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TECHNICAL GUIDE

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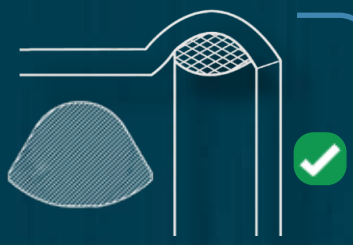
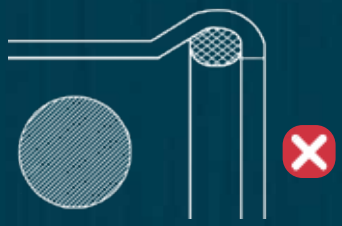


RAPIDPRESS



OTHER BRANDS

CATALOGUE & TECHNICAL GUIDE AVAILABLE

SCAN TO VIEW THE TECHNICAL GUIDE

FULL RANGE OF PRESS-FIT AVAILABLE ONLINE

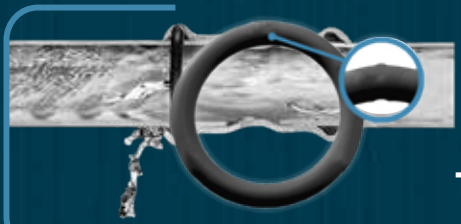
SCAN TO VIEW FULL PRODUCT RANGE

CUT | DEBURR | WITNESS MARK | ASSEMBLE | PRESS

SEE TECHNICAL GUIDE FOR FULL PROCESS

TEST CERTIFICATES AVAILABLE

Indelibly marked with heat number



LEAK BEFORE PRESS SEAL UP TO 54MM

DVGW

WaterMark

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RAPIDPRESS INOX

Stainless grade 304 & 316
Pressure rating 16 bar
-20 / +120°c

RAPIDPRESS EXTREME

Stainless Grade 304 & 316
Pressure rating 16 bar
-20 / +220°c

RAPIDPRESS GAS

Stainless Grade 316
Pressure rating 5 bar
-20 / +70°c

RAPIDPRESS STEAM

Stainless Grade 316
Pressure rating 7 bar
-20 / +165°c

HUGE SIZE RANGE

Diameters (mm)

15	76
22	88.9
28	108
35	139
42	168
54	

APPLICATIONS

Potable Water
Fire Protection
Compressed Air
Cooling
Heating
Wastewater
Natural Gas
Solar Thermal
Process Water
Steam

ITALIAN MADE

3rd largest press fit manufacturer in the world!

TOOLING

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About The RapidPress System

With the **RapidPress INOX** Stainless Steel press fit system for potable water, compressed air, steam and gas installations, **RapidPress Steel** for closed hot water heating systems, **RapidPress Copper** for potable water and gas installations and **RapidPress Copper-Nickel** for marine sector, **RapidPress** offers a comprehensive press-fit range in the dimension range from 12 - 168.3 mm OD, together with piping pressing tools and accessories.

What are the benefits?

RELIABILITY
Our RapidPress system is designed to be used with M profile press jaws. The pressing tools have built-in safety features to ensure a consistently perfect press and complete seal every time.

EFFICIENCY
Rapid Installation. The assembly process is simple, easy, and user-friendly, and does not require qualified welders.

QUALITY
RapidPress products are made from high-quality stainless steel grade 316L, which is highly resistant to corrosion and meets the WaterMark™ certification. The standard black EPDM O-rings are resistant to aging, heat, and chemical additives.

LENTICULAR SEAL
Our Patented Lenticular seal profile allows for 20% more sealed surface area than other seals, and is easier to insert. Up to 54mm features leak before press seals, and various seal materials are available, including EPDM, FKM, and HNBR.

TEST CERTIFICATES
We are the only press-fit supplier able to supply test certificates for all fittings and tubes. Each fitting is Indelibly marked with a heat number.

SAFETY
The RapidPress system eliminates naked flames, hot work permits, gas bottles, fire hazards, and heavy installation equipment, making it easier to comply with safety requirements.

LABOUR SAVING
RapidPress saves time and reduces labour costs by requiring fewer installation hours on site and lower skilled tradesmen to carry out installations.

CONSISTENCY
Every connection in the installation is uniform and consistent, eliminating the need for re-work due to inconsistency of connection quality.

