STEEL FIX®

simple – robust – superior

KE KELIT®
INNOVATIVE PIPE SYSTEMS

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Metal Pipe Systems

simple – robust – superior

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Contents

Note:
Please consult this handbook for installation rules, specifically in regard to the joining technology, before using STEELFIX for the first time.

Index of Abbreviations

In STEELFIX-specific documents, we use the common abbreviations below.

Abbreviation	Designation	Unit
d	External pipe diameter	mm
di	Internal pipe diameter	mm
l	Pipe length, installation length	m
LU	Loading unit	
$\dot{m}$	Mass flow	l/h
MDP	System operating pressure	bar
Q_A	Point-of-use flow rate (EN 806-3)	l/s
Q_A	Minimum flow rate for fittings (EN 806-3)	l/s
R	Pipe friction pressure gradient	Pa/m
s	Pipe wall thickness	mm
t	Temperature	°C
V	Volume, contents	l/m
$\dot{V}$	Volumetric flow rate	l/s
$\dot{V}_R$	Calculation flow rate (1988-300)	l/s
$\dot{V}_R$	Peak flow rate (1988-300)	l/s
v	Flow rate	m/s
Z	Individual resistance	Pa/m
ϱ	Density	kg/m³
α	= Expansion coefficient	mm/mK
Δ_L	Linear expansion	mm
Δ_p	Total pressure loss	Pa
Δ_t	Temperature difference	K
ζ	Loss coefficient	
λ	Thermal conductivity	W/mK
Σ	Total	

KE KELIT quality targets

1. Our quality targets extend beyond the quality of the products themselves and include all the areas required by ÖNORM EN ISO 9001.

2. Suppliers and customers are integrated into the order-related quality assurance system to ensure that errors are prevented at this early stage.

3. Every employee is responsible for the quality of their own work and should be highly motivated to perform continuous self-assessment.

4. We consider meeting specific market and customer demands as a precondition for highest customer satisfaction.

5. A responsible attitude towards the environment, both now and in the future, is the driving force that pushes us to manufacture long-lasting products using environmentally-friendly processes.

Senator Karl Egger
Honorary Managing Director

Certifications – Tests – Registration

Both the individual parts and the entire system are subject to basic and regular tests. Multiple forms of monitoring are employed to ensure that we meet the specified quality targets:

Quality assurance system certified by Quality Austria
ÖNORM EN ISO 9001 – Reg. no. AT 00366/0
ÖNORM EN ISO 14001 – Reg. no. AT 02097/0
ÖNORM EN ISO 10005 – Reg. no. AT 00001/0
ÖNORM EN ISO 50001 – Reg. no. AT 0126/0

Self-monitoring at the KE KELIT quality laboratory:

- Raw material parameters
- Dimensions and tolerances
- Processing quality, surfaces
- Pipe marking

Third-party monitoring by authorized testing authorities:

- System testing, material identity
- Weld seam inspections
- Corrosion behaviour
- Bendability of the pipe
- Inspection of all laser-welded and soldered fittings versus a vacuum using a vacuum leak test machine. The ÖVGW quality mark results from the total of in-house and third-party monitoring

Registration No. for stainless steel
Material No.: 1.4401 and 1.4521
Press system: W 1.477

Carbon steel precision steel pipe
ÖNORM EN 10305-3 Technical conditions of delivery
Stainless steel – corrosion-resistant steels
ÖNORM EN 10312, 10217-7

Suitability for drinking water
as per ÖNORM B 5014-1 and 3
Carbon steel recognition No. G 411012
Stainless steel recognition No. G 411013

Reg. No.: R-15.2.3-21-17154
Reg. No.: R-15.2.3-21-17158
Reg. No.: R-15.2.3-21-17159
Reg. No.: R.15.2.4-21-17160

Compliance with the New Zealand Building Code
NZBC: Durability B2.3.1 (a), Hazardous Building Materials F2.3.1
Piped Services G10.3.1, Water Supplies G12.3.2; G12.3.7
Energy Efficiency H1.3.4 (b)

Watermark No.: WM-022766
Certificate of Conformity for the right to use the WaterMark in accordance with Australian Standards; AS 3688:2016 Water supply and gas-systems-Metallic fittings and end-connectors.
AS 5200.053-2008 Plumbing and drainage products

Threaded fittings

- Tapered male thread and cylindrical female thread conform to DIN EN 10226
- Cylindrical connections that are not sealed in the thread conform to ISO 228-1

The STEELFIX pipe concept

A balanced and comprehensive metal pipe concept for

simple, robust and superior applications

Benefits

- Unbreakable press connection from d15-108mm
- "leak before pressed" from d15–54mm
- Low thermal expansion
- Thin-walled, large cross-section – small dimensions
- Permanently leakproof
- Highly rigid, less suspension parts
- Straight lengths for visually perfect exposed installation

STEELFIX-C steel

Material number:
1.0034: non-alloy ULC C steel RSt 34-2

- for closed water circuits
- Suitable for dry compressed air systems
- wet sprinkler and fire extinguishing water systems
- Solar energy systems with VITON O-rings

STEELFIX stainless steel

Material number:
1.4401: Stainless steel X5 CrNiMo 1712-2
1.4521: Stainless steel X2 CrMoTi 18-2
1.4301: Stainless steel X5CrNI18-10

- Suitable for drinking water for 1.4401 and 1.4521
- Heating or cooling
- Suitable for compressed air and vacuums
- Corrosion-free surface
- Pleasant, solid metal appearance

STEELOX flexible stainless steel multilayer pipe system

Material number:
1.4435:stainless steel X2 CrNiMo 18-14-3

- Well-engineered integrated system
- robust - superior - flexible
- Available as a pre-insulated model
- Pipe product range: d16, 20 and 25
- Proven press-fit connections

CF100 carbon steel pipe

Steel-galvanised precision pipe

STEELFIX carbon steel pipes are thin-walled precision steel pipes that are manufactured from a special steel that has a particularly low carbon content. The pipe is protected from external corrosion by means of a galvanic zinc layer and a passivation/chromate layer. The zinc layer is applied thermally, which achieves good adhesion.

Dimension range: d15-108mm

Area of application

Carbon Steel Press System d15-108mm: -35°C to 120°C; tmax 150°C/16 bar
compressed air press system: d15-54mm/16 bar; d67-108mm/10 bar

Applications

Installations must always meet local specifications.

- Closed water heating systems as per ÖNORM EN 12828
- Closed water circuits, cooling systems with a water/glycol mixture
- Shipbuilding
- Vacuum systems up to -0.6 bar
- Wet fire extinguishing water systems without external feed
- Chemical media or constituents must match the quality of the respective pipes and fittings and their sealing elements must be resistant to them. In individual cases, KE KELIT will issue approval
- Due to the high operating temperatures of solar energy systems, you must use O-rings made from VITON (CP990, green).

IMPORTANT! Use the correct O-rings for the respective application!

CF100 technical attributes

Material 1.0034	Non-alloy Ultra Light Carbon (ULC) carbon steel, RSt 34-2 as per EN10305-3
Dimension range	d15–108mm
Finish	External zinc layer thickness 8-15 µm. The pipe's weld seam is galvanised externally at a later time
Longitudinal pipe seam	HF-welded
Seam distance	external
Colour	Silver
Linear expansion coefficient	0.0108 mm/mK
Minimum tensile strength	300 N/mm²
Lowest bending radius	3.5 x external diameter of pipe up to d28 mm
As-delivered rod length:	6m, with protective caps on both sides

CF150 internal/external galvanised carbon steel pipe

Internal and external galvanised steel precision pipe

STEELFIX internal and external galvanised carbon steel pipes have the same technical characteristics as STEELFIX carbon steel pipes; however, they have a 15-27 µm zinc layer and an additional thermally applied zinc layer on the inside of the pipe.

Dimension range: d22-108mm

Area of application

Carbon Steel Press System d22-108mm: -0°C to 70°C; /16 bar
compressed air press system: d22-54mm/16 bar; d76-108mm/10 bar

Applications

Installations must always meet local specifications.

- Wet fire extinguishing water piping as per TRVB 128S DIN 1988-600.
- Wet sprinkler piping
- Shipbuilding
- Compressed air in conjunction with press fittings ONLY
- Dry compressed air as per ISO 8573 up to a maximum water content of 880 mg/m³
- If a maximum water content of 880 mg/m³ for dry compressed air lines is exceeded, you must use STEELFIX stainless steel
- In the case of vegetable or synthetic mineral oil-based compressed air systems with an oil content >25mg/m³, you must use O-rings made of VITON (CP990 green).

IMPORTANT! Use the correct O-rings for the respective application!

CF150 technical attributes

Material 1.0031	Non-alloy Ultra Light Carbon (ULC) carbon steel, E190 as per EN10305-3
Dimension range	d22–108mm
Finish	Internal and external zinc layer thickness 15-27 µm. The pipe's weld seam is galvanised externally at a later time
Longitudinal pipe seam	HF-welded
Seam distance	external
Colour	Silver
Linear expansion coefficient	0.0108 mm/mK
Lowest bending radius	3.5 x external diameter of pipe up to d28 mm
As-delivered rod length:	6m, with protective caps on both sides

STEELFIX carbon steel pipe

Heating systems are expensive, which means that more economic alternatives are much sought-after. One of these alternatives is STEELFIX carbon steel. In the field of heating engineering, this material is particularly favourably priced and optimised for precisely this type of application.
KE KELIT will be glad to provide you with information about the areas of application of various carbon steel pipes and their particular benefits.

- Carbon steel components (fittings, pipe and tools) are perfectly coordinated to ensure that connections are made of the highest quality.
- You can use the carbon steel system for a wide range of special applications.
- Chemical media or constituents must match the quality of the respective pipes and fittings and their sealing elements must be resistant to them. In individual cases, KE KELIT will issue approval

Dimension ranges

CF100 d x s mm	CF150 Internal/external Galvanised	DN	Internal diameter mm	Mass kg/m	Contents l/m
15 x 1.2	–	12	12.6	0.42	0.125
18 x 1.2	–	15	15.6	0.49	0.192
22 x 1.5	22 x 1.5	20	19.0	0.76	0.284
28 x 1.5	28 x 1.5	25	25.0	0.98	0.491
35 x 1.5	35 x 1.5	32	32.0	1.24	0.804
42 x 1.5	42 x 1.5	40	39.0	1.54	1.195
54 x 1.5	54 x 1.5	50	51.0	1.99	2.043
66.7 x1.5	–	65	63.7	2.41	3.187
76.1 x 2.0	76.1 x 2.0	65	72.1	3.50	4.083
88.9 x 2.0	88.9 x 2.0	80	84.9	4.41	5.661
108 x 2.0	108 x 2.0	100	104.0	5.38	8.495

Dimensioning and pressure loss for STEELFIX carbon steel pipes

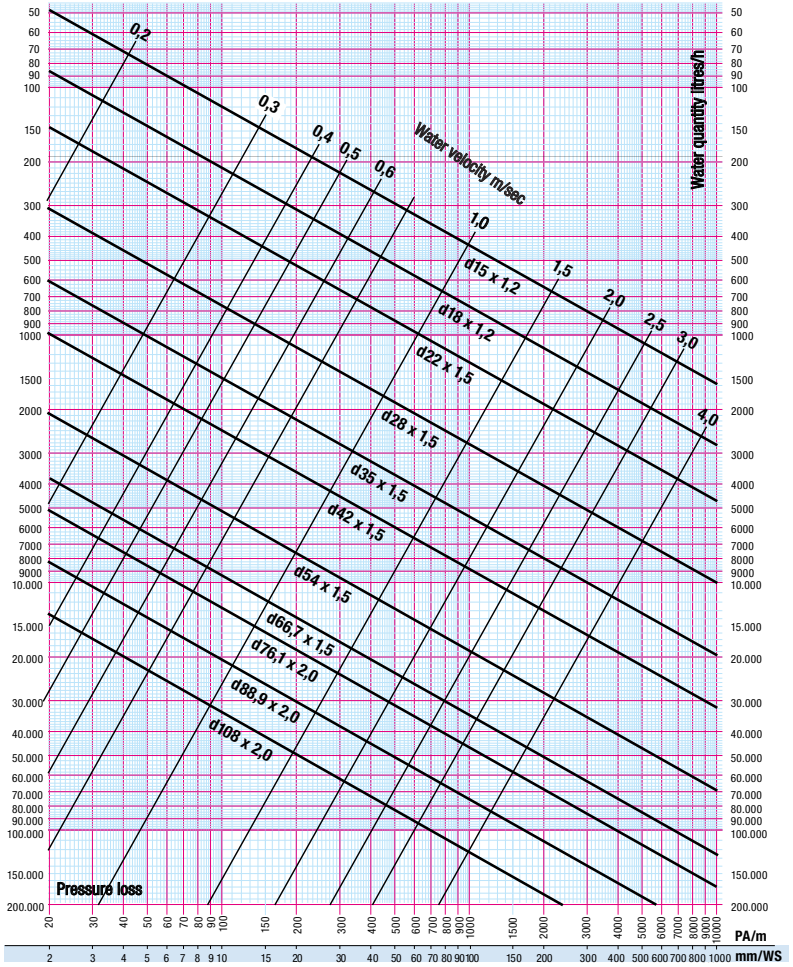
STEELFIX carbon steel pipe:
d15, 18, 22, 28, 35, 42, 54, 67, 76, 89, 108

The pressure losses for water are calculated according to the Nikuradse formula:

$$R = 8.48455 \cdot 10^9 \cdot \dot{m}^{1.7749} \cdot di^{-4.807}$$

Pipe roughness: 0.01mm
Water temperature 45°C

R = Pressure loss due to pipe friction pressure gradient (Pa/m)
$\dot{m}$ = Mass flow (l/sec)
di = Internal pipe diameter (mm)



Pressure test report for heating systems

KE KELIT recommends carrying out a leak test based on the "Pressure tests for integrated radiator installations" in accordance with ÖNORM EN 14336. Caution! Before every pressure test, ensure that all the steps in the installation instructions have been carried out conscientiously.

Functional test when using "leak before pressed" fittings

For temperature differences (> 10 K) between ambient temperature and fill water temperature, a waiting time of 30 min. must be adhered to after filling the system with drinking water so the temperature can equalize.

Test pressure: 0.05 MPa (0.5 bar) up to max. 0.2 MPa (2 bar)
Test duration: 15 minutes after temperature equalization between the pipe and test medium.
Test differential pressure: 0.0 bar

A visual check must then be performed on all pipe connections.

If a pressure test is performed using air or inert gases following the pressure test for drinking water systems, you can omit the functional test!

Pressure test

Check the pipe network at 1.3 times the system pressure. If possible, the pressure gauge should be positioned at the lowest point in the system. The temperature equalization between ambient temperature and fill water temperature must be taken into account after applying the test pressure by waiting an adequate amount of time. After the waiting time, the test pressure must be reapplied, if required.
For the period of the pressure test, you must disconnect from the system to be tested all the containers, devices and fittings that are not suitable for the test pressure. The system is filled with filtered water and fully bled of air. A visual check of the pipe fittings was performed during the test.

KELIT recommends a testing period of 30 minutes.

Calculated test pressure: ..... bar
Testing period ..... hr

☐ NO pressure loss was observed during the testing period.

☐ The system contains ..... as the antifreeze:

☐ The system does NOT contain any antifreeze, which means that it has been emptied completely for safety reasons.

Location: .....

Property: .....

System pressure: .....

Confirmation

Responsible person: .....

Date: ..... Time: from ..... to .....

Client: .....

Signature/stamp

NF100 stainless steel pipe 1.4401

STEELFIX stainless steel pipes are made from austenitic stainless steel and have been tested for drinking water installation and approved for installing pipes above ground (not laying in the ground).
The internal and external surfaces of the pipes are bare metal, free from annealing colour and are supplied free from corrosive residue. Double inspections at the factory ensure that strict dimensional tolerances and weld seam execution are complied with. The limit values for nickel migration of <0.02 mg/l as per the EU Directive are fallen short of significantly; apart from this, no heavy metals (e.g. nickel) are discharged into drinking water.

Dimension range: d15-108mm

Area of application

Stainless Steel Press System d15-108mm: -35°C to 120°C; tmax 150°C/16bar

Compressed air press-fit system: d15-54mm/16bar; d76-108mm/10bar

Applications

Installations must always meet local specifications.

- Drinking water installations as per EN 806 Parts 1-5, ÖNORM B 2531 and DIN 1988-300
- Non-drinking water and rainwater utilisation systems
- Water for industrial applications
- Closed cooling and chilling systems
- Wet and dry fire extinguishing water piping as per TRVB 128S and DIN 1988-600
- Wet and dry sprinkler systems
- Re-treated water, e.g. softened water, partially and completely demineralized water, distilled water or water with glycol
- Solar energy systems
- Compressed air in conjunction with press fittings ONLY

IMPORTANT! Use the correct O-rings for the respective application!

NF100 technical attributes

Material 1.4401	X5 CrNiMo 1712-2 as per DIN EN 10088
Dimension range	d15–108mm
Longitudinal pipe seam	Laser-welded
Seam distance	external
Colour	Matte silver
Linear expansion coefficient	0.016 mm/mK
Lowest bending radius	3.5 x external diameter of pipe up to d28 mm
As-delivered rod length:	6m, with protective caps on both sides

NF110 stainless steel pipe 1.4521, nickel-free

The STEELFIX nickel-free stainless steel pipe is made from ferrite stainless steel and, from a dimensional point of view, is similar to the NF100 pipe; however, the 1.4521 alloy contains NO nickel.
Other properties of the NF110 include slight magnetisation in addition to reduced linear expansion of about 35% compared to the NF100.

Dimension range: d15-54mm

Area of application

Stainless Steel Press System d15-54mm: -35°C to 120°C; tmax 150°C/16bar

Compressed air press-fit system:: d15-54mm/16bar

Applications

Installations must always meet local specifications.

- Drinking water installations as per EN 806 Parts 1-5, ÖNORM B 2531 and DIN 1988-300
- Non-drinking water and rainwater utilisation systems
- Closed cooling and chilling systems
- Wet and dry fire extinguishing water piping as per TRVB 128S and DIN 1988-600
- Wet and dry sprinkler systems
- Re-treated water, e.g. softened water, partially and completely demineralized water, distilled water, water with glycol.
- Solar energy systems
- Compressed air in conjunction with press fittings ONLY

IMPORTANT! Use the correct O-rings for the respective application

NF110 technical attributes

Material 1.4521	X2 CrMoTi 18-2 as per DIN EN 10296-2 (NICKEL-FREE)
Dimension range	d15–54 mm
Longitudinal pipe seam	Laser-welded
Seam distance	external
Colour	Matte silver
Linear expansion coefficient	0.0104 mm/mK
Lowest bending radius	3.5 x external diameter of pipe up to d28 mm
As-delivered rod length:	6m, with protective caps on both sides

NF130 stainless steel pipe 1.4301

STEELFIX stainless steel pipes are all-purpose austenitic stainless steel pipes with good resistance to atmospheric, organic and inorganic chemicals. Due to the pipes' outstanding resistance to intergranular corrosion, good cold formability, good deep-drawing capability and weldability, they are used very frequently.
In the case of heating and cooling systems with two-pipe systems, take into account corrosion protection measures as per ÖNORM H5155!

Dimension range: d15-108mm

Area of application

Stainless Steel Press System d15-108mm: -35°C to 120°C; tmax 150°C/16 bar
Compressed air press-fit system: d15-54mm/16 bar; d76-108mm/10 bar

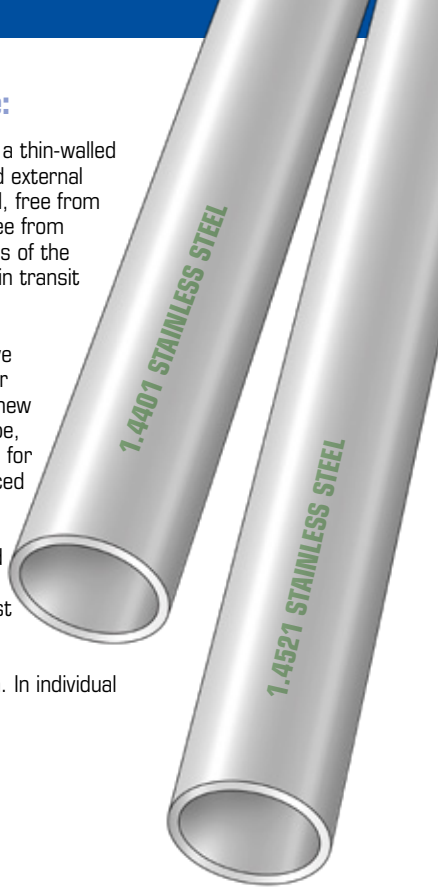
Applications
Installations must always meet local specifications.

- Closed heating systems
- Steam system
- Wet fire extinguishing water piping as per TRVB 128S
- Cooling and chilling systems
- Solar energy systems

Take into account corrosion protection measures as per ÖNORM H 5155!

