unit, wall-mounting - ready for pressure test

Radiator connection with radiator mounting unit, wall-mounting - connected to the valve block

The connection between flow and return allows the heating system to be pressure tested without a construction plug. To assemble the radiator, the U-pipe is suitably shortened and connected to the valve block via a pinch screw connection.

Alternatively, a radiator mounting fitting is available on the floor. It is also equipped with a U-pipe and allows you to perform a pressure test without assembly plugs.

Radiator connection with radiator mounting unit, floor-mounting - ready for pressure test

Radiator connection with radiator mounting unit, floor-mounting - connected to the valve block

Annex

Resistance list PPSU

Brand name	Date	Concentration	Manufacturer	Use
Cooling lubricants				
Castrol nonol cooling lubricant		100%	Castrol	Not permitted
Rocol RTD		100%		Not permitted
Cooling lubricant M200 No. 1	June 2009	100%		Not permitted
Disinfection agents				
FINKTEC FT-99 CIP		6%	Finktec GmbH	Not permitted
Mikro Quat		100%	Ecolab	Not permitted
Mikrobac forte		1%, 23 °C	Bode Chemie	Permitted
Hydrogen peroxide		35%, 23 °C		Permitted
Potassium permanganate KMnO4		15 mg/l, 23 °C		Permitted
Sodium hypochlorite NaOCl		> 6%, 23 °C		Permitted
Calcium hypochlorite Ca(ClO)2		50 mg/l, 23 °C		Permitted
Chlorine dioxide ClO2		6 mg/l, 23 °C		Permitted
Aniosteril D2M	June 2009	5%	Laboratoires Anios	Permitted
Aniosteril Contact	June 2009	1%	Laboratoires Anios	Permitted
Witty W4		2%, 23 °C, 4 h		Permitted
Descaler				
DS-40		4%		Not permitted
Boiler noise protection		0.20%		Permitted
Calcolith DP		10%, 40 °C, 24 h		Permitted
Calcolith TIN-BE		5%, 80 °C, 24 h		Permitted
Household descalers (quick descalers)		20%		Permitted
LS1		0.60%		Permitted
MB1		4%		Permitted
Super Concentrate		0.20%		Permitted
Superfloc		2%		Permitted
Cleaning agents				
Arkopal 110		5%	Hoescht	Not permitted
ANTIKAL		100%	P & G	Not permitted
BREF - For The Bathroom		100%	Henkel	Permitted
BREF - Fresh Shower		100%	Henkel	Permitted
CAROLIN - gloss cleaner		1.80%	Boltom Belgium	Permitted
CAROLIN - aktive fresh		1.90%	Boltom Belgium	Permitted
CAROLIN - with linseed oil		1.90%	Boltom Belgium	Permitted
CAROLIN - Marseille soap		1.80%	Boltom Belgium	Permitted
Meister Proper - lemon		3.40%	P & G	Not permitted
Meister Proper - Extra Hygiene		3.50%	P & G	Permitted
Meister Proper - sensitive surfaces		2.40%	P & G	Not permitted
Meister Proper - orange peel		3.40%	P & G	Not permitted
Meister Proper - winter fresh		3.40%	P & G	Not permitted
TERRA - stone floors		12%	Henkel	Permitted
TERRA - parquet		3.20%	Henkel	Permitted
TERRA - high gloss floors	June 2009	100%	Henkel	Permitted
Seals				