Product Range	Material	O-Ring	Diameters	Min/Max Degrees Celsius & Pressure	Note
RAPIDPRESS INOX	STAINLESS STEEL	EPDM	Ø 15 - 168.3 mm	-20 / +120°C 16 bar Max 16 bar	Ø139.7 - 168.3mm Oversize
RAPIDPRESS EXTREME	STAINLESS STEEL	FKM	Ø 15 - 108 mm	-20 / +220°C 16 bar Max 16 bar	FKM Seal
RAPIDPRESS GAS	STAINLESS STEEL	NBR - HNBR	Ø 15 - 108 mm	-20 / +70°C 5 bar Max 5 bar	Methane, Natural Gas & LPG
RAPIDPRESS STEAM	STAINLESS STEEL	STEAM	Ø 15 - 54 mm	-20 / +165°C 7 bar Max 7 Bar	--

Stainless Steel Inox Specifications

GENERAL APPLICATION

RapidPress INOX press fittings are made of high-alloyed austenitic stainless Cr-Ni-Mo steel (AISI 316L/1.4404) and marked with the manufacturer name, diameter, DVGW test symbol, and internal code. The press fittings come with a black EPDM seal ring standardly fitted. These high-quality components are perfect for heating, cooling, compressed air, oil, and diesel lines in various sectors, including food & beverage, industrial, civil, and manufacturing.

Pressure & Temperature Rating

- Standard Maximum operating pressure: 230PSI / 16Bar
- Up to 928PSI / 64Bar available on approved applications.
- Operating temperature: -20°C / +120°C
- Maximum temperature: 220°C with RapidPress Extreme.

Manufacturing Standards

The RapidPress system uses metric size fittings and tube which is made to standard:

- **EN10217-7**
- **EN10312**

WaterMark™ Approval

The RapidPress system is WaterMark™ approved for use with potable water when using stainless steel grade 316L. This certifies the product complies with the plumbing code and the relevant standards.

In this range

45° & 90° Elbows, Spiggots & Wing Backs
Tee's
Couplers
Unions
Adapters - BSP, Tri Clover & RJT
Metric RapidPress Tube
Valves
Flanges
Clamps
RapidPress Extreme
RapidPress Tools
RapidPress Pressing Tools

Tooling

RapidPress crimping tools are available for hire or purchase.

Seal Specifications

BLACK EPDM SEAL

The black EPDM rubber seal is standard for stainless steel and carbon steel systems. EPDM is suitable for temperatures between -20 and +120 °C and for pressures up to a maximum of 230PSI / 16Bar. It has a host of applications and is used for drinking water, heating, cooling, steam, fire fighting, compressed air (oil free) and inert gas systems.

GREEN FKM SEAL

The green FKM seal is used in high temperature or with harsh chemicals. It is suitable for temperatures between -20 and +220 °C and for pressures up to a maximum of 230PSI / 16Bar.

YELLOW HNBR SEALS

The yellow HNBR seals are used with our gas rated press-fit system as they are resistant to ageing and heat. They are suitable for temperatures between -20°C and +70°C, and for pressures up to a maximum of 70 PSI or 5Bar.

WHITE STEAM SEALS

The White seals are used for saturated steam press-sit system suitable for temperatures between –20 and 165°C and a maximum pressure of 7 absolute bars. The STEAM o-ring is compatible with hydrocarbons, oils and other aggressive substances.

Available Sizes

METRIC TUBE & FITTINGS

The RapidPress system uses metric size fittings and tube. Below are common stocked sizes in stainless steel grade 316L including 15, 22, 28, 35, 42, 54, 76.1, 88.9, 108, 139.7 and 168.3.

Size	Outside Diameter	Wall Thickness
15	15.0 mm	1.0 mm
22	22.0 mm	1.2 mm
28	28.0 mm	1.2 mm
35	35.0 mm	1.5 mm
42	42.0 mm	1.5 mm
54	54.0 mm	1.5 mm
76	76.1 mm	1.5 mm
88.9	88.9 mm	2.0 mm
108	108.0 mm	2.0 mm
139.7	139.7 mm	2.0 mm
168.3	168.3 mm	2.0 mm

Contents

1.0 Introduction

1.1 RapidPress

RapidPress is a **Stainless Steel, Carbon Steel, and Copper/Copper-Nickel** press fit system supplied by a leading manufacturer with over 50 years of experience in the production and distribution of press fit systems. With an extensive background in the industry this manufacturer has a proven track record of producing durable and reliable press fit systems that are suitable for a wide range of applications.