STEELFIX stainless steel pipe:

- The STEELFIX stainless steel pipe is a thin-walled precision steel pipe. The internal and external surfaces of the pipes are bare metal, free from annealing colour and are supplied free from corrosive residue. Caps on both ends of the pipe prevent internal contamination in transit or during storage
- The various material qualities in the STEELFIX range ensure that you have available exactly the right product for your requirements – Thanks to the new 1.4301 STEELFIX stainless steel pipe, KE KELIT provides a perfect solution for closed systems using favourably priced stainless steel pipes.
- STEELFIX stainless steel pipes and fittings are suitable for any open and closed heating systems.
- Chemical media or constituents must match the quality of the respective pipes and fittings and their sealing elements must be resistant to them. In individual cases, KE KELIT will issue approval



NF130 technical attributes

Material 1.4301	X5CRNI18-10
Dimension range	d15–108 mm
Longitudinal pipe seam	Laser-welded
Seam distance	external
Colour	Matte silver
Linear expansion coefficient	0.016 mm/mK
Lowest bending radius	3.5 x external diameter of pipe up to d28 mm
As-delivered rod length:	6m, with protective caps on both sides

Dimension ranges

1.4401 d x s mm	1.4521 d x s mm	1.4301 d x s mm	DN	Internal diameter mm	Mass kg/m	Contents l/m
15 x 1.0	15 x 1.0	15 x 1.0	12	13.0	0.33	0.133
18 x 1.0	18 x 1.0	18 x 1.0	15	16.0	0.41	0.201
22 x 1.2	22 x 1.2	22 x 1.2	20	19.6	0.62	0.302
28 x 1.2	28 x 1.2	28 x 1.2	25	25.6	0.79	0.515
35 x 1.5	35 x 1.5	35 x 1.5	32	32.0	1.24	0.804
42 x 1.5	42 x 1.5	42 x 1.5	40	39.0	1.50	1.195
54 x 1.5	54 x 1.5	54 x 1.5	50	51.0	1.97	2.042
76.1 x 2.0	–	76.1 x 2.0	65	72.1	3.55	4.548
88.9 x 2.0	–	88.9 x 2.0	80	84.9	4.15	5.661
108 x 2.0	–	108 x 2.0	100	104.0	5.05	8.495

STEELFIX combined with STEELOX

Stable with flexible

Combined with STEELOX, the STEELFIX stainless steel piping system is a perfect addition to drinking water installations. The large-sized basement manifolds and risers made of STEELFIX stainless steel up to a size of 108 mm transport the water directly to the building levels where it is needed.
After this, the flexible STEELOX stainless steel composite pipe system supplies water to kitchens, showers, sinks, etc. without any loss of quality. This means that the installation system from the entrance to the building right up to the end user is completely made from stainless steel.

STEELOX

Properties

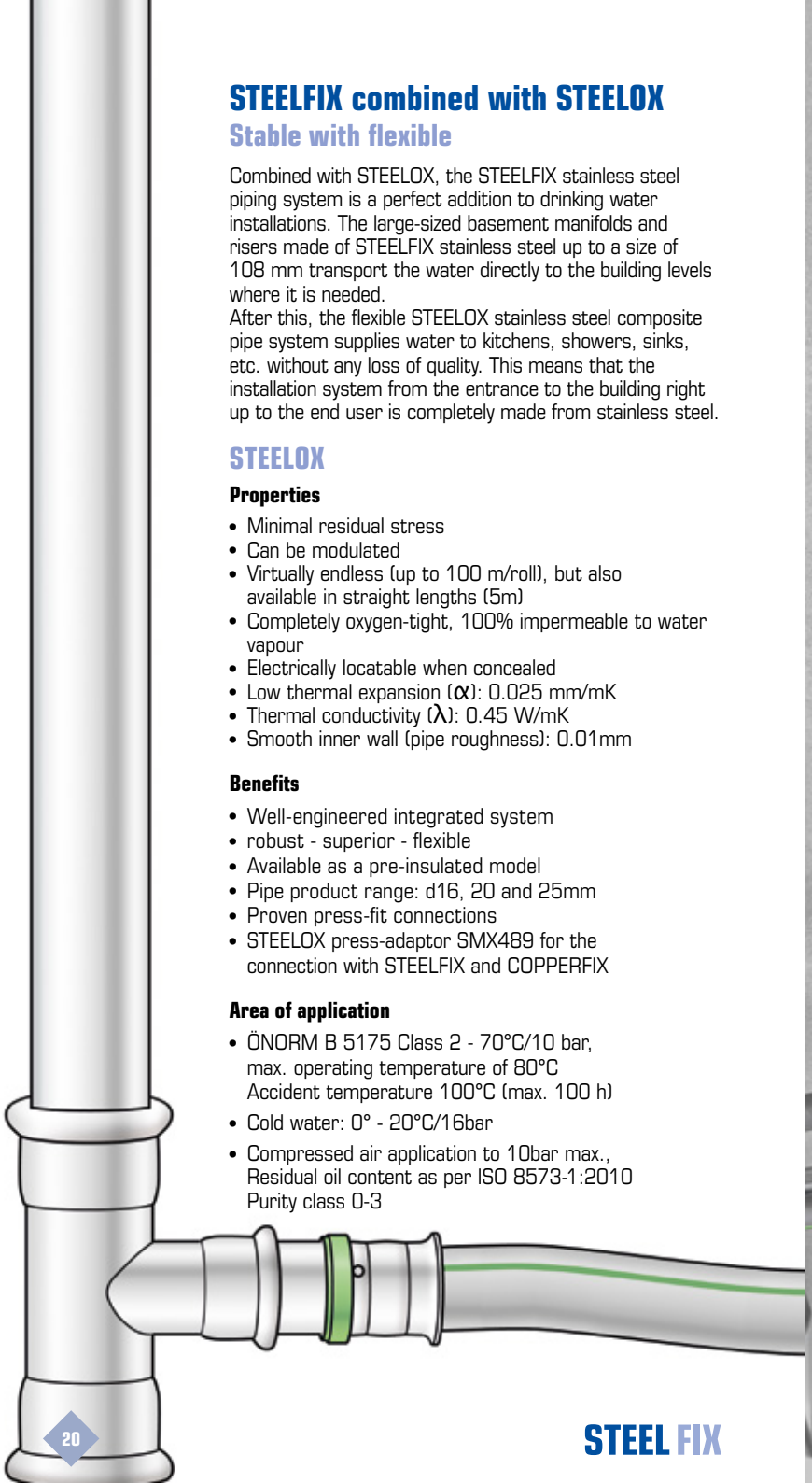
- Minimal residual stress
- Can be modulated
- Virtually endless (up to 100 m/roll), but also available in straight lengths (5m)
- Completely oxygen-tight, 100% impermeable to water vapour
- Electrically locatable when concealed
- Low thermal expansion (α): 0.025 mm/mK
- Thermal conductivity (λ): 0.45 W/mK
- Smooth inner wall (pipe roughness): 0.01mm

Benefits

- Well-engineered integrated system
- robust - superior - flexible
- Available as a pre-insulated model
- Pipe product range: d16, 20 and 25mm
- Proven press-fit connections
- STEELOX press-adaptor SMX489 for the connection with STEELFIX and COPPERFIX

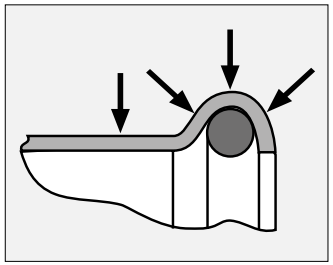
Area of application

- ÖNORM B 5175 Class 2 - 70°C/10 bar, max. operating temperature of 80°C Accident temperature 100°C (max. 100 h)
- Cold water: 0° - 20°C/16bar
- Compressed air application to 10bar max., Residual oil content as per ISO 8573-1:2010 Purity class 0-3



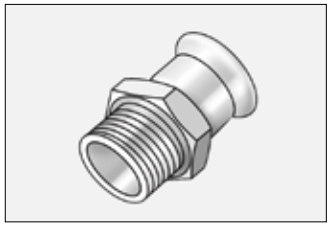
Pressing with M contour

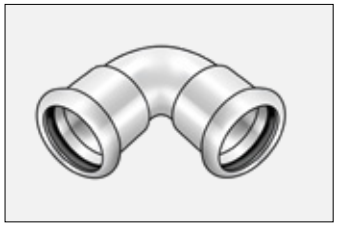
Benefits of M contour:



The fitting is pressed onto the pipe using the radial press procedure, which results in a longitudinal non-positive sealed connection. The seamless transition between the fitting and the pipe effectively prevents dirt or dust particles from entering the sealing chamber of the fittings. The contour edge provides additional mechanical securing for the pipe fitting connection. The position of the O-ring at the start of the fitting allows you to inspect or replace the sealing element quickly and safely. With M pressing, the sealing chamber is deformed uniformly from three sides, which achieves a wide contact surface for the O-ring. KE KELIT recommends using the original pressing tools that are offered.
If you use third-party tools, pay attention to the system approval for carbon steel and stainless steel pressings (M contour) and to the processing information of the respective manufacturer.

STEELFIX press fittings with M contour





Stainless steel press fittings d15-108 mm

STEELFIX stainless steel press fittings are manufactured from 1.4404 material in dimensions d15-54 mm with the "leak before pressed" function.

Carbon steel press fittings d15-108 mm

STEELFIX carbon steel press fittings are manufactured from RSt 34-2 material and are protected from external corrosion by means of a galvanically applied zinc layer. This zinc layer only offers limited protection from the effect of moisture.

STEELFIX stainless steel and carbon steel press fittings are "leak before pressed" in dimensions d15-54 mm.

"Leak before pressed" safety function

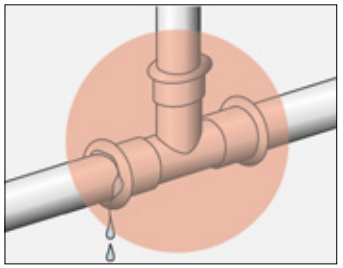
STEELFIX Press carbon steel as well as STEELFIX Press stainless steel are supplied with the "leak before pressed" safety function.

The special design of the O-rings in all fittings up to d54 ensures that fittings, which have not been pressed, will leak during the initial pressure test.
If not pressed water escapes the fitting due to the small grooves on the O-ring's surfaces. The installer can immediately see which fitting leaks and is not pressed.

Once pressed the O-ring deforms in the sealing chamber and guarantees an airtight and watertight connection.

For larger sizes, this function is guaranteed by the special geometry of the fitting.

O-rings with the "leak before pressed" safety function are available in dimensions d15-54 mm made from EPDM, VITON and FPM.



Benefits

Safety: "Leak before pressed" from d15–54mm

Guaranteed: SEALED after pressing

Strength: No weakening of the O-rings

Area of application of O-rings for STEELFIX press-fit systems:

Material	Operating temperature in °C	Max. short-term operating temperature in °C	Max. operating pressure bar	Colour	Applications
EPDM Leak before pressed	-35/+135	150	16	Black	With KTW recommendation. Installations for drinking water and treated water for circulation pipes, osmosis water and fire-extinguishing water piping, amongst others.
VITON Leak before pressed	-30/+200	230	16	Green	Installations for compressed air, heating oil, vegetable oils, fuels, greases amongst others, industrial purposes, ozone-resistant, solar energy systems
FPM Leak before pressed	-20/+175	190	16	Grey	Installations for steam systems

Installation instructions
STEELFIX press connection

STEELFIX carbon steel and stainless steel system

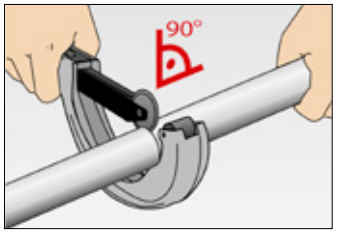
Only ever deploy trained installation specialists!

1. Determining pipe lengths

You can determine pipe lengths using the Z dimension method.

Check the pipes for surface damage and contamination!

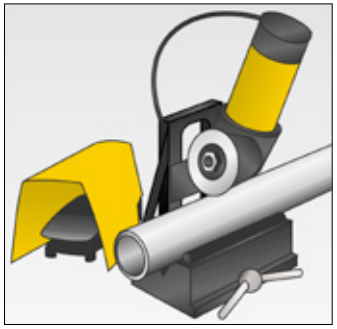
Refer to the program overview for fitting dimensions and the Z dimensions.



2. Separating pipes

Always cut to length at right angles!

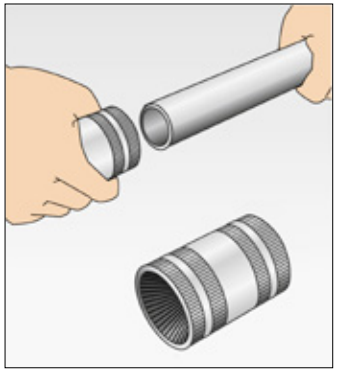
- Use a pipe cutter
- Pipe cutter with electric motor
- Fine-toothed hand saw
- Mechanical saw with electric motor
- When processing stainless steel pipes, the tools you use must be suitable for stainless steel
- Under no circumstances must you use cutting disks, coarse-toothed saws or flame cutting to separate pipes.
- Carry out saw cuts correctly and completely, i.e. interrupting of cuts that have not been made completely IS NOT ALLOWED, since there is a risk of corrosion at the breaking point!



3. Deburring pipes

To avoid damage to the sealing elements when pushing on press-fittings, you must deburr and clean the inside and outside after cutting the pipe ends to size.

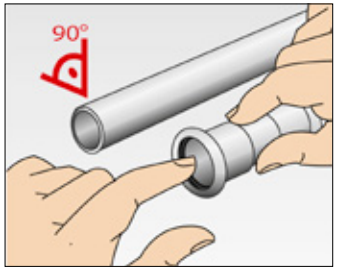
- Use a WZ210 pipe deburring tool for up to d54 mm
- Electrical pipe deburring tool
- Semi-circular smoothing file (as an alternative)
- It is essential to remove any swarf or similar things that sticks to the pipe
- You should use two separate pipe deburring tools for carbon steel or stainless steel.



4. Inspecting the pipes and fittings

Before carrying out installation, check the following points:

- The pipes must be cut off at right angles, deburred and be round
- Check correct functioning and carry out a visual inspection of the O-rings in the fitting.
- Check the pipe and fittings for foreign bodies (dirt, swarf, etc.); if necessary, clean them.



5. Marking the insertion depth on the pipe

To ensure safe and correct press fitting, you must permanently mark the insertion depth on the pipe or press fitting with insertion ends before starting installation.

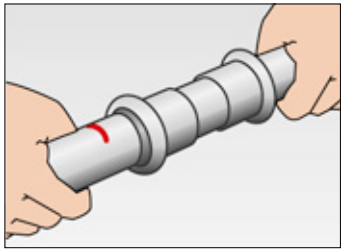
- Mark the insertion depth from d15 to d108 mm using a WZ240 press insert depth gauge
- You must only ever shorten fittings with insertion ends up to the minimum bending radius plus the insertion depth and a 10mm space for pressing.

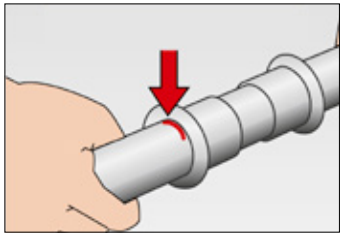
Marking the insertion depth

Insertion depth for carbon steel and stainless steel press fittings

Size	mm	Size	mm
d15	20	d54	35
d18	20	d66,7	50
d22	21	d76,1	55
d28	23	d88,9	63
d35	26	d108	77
d42	30		

6. Pushing the pipes into the press fittings





- While rotating the pipe slightly and pressing it in the axial direction at the same time, push it into the marked insertion depth
- You must still be able to see the insertion depth marking on the pipe!
- With fittings with no end stop (e.g. sliding sleeves), you must push the pipe in at least as far as the marked insertion depth
- Tipping the pipe into the press fittings can damage the O-rings and is not allowed
- For assembly-specific reasons, the O-ring can be treated additionally with water
- UNDER NO CIRCUMSTANCES must you use oils or greases as lubricants

7. Choose a suitable press machine

Make sure that only (M contour) press jaws or press loops that match the fitting dimension are used.

KE KELIT recommends:

WZ280 press jaws M d15-35mm
WZ281 press adapter d35-54 in conjunction with
WZ282 press loop M d42-54mm
WZ281 press adapter d67-108 in conjunction with
WZ288 press adapter M d67-108mm

WZ280

WZ281

WZ282/WZ288

8. Clean and inspect the press machines

Make sure you have inspected the press tools, press heads, adaptors and slings before making any press connections.

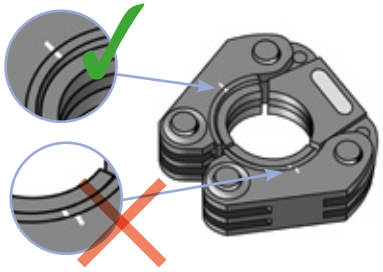
- The press tools must be in good working order and that maintenance of machines and press jaws are carried out on a regular basis according to the manufacturer's instructions. Any tooling that is not in good working is not to be used to make any press connections.
- The minimum interval for the maintenance of machines is one year!
- Before pressing, you must clean the M-Contour of the press heads, adaptor and slings with a clean cloth without using a cleaning product.

⚠ Cleaning products can cause corrosion!
Only clean the M-Contour with a clean cloth to avoid damaging the material.

⚠ Small metal particles can cause pitting!
If the same M-Contour press heads, adaptors and slings have been used to press other materials it is particularly important to remove small metal particles which if pressed into the STEELFIX fittings could cause corrosion such as pitting.

9. Grease and adjust slide segments

- To ensure that the press loops work perfectly, the slide segments must be movable.
- Press Slings used to press STEELFIX need to be lubricated with an approved lubricant spray such as BRUNOX regularly to ensure an even press connection.
- Make sure that the markings on the slide segments and the shells line up in the initial position

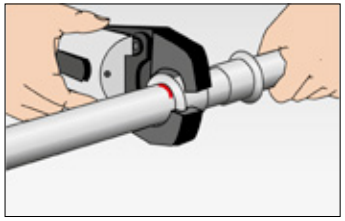


- KE KELIT recommend regular application of lubricant spray when using press slings, no more than 50 press connections are made before the application of additional lubricant spray for STEELFIX.
- Note that care must be taken to avoid any contact between lubricant and 'O-rings'!

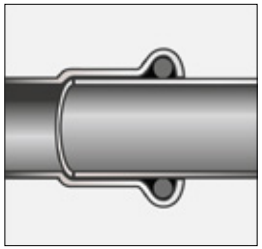
Pressing

10. Pressing

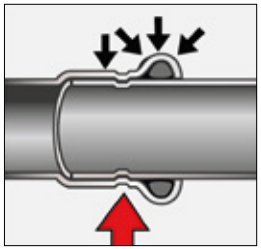
- The groove of the press jaw or the press loop must surround the press fitting's sealing chamber.
- Hold the press head at right angle to the pipe.



Before pressing



After pressing



Caution! In dimension d108 mm, two pressings are needed with different ZB 221 (108/1) and ZB 222 (108/2) WZ281 press adapters!

- Please pay attention to the enclosed instructions for the respective press machines and press jaws.
- Pressing must be carried out all the way to the end without being interrupted
- You must not use press tools for a long period of time without interruptions!
  Refer to the operating instructions for the respective press tool!
- After pressing, you must be able to see the marking on the pipe

Correct processing ensures safe and permanently leakproof connections. Deformation of the pipe and sleeve section represents a proven and longitudinal non-positive connection.

Areas of application of STEELFIX systems

You must comply with the operating conditions that are listed in the key approvals, standards and technical policies. They may differ from the table. The KE KELIT team will be glad to deal with any questions or you may have or provide special solutions.

	NF100 1.4401	NF110 1.4521	NF130 1.4301	CF100	CF150
Cold drinking water	✓	✓			
Hot drinking water and circulation	✓	✓			
Softened cold water	✓	✓			
Completely demineralized water	✓	✓			
Wet fire-extinguishing pipeline	✓	✓	✓		✓
Dry fire-extinguishing pipeline	✓	✓			
Wet sprinkler	✓	✓	✓		
Dry sprinkler	✓	✓			
Steam system	✓	✓	✓		
Closed heating system	✓	✓	✓	✓	
Combined heating/cooling 2-pipe system	✓	✓	✓[a]		
Closed cooling/chilling system	✓	✓	✓		
High-pressure >16bar operating pressure	✓[b]	✓[b]	✓[b]	✓[b]	
Solar	✓	✓	✓	✓	
Dry compressed air	✓	✓	✓		✓
Wet compressed air water content >880mg/m³	✓	✓	✓		

Last revision: August 2021

a. In the case of heating and cooling systems with two-pipe systems, you may need to take into account corrosion protection measures as per ÖNORM H 5155!
b. Applications above 16bar are only possible with suitable press loops and machines!