Brand name	Date	Concentration	Manufacturer	Use
Cimberio Loxeal 58 11 PTFE thread sealant		100%		Not permitted
Dreibond 5331		100%, 23 °C	Dreibond	Not permitted
EPDM rubber O-ring		100%	Join de France	Permitted
Easyfit (Griffon)	June 2009	100%	Bison International	Not permitted
Everseal pipe thread sealant		100%, 82 °C	Federal Process Corp.	Not permitted
FACOT PTFE SEAL (PTFE sealant)		100%		Not permitted
Filjoint	June 2009	100%	GEB	Not permitted
FILETPLAST EAU POTABLE	June 2009	100%	GEB	Permitted
GEBATOUT 2	June 2009	100%	GEB	Permitted
GEBETANCHE 82 (EX-GEB)	June 2009	100%	GEB	Not permitted
Griffon assembly kit		100%	Verhagen-Herlitzius BV.	Permitted
Kolmat jointpaste (- 30 up to + 135 °C)		100%	Denso	Permitted
Locher Paste Spezial		100%	Locher & Co AG	Permitted
Loctite 5061		100%	Loctite	Permitted
Loctite 518 seal eliminator		100%, 82 °C	Loctite	Not permitted
Loctite 5331	June 2009	100%	Loctite	Permitted
Loctite 5366 silicomet AS-310		100%	Loctite	Permitted
Loctite 542		100%, 23 °C	Loctite	Not permitted
Loctite 55	June 2009	100%	Loctite	Not permitted
Loctite 572 thread sealant	June 2009	100%, 60 °C	Loctite	Not permitted
Loctite 577		100%, 23 °C	Loctite	Not permitted
Loctite Dryseal	Sep. 2008	100%	Loctite	Permitted
Manta Tape		100%		Permitted
Multipak		100%		Permitted
Neo-Fermit		100%	Nissen & Volk	Permitted
Neo-Fermit Universal 2000		100%	Nissen & Volk	Permitted
Plastic Fermit - sealant		100%	Nissen & Volk	Permitted
Precote 4		100%	Omnifit	Not permitted
Precote 80		100%	Omnifit	Not permitted
RectorSeal # 5		100%, 82 °C	RectorSeal Corp.	Not permitted
Red Silicone Sealant (- 65 up to + 315 °C) Silicone sealant		100%	Loctite	Permitted
Rite-Lok		100%	Chemence	Not permitted
Scotch-Grip Rubber & Seal Adhesive # 1300		100%, 82 °C	3M	Not permitted
Scotch-Grip Rubber & Seal Adhesive # 2141		100%, 82 °C	3M	Not permitted
Scotch-Grip Rubber & Seal Adhesive # 847		100%, 82 °C	3M	Not permitted
Selet Unyte		100%, 82 °C	Whitman	Not permitted
Tangit metalock	Apr. 2007	100%	Henkel	Not permitted
Tangit Racoretanche	June 2009	100%	Loctite	Permitted
Tangit Unilock	June 2009	100%	Henkel	Not permitted
TWINEFLO (PTFE band) + processing medium		100%	Resitape / Ulith	Permitted
Twineflon	March 2009	100%	Unith	Permitted
Unipack	May 2006	100%		Not permitted
Unipack Packsalve		100%		Permitted
Viscotex Locher Paste 2000		100%		Permitted
Adhesive				

Brand name	Date	Concentration	Manufacturer	Use
Atmosfix	July 2009	100%	Atmos	Not permitted
ARMAFLEX 520 ADHESIVE	Dec. 2008	100%, 50 °C		Not permitted
ARMAFLEX HT 625	Dec. 2009	100%, 50 °C		Not permitted
BISON SILIKONENKIT SANITAIR		100%		Permitted
Bison-Tix contact adhesive		100%, 23 °C	Perfecta International	Not permitted
CFS SILICONE SEALANT S-200 silicone sealant)		100%		Permitted
Colle Mastic hautes Performances	June 2009	100%	Orapi	Permitted
Epoxy ST100	July 2007	100%		Not permitted
GENKEM CONTACT ADHESIVE		100%		Not permitted
GOLD CIRCLE SILICONEKIT BOUW TRANSPARENT		100%		Permitted
Knauf Sanitär Silicone Kit		100%		Permitted
Knauf Silicone Kit for Acrylic	July 2009	100%	Henkel	Permitted
Pattex colle rigide PVC		100%		Not permitted
PEKAY GB480 (Vidoglue) adhesive		100%		Not permitted
PEKAY GB685 (Insulglue) adhesive		100%		Permitted
Repa R 200		100%		Permitted
RUBSON SILIKON SANITÄR TRANSPARENT SET		100%	Rubson	Permitted
RUBSON SILIKON SANITÄR TRANSPARENT SET		100%	Rubson	Permitted
Hydrophobic wood glue		100%		Permitted
Foams				
BISON PUR FOAM	March 2009	100%		Not permitted
Boxer Mounting Foam	Feb 2007	100%		Not permitted
Gunfoam - Winter - Den Braven East sp. z o.o.	Feb 2007	100%		Not permitted
Gunfoam Proby	Feb 2007	100%		Not permitted
Hercusal	Feb 2007	100%		Not permitted
MODIPUR HS 539	July 2009	100%	Wickes	Not permitted
MODIPUR US 24 TEIL 2	July 2009	100%		Not permitted
MODIPUR HS 539 / US 24 TEIL 2 (1/1)	July 2009	100%		Not permitted
PUR Foam (contains diphenylmethane-4,4-diisocyanate)		100%		Not permitted
O.K. - 1 K PUR		100%		Not permitted
Omega Faum - foam	Feb 2007	100%		Not permitted
Proby Mounting Foam	Feb 2007	100%		Not permitted
PURATEC - 1 K PUR		100%		Not permitted
PURATEC - 2 K PUR		100%		Not permitted
Ramsauer PU foam	July 2009	100%		Not permitted
Shaft and Well Foam Klima plus		100%		Not permitted
Soudal Mounting Foam for low temperatures	Feb 2007	100%		Not permitted
SOUDAL Gun Foam Soudalfoam -10	Feb 2007	100%		Not permitted
SOUDAL PU foam	July 2009	100%		Not permitted
Door mounting foam 2-K Klima plus		100%		Permitted
TYTAN Professional Gun Foam Winter	Feb 2007	100%		Not permitted
TYTAN Professional for PCV gun foam	Feb 2007	100%		Not permitted
TYTAN Professional Lexy 60 low-pressure	Feb 2007	100%		Not permitted
TYTAN Euro-Line Mounting Foam	Feb 2007	100%		Not permitted
TYTAN Professional for PCV mounting foam	Feb 2007	100%		Not permitted
ZIMOWA SUPER PLUS - (mounting foam)	Feb 2007	100%		Not permitted