The Metal Company is committed to providing our customers with the best products and services possible. We understand the importance of having a press fit system that is reliable and easy to use, which is why we have chosen to work with a leading manufacturer who has a distinctive quality management system that has been certified in accordance with UNI EN ISO 9001:2015.

When you choose **RapidPress** from The Metal Company, you can trust that you are getting a press fit system that is built to last, our extensive experience in the industry and our commitment to providing high-quality products, we are confident that **RapidPress** will meet all of your press fit needs.

1.2 Press Fit Systems in Water, Heating and Cooling Installation

Press fit was developed in Sweden in the late 1950s and have become popular around the world since the 1980s. Fast, solid, and permanent connection method for tubing in water, gas, and heating installations.

Available in various materials including **Stainless Steel**, **Carbon Steel**, **Copper** and **Copper-Nickel.**

RapidPress has further developed the **Stainless Steel, Carbon Steel, and Copper/Copper-Nickel** press fittings simplifying the assembly process and improving the sealing surface to minimize the risk of accidental non-pressing through the use of a security seal ring.

With the **RapidPress INOX** press fit system of **Stainless Steel** for potable water and gas installations, **RapidPress Steel** for closed hot water heating systems, **RapidPress Copper** for potable water and gas installations, **RapidPress Copper-Nickel** for naval sector, **RapidPress** offers a comprehensive shaped fitting series in the dimension range from 12 - 168.3 mm OD, together with pressing tools and accessories.

To simplify applications for the fitter, the pressing of the fittings has been constructed so that all the tools approved from the press fit systems leading manufacturers, i.e. pressing tools and pressing jaws or collars are also approved by **RapidPress**. The planning and installation of potable water and heating systems demands comprehensive expert knowledge together with knowledge of a multitude of industrial standards and technical guidelines of particular importance are DIN 1988 part 100-600 the VDI guideline 6023. DIN EN 806, DIN EN 1717, DIN EN 12329 and the amendment to the potable water legislation (TrinkwV), which came into effect on the 1st January 2003 as well as DVGW work sheets W 534 and GW 541.

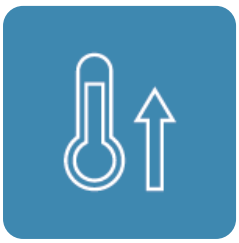
This Technical Guide is intended to provide especially planners and fitters with essential information to help both size up the field of application and to carry out professional installation.

Compressed Air


Potable Water


Fire Protection Systems


Process Water


Heating


Wastewater


Cooling


Solar Thermal

2.0 Press Fit Systems

2.1 Connection Technique - M Profile

The press connection is made by inserting the tube into the press fitting as far as the marked insertion depth. The connection is created by pressing, using an approved pressing tool (see point 2.13 Pressing tools).

Dimensions ø 12-35mm must be pressed with jaws, ø 42-168.3mm must be pressed with pressing collars/chains.

The longitudinal and compression closing character of the connection is clearly illustrated in figures 2 and 3. During the pressing process a deformation takes place on two planes. The first plane creates a permanent connection and provides mechanical strength through the mechanical deformation of the press fitting and the tube. On the second plane the seal ring is deformed in its cross section and through its elastic properties creates the permanently tight joint.

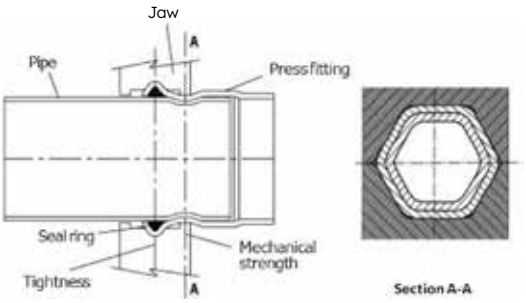


Figure 2 - Section through an **RapidPress INOX/ RapidPress Steel/RapidPress Copper/RapidPress Copper-Nickel** connection with jaw still in position.

Dimensions of ø 12 - 35 produce a hexagonal pressing profile.