CP980
EPDM (black)

CP990
VITON (green)

CP970
FPM (grey)

	Operating temp.	EPDM (black)	VITON (green)	FPM (grey)
Cold drinking water	135°C	✓		
Hot drinking water and circulation	135°C	✓		
Softened cold water	135°C	✓		
Completely demineralized water	135°C	✓		
Wet fire-extinguishing pipeline	135°C	✓		
Dry fire-extinguishing pipeline	135°C	✓		
Wet sprinkler	135°C	✓		
Dry sprinkler	135°C	✓		
Steam system	175°C			✓
Closed heating system	135°C	✓		
Closed cooling/chilling system	135°C	✓		
High-pressure >16bar Operating pressure	135°C	✓		
Solar	200°C		✓	
Dry compressed air		✓		
Wet compressed air water content >880mg/m³		✓		
Oil content (mg/m³) <25		✓		
Oil content (mg/m³) >25			✓	

Last revision: August 2021

Dimensioning, pressure loss of STEELFIX pipes

The total pressure loss (Δp) for a STEELFIX system is calculated by multiplying the length of the pipeline (l) by the pipe friction pressure gradient (R), and then adding the sum (Σ) of the individual resistance values (Z)

Total pressure loss Δp: $\Delta p = l \cdot R + \Sigma Z$ **in (Pa)**

The selection of pipe size for the water lines depends on:

- The available water pressure and geodetic height difference
- The pressure loss from instruments and minimum flow pressure (fittings)
- The pipe friction pressure gradient and flow velocities
- The individual resistance values of the fittings
- The type, number and simultaneous operation of the points of use

Permissible flow velocities according to DIN 1988-300

Calculated flow velocity in m/s of a flow duration of line section	<15 min	>15 min
Consumption lines: Partial sections with resistance coefficients of ζ < 2.5 for the individual resistances[a]	5	2
Consumption lines: Partial sections with resistance coefficients of ζ >_ 2.5 for the individual resistance values[b]	2.5	2

[a] e.g. piston valve, ball valve, slanted-seat valves [b] e.g. globe valve

Guidelines for circulation systems according to DIN 1988-300

The circulation system should be designed such that the temperature difference between the inlet and outlet of the drinking water storage tank does not exceed 5 K. The temperature of the hot water may not fall below 55°C at any point within the system. For economic reasons, the flow velocity in circulation systems should be approximately 0.2-0.5 m/s; in exceptional cases, up to a maximum of 1.0 m/s.

Determining individual resistance values (Z) **for typical fittings:**

$$Z = \zeta \cdot \frac{v^2 \rho}{2}$$

ρ = density kg/m³
v = calculated flow velocity
ζ = Loss coefficient

Size d	Equal coupling ζ	90° elbow ζ	45° elbow ζ	Run tee with diverging flow ζ	Tee bore with diverging flow ζ	Wall bracket ζ
						
15	0.36	1.02	0.69	0.40	1.13	1.08
18	0.46	0.93	0.77	0.50	1.41	1.22
22	0.11	0.44	0.38	0.15	1.05	1.09
28	0.05	0.35	0.28	0.13	0.93	-
35	0.03	0.31	0.29	0.08	0.93	-
42	0.06	0.25	0.22	0.11	1.20	-
54	0.06	0.30	0.19	0.09	1.15	-
66.7	0.05	0.28	0.17	0.09	1.10	-
76.1	0.04	0.25	0.15	0.08	1.07	-
88.9	0.04	0.24	0.13	0.07	1.06	-
108	0.03	0.23	0.12	0.07	1.05	-

Sizing according to ÖNORM EN 806-3

This calculation method is used to determine the pipe size for standard installations up to a maximum of 12 residential units. The method is used for cold and hot water pipelines. Standard installations are defined in ÖNORM EN 806-3 Point 4.2. For special installations, like hospitals, sanatoriums, hotels, schools, etc., for example, you must use DIN 1988/300 to carry out calculation in accordance with ÖNORM B 2531.

Point of use	Q_A l/s	Q_{min} l/s	LU
Bathroom vanity, sink, bidet, toilet tank	0.1	0.1	1
Dishwasher, shower head, utility sink, household kitchen sink, washing machine[a]	0.2	0.15	2
Urinal flusher	0.3	0.15	3
Bathtub faucet	0.4	0.3	4
Spigots for garden/garage	0.5	0.4	5
Commercial kitchen sink DN 20, bathtub faucet	0.8	0.8	8
Flush valve DN 20	1.5	1.0	15
For commercial washing machines, see the manufacturer's specifications.			

One loading unit (LU) corresponds to a point-of-use fitting flow (Q_A) of 0.1 l/s
Minimum flow rate for fittings (Q_{min})

With regard to efficiency, the flow velocity should be at least 1 m/s. To keep flow noise at a reasonable level, main supply lines, risers, and floor distribution lines should not exceed 2 m/sec. In the case of individual supply lines, flow velocities of up to 4 m/s are permissible.

After adding in the previously weighted loading units (LU), the pipeline diameter (d) can be selected using the inner diameter (di) from the table below.

Example:

The following are all connected to a riser:

4 bathtubs	4 x LU	4=	16
2 showers	2 x LU	2=	4
4 bathroom vanities	4 x LU	1=	4
4 cisterns	4 x LU	1=	4
4 kitchen sinks	4 x LU	2=	8
4 dishwashers	4 x LU	2=	8
2 washing machines	2 x LU	2=	4
Total loading unit	(LU)		48

Result:

According to ÖNORM EN 806-3,
the table below yields STEELFIX d28 x 1.2 mm

Size d x s mm	Inner diameter di mm	Water flow rate l/m	Loading unit LU	Highest individual value LU	Max. pipe length m
15x1	13.0	0.13	3	-	15
15x1	13.0	0.13	4	-	9
15x1	13.0	0.13	6	4	7
18x1	16.0	0.20	10	5	-
22x1.2	19.6	0.30	20	8	-
28x1.2	25.6	0.52	50	-	-
35x1.5	32.0	0.80	165	-	-

Sizing guidelines
Excerpt from DIN 1988-300

1. Determine the calculation flow rates and minimum flow pressures of the point-of-use fittings
The calculation flow rate $\dot{V}_R$ is an assumed point-of-use flow rate for the calculation step. Refer to the table for the calculation flow rates of common fittings.
The calculation flow rate $\dot{V}_R$ is the mean value resulting from the following equation:

$$\dot{V}_R = \frac{\dot{V}_{min} + \dot{V}_{max}}{2}$$

2. Calculation of total flows and allocation to partial sections
Against the direction of flow – ending at the most distant point of use and at the supply line in each case – the calculation flows are added up and the total flow rates resulting from this must then be assigned to the corresponding line sections. The respective partial section begins with the fitting at which the total flow rate or the diameter changes. At the junction point of the cold water line for the drinking water heater, the total flow rates of the cold and hot water sides are added together.

3. Use of the conversion curve to convert total flow rate to peak flow rate
When calculating pipeline systems, always include all the points of use with their calculation flow rates.
The exception to this rule is the case where, in a single utilization unit (UU), a second sink, a shower in addition to a bathtub, a bidet, a urinal, or taps in anterooms of toilet facilities are installed. These are not included in the total flow rate.

4. Simultaneous operation depending on building type
The peak flow rate is calculated as a function of the total flow rate, while the simultaneousness of the water usage depends on the type of use for the building (e.g., in apartments, hotels, etc.)
It is generally assumed that not all the connected points of use are open completely at the same time.

5. Choose the pipe diameter
Calculate the pipe diameter and the pipe friction pressure gradient, as well as the related calculated flow velocity.

6. Comparison of pressure loss with available pressure
The total pressure loss for the calculated pipe diameters should for the most part approximate the available pressure difference without exceeding it.

7. Minimum flow pressures and calculation flow rates $\dot{V}_R$ (l/s) of common drinking water extraction points

Minimum flow pressure bar	Type of drinking water point of use	Size	$\dot{V}_R$
	Spigots and faucets		
0.5	without aerator[a]	DN 15	0.30
0.5		DN 20	0.50
0.5		DN 25	1.00
1.0	with aerator	DN 10	0.15
1.0		DN 15	0.15
	Mixing valves[b, c] for		
1.0	Showers	DN 15	0.15
1.0	Bathtubs	DN 15	0.15
1.0	Kitchen sinks	DN 15	0.07
1.0	Bathroom vanities	DN 15	0.07
1.0	Bidets	DN 15	0.07
	Household appliances		
0.5	Dishwasher	DN 15	0.07
0.5	Washing machines	DN 15	0.15
	Toilets and urinals		
1.0	Flush valve for urinal manual or electronic	DN 15	0.30
1.2	Flush valve for toilet	DN 20	1.00
0.5	Toilet tank according to EN 14124	DN 15	0.13

a) With no devices connected (e.g. a lawn sprinkler)

b) The stated calculation flow rate must be included in the calculation for the connection on the hot and cold water side.

c) Angle valves, e.g. for bathroom vanity fixtures and shower hose connections, should be taken into account as individual resistances or in the minimum flow pressure of the point-of-use fitting.

Important information:

Fixture manufacturers are required to state the minimum flow pressure and calculation flow rates $\dot{V}_R$ for their fixtures. Always take the manufacturer's information into consideration when sizing the pipe diameter. If these values are greater than the ones provided in the table, the drinking water installation must be sized using the manufacturer's specifications.

Note:

Points of use not covered by the table as well as fittings and fixtures of the same type, but with fitting flow rates or minimum flow pressures greater than those stated, must also be included according to the manufacturer's specifications.

Excerpt from DIN 1988-300

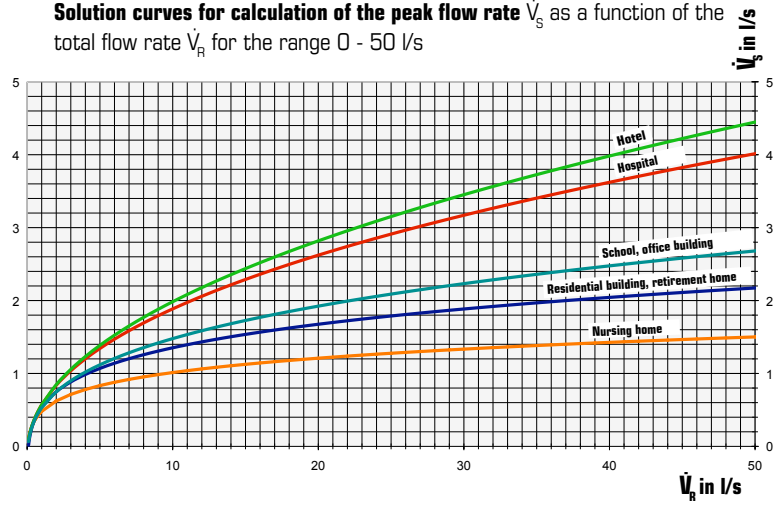
For the building types indicated in the table, the peak flow rate $\dot{V}_S$ is calculated within the following scope:

$$\sum \dot{V}_R: 0.2 \text{ to} \leq 500 \text{ l/s}$$

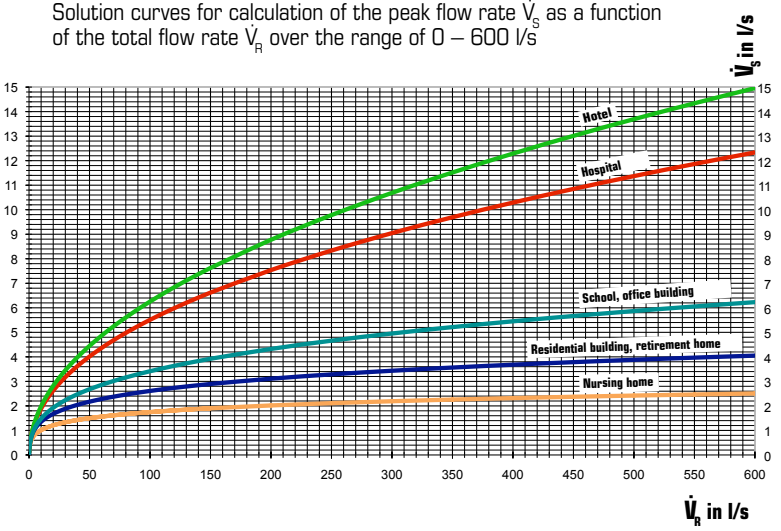
The peak flow rate ($\dot{V}_S$) is calculated based on the building type using the constants from the table (page 23) as follows:

$$\dot{V}_S: a \left(\sum \dot{V}_R\right)^b - c$$

Solution curves for calculation of the peak flow rate $\dot{V}_S$ as a function of the total flow rate $\dot{V}_R$ for the range 0 - 50 l/s



Solution curves for calculation of the peak flow rate $\dot{V}_S$ as a function of the total flow rate $\dot{V}_R$ over the range of 0 – 600 l/s



Constants (a, b, c) for peak flow rate by building type

Building type	Constant		
	a	b	c
Residential building	1.48	0.19	0.94
Assisted-living facility, retirement home	1.48	0.19	0.94
Patient ward in hospital	0.75	0.44	0.18
Hotel	0.70	0.48	0.13
School and office building	0.91	0.31	0.38
Nursing home	1.40	0.14	0.92

Exceptions to the calculation of the peak flow rate $\dot{V}_S$

Utilization units (UU)

A room that contains points of use and is located within a residential building (e.g., bathroom, kitchen, housekeeping room), or in a non-residential building where it can be assumed that usage is residential in nature. Experience has shown that, in the direction of flow towards the end of the branch line and in the floor distribution of UUs, the flow rates from the calculation are too high, since in most cases no more than two points of use are ever open at the same time, e.g., in a bathroom.

For this reason, the peak flow rate in each partial section of a UU is set to no more than the total flow rate of the two largest points of use installed on the partial section (also applies to single-UU situations where the calculation results in a lower flow rate).

If a second UU is connected to a partial section (e.g., in the riser), the peak flow rates of both UUs are added together, provided that the resulting peak flow rate is less than the value calculated using the equation. Otherwise, the peak flow rate must be determined using the respective equation.

Permanent consumers

The flow rate of a permanent consumer is added to the peak flow rate of the other points of use. Water usage with a duration of more than 15 minutes, e.g. a garden sprinkler valve, are considered to be permanent consumption.

Series systems

Calculation here is based on the total flow rate. The degree of simultaneous water usage must be defined together with the system operator. If they can occur simultaneously, the peak flow rates of the series system must be added together.

Special buildings, commercial and industrial facilities

For special buildings (i.e., other than those indicated above), industrial plants, agricultural buildings, nurseries and market gardens, slaughterhouses, dairies, business establishments, commercial laundry facilities, catering companies, public baths, etc., the peak flow rate must be determined from the total flow rate in consultation with the facilities operator. If the peak flow rates for the sections of the drinking water installation occur at the same time, they must be added together.

Dimensioning and pressure loss for stainless steel pipes

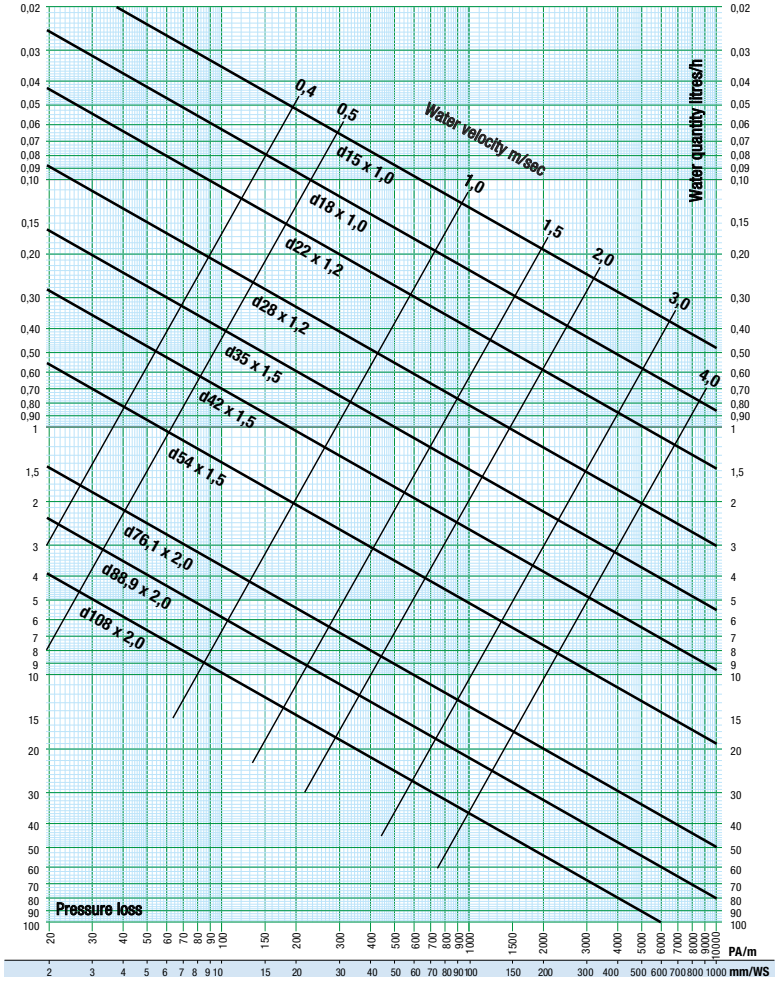
STEELFIX stainless steel pipe: d15, 18, 22, 28, 35, 42, 54, 76, 89, 108 mm

The pressure losses for water are calculated according to the Nikuradse formula:

$$R = 8.48455 \cdot 10^9 \cdot \dot{m}^{1.7749} \cdot di^{-4.807}$$

Pipe roughness: 0.01 mm
Water temperature 45°C

R = Pressure loss due to pipe friction pressure gradient (Pa/m)
$\dot{m}$ = Mass flow (l/sec)
di = Internal pipe diameter (mm)



Flushing report in conformity with ÖNORM B 2531 for drinking water systems – flushing medium – drinking water

Client: .....

Contractor: .....

Property: .....Test section: .....

Pipe material:.....Date: .....

To meet the requirements of ÖNORM EN 806-4, proceed as described below.

Standard values for the minimum number of points of use to be opened

Largest nominal width of line in section currently being flushed (DN)	20	25	32	40	50	65	80	100
Minimum number of points of use to be opened	2	2	4	6	8	12	18	28
Opened for flushing:								

Note: Regardless of the flushing procedure, each point of use should be opened completely once during system commissioning.
According to ÖNORM EN 806-4, the pipes must be commissioned properly no later than 7 days after being flushed.
The flushing process with an air/water mixture is described in ÖNORM EN 806-4.

- ☐ The drinking water used for flushing was filtered (no particles greater than or equal to 150 µm)
- ☐ The hot and cold water lines were flushed separately.
- ☐ Circulation lines were flushed in sections, directly prior to entry into the hot water heater.
- ☐ The minimum number of points of use was defined in conformity with ÖNORM.
- ☐ All the shut-off and control valves were open completely during the flushing process.
- ☐ Sensitive fittings (e.g. solenoid valves, flush valves, thermostatic fittings, control valves) and devices (e.g. drinking water heaters) were replaced with adapters or bypassed according to the manufacturer's specifications.
- ☐ The installation was flushed in sections, beginning with the first riser after the main shut-off.

Proper flushing of the system is hereby confirmed.

Installation company/fitter: .....

Client.....

Pressure test for drinking water systems with air or inert gases according to ÖNORM B 2531

The pressure test using air or inert gases is carried out in a two-stage process comprising a leak test and a load test. The leak test for pipelines ≤ DN 50/ OD 63 can be performed in 2 ways.

You can carry out the pressure test using air or inert gases on a section-by-section basis;
however, it is no replacement for a final pressure test using drinking water!

The pressure test must be carried out with air or inert gases that are essentially oil- and dust-free and it is suitable for all pipe materials. Inert gas must be used when the pressure test is carried out in buildings with demanding hygienic requirements (e.g. in medical facilities).

Due to the compressibility of the medium, test pressures above 300 kPa (3 bar) must not be applied for safety reasons when using air or inert gases for the pressure test!

Higher test pressures pose a higher safety risk and do not increase the testing accuracy.

Take necessary precautions to keep people and objects safe during the test. Splitting the pipeline into small pipe sections during the pressure test results in higher testing accuracy and therefore greater safety. A gradual pressure increase is useful as an additional safety precaution. All pipe openings must be closed tightly using plugs or blind flanges with enough strength to withstand the test pressure. When carrying out a pressure test using air or inert gases, the connections between the pipeline parts must be accessible and visible, and bleed valves must be available to ensure safe discharge of the test pressure.
If leaks are found or a pressure drop is detected, you must check that all the connections are tight using suitable bubble-forming leak detectors. Once the leaks have been eliminated, the pressure test must be repeated.