Brand name	Date	Concentration	Manufacturer	Use
Greases				
BAYSILONE OIL M 1000		100%		Permitted
BECHEM BERUSOFT 30		100%	bechem	Permitted
Bechem Berulube Sihaf 2	May 2008	100%	bechem	Permitted
Dansoll Silec Blue Silicone Spray		100%	dansoll	Permitted
Dansoll Super Silec Sanitär mounting paste		100%	dansoll	Permitted
Huile de chenevis		100%		Permitted
Kluber Proba 270		100%	Kluber	Permitted
Kluber Paralig GTE 703		100%, 80 °C, 96 h	Kluber	Permitted
Kluber Syntheso glep1		100%, 135 °C, 120 h	Kluber	Not permitted
KLÜBERSYNTH VR 69-252		100%	Kluber	Permitted
Kluber Unislikikone L641		100%	Kluber	Permitted
Kluber Unislikikone TKM 1012		100%, 80 °C, 96 h	Kluber	Permitted
OKS 462 / 0956409		100%	Kluber	Permitted
OKS 477 VALVE GREASE		100%	Kluber	Permitted
Laureat Zloty Installator		100%		Permitted
Luga Spray (Leif Koch)		100%	Leif Koch	Permitted
Rhodorsil 47 V 1000		100%, 80 °C, 96 h		Permitted
SiliKon Spray (Motip)		100%	Motip	Permitted
silicona lubricante SDP ref S-255		100%		Permitted
Silicone oil M 10 - M 100000		100%		Permitted
Silicone oil M 5		100%		Permitted
Turmisilon GL 320 1-2		100%		Permitted
UNISILIKON L250L	June 2008	100%		Permitted
Wacker silicone		50%, 95 °C, 96 h	Wacker	Not permitted
Metals				
Copper ions (Cu 2+)		50 ppm		Permitted
Solder flux S 39	June 2009	100%		Permitted
Solder flux S 65	July 2009	100%		Not permitted
YORKSHIRE FLUX		100%		Not permitted
Degussa Degufit 3000		100%	Degussa	Permitted
Aluminium ions (Al 3+)		50 ppm		Permitted
Atmosflux	July 2008	100%		Permitted
Paint				
Sigma Superprimer TI		100%	Sigma Coatings	Permitted
Sigma Amarol		100%	Sigma Coatings	Permitted
Decalux		100%	De Keyn Paint	Permitted
Permaline		100%	ITI-Trimetal	Permitted
Silvatane		100%	ITI-Trimetal	Permitted
DULUX water-based high-gloss paint		100%	ICI	Not permitted
DULUX water-based silky gloss paint, satin		100%	ICI	Not permitted
DULUX for microporous wood, silky gloss		100%	ICI	Permitted
DULUX floor paint, very tough, silky gloss		100%	ICI	Permitted