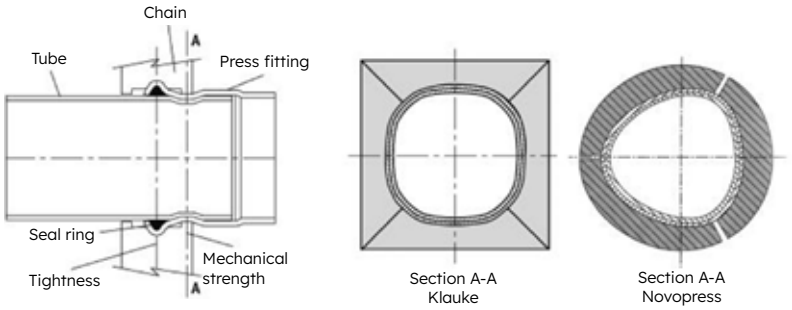


Figure 3 - Section through an **RapidPress INOX/ RapidPress Steel/RapidPress Copper/RapidPress Copper-Nickel** connection with collar still in position.

Dimensions of ø 42 - 168.3 mm produce a defined profile.

The complete range of the Press Fit systems **RapidPress INOX/RapidPress Steel/RapidPress Copper/RapidPress Copper-Nickel** is described in the relevant "Product range" catalogue.

2.2 RapidPress INOX Press Fittings

RapidPress INOX press fittings are manufactured using high-alloyed austenitic stainless Cr-Ni-Mo steel with the material number AISI 316L (1.4404). The press fittings are indelibly marked with laser reporting the manufacturer name, diameter.

DVGW test symbol and internal code. The formed ends of the press fittings are fitted with a black EPDM seal ring as standard for potable water applications.

Figure 4 - RapidPress INOX press fitting

2.3 RapidPress INOX Gas Press Fittings

RapidPress INOX GAS press fittings are manufactured using high-alloyed austenitic stainless Cr-Ni-Mo steel with the material number AISI 316L (1.4404).

They differ from **RapidPress INOX** for potable water installations in that they have a factory-fitted yellow NBR / HNBR seal ring and are also indelibly marked **RapidPress INOX** in black and indelibly yellow marked with **'RapidPress'** and the pressure range 'PN 5 /GT 1'.

Mixed installation (components from different manufacturers) is not permitted if gas tubes are installed.

Figure 5 - RapidPress INOX GAS press fitting

2.4 RapidPress INOX Tubing

RapidPress INOX tubes are available in different materials with various approvals according to the various applications. The longitudinally welded tubes are thin-walled manufactured according to DVGW worksheet GW 541. EN 10217-7 (DIN17455) and EN 10312.

The different types of tube materials are:

- Austenitic high-alloy Cr-Ni-Mo steel in AISI 316L (1.4404) material. DVGW certified;
- "Nickel-free" ferritic stainless steel of AISI 444 (1.4521) material. DVGW certified;
- High-alloy austenitic Cr-Ni steel of AISI 304L (1.4307) material, not DVGW certified.

The applications according to the different materials are:

- Drinking water installations with DVGW certification, tube made in AISI 316L (1.4404) or AISI 444 (1.4521) "nickel-free" material;
- Gas system material AISI 316L (1.4404);
- Applications where DVGW certification is not required. AISI 304L (1.4307) can also be used such as in heating, cooling, compressed air, drinking water systems where DVGW certification is not required, etc.

Inner and outer surfaces are bare metal and free of annealing colours and corrosion-promoting substances.
RapidPress INOX tubes are classified as non-combustible tube according to material class A; they are supplied in lengths of 6 meters or 3 meters depending on the material and are closed with plastic plugs/caps at the ends.

TABLE 1: RAPIDPRESS INOX TUBE - DIMENSIONS AND CHARACTERISTICS				
Tube outside diameter x wall thickness mm	Nominal width DN	Tube inside diameter mm	Mass kg/m	Water volume l/m
15 x 1	12	13	0.351	133
18 x 1	15	16	0.426	201
22 x 1.2	20	19.6	0.625	302
28 x 1.2	25	25.6	0.805	514
35 x 1.5	32	32	1.258	804
42 x 1.5	40	39	1.521	1,194
54 x 1.5	50	51	1.972	2,042
76.1 x 2	65	72.1	3.711	4,080
88.9 x 2	80	84.9	4.352	5,660
108 x 2	100	104	5.308	8,490
139.7 x 2	125	135.7	6.896	14,460
168.3 x 2	150	164.3	8.328	21,200
139.7 x 2.6	125	134.5	8.926	14,208
168.3 x 2.6	150	163.1	10.788	20,893

2.5 RapidPress Steel Press Fit

RapidPress Steel press fittings are made of unalloyed steel with material number E 195 (material n° 1.0034) up to 108 mm outer diameter. A galvanic zinc coating with a thickness of 6 - 12 mm protects against external corrosion. Unlike the **RapidPress INOX** press fittings. **RapidPress Steel** fittings are indelibly marked in red with the manufacturer name, diameter and internal code. The black EPDM sealing ring used for **RapidPress INOX** is also fitted into the formed ends of the press fittings.