Two-stage pressure test for all pipelines ≤ DN 50/OD 63

Comprising a leak test according to version 1 or 2 and a load test

Leak test – version 1
Test pressure 15 kPa (150 mbar) – test duration 60 min. Display accuracy of the pressure gauge or the standpipe 0.1 kPa (1 mbar)

Leak test – version 2
Test pressure 1000 kPa (1 bar) – test duration 60 min. Display accuracy of the pressure gauge 5 kPa (50 mbar); in addition, you must check that all the connections in the system are tight using suitable bubble-forming test equipment

Load test
Test pressure 3000 kPa (3 bar) – test duration 10 min. Display accuracy of the pressure gauge 10 kPa (100 mbar)

Two-stage pressure test for all pipelines > DN 50/OD 63

Consisting of a leak test and a load test

Leak test
Test pressure 15 kPa (150 mbar) – test duration 90 minutes Display accuracy of the pressure gauge or the standpipe 0.1 kPa (1 mbar); in addition, all the connections in the system can be checked for tightness using suitable bubble-forming leak detectors.

Load test
Test pressure 1000 kPa (1 bar) – test duration 10 min. Display accuracy of the pressure gauge 10 kPa (100 mbar)

Pressure test for drinking water systems with air or inert gases according to ÖNORM B 2531

Test medium: air or inert gases

Client:.....

Contractor: .....

Property: .....Test section:.....

Pipe materials and sizes: .....

Ambient temperature: .....Temperature equalization: ☐

Maximum system operating pressure, MDP:.....Visual inspection: ☐

Two-stage pressure test for all pipelines ≤ DN 50/OD 63:
Comprising a leak test according to version 1 or 2 and a load test

Leak test – version 1 ☐
Test pressure 15 kPa (150 mbar) – test duration 60 minutes

Leak test – version 2 ☐
Test pressure 1000 kPa (1 bar) – test duration 60 minutes

Additionally, you must check that all the connection points in the system are tight using suitable bubble-forming leak detectors

Load test ☐
Test pressure 3000 kPa (3 bar) – test duration 10 minutes

Two-stage pressure test for all pipelines > DN 50/OD 63:
Consisting of a leak test and a load test

Leak test ☐
Test pressure 15 kPa (150 mbar) – test duration 90 minutes
Additionally, all connections in the system can be checked for tightness using suitable bubble-forming leak detectors.

Load test ☐
Test pressure 1000 kPa (1 bar) – test duration 10 minutes

Notes
After a successful pressure test, we recommend drawing up a confirmed test report.
The pressure test using air or inert gases does not eliminate the need for the pressure test with drinking water required by ÖNORM EN 806-4, which must be carried out immediately before the system is commissioned.

Confirmation

Responsible person: .....

Date:..... Time: from .....to .....

Client:.....

.....

Pressure test for drinking water systems using drinking water according to ÖNORM EN 806-4

When using "leak before pressed" fittings, a functional test must be performed according to the manufacturer's specifications
In the case of temperature differences (> 10 K) between the ambient and fill water temperatures, you must wait for 30 minutes after filling the system with drinking water so the temperature can equalize.

Test pressure: 0.05 MPa (0.5 bar) up to max. 0.2 MPa (2 bar)
Test duration: 15 minutes after temperature equalization between the pipe and test medium.

Test differential pressure: 0.0 bar
A visual check must then be performed on all pipe connections.

If a pressure test is carried out using air or inert gases, the functional test may be omitted!

Pressure test for drinking water systems in conformity with ÖNORM EN 806-4

The pressure test using drinking water is a combined leak and load test and, according to ÖNORM EN 806-4, must be performed on all pipes. Pipes and other pipeline parts must be rated for the highest system operating pressure (MDP) according to ÖNORM EN 805 or the ÖNORM EN 806 series.
However, they must be designed for at least a system operating pressure (MDP) or nominal pressure (PN) of 1.0 MPa (10 bar).

Since ÖNORM EN 806-4 requires that the test pressure be 1.1 times the highest system operating pressure, the pressure test must be carried out at at least 1.1 MPa (11 bar).

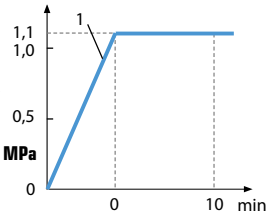
Display accuracy of the pressure gauge (preferably positioned at the lowest point): 0.02 MPa (0.2 bar).
Depending on the pipe materials and sizes, test method "A" is used for the leak and load test as per ÖNORM EN 806-4.

Test method A – test duration 10 minutes

- For all multilayer composite systems with **d14-75mm**
- For all metal pipe systems with **d12–108 mm**
- For all plastics (e.g. PP, PE, PEX, PB and others) ≤ **DN 50/OD 63**
- For all combined systems (metal and multilayer composite systems with plastics) ≤ **DN 50/OD 63**

The system must be filled with water, all the air must be bled out, and all points of use must be closed.

The test pressure (1) must be applied using pumps and be maintained for 10 minutes. During this time, the test pressure must remain constant without any pressure drops.



If a pressure test was carried out using air or inert gases according to ÖNORM B 2531, you can carry out the pressure test at 0.9 MPa (9 bar).

Pressure test report for drinking water systems using drinking water according to ÖNORM EN 806-4

Test medium: Drinking water

Test pressure according to ÖNORM EN 806-4 at 1.1 MPa (11 bar)
Test pressure according to air pressure test according to ÖNORM B 2531 at 0.9 MPa (9 bar)

Client:.....

Property: .....Test section: .....

Pipe materials and sizes: .....

Functional test according to manufacturer's specifications
Test pressure: 0.05 MPa (0.5 bar) up to max. 0.2 MPa (2 bar)
Test duration: 15 minutes

Ambient temperature: .....Air bled from system ☐
Temperature equalization ☐ Visual inspection ☐
Functional test carried out: Yes ☐ No ☐

Pressure test for drinking water systems with at least 1.1 MPa (11 bar)
Combined air and drinking water test at at least 0.9 MPa (9 bar)

Test pressure EN 806-4 at 11 bar ☐ **Test pressure B 2531 at 9 bar** ☐

Pipe: d...../.....m	Pipe: d...../.....m	Pipe: d...../.....m
Pipe: d...../.....m	Pipe: d...../.....m	Pipe: d...../.....m
Pipe: d...../.....m	Pipe: d...../.....m	Pipe: d...../.....m
Pipe: d...../.....m	Pipe: d...../.....m	

Test method A – test duration 10 minutes ☐

Metal systems and multilayer composite pipe systems – all sizes Plastic systems and combined systems with plastics ≤ DN 50/OD 63

Visual inspection ☐ The system is tight ☐

- **Temperature fluctuations can influence the test pressure.**
- **Each pressure test is a snapshot of the actual situation and can provide no guarantee against installation errors.**
- **After a successful pressure test, we recommend drawing up a confirmed test report.**

Confirmation

Responsible person: .....

Date:.....Time: from.....to .....

Client:.....

.....

Insulation of cold water pipelines according to ÖNORM H 5155

ÖNORM H 5155 applies to insulation of building service installations to standardise and simplify the design, installation and maintenance of insulation systems.

- The purpose of ÖNORM H 5155 is to specify insulation thicknesses to minimise the transfer of heat from transport media to the surrounding environment and vice versa.
- ÖNORM H 5155 applies to the insulation of all components in heating and drinking water systems.
- Insulation also varies depending on the type of installation and the location of the lines (e.g., false-wall installations, false ceilings, heated rooms, etc. ...)
- Please follow KE KELIT's recommendations, which also factor in comfort aspects such as noise reduction and more.
- Insulation of hot water pipes

ÖNORM H 5155 specifies a lambda value (λ) of 0.036 W/mK for cold water pipes at an average temperature of 0°C and an external heat transfer coefficient of 9 W/m²K.

Because LEXEL pipes have a lambda value (λ) of 0.036 W/mK at 20°C, the insulation thicknesses required by ÖNORM can be met with the following LEXEL insulations:

LEXEL insulation hose, 4 mm	LEXEL insulation hose, 9 mm
LEXEL insulation hose, 13 mm	LEXEL insulation hose, 20 mm

Extract from ÖNORM H 5155, Table 6. In this case, however, the DN/OD values have been adapted to the specific KE KELIT pipe dimensions

External pipe diameter mm	**15**	**18**	**22**	**28**	**35**	**42**	**54**	**76**
Installation location	**Minimum insulation thickness mm**							
Utility room	13	13	13	13	19	19	25	25
Unheated room, exposed	9	9	9	9	13	13	19	19
Heated room, exposed	13	13	13	13	19	19	25	25
Installation shaft or corridor, WITH hot water pipes	13	13	13	13	19	19	25	25
Installation shaft or corridor, WITHOUT hot water pipes	9	9	9	9	13	13	19	19
False ceiling, raised floor, lightweight partition wall, in-wall installation, floors (distribution lines only)	13	13	13	13	19	19	25	25
False-wall installation, floor (floor supply and individual supply lines)	4	4	4	4	9	9	13	13
False-wall installation, floors, next to hot-water circulating pipes (floor and individual supply lines)	13	13	13	13	19	19	25	25

Country-specific standards and laws regarding pipe insulation must be taken into consideration and complied with.

Heat insulation of heating system and hot water pipes in accordance with ÖNORM H 5155

ÖNORM H 5155 is for insulating building service installations to standardise and simplify the design, installation and maintenance of insulation systems.

- The purpose of ÖNORM H 5155 is to specify insulation thicknesses to minimise the transfer of heat from transport media to the surrounding environment and vice versa.
- ÖNORM H 5155 applies to the insulation of all components in heating and drinking water systems.
- Insulation also varies depending on the type of installation and the location of the lines (e.g., false-wall installations, false ceilings, heated rooms, etc. ...)
- Please follow KE KELIT's recommendations, which also factor in comfort aspects such as noise reduction and more.
- Insulation for cold water pipes

ÖNORM H 5155 specifies a lambda value (λ) of 0.047 W/mK for heating and hot water pipes at an average temperature of 50°C and an external heat transfer coefficient of 9 W/m²K.

Because LEXEL pipes have a lambda value (λ) of 0.039 W/mK at 40°C, the insulation thicknesses required by ÖNORM can be met with the following LEXEL insulations:

LEXEL insulation hose, 4 mm	LEXEL insulation hose, 9 mm
LEXEL insulation hose, 13 mm	LEXEL insulation hose, 20 mm

Extract from ÖNORM H 5155, Table 2. In this case, however, the DN/OD values have been adapted to the specific KE KELIT pipe dimensions

External pipe diameter mm	**15**	**18**	**22**	**28**	**35**	**42**	**54**	**76**
Installation location	**Minimum insulation thickness mm**							
Utility room	20	20	25	30	40	40	55	70
Unheated room	20	20	25	30	40	40	55	70
Heated room	10	10	15	15	20	20	30	35
Installation shaft or corridor mostly adjacent to unheated areas	20	20	25	30	40	40	55	70
False ceiling, raised floor, installation shaft or corridor mostly adjacent to unheated areas	10	10	15	15	20	20	30	35
In-wall installation, floors in unheated rooms	10	10	10	10	10	10	10	10
In-wall installation, floors in heated rooms	5	5	5	5	10	10	10	10

Country-specific standards and laws regarding pipe insulation must be taken into consideration and complied with.

Dismounting pressure test push-in fittings

You carry out dismounting using the dimension-specific WZ260 STEELFIX stainless steel plug-in dismounting tool

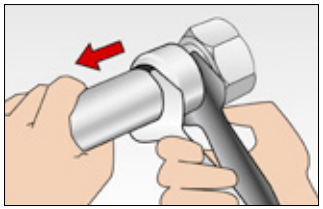
1. You can dismount NF457 fittings of dimensions d15-28 mm using the dismounting tool by pressing together the plastic sleeve and pushing it into the fitting and relieving the load on the grab ring (retaining ring) in the fitting.

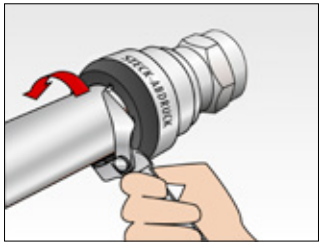
2. The NF457A stainless steel pressure testing push-adaptor with female thread of dimensions d35-54 mm is marked clearly and is fitted with a special dismounting end ring (TDX).

3. Using the WZ260 dismounting tool, you can relieve the load on the grab ring by rotating the inner ring in the dismounting end ring (TDX) and you can then pull the fitting down off the pipe.

4. These two fittings are specifically designed for pressure testing and they can be mounted on carbon steel or stainless steel pipes and on copper pipes.

You must pay attention to Points 1-7 of the installation instructions for STEELFIX press connections!





5. Spare parts for the NF457A d35-54 mm are available separately

- NF980 Stainless steel push-in fitting O-ring
- NF982 Stainless steel push-in fitting retaining claw
- NF984A Stainless steel push-in fitting dismounting end ring (TDX)

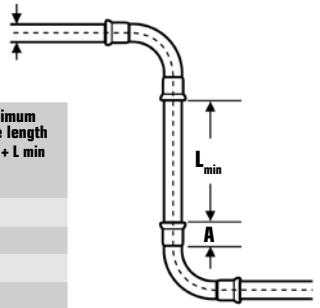
ATTENTION, only ever use stainless steel pressure testing push-adaptors with female thread for pressure testing!

Press fitting

Installation and space requirement

When installing STEELFIX piping systems, you must pay attention to a few assembly-specific dimensions of the fittings and pipes. To ensure correct processing, the table lists important minimum spacing and the space requirements for installation. The dimensions are relative to the general installation geometries and are shown in schematic form in illustrations A, B and C.

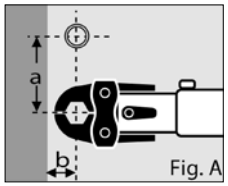
Pipe fitting – minimum spacing minimum pipe length diameter

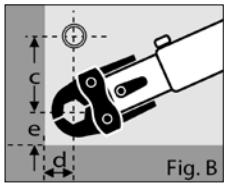


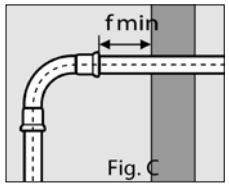
Pipe diameter d mm	Fitting insertion depth A mm	Minimum spacing L min mm	Minimum pipe length 2xA + L min mm
15	20	10	50
18	20	10	50
22	21	10	52
28	23	10	56
35	26	10	62
42	30	20	80
54	35	20	90
66.7	50	40	140
76.1	55	40	150
88.9	63	50	180
108	77	50	210

Pipe d mm	a mm	b mm	c mm	d mm	e mm	f mm
15	56	20	75	25	28	40
18	60	20	75	25	28	40
22	65	25	80	31	35	40
28	75	25	80	31	35	60
35	75	30	80	31	44	70
42	140/115*	60/75*	140/115*	60/75*	75*	70*
54	140/120*	60/85*	140/120*	60/85*	85*	70*
66.7	130*	100*	155*	105*	105*	80*
76.1	140*	110*	165*	115*	115*	80*
88.9	150*	120*	185*	125*	125*	90*
108	170*	140*	200*	135*	135*	110*

*) Press loops







Expansion behaviour of STEELFIX pipes

Depending on the material, pipes expand in a different way due to thermal loading. The inherent elasticity of the pipe network can absorb slight changes in length.

You must compensate for greater changes in length at installation by means of an appropriate expansion space, expansion compensators or by setting sliding and fixed points.

Prior calculation of the change in length that can be expected allows you to determine the possible compensator, which can be taken into account at installation.

The linear expansion depends on the pipe length, the increase in temperature and the expansion coefficient, but does not depend on the pipe size.

Calculating the linear expansion:

$$\Delta_L = L \cdot \Delta_t \cdot \alpha$$

ΔL= Linear expansion in (mm)
L = Length of the pipe in (m)
Δt = Temperature difference (K)
α = The linear expansion coefficient (mm/mK)

Example for stainless steel 1.4401:
L : 25 m
Δ_t: 60 K
α: 0.016 mm/mK

Δ_L= 25 x 60 x 0.016 = 24.00 mm

Under this condition, the free expansion of a pipe amounts to **24,0 mm**

Characteristic values of different materials

Systems	Expansion coefficient α=mm/mK	E-modulus 60° N/mm2
Carbon steel	0.0108	220,000
Stainless steel 1.4401	0.016	200,000
Stainless steel 1.4521	0.0104	200,000
Stainless steel 1.4301	0.016	200,000
Copper	0.016	130,000
KELEN	0.140	300
PEX	0.175	540
KELOX	0.025	4,240
PVC	0.080	1,100

Important material characteristic values for STEELFIX:

Linear expansion coefficient:

Carbon steel:
α = 0.0108 mm/mK

NF100 stainless steel:
α = 0.016 mm/mK

NF110 stainless steel:
α = 0.0104 mm/mK

NF130 stainless steel:
α = 0.016 mm/mK

Attention:
An NF110 stainless steel pipe has linear expansion that is 35% lower!

Carbon steel pipe linear expansion diagram

Temperature difference Δ_t (K)

Pipe length m	10	20	30	40	50	60	70	80	90	100
1	0.11	0.22	0.32	0.43	0.54	0.65	0.76	0.86	0.97	1.08
2	0.22	0.43	0.65	0.86	1.08	1.30	1.51	1.73	1.94	2.16
3	0.32	0.65	0.97	1.30	1.62	1.94	2.27	2.59	2.92	3.24
4	0.43	0.86	1.30	1.73	2.16	2.59	3.02	3.46	3.89	4.32
5	0.54	1.08	1.62	2.16	2.70	3.24	3.78	4.32	4.86	5.40
10	1.08	2.16	3.24	4.32	5.40	6.48	7.56	8.64	9.72	10.80
15	1.62	3.24	4.86	6.48	8.10	9.72	11.34	12.96	14.58	16.20
20	2.16	4.32	6.48	8.64	10.80	12.96	15.12	17.28	19.44	21.60
25	2.70	5.40	8.10	10.80	13.50	16.20	18.90	21.60	24.30	27.00
30	3.24	6.48	9.72	12.96	16.20	19.44	22.68	25.92	29.16	32.40
35	3.78	7.56	11.34	15.12	18.90	22.68	26.46	30.24	34.02	37.80
40	4.32	8.64	12.96	17.28	21.60	25.92	30.24	34.56	38.88	43.20
45	4.86	9.72	14.56	19.44	24.30	29.16	34.02	38.88	43.74	48.60
50	5.40	10.80	16.20	21.60	27.00	32.40	37.80	43.20	48.60	54.00
55	5.94	11.88	17.82	23.76	29.70	35.64	41.58	47.52	53.46	59.40
60	6.48	12.96	19.44	25.92	32.40	38.88	45.36	51.84	58.32	64.80

Expansion length in mm

Stainless steel 1.4401 linear expansion diagram

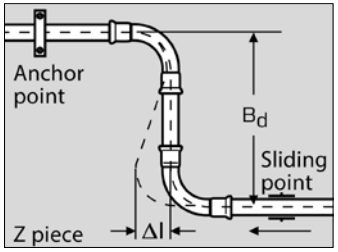
Temperature difference Δ_t (K)

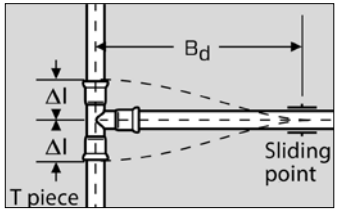
Pipe length m	10	20	30	40	50	60	70	80	90	100
1	0.16	0.32	0.48	0.64	0.80	0.96	1.12	1.28	1.44	1.60
2	0.32	0.64	0.96	1.28	1.60	1.92	2.24	2.56	2.88	3.20
3	0.48	0.96	1.44	1.92	2.40	2.88	3.36	3.84	4.32	4.80
4	0.64	1.28	1.92	2.56	3.20	3.84	4.48	5.12	5.76	6.40
5	0.80	1.60	2.40	3.20	4.00	4.80	5.60	6.40	7.20	8.00
10	1.60	3.20	4.80	6.40	8.00	9.60	11.20	12.80	14.40	16.00
15	2.40	4.80	7.20	9.60	12.00	14.40	16.80	19.20	21.60	24.00
20	3.20	6.40	9.60	12.80	16.00	19.20	22.40	25.60	28.80	32.00
25	4.00	8.00	12.00	16.00	20.00	**24.00**	28.00	32.00	36.00	40.00
30	4.80	9.60	14.40	19.20	24.00	28.80	33.60	38.40	43.20	48.00
35	5.60	11.20	16.80	22.40	28.00	33.60	39.20	44.80	50.40	56.00
40	6.40	12.80	19.20	25.60	32.00	38.40	44.80	51.20	57.60	64.00
45	7.20	14.40	21.60	28.80	36.00	43.20	50.40	57.60	64.80	72.00
50	8.00	16.00	24.00	32.00	40.00	48.00	56.00	64.00	72.00	80.00
55	8.80	17.60	26.40	35.20	44.00	52.80	61.60	70.40	79.20	88.00
60	9.60	19.20	28.80	38.40	48.00	57.60	67.20	76.80	86.40	96.00

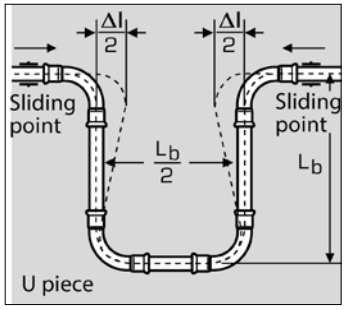
Expansion length in mm

Expansion bend of freely installed STEELFIX pipes

When subjected to thermal expansion, STEELFIX pipes in exposed installations must undergo corresponding expansion compensation. It is possible to absorb slight linear expansion by means of an expansion space or the elasticity of the pipe network. With relatively large linear expansion, it is necessary to provide Z-, T- or U-shaped expansion bends. In complicated cases, you can also use STEELFIX NP478 or NP479 axial compensators for closed systems.