Brand name	Date	Concentration	Manufacturer	Use
DULUX metal paint, anti-corrosive, high gloss		100%	ICI	Permitted
Hammerite white, silky gloss		100%	ICI	Permitted
Hammerrite white, high gloss, based on Xyleen		100%	ICI	Not permitted
Hammerite silver-grey high gloss, based on Xyleen		100%	ICI	Permitted
Boss Satin		100%	BOSSPAINTS	Permitted
Hydrosatin Interior		100%	BOSSPAINTS	Permitted
Carat		100%	BOSSPAINTS	Permitted
Bolatex		100%	BOSSPAINTS	Permitted
Optiprim		100%	BOSSPAINTS	Permitted
Elastoprim		100%	BOSSPAINTS	Permitted
Plastiprop		100%	BOSSPAINTS	Not permitted
Formule MC		100%	BOSSPAINTS	Not permitted
MAPEGRUNT		100%	Mapei	Permitted
DULUX PRIMER		100%	ICI	Permitted
UNI-GRUNT		100%	Atlas	Permitted
Wall filler and construction products				
Bituperl (insulating filler with bitumen)		100%		Permitted
Insulating coat with bitumen		100%		Permitted
Cold adhesive for bitumen paper		100%		Permitted
Climacoll adhesive for pipe insulation foam		100%		Not permitted
Compactuna		6%		Permitted
FERROCLEAN 9390	Feb 2008	100%		Permitted
FT-extra		100%		Permitted
Giso base primer		100%		Not permitted
KNAUF STUC PRIMER	July 2009	100%		Permitted
Mellerud mould killer		100%		Permitted
Mineral wool insulation with blocking layer against metal vapour	July 2007	100%		Not permitted
Nivoperl (insulating filler)		100%		Permitted
PCI LASTOGUM	Feb 2008	100%		Permitted
PCI Seccoral 1K	Feb 2008	100%		Permitted
Perfax Rebouche tout	July 2009	100%		Permitted
PE pipe insulation foam		100%		Permitted
Polyfilla inner wall filler		100%	Polyfilla	Permitted
Porion immediate trowel		100%	Henkel	Permitted
Porion mortar for repairs		100%	Henkel	Not permitted
Portland Cement - cement		100%	CBR	Permitted
RIKOMBI KONTAKT (RIGIPS)		100%		Permitted
Self-adhesive insulation PE foam (wrapping tape)		100%		Not permitted
SOPRO FDH 525 (liquid foil)	Sep. 2008	100%		Permitted
Stucal Putz		100%	Gyproc	Permitted
TANGIT REINIGER	July 2007	100%		Not permitted
TANGIT special cleaner	July 2007	100%		Permitted
Tile adhesive		100%		Permitted
Universal primer		100%		Permitted
Wood-concrete Multiplex Bruynzeel (moisture from...)		100%		Not permitted
Wood pint (moisture from...)		100%		Not permitted

Brand name	Date	Concentration	Manufacturer	Use
Wood MDF medium density fibreboard (moisture from...)		100%		Not permitted
Wood Multiplex sealed watertight (moisture from...)		100%		Not permitted
Anti-Termite				
Aripyreth Oil Solution		100%, 23 °C		Permitted
Baktop MC		100%, 23 °C		Permitted
Ecolofen CW		100%, 23 °C		Permitted
Ecolofen Emulsificable Concentrate - emulsifiable concentrate		100%, 23 °C		Permitted
Ecolofen Oil Solution - oil solution		100%, 23 °C		Permitted
Grenade MC		100%, 23 °C		Permitted
Hachikusan 20WE/AC		100%, 23 °C		Permitted
Hachikusan FL		100%, 23 °C		Permitted
Kareit Oil Solution - oil solution		100%		Permitted
Rarap MC		100%, 23 °C		Permitted
Corrosion inhibitors				
BAYROFILM T 185		0.30%		Permitted
Copal corrosion inhibitor	April 2007	100%		Permitted
KAN-THERM	Sep. 2008	100%		Permitted
INIBAL PLUS	Sep. 2008	100%		Permitted
NALCO VARIDOS 1PLUS1	Jan 2009	2%, 23 & 95 °C		Permitted
Gas leak sprays				
LIQUI MOLY leak seeker spray		100%, 23 °C		Permitted
Multitek gas leak spray		100%		Not permitted
Sherlock gas leak detector		100%		Permitted
Ulith leak detector spray	Sep. 2008	100%		Permitted
LEAK TRACE SPRAY 400ML (PART 3350)	Jan 2009	100%, 23 °C & 95 °C		Permitted
LEAK TRACE SPRAY 400ML (PART 1809)	Jan 2009	100%, 23 °C & 95 °C		Permitted
LEAK TRACE PLUS (PART 890-27)	Jan 2009	100%, 23 °C & 95 °C		Permitted
LEAK TRACE 400 ML (PART 890-20)	Jan 2009	100%, 23 °C & 95 °C		Permitted
LEAK TRACE SPRAY ROTEST	Jan 2009	100%, 23 °C & 95 °C		Permitted
GUPOFLEX LEAK-SEEKER (ART 301) leak seeker	Jan 2009	100%, 23 °C & 95 °C		Permitted
LEAK TRACE 5 L (PART 4120)	Jan 2009	100%, 23 °C & 95 °C		Permitted
GUEPO LEAK-SEEKER ETL (ART 121) leak seeker	Jan 2009	100%, 23 °C & 95 °C		Permitted
GUEPO LEAK-SEEKER SOAPLESS (ART 131) soapless leak seeker	Jan 2009	100%, 23 °C & 95 °C		Permitted
GASLEAK DETECTOR (GRIFFON)	June 2009	100%, 60 °C		Permitted
GASLEAK DETECTOR KZ gas leak detector	June 2009	100%, 60 °C		Permitted

The information in this table has been compiled to the best of our knowledge and is intended as general information. The results in the table show typical average values from a representative number of individual measurement results. These values should in no way be seen as specifications. Furthermore, TECE assumes no responsibility for the use of products not contained in this list.

Annex