Calculation of the expansion bend:

$$B_d = K_z \times \sqrt{d \times \Delta_l}$$
$$L_b = K_u \times \sqrt{d \times \Delta_l}$$

B_d: Z- or T-shaped expansion bend length in (mm)
L_b: U-shaped expansion bend length in (mm)
K_z: 45 for Z and T expansion compensation
K_u: 25 for U expansion compensation
d: Size of the pipe in (mm)
Δ_l: Linear expansion in (mm)

Compensation solutions

Compensation is always carried out between two anchor points, or between anchor points and changes in direction.

Important material constants for STEELFIX:

K_z: 45 = for a Z- or T-shaped expansion bend

K_u: 25 = for a U-shaped expansion bend

Example for stainless steel:

L: 25 m
Δt: 60 K
α: 0.0160 (stainless steel)
d: Stainless steel pipe d22 mm
Δl: 25 x 60 x 0.016 = 24.00 mm

WithZ or T expansion compensation:

B_d: $K_z \times \sqrt{d \times \Delta_l}$
B_d: $45 \times \sqrt{22 \times 24.00} = 1034.02$ mm

With U expansion compensation:

L_b: $K_u \times \sqrt{d \times \Delta_l}$
L_b: $25 \times \sqrt{22 \times 24.00} = 574.45$ mm

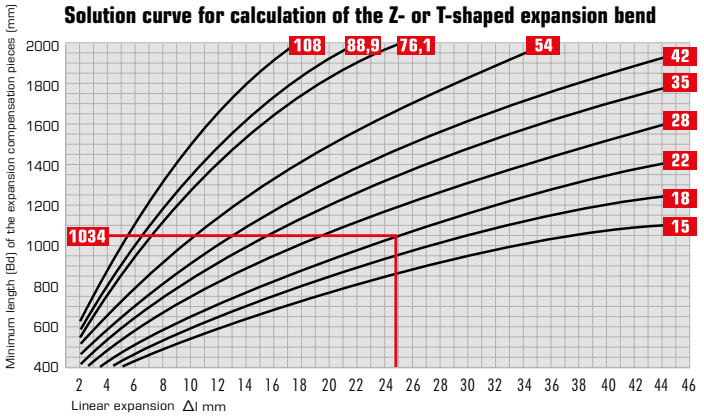
The expansion bend length of a stainless steel pipe for a Z- or T-shaped leg is: **1034 mm**
For a U-shaped leg it is: **575 mm**

Positioning fastenings

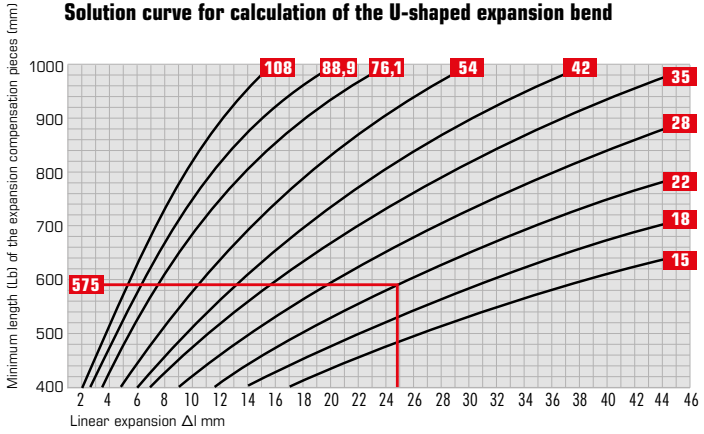
Correct positioning of hose clamps, anchor points, etc. are an important factor when installing steel pipes and their fastenings. You must pay attention to the following rules:

- Do not position anchor points in the immediate vicinity of fittings
- Sliding guides must not prevent expansion in the longitudinal direction
- To prevent possible deformation of the pipe, you must provide only one anchor point in the case of straight pipe sections; to guide possible linear expansion in both directions it is advisable to position the anchor point as close as possible to the centre of the straight section
- It is advisable to use hose clamps with an elastomer insert
- If necessary, suppliers of fastening clips can provide suitable solutions (anchor points, sliding clamps, etc.)
- Guide values for supporting widths

Solution curve for calculation of the Z- or T-shaped expansion bend



Solution curve for calculation of the U-shaped expansion bend



Summary of important laying and installation guidelines

Storage and transportation

- Store and transport all STEELFIX system components with care.
- At the factory, all STEELFIX pipes are fitted with plugs and packaged in plastic sacks and cardboard boxes.
- Any damage, notches or grooves on or to the pipes can result in problems in the sealing area.
- STEELFIX carbon steel and stainless steel pipes should be stored separately.
- Carbon steel pipes must be stored in a dry place. Moisture can lead to surface corrosion.

Press fittings

- Before carrying out pressing, you must check that the press jaw or the press tool are functioning properly. If they are contaminated, you may need to clean them.
- Before pressing, you must check the tools in use, including the press jaws, for damage.
- After carrying out pressing, you must not rotate the fittings any more!
- You must not carry out pressing with press loops WITHOUT fittings
- With dimensions d15-88.9mm, you must not press a connection more than once!
- You must not use press tools for a long period of time without interruptions! Refer to the operating instructions for the respective press tool!

Caution! In dimension d108mm, two pressings are needed with WZ281 press adapters ZB 221 (108/1) and ZB 222 (108/2)!

Pressing tools

Commercially available pressing tools consist of a press and the associated press jaws or press loops. The press can be battery- or mains-powered. You must use the appropriate **M-contour** press jaws or press loops for each pipe diameter. For diameters d42 to d108, you must use a special adapter in addition to the press loops.

High-pressure press tools

In the case of systems like sprinkler pipes, for example that need higher pressures (maximum of 25 bar – depending on the dimensions), the WZ273S press ACO 403 with its associated **M-contour** WZ288S high-pressure press loops are available.

Please pay attention to the enclosed instructions for the respective presses!

Maintaining pressing tools

- After pressing 50 times in dimensions from d42-108mm, you must spray the joints and sliding elements of press loops with graphite oil!
- CAUTION! In the case of continuous pressing, there is a risk of overheating; refer to the manufacturer's instructions!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty. Please contact KE KELIT or the respective tool manufacturer directly!

Threaded connections

- STEELFIX male and female threads are manufactured according to ÖNORM EN 10226; cylindrical connections where pressure-tight joints are not made on the threads are manufactured as per ISO 228-1.
- To seal stainless steel press fittings, you must use hemp pipe thread packer or other commercially available chloride-free sealants.
- Due to the water-soluble chloride ions that Teflon sealing tapes contain, you must not use them in conjunction with stainless steel.
- You can use Teflon sealing tapes with carbon steel fittings without any restrictions.
- In the case of flange connections, make sure that seals are installed when dry. Pay attention to the recommendations of the seal manufacturer!

Bending STEELFIX pipes

- STEELFIX pipes are bent when cold; to do this, you use commercially available draw bending tools with appropriate bending segments.
- Due to the risk of corrosion, you are NOT allowed to bend STEELFIX pipes when they are hot!
- Pipe ends that open into a fitting must not demonstrate any ovality due to bending.

Bending radii of STEELFIX pipes up to a maximum of d28 mm

Stainless steel pipe	R_{min} = 3.5 x d
Carbon steel pipe	R_{min} = 3.5 x d
Carbon steel pipe with PP jacket	R_{min} = 3.5 x d

Smaller bending radii are not allowed!

Important processing guidelines

- Cut pipe ends to length straight and at right angles.
- Deburr the pipe ends on the inside and outside
- Mark the insertion depth
- Carry out a visual inspection of the O-ring
- Insert straight; pay attention to the insertion depth
- Use a suitable press
- Carry out pressing using M contour press jaws
- Seal and screw in threaded connections before pressing in
- Carry out a pressure test according to the standard and the KE KELIT specification
- Flush the pipe according to the standard

Expansion

- Linear expansion of STEELFIX pipes is temperature-dependent
- With metal pipes the force is many times greater than with plastic pipes; pay attention to tensile forces.
- Branch pipes of main pipes or risers in the masonry or similar must be insulated such they are not subjected to mechanical loading.
- Pay attention to the expansion properties, in particular position the fastenings and pipe clamps correctly

Guide values for support shafts of horizontally laid STEELFIX pipes

- To effectively prevent structure-borne sound being transmitted, clamps with elastomer inserts are used for sound decoupling!
- Only ever put fastening points on pipes and not on the fittings!
- Position fixed and sliding clamps to ensure that the expansion properties of STEELFIX pipes are not impeded.

STEELFIX pipe d mm	ÖNORM EN 806-4 m	KELIT recommen-dation m
15	1.20	1.50
18	1.50	1.50
22	1.80	2.50
28	1.80	2.50
35	2.40	3.50
42	2.40	3.50

STEELFIX pipe d mm	ÖNORM EN 806-4 m	KELIT recommen-dation m
54	2.70	3.50
66.7	3.00	4.30
76.1	3.00	5.00
88.9	3.00	5.00
108	3.00	5.00

Equipotential bonding

STEELFIX pipes are electrically conductive, which means that they must be incorporated into the main equipotential bonding conductor for electrical systems (earthing).
This must be carried out by a licensed electrical contractor.

General insulation regulations for pipes

- Use approved, closed-cell insulation material that is appropriate to the installation.
- STEELFIX pipes and fittings that are installed in the floor or flush-mounted must be protected from external corrosion using a protective coating and anti-corrosion tapes or watertight, spliced insulation material.
- STEELFIX piping systems must not be subjected to permanent moisture; you must not use insulation made from felt.
- Connecting pipes that stick out of the ground must be protected from corrosion (mopping water and cleaning agents).
- STEELFIX carbon steel pipes and fittings in areas at risk from damp and moisture, etc. must have an anti-corrosion material applied and/or be wound in sealing tape if necessary.
- In the case of carbon steel pipes with which the dew can be fallen short of due to the operating conditions, you must comply with ÖNORM H 5155 and apply a continuous corrosion protection coating and stick on diffusion-resistant insulation at the specified intervals.

Antifreeze and auxiliary heating

- Metal pipes must be protected from frost; insulate them appropriately.
- You can install system-compatible auxiliary heating systems on STEELFIX pipes without any restrictions.
- Glycol or antifreeze products that are available from specialist dealers present no problems for stainless steel and carbon steel pipes and their connection components when mixed with water at temperatures of up to -30°C. Pay attention to the suppliers' application information.

Flushing drinking water pipelines

After installing drinking water pipelines, you must flush them in accordance with the standard; if necessary, you must pay attention to the particular specifications in ÖNORM B 2531 and ÖNORM EN 806-4.

Pressure test

- You should carry it out before insulating, applying the coating, etc.
- For hygienic reasons, you must carry out a pressure test as per ÖNORM B 2531 on drinking water systems using air or inert gases. You must not carry out the pressure test using water as per ÖNORM EN 806-4 until directly before commissioning of the system.
- Due to the risk of corrosion, after you have carried out the pressure test the pipe must be kept full or you must ensure that the system is drained completely and dried.
- Every water and heating system installation must be subjected to a pressure test in accordance with the standard; to do this, use the pressure testing push-adaptors.
- From d15-54 mm STEELFIX system press components are "not pressed, not sealed", which means that you must subject them to air pressure testing or functional inspection.
- It is advisable to draw up a record of the pressure test.

Fire behaviour of STEELFIX pipes

- STEELFIX carbon steel and stainless steel pipes are to be rated as non-flammable pipes of building material class A1 as per ÖNORM EN 13501.
- Pipes with plastic sheathing of up to 2 mm in thickness are treated as non-flammable pipes from the point of view of building law.
- **Fire protection**

  STEELFIX steel pipes with non-flammable sectional insulation **(ROCKWOOL-RS 800)** installed in the wall and ceiling structures:
- d15-108 mm pipes installed in shaft, partition, cross-laminated timber walls, etc. must be routed through a soft fitting with a **(PROMASTOP-CC)** fire-resistant coating.
- d15-108mm pipes are allowed to be installed in fire-resistant solid wall and ceiling structures if the annular gap is plastered with mortar appropriately.

  STEELFIX steel pipes with flammable insulation **(B-s3, d0)** are also allowed to be installed in wall and ceiling structures:
- d15-108mm pipes that are routed through solid wall or ceiling structures in core drilled holes must be wrapped in a single-layer of **PROMASTOP-W** fire-protection tape.
- d15-42mm pipes that are installed in shaft, partition and cross-laminated timber walls, etc. must be wrapped in a single-layer of **PROMASTOP-W** fire-protection tape.
- d15-108mm that are installed shaft, partition and cross-laminated timber walls, etc. must be routed through a soft fitting with a **PROMASTOP-CC** fire-resistant coating; in addition, they must be wrapped in a single-layer of **PROMASTOP-W** fire-protection tape.
- For details, refer to the manufacturer's documentation of the respective supplier of the fire-protection technology.
- You must comply with regional guidelines and regulations.

To lay

STEELFIX metal pipe systems perfectly, you need the normal numbers and types of tools. For your safety, we recommend using our original tools which have been tried and tested multiple times in practice applications, and also that they be regularly serviced.

To ensure warranty coverage,
you must exclusively use STEELFIX system components (pipes, fittings and M contour tools) in every installation.

Special applications

- When using chemicals, you must always coordinate functionality with the pipe and sealing elements.
- KE KELIT must have approved special applications in writing.
- Treated water, service water and the use of completely demineralized water do not present any problems to NF100 and NF110 STEELFIX stainless steel pipes; you should, however, coordinate the application with KE KELIT.
- Press connections are not gap-free connection technologies, which means that they can only be used in food sector applications to a limited extent.
- The standard STEELFIX press-fit system is fitted with black EPDM O-rings. For applications in water temperatures of up to 200°C, a green VITON O-ring is available.
  Users must replace it themselves!
- STEELFIX carbon steel and stainless steel pipes can be used for vacuum applications at a **maximum vacuum of -0.6 bar**
- STEELFIX piping systems have not been inspected for use with flammable media (fuels, gases, etc.)

Disinfection

The primary objective of ÖNORM B 5019 or B 5021 is to prevent bacterial contamination of drinking water systems without using disinfectants. Disinfection measures are regulated by these standards.
You must carry out disinfection of the drinking water piping system in accordance with the KE KELIT disinfection guideline, visit **www.kekelit.com**
For disinfectants listed in ÖNORM B 5019 and B 5021 (e.g., chlorine, chlorine dioxide, ozone, etc.), comply with the respective concentrations and exposure times and do not exceed them under any circumstances. If disinfection is performed in contravention of KE KELIT's disinfection guideline and/or compliance with the concentrations and exposure times specified in the standards, damage to material cannot be ruled out.

According to ÖNORM B 5019 or B 5021, thermal disinfection is always preferable to chemical disinfection!

STEELFIX stainless steel

Internal corrosion

- STEELFIX NF100 and NF110 stainless steel pipes can be used for water treatment systems in domestic applications (e.g., water softeners), and for applications involving distilled water, water containing glycol, and reverse osmosis or demineralized water.
- You CANNOT use STEELFIX stainless steel for condensate piping of oil or gas condensing boilers (with a pH value of < 6.0).

External corrosion

- External corrosion of STEELFIX stainless steel only ever occurs if damp pipes come into contact with materials that either contain or produce chlorides.
- You must make sure that the insulation or protective coating that have been applied in accordance with valid standards are not damaged.
- As per ÖNORM H 5155, NF130 stainless steel pipe 1.4301 needs NO additional corrosion protection if the medium temperature is between -35°C and 20°C, the ambient temperature during downtimes is not greater than 35°C and the pipe is not flushed with warm media. As an alternative, it is possible to use chloride-free insulating material (e.g. NH/Armaflex or FLEXCELL XLPE).

STEELFIX C-steel

Internal corrosion

- In closed water heating systems, it is not normally possible for internal corrosion to occur. If the STEELFIX carbon steel heating system is not in operation, it must be always be kept full or you must drain it completely and dry it.
- Non-compliance with ÖNORM H 5195 when using heating or cooling water in closed systems can result in internal corrosion of carbon steel pipes. This standard specifies the pH value **(preferably 8.2-10.0)** and the water hardness (dH) of heating and refilling water. This can affect the functions of valves and regulating equipment, etc.
- As specified in ÖNORM H 5195, you can use carbon steel fittings that are galvanised on the inside in conjunction with steel pipe systems that are not coated inside.

External corrosion

- STEELFIX carbon steel pipes must not be stored or installed permanently unless they are protected from moisture.
- You must prevent permanent contact between the outside and corrosive media.
- In the case of carbon steel pipes with which the dew point can be fallen short of due to the operating conditions, you must comply with ÖNORM H 5155 and apply a continuous corrosion protection coating and stick on diffusion-resistant insulation at the specified intervals
- Closed-cell insulation material on its own does not represent adequate corrosion protection with regard to condensation in cooling water systems.

Mixed installation

- STEELFIX stainless steel pipes and fittings can be connected to fixtures and fittings made of stainless steel and non-ferrous metals with no problems.
- When connected to carbon steel, galvanized or base metal fittings and fixtures, contact corrosion may occur. This can be avoided through the use of a fixture or spacer made of plastic or non-ferrous metal with a minimum length of 50 mm.

Material mixture combination options

Fittings		Copper	Brass	Carbon steel	Stainless steel
Pipe	**system**				
Copper	**closed**	Allowed	Allowed	Allowed	Allowed
	Open	Allowed	Allowed	Not allowed	Allowed
Carbon steel	**closed**	Allowed	Allowed	Allowed	Allowed
	Open	Not allowed	Not allowed	Not allowed	Not allowed
Stainless steel	**closed**	Allowed	Allowed	Allowed	Allowed
	Open	Allowed	Allowed	Not allowed	Allowed

In case of doubt, do not hesitate to contact our application technicians. There may not be an optimum solution for every case, but we can always help.
Installation videos can be viewed using the KE KELIT QR code.
www.youtube.com/kekelit

STEELFIX product overview

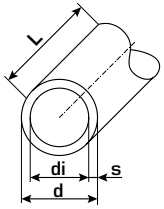
The STEELFIX pipe system is continuously adapted to meet changing engineering requirements, and is enhanced on a systematic basis. The most up-to-date version of our available product range can be found in the current STEELFIX price lists.

On request, we can manufacture special fittings, like elbows with different leg lengths produced from the respective medium pipe or special fitting designs as a workshop prefabrication, for example.

Product codes (e.g. CF100 = carbon steel pipe or CP440 = carbon steel press-tee …) make ordering much easier, which means that you should quote them in all your wholesale orders.

STEELFIX C-steel

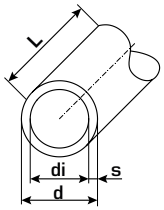
CF100 Carbon steel pipe



Thin-walled, longitudinally welded stainless steel pipes according to EN 10305-3 with particularly low carbon content and with the outside protected by a thermally applied zinc layer and a passivising/ chromium layer
Application area: Closed heating and cooling circuits
Operating temperature: -35°C to 120°C - tmax 150°C/16 bar - briefly
Rod length: 6m

d mm	s mm	di mm	Weight kg/m	Capacity l/m
15	1.2	12.6	0.42	0.125
18	1.2	15.6	0.49	0.192
22	1.5	19	0.76	0.284
28	1.5	25	0.98	0.491
35	1.5	32	1.24	0.804
42	1.5	39	1.54	1.195
54	1.5	51	1.99	2.043
66.7	1.5	63.7	2.41	3.187
76.1	2.0	72.1	3.50	4.083
88.9	2.0	84.9	4.41	5.661
108	2.0	104	5.38	8.495

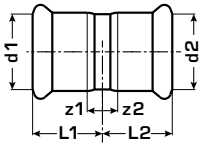
CF150 Internal/external galvanised carbon steel pipe



Thin-walled, longitudinally welded stainless steel pipes according to EN 10305-3 with particularly low carbon content and with the inside and outside coated with a thermally applied Sendzimir-zinc layer and the outside additionally protected by a passivising/ chromium layer
Application area: Closed wet fire-extinguishing water systems, dry compressed air systems
Operating temperature and pressure: -35°C to 70°C/16bar
Dry compressed air in conjunction with press fittings ONLY:
d15 - 54 mm - max. 16 bar
d76 - 108 mm - max. 10 bar
Marking: Purple protective caps
Rod length: 6m

d mm	s mm	di mm	Weight kg/m	Capacity l/m
22	1.5	19	0.76	0.284
28	1.5	25	0.98	0.491
35	1.5	32	1.24	0.804
42	1.5	39	1.54	1.195
54	1.5	51	1.99	2.043
76.1	2	72.1	4.41	5.661
88.9	2	84.9	5.38	8.495
108	2	104	3.50	4.083

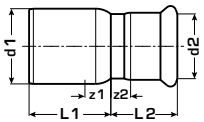
CP410 Carbon steel press-coupling



Press-coupling straight made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
15	15	25	5	25	5
18	18	25	5	25	5
22	22	26	5	26	5
28	28	28	5	28	5
35	35	31	5	31	5
42	42	38	8	38	8
54	54	43	8	43	8
66.7	66.7	60	10	60	10
76.1	76.1	63	8	63	8
88.9	88.9	72	9	72	9
108	108	86	9	86	9

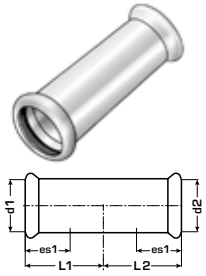
CP411 Carbon steel press-reduction socket male/ female



Press-reduction socket male/female straight made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
18	15	27	7	31	11
22	15	32	11	29	9
22	18	29	8	32	12
28	15	38	15	30	10
28	18	36	13	30	10
28	22	33	10	33	12
35	22	41	15	30	9
35	28	34	8	36	13
42	22	51	21	32	11
42	28	51	21	32	9
42	35	41	11	39	13
54	22	63	28	34	13
54	28	58	23	33	10
54	35	57	22	38	12
54	42	52	17	44	14
66.7	28	96	46	41	18
66.7	35	84	34	38	12
66.7	42	81	31	44	14
66.7	54	72	22	48	13
76.1	42	97	42	50	20
76.1	54	86	31	55	20
76.1	66.7	75	20	64	14
88.9	54	101	38	54	19
88.9	66.7	92	29	65	15
89.9	76.1	90	27	68	13
108	66.7	122	45	65	15
108	76.1	120	43	68	13
108	88.9	110	33	77	14

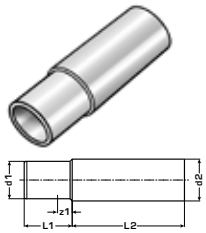
CP415 Carbon steel press-repair coupling



Press-repair coupling straight made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	L2 mm
15	15	40	40
18	18	40	40
22	22	42	42
28	28	46	46
35	35	52	52
42	42	61	61
54	54	70	70
66.7	66.7	99	99
76.1	76.1	115	115
88.9	88.9	131	131
108	108	151	151

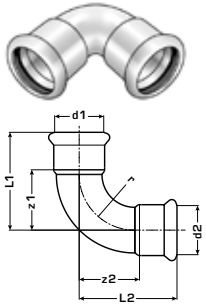
CP416 Carbon steel press-weld on pipe



Weld-on pipe, straight, made of carbon steel as an adaptor for steel pipes
ATTENTION, apply corrosion protection after welding!

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm
15	17	32	9	88
18	20	32	10	88
22	24	35	13	85
28	31	35	14	85
35	38	35	12	85
42	44.5	40	12	80
54	57	49	12	71
76.1	80	102	45	128
88.9	95	118	52	112
108	110	138	38	100

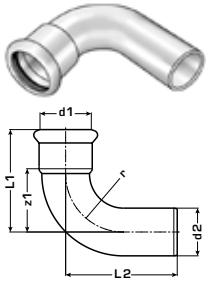
CP420 Carbon steel press-elbow 90°



Press-elbow 90° made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm	r mm
15	15	41	21	41	21	18
18	18	45	25	45	25	22
22	22	51	30	51	30	27
28	28	61	38	61	38	34
35	35	72	46	72	46	42
42	42	87	57	87	57	51
54	54	105	70	105	70	65
66.7	66.7	145	95	145	95	80
76.1	76.1	155	100	155	100	92
88.9	88.9	179	116	179	116	107
108	108	216	139	216	139	130

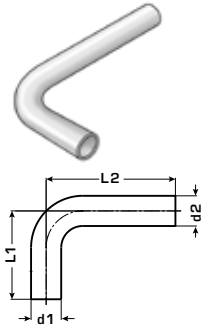
CP421 Carbon steel press-elbow 90° male/female



Press-elbow 90° male/female made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	r mm
15	15	41	21	49	18
18	18	45	25	51	22
22	22	51	30	58	27
28	28	61	38	66	34
35	35	72	46	76	42
42	42	87	57	93	51
54	54	105	70	111	65
66.7	66.7	145	95	157	80
76.1	76.1	155	100	168	92
88.9	88.9	179	116	193	107
108	108	216	139	233	130

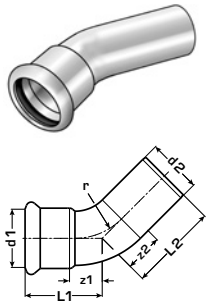
CP422 Carbon steel press-elbow 90° male/male



Elbow 90° male/male made of carbon steel, coated with a zinc layer Dimensions:
d15-22 - 120x70mm
d28 - 120x80mm
d35 - 200x120mm
d42 - 250x150mm
d54 - 300x200mm

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	r mm
15	15	72	52	122	18
18	18	72	52	122	22
22	22	74	53	122	27
28	28	84	61	122	34
35	35	122	96	202	42
42	42	152	122	252	51
54	54	202	167	302	65

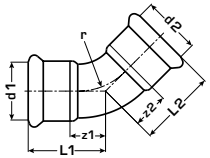
CP424 Carbon steel press-elbow 30° male/female



Press-elbow 30° male/female made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d42-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
42	42	48	18	54	24
54	54	62.5	27.5	58	23
66.7	66.7	78.5	31.5	88	41
76.1	76.1				
88.9	88.9	94.5	31.5	117	54
108	108	114	37	145	68

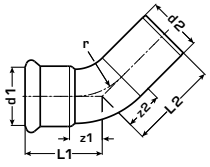
CP425 Carbon steel press-elbow 45°



Press-elbow 45° made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm	r mm
15	15	31	11	31	11	18
18	18	32	12	32	12	22
22	22	35	14	35	14	27
28	28	40	17	40	17	34
35	35	46	20	46	20	42
42	42	56	26	56	26	51
54	54	67	32	67	32	65
66.7	66.7	98	48	98	48	80
76.1	76.1	101	46	101	46	92
88.9	88.9	116	53	116	53	107
108	108	139	62	139	62	130

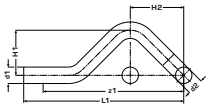
CP426 Carbon steel press-elbow 45° male/female



Press-elbow 45° male/female made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	r mm
15	15	31	11	38	18
18	18	32	12	39	22
22	22	35	14	42	27
28	28	40	17	46	34
35	35	46	20	51	42
42	42	56	26	63	51
54	54	67	32	73	65
66.7	66.7	98	48	110	80
76.1	76.1	101	46	114	92
88.9	88.9	116	53	130	107
108	108	139	62	157	130

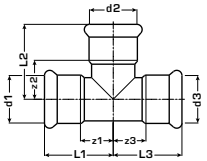
CP427 Carbon steel curved pipe male/male



Curved pipe for parallel lines m/m made of carbon steel coated with a zinc layer

d1 mm	d2 mm	L1 mm	z1 mm	H1 mm	H2 mm
15	15	158	138	37	57
18	18	165	145	40	60
22	22	178	157	44	65
28	28	210	187	50	74

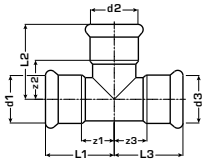
CP440 Carbon steel press-tee



Press-tee equal or reduced made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	d3 mm	L1 mm	z1 mm	L2 mm	z2 mm	L3 mm	z3 mm
15	15	15	35	15	44	24	35	15
15	18	15	35	15	44	24	35	15
15	22	15	35	15	48	27	35	15
18	15	18	37	17	46	26	37	17
18	18	18	37	17	46	26	37	17
18	22	18	37	17	47	26	37	17
22	15	15	35	15	48	27	35	15
22	15	22	40	19	48	28	40	19
22	18	22	40	19	48	28	40	19
22	22	15	40	19	48	28	48	28
22	22	22	40	19	49	28	40	19
22	28	22	40	19	52	29	40	19
28	15	28	45	22	51	31	45	22
28	18	28	45	22	51	31	45	22
28	22	28	45	22	52	31	45	22
28	28	28	45	22	54	31	45	22
35	15	35	52	26	54	34	52	26
35	18	35	52	26	54	34	52	26
35	22	35	52	26	55	34	52	26
35	28	35	52	26	57	34	52	26
35	35	35	52	26	60	34	52	26
42	22	42	60	30	58	37	60	30
42	28	42	60	30	60	37	60	30
42	35	42	60	30	63	37	60	30
42	42	42	61	31	67	37	61	31
54	22	54	71	36	64	43	71	36
54	28	54	71	36	66	43	71	36
54	35	54	71	36	69	43	71	36
54	42	54	71	36	73	43	71	36
54	54	54	71	36	78	43	71	36

CP440 Carbon steel press-tee



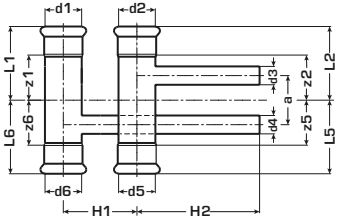
Press-tee equal or reduced made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	d3 mm	L1 mm	z1 mm	L2 mm	z2 mm	L3 mm	z3 mm
66.7	28	66.7	99	49	73	50	99	49
66.7	35	66.7	99	49	76	50	99	49
66.7	42	66.7	99	49	80	50	99	49
66.7	54	66.7	99	49	85	50	99	49
66.7	66.7	66.7	99	49	101	51	99	49
76.1	22	76.1	115	60	68	47	115	60
76.1	28	76.1	115	60	85	62	115	60
76.1	35	76.1	115	60	87	61	115	60
76.1	42	76.1	115	60	97	67	115	60
76.1	54	76.1	115	60	110	75	115	60
76.1	66.7	76.1	115	60	104	54	115	60
76.1	76.1	76.1	115	60	110	55	115	60
88.9	22	88.9	130	67	76	55	130	67
88.9	28	88.9	130	67	92	69	130	67
88.9	35	88.9	130	67	97	71	130	67
88.9	42	88.9	130	67	105	75	130	67
88.9	54	88.9	130	67	117	82	130	67
88.9	66.7	88.9	130	67	111	61	130	67
88.9	76.1	88.9	130	67	117	62	130	67
88.9	88.9	88.9	130	67	128	65	130	67
108	22	108	155	78	85	64	155	78
108	28	108	155	78	102	79	155	78
108	35	108	155	78	107	81	155	78
108	42	108	155	78	115	85	155	78
108	54	108	155	78	128	93	155	78
108	76.1	108	155	78	128	73	155	78
108	88.9	108	155	78	137	82	155	78
108	108	108	155	78	153	76	155	78

CP442 Carbon steel press curved tee

Press curved tee, equal or reduced, made of carbon steel coated with a zinc layer, incl. EPDM sealing components, "leak before pressed" Press contour: M

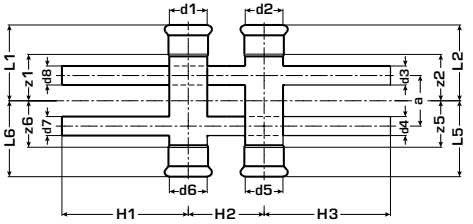
d1/d3 mm	L1/L2/L5/L6 mm	z1/z2/z5/z6 mm	H1 mm	H2 mm	a mm
15x15	60	40	60	100	40
18x15	60	40	60	100	40
22x15	60	39	60	100	40
28x15	60	37	60	100	40



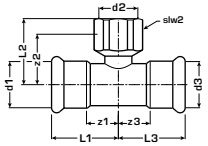
CP443 Carbon steel press curved cross-tee

Press cross tee, equal or reduced, made of carbon steel coated with a zinc layer, incl. EPDM sealing components, "leak before pressed" Press contour: M

d1/d3 mm	L1/L2/L5/L6 mm	z1/z2/z5/z6 mm	H1 mm	H2 mm	a mm
15x15	60	40	100	60	40
18x15	60	40	100	60	40
22x15	60	39	100	60	40
28x15	60	37	100	60	40
35x15	60	34	100	60	40



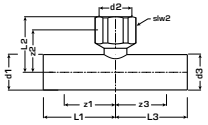
CP447 Carbon steel press-tee with branch female



Press-tee with threaded branch female made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inch-es	d3 mm	L1 mm	z1 mm	L2 mm	z2 mm	L3 mm	z3 mm	slw2 mm
15	1/2"	15	35	15	37	22	35	15	28
18	1/2"	18	37	17	37	22	37	17	28
22	1/2"	22	40	19	39	24	40	19	28
28	1/2"	28	45	22	42	27	45	22	28
28	3/4"	28	45	22	44	28	45	22	35
28	1"	28	45	22	48	25	45	22	47
35	1/2"	35	52	26	46	31	52	26	28
35	3/4"	35	52	26	48	31	52	26	35
35	1"	35	52	26	52	29	52	26	47
42	1/2"	42	61	31	48	33	61	31	28
42	3/4"	42	61	31	50	34	61	31	35
42	1"	42	61	31	54	31	61	31	47
54	1/2"	54	71	36	54	39	71	28	28
54	3/4"	54	71	36	56	40	71	36	35
54	1"	54	71	36	60	37	71	36	47
66.7	3/4"	66.7	99	49	67	51	99	49	35
76.1	3/4"	76.1	115	60	82	66	115	60	35
88.9	3/4"	88.9	130	67	84	68	130	67	35
108	3/4"	108	155	78	94	78	155	78	35

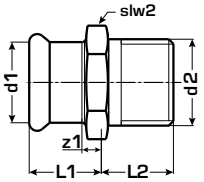
CP447G Carbon steel press-adaptor tee female - pipe end



Press tee as a pipe end with female-threaded branch made of carbon steel coated with a zinc layer
Total length: 88mm with branch 1/2" female in the middle

d1 mm	d2 inch-es	d3 mm	L1 mm	z1 mm	L2 mm	z2 mm	L3 mm	z3 mm	slw2 mm
22	1/2"	22	43	22	39	24	43	22	24
28	1/2"	28	44	21	42	27	44	21	24
35	1/2"	35	47	21	46	30	47	21	24
42	1/2"	42	49	19	49	33	49	19	24

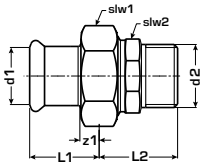
CP450 Carbon steel press-adaptor male



Press-adaptor with male thread conforming to EN 10226-1 made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	slw2 mm
15	3/8"	22	2	13	28
15	1/2"	22	2	17	28
18	1/2"	22	2	17	31
18	3/4"	22	2	18	31
22	1/2"	26	5	17	37
22	3/4"	26	5	18	37
22	1"	28	7	22	39
28	3/4"	28	5	22	44
28	1"	28	5	20	47
35	1"	33	7	20	53
35	5/4"	33	7	22	53
42	5/4"	34	4	25	55
42	6/4"	35	5	24	64
54	6/4"	39	4	26.5	70
54	2"	41	6	28	81
66.7	2 1/2"	57	7	33	98
76.1	2 1/2"	64	9	33	92
88.9	3"	73	10	36	110

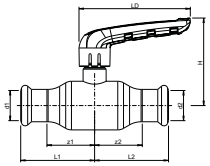
CP451 Carbon steel press-union with male thread



Press-union with male thread conforming to EN 10226-1 made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	slw1 mm	slw2 mm
15	1/2"	29	9	35	35	29
18	1/2"	29	9	35	35	29
22	3/4"	30	9	40	42	37
28	1"	31	8	44	53	45
35	5/4"	34	8	48	60	57
42	6/4"	41	11	47	67	59
54	2"	47	12	53	87	75

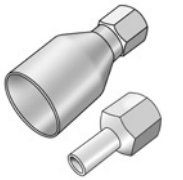
CP453 Carbon steel press-ball valve

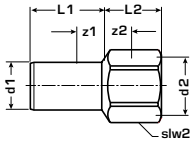


Press-ball valve with full bore, ball and basic body with full flow, made of carbon steel coated with a zinc layer, incl. EPDM sealing components, "leak before pressed" Press contour: M
Operating temperature: - 35°C - tmax 135°C

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
15	15	47	27	47	27
18	18	51.5	32	51.5	32
22	22	60.5	40	60.5	40
28	28	67.5	45	67.5	45
35	35	80.5	55	80.5	55
42	42	99	69	99	69
54	54	113	79	113	79

CP454 Carbon steel press-connector straight female

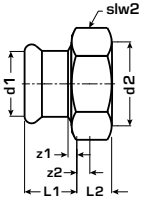




Press-adaptor with female thread made of carbon steel with pipe dimensions and coated with a zinc layer

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	slw2 mm
15	1/2"	30	10	21	24
18	1/2"	29	9	21	24
18	3/4"	30	10	23	30
22	1/2"	30	9	20	24
22	3/4"	31	10	22	30
28	1/2"	45	22	21	24
35	1/2"	54	28	21	24
42	1/2"	81	51	21	24
54	1/2"	86	51	21	24

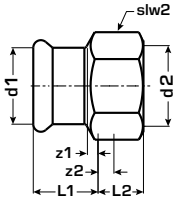
CP455 Carbon steel press-screw connection with female thread



Press-fit transition screw connection with female thread for connecting to fittings, made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	3/4"	29	9	8	2	35
18	3/4"	29	9	8	2	35
22	1"	30	9	10	2	42
28	5/4"	31	8	10	2	53
35	6/4"	34	8	11	2	60
42	1 3/4"	41	11	11	2	60
54	2 3/8"	47	12	11	3	87

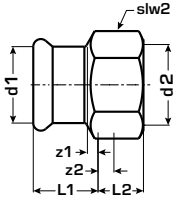
CP456 Carbon steel press-Euro screw fitting



Press-Euro screw fitting for connecting to installation components with a 3/4" EURO CONE (male thread) conforming to DIN215 made of carbon steel coated with a zinc layer, incl. EPDM sealing components, "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	3/4"	21	1	16	7	30
18	3/4"	22	2	16	7	30

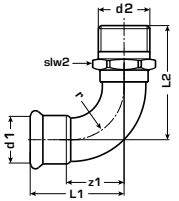
CP457 Carbon steel press-adaptor with female thread



Press-adaptor with female thread made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	1/2"	22	2	19	4	28
18	1/2"	21	1	19	4	31
18	3/4"	23	3	20	4	35
22	1/2"	22	1	14	0	37
22	3/4"	23	2	20	4	37
28	1/2"	24	1	14	1	47
28	3/4"	24	1	17	0	44
28	1"	26	3	23	4	47
35	1/2"	30	4	12	1	53
35	3/4"	28	2	15	3	53
35	1"	33	7	13	0	53
35	5/4"	28	2	22	7	53
42	6/4"	32	2	22	6	62
54	2"	37	2	26	8	77

CP460 Carbon steel press-elbow adaptor 90° with male thread

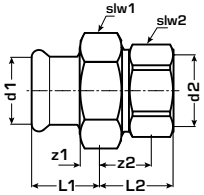


Press-elbow adaptor 90° with male thread conforming to EN 10226-1 made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm	r mm
15	1/2"	41	21	50	50	25	22
18	1/2"	45	25	54	54	25	27
22	3/4"	51	30	62	62	35	34
28	1"	61	38	74	74	42	42
35	5/4"	72	46	86	86	53	51
42	6/4"	87	57	96	96	58	65
54	2"	105	70	116	116	69	18

CP466 Carbon steel press-union with female thread

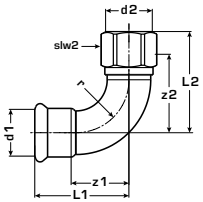
Press-union with female thread conforming to EN 10226-1 made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M



d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw1 mm	slw2 mm
15	1/2"	29	9	30	15	35	31
18	1/2"	29	9	30	15	35	31
22	3/4"	30	9	33	17	42	39
28	1"	31	8	34	15	53	49
35	5/4"	34	8	42	20	60	58
42	6/4"	41	11	42	20	67	64
54	2"	47	12	46	20	87	81

CP467 Carbon steel press-elbow adaptor 90° with female thread

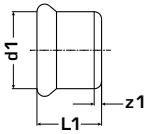
90° press-elbow with female thread made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M



d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm	r mm
15	1/2"	41	21	48	33	24	18
18	1/2"	45	25	52	37	24	22
22	1/2"	51	30	59	44	27	27
22	3/4"	51	30	59	43	30	27
28	1/2"	61	38	65	49	32	34
28	3/4"	61	38	70	51	41	34
28	1"	61	38	65	50	32	34
35	1/2"	72	46	75	54	41	42
35	3/4"	72	46	75	56	41	42
35	1"	72	46	75	55	41	42

CP471 Carbon steel press cap

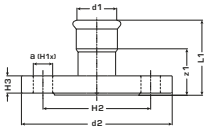
Press-cap made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M



d1 mm	L1 mm	z1 mm
15	23	3
18	23	3
22	24	3
28	26	3
35	29	3
42	37	7
54	42	7
66.7	60	10
76.1	64	9
88.9	72	9
108	97	20

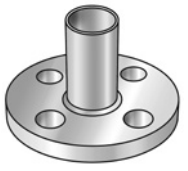
CP486 Carbon steel press-adaptor flange PN10/16

Press-adaptor flange, flat sealing made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" hole circle dimensioning conforming to DIN 2501-PN16 Press contour: M

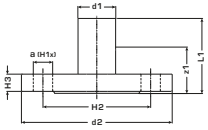


d1 mm	d2	L1 mm	z1 mm	H1 UNIT	H2 mm	H3 mm	d2 mm	a mm
35	DN32	52	26	4	100	16	140	18
42	DN40	59	29	4	110	16	150	18
54	DN50	69	34	4	125	16	165	18
66.7	DN65	71	21	4	145	16	185	18
76.1	DN65	94	39	4	145	16	185	18
88.9	DN80	98	35	4	160	18	200	18
108	DN100	94	17	4	180	18	220	18

CP486R Carbon steel press-adaptor flange - pipe end PN10/16



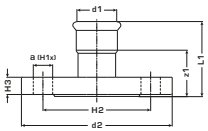
Press-adaptor flange, flat sealing made of carbon steel coated with a zinc layer and pipe end Hole circle dimensioning conforming to DIN 2501-PN16



d1 mm	d2	L1 mm	z1 mm	H1 UNIT	H2 mm	H3 mm	d2 mm	a mm
67	DN65	125.5	75.5	4	145	18	185	18
76	DN65	125.5	70.5	4	145	18	185	18
88.9	DN80	146.5	83.5	8	160	19.5	200	18
108	DN100	169	92	8	180	20	220	18

CP487 Carbon steel press-adaptor flange PN6

Press-adaptor flange, flat sealing made of carbon steel coated with a zinc layer, incl. EPDM sealing components, d15-54 "leak before pressed" hole circle dimensioning conforming to DIN 2501-PN6 Press contour: M

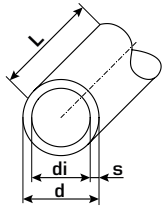


d1 mm	d2	L1 mm	z1 mm	H1 PCS	H2 mm	H3 mm	d2 mm	a mm
66.7	DN 65	71	21	4	130	12	160	14
76.1	DN 65	94	39	4	130	12	160	14
88.9	DN 80	98	35	4	150	14	190	18
108	DN 100	94	17	4	170	14	210	18

STEELFIX stainless steel

NF100 Stainless steel pipe 1.4401

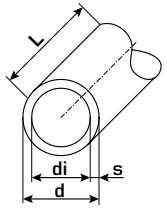
Thin-walled, longitudinally welded stainless steel pipes 1.4401 according to EN 10088, EN 10312 and EN 10217-7 outside and inside bare metal Application area: Drinking water installations, service and rain water, sprinkler systems, fire-extinguishing piping wet and dry systems
d15 - 54 mm - max. 16 bar
d76 - 108 mm - max. 10 bar
Operating temperature: -35°C to 120°C - tmax 150°C/16 bar - briefly Rod length: 6m



d mm	s mm	di mm	Weight kg/m	Capacity l/m
15	1.0	13.0	0.33	0.133
18	1.0	16.0	0.41	0.201
22	1.2	19.6	0.62	0.302
28	1.2	25.6	0.79	0.515
35	1.5	32.0	1.24	0.804
42	1.5	39.0	1.50	1.195
54	1.5	51.0	1.97	2.042
76.1	2.0	72.1	3.55	4.548
88.9	2.0	84.9	4.15	5.661
108	2.0	104.0	5.05	8.495

NF110 Stainless steel-pipe 1.4521 - nickel-free

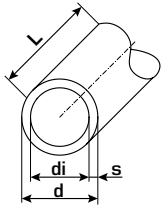
Thin-walled, longitudinally welded nickel-free stainless steel pipes 1.4521 according to EN 10088, EN 10296-2 outside and inside bare metal
Application area: Drinking water installations, service water and rain water d15 - 54 mm - max. 16 bar
Operating temperature: -35°C to 120°C - tmax 150°C/16 bar - briefly Rod length: 6m



d mm	s mm	di mm	Weight kg/m	Capacity l/m
15	1.0	13.0	0.33	0.133
18	1.0	16.0	0.41	0.201
22	1.2	19.6	0.62	0.302
28	1.2	25.6	0.79	0.515
35	1.5	32.0	1.24	0.804
42	1.5	39.0	1.50	1.195
54	1.5	51.0	1.97	2.042

NF130 Stainless steel pipe 1.4301

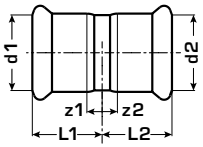
Thin-walled, longitudinally welded stainless steel pipes 1.4301 according to EN 10088, EN 10312 and EN 10217-7 outside and inside bare metal Application area: Closed heating or cooling water systems in conjunction with stainless steel fittings only, if necessary, pay attention to corrosion protection measures!
d15 - 54 mm - max. 16 bar
d76 - 108 mm - max. 10 bar
Operating temperature: -35°C to 120°C - tmax 150°C/16 bar - briefly Rod length: 6m
ATTENTION - NOT suitable for drinking water!



d mm	s mm	di mm	Weight kg/m	Capacity l/m
15	1.0	13.0	0.33	0.133
18	1.0	16.0	0.41	0.201
22	1.2	19.6	0.62	0.302
28	1.2	25.6	0.79	0.515
35	1.5	32.0	1.24	0.804
42	1.5	39.0	1.50	1.195
54	1.5	51.0	1.97	2.042
76.1	2.0	72.1	3.55	4.548
88.9	2.0	84.9	4.15	5.661
108	2.0	104.0	5.05	8.495

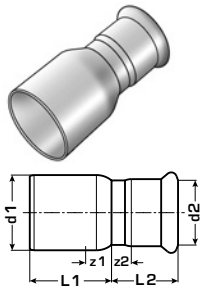
NP410 Stainless steel press-coupling

Press-coupling straight made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M



d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
15	15	25	5	25	5
18	18	25	5	25	5
22	22	26	5	26	5
28	28	28	5	28	5
35	35	31	5	31	5
42	42	36	6	36	6
54	54	41	6	41	6
76.1	76.1	71	16	71	16
88.9	88.9	82	19	82	19
108	108	96	19	96	19

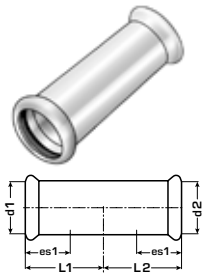
NP411 Stainless steel press-reduction socket male/female



Press-reduction socket f/m straight made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
18	15	28	8	27	7
22	15	33	12	28	8
22	18	30	9	28	8
28	15	40	17	28	8
28	18	38	15	28	8
28	22	34	11	29	8
35	15	47	21	32	12
35	18	46	20	32	12
35	22	42	16	29	8
35	28	38	12	31	8
42	22	53	23	33	12
42	28	51	21	31	8
42	35	42	12	34	8
54	28	62	27	34	11
54	35	60	25	34	8
54	42	55	20	40	10
76	42	72	17	79	49
76.1	54	98	43	42	7
88.9	54	114	51	42	7
88.9	76	88	25	68	13
108	76	127	50	69	14
108	89	113	36	77	14

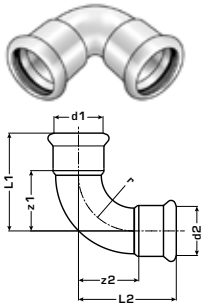
NP415 Stainless steel press-repair coupling



Press-repair coupling straight made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 mm	L1 mm	L2 mm
15	15	40	40
18	18	40	40
22	22	42	42
28	28	46	46
35	35	51	51
42	42	60	60
54	54	70	70
76.1	76.1	115	115
88.9	88.9	129	129
108	108	153	153

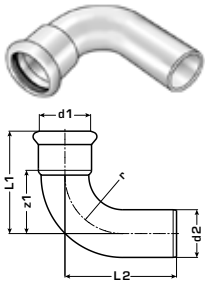
NP420 Stainless steel press-elbow 90°



Press-elbow 90° made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm	r mm
15	15	41	21	41	21	18
18	18	45	25	45	25	22
22	22	51	30	51	30	27
28	28	60	37	60	37	34
35	35	71	45	71	45	42
42	42	86	56	86	56	51
54	54	105	70	105	70	65
76.1	76.1	150	95	150	95	91
88.9	88.9	174	111	174	111	107
108	108	215	138	215	138	130

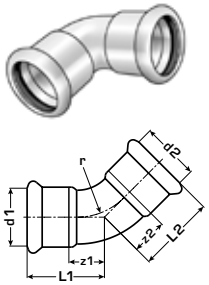
NP421 Stainless steel press-elbow 90° male/female



Press-elbow 90° f/m made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm	r mm
15	15	41	21	53	33	18
18	18	45	25	51	31	22
22	22	51	30	60	39	27
28	28	60	37	66	43	34
35	35	71	45	76	50	42
42	42	86	56	93	63	51
54	54	105	70	111	76	65
76.1	76.1	150	95	165	110	91
88.9	88.9	175	112	190	127	107
108	108	216	139	238	161	130

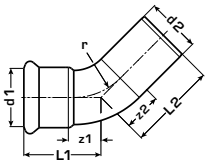
NP425 Stainless steel press-elbow 45°



Press-elbow 45° made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm	r mm
15	15	31	11	31	11	18
18	18	32	12	32	12	22
22	22	35	14	35	14	27
28	28	40	17	40	17	34
35	35	47	21	47	21	42
42	42	56	26	56	26	51
54	54	67	32	67	32	65
76.1	76.1	98	49	98	49	91
88.9	88.9	112	61	112	61	107
108	108	138	61	138	61	130

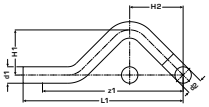
NP426 Stainless steel press-elbow 45° male/female



Press-elbow 45° f/m made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm	r mm
15	15	30	10	38	18	18
18	18	32	12	39	19	22
22	22	35	14	42	21	27
28	28	40	17	46	23	34
35	35	46	20	51	25	42
42	42	56	26	63	33	51
54	54	65	30	73	38	65
76.1	76.1	98	43	117	62	91
88.9	88.9	112	49	131	68	107
108	108	138	61	154	77	130

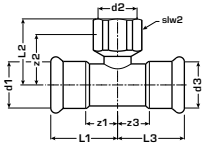
NP427 Stainless steel curved pipe male/male



Curved pipe for parallel lines m/m made of stainless steel 1.4404

d1 mm	d2 mm	L1 mm	z1 mm	H1 mm	H2 mm
15	15	158	138	37	57
18	18	165	145	40	60
22	22	178	157	44	65
28	28	210	187	50	74

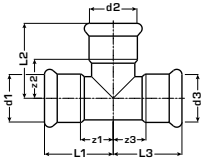
NP447 Stainless steel press-tee with branch female



Press-tee with female-threaded branch made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	d3 mm	L1 mm	z1 mm	L2 mm	z2 mm	L3 mm	z3 mm	slw2 mm
15	1/2"	15	35	15	34	24	35	15	24
18	1/2"	18	37	17	35	25	37	17	24
22	1/2"	22	40	19	37	27	40	19	24
22	3/4"	22	40	19	39	28	40	19	30
28	1/2"	28	45	22	40	30	45	22	24
28	3/4"	28	45	22	42	31	45	22	30
28	1"	28	45	22	46	33	45	22	24
35	1/2"	35	51	25	44	34	51	25	30
35	3/4"	35	51	25	46	35	51	25	24
35	1"	35	51	25	50	37	51	25	30
42	1/2"	42	60	30	46	36	60	30	24
42	3/4"	42	60	30	48	37	60	30	67
42	1"	42	60	30	52	39	60	30	30
54	1/2"	54	71	36	52	42	71	36	38
54	3/4"	54	71	36	54	43	71	36	38
54	1"	54	71	36	58	45	71	36	38
76.1	3/4"	76.1	116	61	68	55	116	61	30
88.9	3/4"	88.9	131	68	87	74	131	68	30
88.9	2"	88.9	131	68	88	66	131	68	65
108	3/4"	108	156	79	86	73	156	79	65

NP440 Stainless steel press-tee

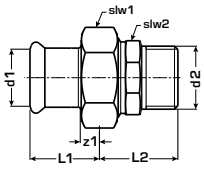


Press-tee equal or reduced made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M

d1 mm	d2 mm	d3 mm	L1 mm	z1 mm	L2 mm	z2 mm	L3 mm	z3 mm
15	15	15	35	15	39	19	35	15
18	15	18	37	17	41	21	37	17
18	18	18	37	17	41	21	37	17
22	15	22	40	19	43	23	40	19
22	18	22	40	17	43	23	40	17
22	22	22	40	19	44	23	40	19
28	15	28	45	22	46	26	45	22
28	18	28	45	22	46	26	45	22
28	22	28	45	22	47	26	45	22
28	28	28	45	22	49	26	45	22
35	15	35	51	25	49	29	51	25
35	18	35	51	25	49	29	51	25
35	22	35	51	25	50	29	51	25
35	28	35	51	25	52	29	51	25
35	35	35	51	25	55	29	51	25
42	22	42	60	30	53	32	60	30
42	28	42	60	30	55	32	60	30
42	35	42	60	30	58	32	60	30
42	42	42	60	30	62	32	60	30
54	22	54	71	36	59	38	71	36
54	28	54	71	36	61	38	71	36
54	35	54	71	36	64	38	71	36
54	42	54	71	36	58	28	71	36
54	54	54	71	36	72	37	71	36
76.1	22	76.1	116	61	68	45	116	61
76.1	28	76.1	116	61	71	47	116	61
76.1	35	76.1	116	61	75	48	116	61
76.1	42	76.1	116	61	79	47	116	61
76.1	54	76.1	116	61	80	43	116	61
76.1	76.1	76.1	116	61	115	60	116	61
88.9	22	88.9	131	68	76	53	131	68
88.9	28	88.9	131	68	76	52	131	68
88.9	35	88.9	131	68	83	56	131	68
88.9	42	88.9	131	68	85	53	131	68
88.9	54	88.9	131	68	93	56	131	68
88.9	76.1	88.9	131	68	116	61	131	68
88.9	88.9	88.9	131	68	127	64	131	68
108	22	108	156	79	85	68	156	79
108	28	108	156	79	88	62	156	79
108	35	108	156	79	94	67	156	79
108	42	108	156	79	96	64	156	79
108	54	108	156	79	102	65	156	79
108	76.1	108	156	79	125	70	156	79
108	88.9	108	156	79	135	72	156	79
108	108	108	156	79	155	78	156	79

NP451 Stainless steel press union with male thread

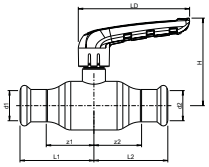
Press-union with male thread conforming to EN 10226-1 made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M



d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	slw1 mm	slw2 mm
15	1/2"	62	9	33	30	25
18	1/2"	62	9	33	30	25
18	3/4"	65	9	36	30	32
22	1/2"	63	9	33	37	25
22	3/4"	69	9	29	37	32
22	1"	72	9	42	37	39
28	1"	73	8	42	46	39
35	5/4"	78	8	44	52	49
42	6/4"	85	11	44	58	51
54	2"	100	12	53	75	65

NP453 Stainless steel press-ball valve

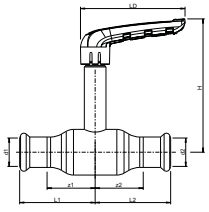
Press-ball valve with full bore, ball and basic body with full flow, made of stainless steel 1.4404, incl. EPDM sealing components, "leak before pressed" Press contour: M
Operating temperature: - 35°C - tmax 135°C



d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
15	15	47	27	47	27
18	18	51.5	32	51.5	32
22	22	60.5	40	60.5	40
28	28	67.5	45	67.5	45
35	35	80.5	55	80.5	55
42	42	99	69	99	69
54	54	113	79	113	79

NP453H Stainless steel press-ball valve with extended spindle

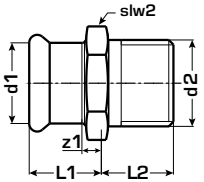
Press-ball valve with full bore, ball and basic body with full flow, with extended spindle for thicker insulations made of stainless steel 1.4404, incl. EPDM sealing components, "leak before pressed" Press contour: M
Operating temperature: - 35°C - tmax 135°C



d1 mm	d2 mm	L1 mm	z1 mm	L2 mm	z2 mm
15	15	47	27	47	27
18	18	51.5	32	51.5	32
22	22	60.5	40	60.5	40
28	28	67.5	45	67.5	45
35	35	80.5	55	80.5	55
42	42	99	69	99	69
54	54	113	79	113	79

NP450 Stainless steel press-adaptor with male thread

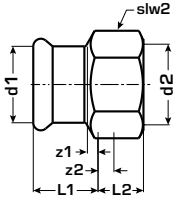
Press-adaptor with male thread conforming to EN 10226-1 made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M



d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	slw2 mm
15	1/2"	23	3	17	28
15	3/4"	24	4	17	31
18	1/2"	23	3	15	31
18	3/4"	24	4	17	31
22	1/2"	27	6	15	37
22	3/4"	27	6	16	37
22	1"	29	8	20	39
28	3/4"	28	5	17	44
28	1"	28	5	20	44
28	5/4"	31	8	21	50
35	1"	33	7	20	52
35	5/4"	33	7	22	52
35	6/4"	34	8	22	57
42	5/4"	37	7	22	62
42	6/4"	37	7	22	62
54	6/4"	43	8	22	77
54	2"	43	8	26	77
76.1	2 1/2"	64	9	33	95
88.9	3"	73	10	36	109

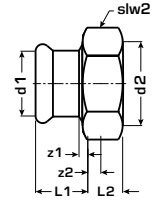
NP457 Stainless steel press-adaptor with female thread

Press-adaptor with female thread made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M



d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	1/2"	22	2	15	5	24
15	3/4"	23	3	17	6	30
18	1/2"	22	2	15	5	27
18	3/4"	22	2	17	6	30
22	1/2"	21	0	15	5	32
22	3/4"	23	2	17	6	32
22	1"	24	3	20	7	38
28	1/2"	26	3	12	1	38
28	3/4"	23	0	17	6	38
28	1"	25	2	20	7	38
28	5/4"	25	2	22	7	46
35	1"	27	1	20	7	46
35	5/4"	28	2	22	7	46
35	6/4"	28	2	22	8	54
42	5/4"	30	0	22	0	54
42	6/4"	32	2	22	8	54
54	6/4"	36	1	22	8	67
54	2"	37	2	26	8	67

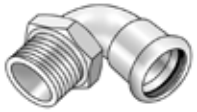
NP455 Stainless steel press-screw connection with female thread

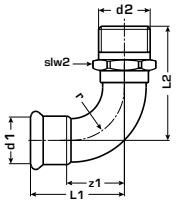


Press-fit transition screw connection with female thread for connecting to fittings, made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed"
Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	3/4"	29	9	8	2	30
18	3/4"	29	9	8	2	30
22	1"	30	9	10	2	37
28	5/4"	31	8	10	2	46
35	6/4"	34	8	11	2	52
42	1 3/4"	41	11	11	2	58
54	2 3/8"	47	12	11	3	75

NP460 Stainless steel press-elbow adaptor 90° with male thread

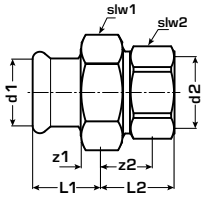




90° press-adapter elbow with male thread conforming to EN 10226-1 made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	slw2 mm
15	3/4"	41	21	48	22
18	1/2"	46	26	52	24
22	3/4"	48	27	60	30
28	3/4"	57	34	67	34
35	3/4"	76	50	88	43
42	1"	80	50	88	49
54	5/4"	100	65	106	62

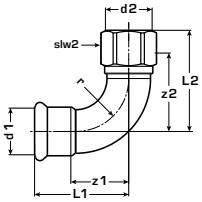
NP466 Stainless steel press union with female thread



Press-union with female thread conforming to EN 10226-1 made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw1 mm	slw2 mm
15	1/2"	57	9	28	18	30	24
15	3/4"	60	9	31	20	30	30
18	1/2"	57	9	28	18	30	24
18	3/4"	60	9	31	20	30	30
22	3/4"	63	9	33	22	37	30
22	1"	66	9	36	23	37	38
28	1"	65	8	34	21	46	38
35	5/4"	73	8	39	24	52	46
42	6/4"	82	11	41	27	58	54
54	2"	91	12	44	26	75	67

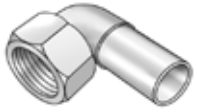
NP467 Stainless steel press-elbow adaptor 90° with female thread

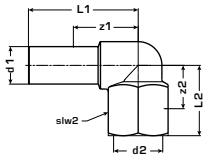


90° press-elbow adaptor with female thread made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	1/2"	44	24	28	13	24
18	1/2"	44	24	28	13	24
22	1/2"	49	28	33	17	30
22	3/4"	55	32	37	24	38
28	1/2"	62	36	42	27	46
28	3/4"	45	24	31	16	24
28	1"	48	25	35	20	24
35	1/2"	51	28	35	19	30
35	3/4"	56	30	35	20	24
35	1"	58	32	37	21	30
35	5/4"	58	32	41	28	38

NP468 Stainless steel press-elbow adaptor 90° pipe dimension with female thread

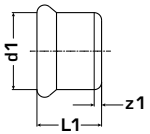




Press-elbow adaptor 90° with pipe dimension and female thread made of stainless steel 1.4404,

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	3/4"	44	24	28	13	24

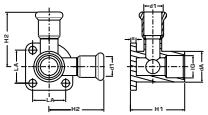
NP471 Stainless steel press-cap



Press-cap made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" Press contour: M

d1 mm	L1 mm	z1 mm
15	23	3
18	23	3
22	24	3
28	26	3
35	29	3
42	37	7
54	42	7
76.1	95	40
88.9	107	45
108	127	50

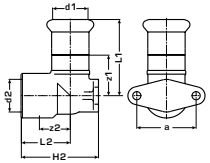
NP475 Stainless steel press-fitting connection tee with female thread



Press-fitting connection tee with female thread, made of stainless steel 1.4404, incl. EPDM sealing components, "leak before pressed" Press contour: M

d1 mm	d3 inches	L1 mm	z1 mm	L2 mm	z2 mm	LH mm	L3 mm	z3/z4 mm	LA mm	LB mm	s mm
15	1/2"	54	39	54	39	54	27	14	28	28	5
18	1/2"	54	39	54	39	54	27	14	28	28	5

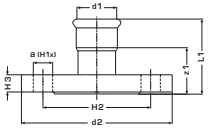
NP480 Stainless steel press-wall bracket 90° with female thread



Press-wall bracket 90°, with female thread, made of stainless steel 1.4404, incl. EPDM sealing components, "leak before pressed" Press contour: M

d1 mm	d2 inches	L1 mm	z1 mm	L2 mm	z2 mm	LH mm	LB
15	1/2"	45	25	28	13	63	40
18	1/2"	45	25	28	13	63	40
22	3/4"	49	28	33	17	64	40

NP486 Stainless steel press-adaptor flange PN10/16

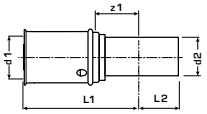


Press-adaptor flange, flat sealing made of stainless steel 1.4404, incl. EPDM sealing components, d15-54 "leak before pressed" hole circle dimensioning conforming to DIN 2501-PN16 Press contour: M

d1 mm	L1 mm	z1 mm	H1 UNIT	H2 mm	H3 mm	d2 mm	a mm
35	70	44	4	100	16	140	18
42	77	47	4	110	16	150	18
54	87	52	4	125	16	165	18
76.1	112	57	4	145	16	185	18
88.9	118	55	8	160	18	200	18
108	114	37	8	180	18	220	18

STEELFIX accessories

KMU489 KELOX-ULTRAX - STEELFIX press adapter

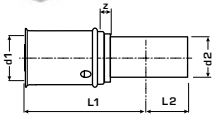


Press-fit adaptor, straight, made of Steelfix, Copperfix pipe dimension to KELOX-ULTRAX - pressing socket made of non-porous metallized red brass, incl. support sleeves with O-rings and steel or stainless steel press sleeves, of d16-32mm "leak before pressed"

ATTENTION! Connection to pipe end only suitable as a compression fitting or press-fit connection!

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm
16	15	35	12,5	20
20	18	35	9,5	20
20	22	35	11	21
25	22	44	11	21
32	28	44	11	23
40	35	63	18	26

SMX489 STEELOX – STEELFIX adapter

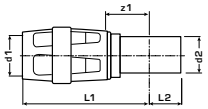


Press-fit adapter, straight, from Steelfix/Copperfix pipe dimension to STEELOX – pressing socket made of red brass with non-porous metal-plating, incl. support sleeves with O-rings and stainless steel pressing sleeves, "leak before pressed"

ATTENTION! Connection to pipe end only suitable as a compression fitting or press-fit connection!

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm
16	15	35	12.5	20
20	22	29	29	3
25	22	44	11	21

KMP489 KELOX-PROTEC - STEELFIX adaptor

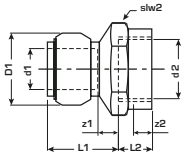


Press/push-in adaptor, straight, from Steelfix, Copperfix pipe size to KELOX-PROTEC - push-in sleeve made of non-porous metal-plated red brass, incl. support sleeves, O-rings, withdrawal barriers and a protector ring as an insertion locking device

ATTENTION! Connection to pipe end only suitable as a compression fitting or press-fit connection!

d1 mm	d2 mm	L1 mm	z1 mm	L2 mm
16	15	47	14	20
20	18	47	14	20
20	22	47	16	21
25	22	55	16	21
32	28	55	15	23

NF457 — Stainless steel push-adaptor with female thread



Push adaptor with female thread made of stainless steel 1.4401, incl. EPDM sealing components and pull-out barriers, can be disassembled, to pressure-test Steelfix and copper pipes
ATTENTION, only use for pressure testing!

d1 mm	d2	L1 mm	z1 mm	L2 mm	z2 mm	slw2 mm
15	1/2"	25	3	17	3	25
18	1/2"	25	3	17	3	25
22	1/2"	30	3	17	3	25
28	3/4"	32	4	17	4	32

NF457A — Stainless steel pressure testing push-adaptor with female thread

Pressure testing push-adaptor with female thread made of stainless steel 1.4401, incl. EPDM sealing components and withdrawal barriers, can be disassembled, to pressure-test Steelfix and copper pipes
ATTENTION, only use for pressure testing!

Bezeichnung	VPE1 SA1
35x5/4"	1
42x6/4"	1
54x2"	1

CF435 — Push SL-connection set

Push SL-radiator connection set made of non-porous metallized brass, suitable for processing with carbon steel, stainless steel and copper pipes, heating/cooling connection pipe d12x1mm, incl. height- and depth-adjustable corner shut-off valve, the longitudinal interference fit pipe connection of the shut-off valve is ensured with an M13 hex key at the front of the shut-off valve, locking is by means of a 4mm Allen key, radiator connections 3/4" female, flat sealing
The end parts are needed for the last radiator of the SL connection set!

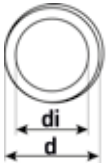
d1 mm	d2 Zoll	A mm	B mm	C mm	D+E+F mm
15	3/4"	175-200	50-175	21,5	113
18	3/4"	175-200	50-175	21,5	113

CP455D — Spare EPDM seal for Steelfix and Copperfix system parts

Spare EPDM seal for Steelfix press system parts CP451, NP451, CP455, NP455 and CP466 and Copperfix press system parts COF455 and COF456

Designation	d mm	di mm	Material quality
15-18x3/4"	24	16	EPDM
22x1"	30	21	EPDM
28x5/4"	39	27	EPDM
35x6/4"	45	35	EPDM
42x1 3/4"	51	39	EPDM
54x2 3/8"	66	51	EPDM

CP455V — Spare VITON seal for Steelfix and Copperfix system parts



Spare VITON (FKM) seal, high-temperature-resistant up to 200°C, for compressed air systems based on mineral or plant-based oils, greases and industrial applications, for Steelfix system press components CP451, NP451, CP455, NP455 and CP466 and Copperfix system press components COF455 and COF456

Designation	d mm	di mm	Material quality
15-18x3/4"	24	16	FPM (FKM)
22x1"	30	21	FPM (FKM)
28x5/4"	39	27	FPM (FKM)
35x6/4"	45	35	FPM (FKM)
42x1 3/4"	51	39	FPM (FKM)
54x2 3/8"	66	51	FPM (FKM)

CP980 EPDM O-ring seal

Press-EPDM O-ring seal for STEELFIX pipe system, d15-54 “not pressed, not sealed” Press contour: M
Colour: black

Designation	Material quality
15	EPDM
18	EPDM
22	EPDM
28	EPDM
35	EPDM
42	EPDM
54	EPDM
76.1	EPDM
66.7	EPDM
88.9	EPDM
108	EPDM

CP990 VITON O-ring seal

Press VITON O-ring seal (FKM) for STEELFIX pipe system, d15-54 “not pressed, not sealed” High-temperature-resistant to 200°C, for compressed air systems based on mineral and plant-based oils, fats and industrial applications
Press contour: M
Colour: green

Designation	Material quality
15	FPM (FKM)
18	FPM (FKM)
22	FPM (FKM)
28	FPM (FKM)
35	FPM (FKM)
42	FPM (FKM)
54	FPM (FKM)
66.7	FPM (FKM)
76.1	FPM (FKM)
88.9	FPM (FKM)
108	FPM (FKM)

CP970 FPM O-ring seal

Press FPM O-ring seal for STEELFIX pipe system, d15-54 “not pressed, not sealed” high-temperature-resistant up to 175°C for steam systems
Press contour: M
Colour: grey

Designation	Material quality
15	FPM (FKM)
18	FPM (FKM)
22	FPM (FKM)
28	FPM (FKM)
35	FPM (FKM)
42	FPM (FKM)
54	FPM (FKM)

STEELFIX tools

WZ210 KELIT pipe deburrer

For deburring and chamfering on the inside and the outside of STEELFIX, COPPERFIX and CLIMATEFIX BLife pipes
Use different pipe deburrers for STEELFIX carbon steel, stainless steel COPPERFIX and CLIMATEFIX BLife pipes!
After deburring the pipes, clean the swarf from them carefully!

Designation	PU1 UNIT
15-35	1
15-54	1

WZ235 KELIT high-performance wheel pipe cutter

For cutting to length STEELFIX and copper pipes up to d54 mm

Designation	PU1 UNIT
15-42	1
15-54	1
Cutting wheel d15-42	1
Cutting wheel d15-54	1

WZ240 STEELFIX insert depth gauge (press)

For marking the insertion depth of STEELFIX stainless steel and carbon steel system press components up to d108mm
Colour: blue

Designation	PU1 SA1
15-108	1

WZ260 STEELFIX stainless steel plug-in dismounting tool

For dismounting STEELFIX stainless steel plug-in fittings
Dimension d15-28mm by pushing in the plastic ring on the fitting
Dimension d35-54mm by screwing on the cap at the fittings
You must always renew the stainless steel grab ring and the seal every time you dismantle the fittings d35-54mm!

The NF457A pressure testing push-adaptor is fitted with a special disassembly end ring; using the WZ260, rotating the inner ring on the fitting relieves the load on the grab ring and you can remove the push adaptor from the pipe
ATTENTION! Only ever use the NF457A for pressure testing!

Designation	PU1 SA1
15	1
18	1
22	1
28	1
35-54	1

WZ970 KELIT cordless press with Li-Ion battery

Klauke electro-mechanical cordless press with Li-Ion battery 18V 3Ah for press-fitting:
KELOX and WINDOX system press components d16-75mm
STEELFIX system press components d15-54mm
STEELOX system press components d16-25mm
COPPERFIX system press components d15-54mm
CLIMATEFIX system press components d12mm
including 2 18 Volt rechargeable batteries and 230 Volt charger for 18 Volt

ATTENTION! When using other makes, a minimum pressing power of at least 30kN is required!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT
Press-SET 18V Li-Ion	1
Rechargeable battery 18V Li-Ion	1
Charger 18V Li-Ion	1
Case blue 18V	1

WZ274N KELIT press ACO 203 XL

Electro-mechanical Novopress lithium-ion battery press machine for pressing STEELFIX and COPPERFIX d15-108mm fresh water and heating system press components with WZ280 press jaws d12-35mm, WZ282 press loops d42-54mm and WZ288 press loops d67-108mm
STEELFIX high-pressure system press components with WZ280 press jaws d15-28mm and WZ282S press loops d35-54mm
KELOX system press components d16-75mm
including two 18 V lithium ion rechargeable batteries and 230V charger for 18V, packaged in a case

KE KELIT recommends inspecting pressing tools once per year to ensure proper function and maintain the warranty; please contact KE KELIT or the respective device manufacturer directly!

Designation	PU1 UNIT
Press set, ACO 203 XL	1
Rechargeable battery ACO 203 XL/403 3Ah	1
Charger, ACO 203 XL/403	1
Case ACO 203 XL	1

WZ280 KELIT press jaws - M

Press jaw inserts for pressing STEELFIX and COPPERFIX system components using a WZ274N KELIT press machine (ACO 203 XL) or a WZ970 KELIT battery press machine
Pressing: M contour

Attention! Cannot be used for KELOX!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT	Profile
15	1	M
18	1	M
22	1	M
28	1	M
35	1	M

WZ281 KELIT press adaptor 35-108

Press adapter suitable for WZ274N KELIT press (ACO 203 XL) for pressing KELIT d35 to d108mm system components using a WZ282 or WZ288 press loop M or WZ970 KELIT battery press machine for pressing KELIT d35 to d54mm system components using a WZ282, press loop M

KE KELIT recommends inspecting pressing tools once per year to ensure proper function and maintain the warranty; please contact KE KELIT or the respective device manufacturers directly!

Designation	PU1 UNIT
35-54 (ZB203)	1
67-108/1 (ZB221)	1
108/2 (ZB222)	1

WZ282 KELIT press loop - M

Press loop for pressing STEELFIX and COPPERFIX system components using a WZ281 press adapter d42-54mm and a WZ274N (ACO 203 XL) or WZ970 KELIT battery press machine
Pressing: M contour

Attention! Do not carry out pressing without fittings!
Caution! Cannot be used for KELOX!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT	Profile
42 Snap on	1	M
54 Snap on	1	M

WZ288 KELIT press loop - M

Press loop for pressing STEELFIX and COPPERFIX system components using a WZ281 press adapter d67-108/1 and d108/2mm and a WZ274N KELIT press machine (ACO 203 XL)
Pressing: M contour

To press size d108mm, you need WZ281 adapters 108/1 and 108/2!

Caution! Do not carry out pressing without fittings!
Caution! Cannot be used for KELOX!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT	Profile
67 Snap on	1	M
76 Snap on	1	M
89 Snap on	1	M
108 Snap on	1	M

WZ282S STEELFIX high-pressure press loop - M

Sprinkler press loop M for pressing STEELFIX high-pressure system components using a WZ281 as an intermediate adapter for size d35 to 54mm in conjunction with a WZ274N KELIT press machine (ACO 203 XL)
Designation: M contour

Attention! Do not carry out pressing without fittings!
Caution! Cannot be used for KELOX!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT	Profile
35 Snap on HP	1	M
42 Snap on HP	1	M
54 Snap on HP	1	M

WZ273S KELIT press ACO 401/403

Electro-mechanical Novopress lithium-ion battery press machine including adapter for WZ288S high-pressure press loops for pressing STEELFIX d76-108mm high-pressure system press components
including one 18V lithium ion rechargeable battery and 230V charger, packaged in a case

KE KELIT recommends inspecting pressing tools once per year to ensure proper function and maintain the warranty; please contact KE KELIT or the respective device manufacturer directly!

Designation	PU1 UNIT
Press set, ACO403	1
Rechargeable battery ACO202/403 5Ah	1

WZ288S STEELFIX high-pressure press loop - M

Press loop for pressing STEELFIX high-pressure system components using a WZ273S KELIT press machine (ACO 403) d76 to 108mm, packaged in a case
Pressing: M contour

Attention! Do not carry out pressing without fittings!
Caution! Cannot be used for KELOX!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT	Profile
76 (HP401)	1	M
89 (HP401)	1	M
108 (HP401)	1	M

WZ290 KELIT press set - M

Press SET for pressing STEELFIX and COPPERFIX system components using a WZ274N press machine ACO 203 XL
Pressing: M contour

Press set 1 consisting of:
1 WZ281 press adapter d35-54
1 WZ282 press loop M d42
1 WZ282 press loop M d54
1 toolbox 1

Press set 2.2 consisting of:
1 WZ281 press adapter d67-76-89-108/1
1 WZ288 press loop M d67
1 WZ288 press loop M d76
1 WZ288 press loop M d89
1 toolbox 2

Press set 3.2 consisting of:
1 WZ281 press adapter d108/2
1 WZ288 press loop M d108
1 toolbox 2

Press set 4.2 consisting of:
1 WZ281 press adapter d67-76-89-108/1
1 WZ281 press adapter d108/2
1 WZ288 press loop M d108
1 toolbox 2

Press set 5 consisting of:
1 each WZ280 press jaws M d15, 18, 22, 28 and 35
1 WZ210 deburrer d12-35
1 WZ240 insert depth gauge (press) d12-54
1 Toolbox 5

ATTENTION! Do not carry out pressing without fittings!
CAUTION! Cannot be used for KELOX!

KE KELIT recommends servicing pressing tools annually to ensure proper function and to maintain the warranty.
Please contact KE KELIT or the respective tool manufacturer directly!

Designation	PU1 UNIT	Profile
Press set 1	1	M
Press set 2.2	1	M
Press set 3.2	1	M
Press set 4.2	1	M
Press set 5	1	M

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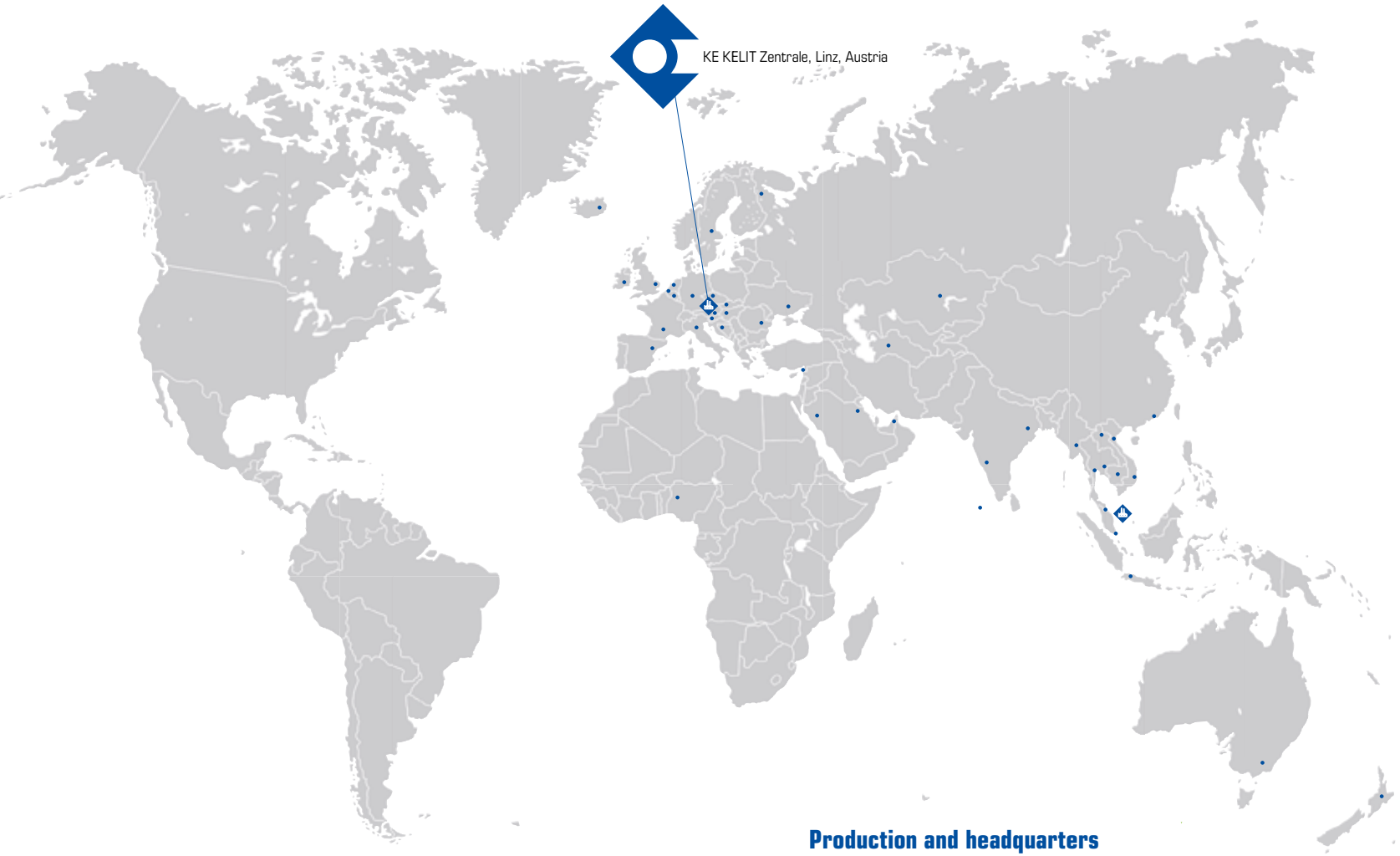

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