2.6 RapidPress Steel Tubing

RapidPress Steel tubes are longitudinally welded thin-walled precision steel tubes according to DIN EN10305-3.

The following materials are available:

- E 220 CR2S4 (material n° 1.0215) tubes galvanised on the outside the zinc coating is 6 - 12 mm;
- E 190 CR2S4 (material n° 1.0031) tubes are sendzimir-galvanised on both sides; the zinc coating is 10 - 20 mm.

The weld seam is smoothed in order to ensure a proper sealing surface. **RapidPress Steel** tube with PP – coat 1 mm thick available in diameters ranging from 12 mm to 108 mm outer diameter (material E 220 CR2S4 - n° 1.0215). are classified in accordance with DIN 4102-1 building material class B2 - non-burning droplets.

RapidPress Steel tube with PP-coating: maximum operating temperature of 120 °C.
RapidPress Steel tube are supplied in lengths of 6 meters.

TABLE 2: RAPIDPRESS STEEL TUBE - DIMENSIONS AND CHARACTERISTICS					
Tube outside diameter x wall thickness mm	Nominal width DN	Tube inside diameter mm	Mass kg/m	Water volume l/m	Tube Outside diameter mm with PP coating
12 x 1.2	10	9.6	0.320	0.072	14
15 x 1.2	12	12.6	0.408	0.125	17
18 x 1.2	15	15.6	0.497	0.191	20
22 x 1.5	20	19	0.824	0.284	24
28 x 1.5	25	25	1.052	0.491	30
35 x 1.5	32	32	1.320	0.804	37
42 x 1.5	40	39	1.620	1.194	44
54 x 1.5	50	51	2.098	2.042	56
76.1 x 2	65	72.1	3.652	4.080	78.1
88.9 x 2	80	84.9	4.290	5.660	90.9
108 x2	100	104	5.230	8.490	110

TABLE 3: CHOICE OF RAPIDPRESS STEEL - TUBES		
316/005 Galvanised on the outside, black inside	316/003 Galvanised on outside, black inside + PP-coating	316/002 Galvanised inside/outside
Dimensions: ø 12 - 108 mm	Dimensions: ø 12 - 108 mm	Dimensions: ø 22 - 108 mm
		
Heating - Solar Compressed Air - Inert Gases	Heating Cooling	Compressed Air Inert Gases

2.7 RapidPress Copper Press Fit

RapidPress Copper press fittings are made in DHP Cu-DHP 99.9 (CW024A) **Copper** and in CuSn5Zn5Pb2 (CC499K) bronze from ø 12 to ø 54 mm included.

RapidPress Copper fittings are indelibly marked with a laser system with the manufacturer name, the diameter and the DVGW control brand and with an internal code. At the press fitting swollen ends, a black EPDM o-ring is fitted.

Figure 6 - RapidPress Copper press fitting

2.8 RapidPress Copper GAS Press Fit

RapidPress Copper GAS press fittings are made in DHP Cu-DHP 99.9 (CW024A) copper and in CuSn5Zn5Pb2 (CC499K) bronze. They differ from **RapidPress Copper** (drinkable water system version) for the following features:

- NBR yellow o-ring fitted at the end of production;
- The yellow indelible marking with **RapidPress Gas** and pressure field PN 5/GT next to the **RapidPress Copper** brand.

A mixed installation (components from different manufacturers) is not permitted if gas tubes are installed.

Figure 7 - RapidPress Copper GAS press fitting

2.9 RapidPress Copper GAS Copper Tube

Tube for **Copper** water and **Gas** installation should comply with the standard EN 1057:2010. "**Copper and Copper Alloys** - Round tubes in **Copper** without welding for water and gas in health-care and heating applications".

TABLE 4: MECHANICAL FEATURES FOR COPPER TUBES - EN 1057

Resistance class	Delivery condition	Ø (mm)
R220	Annealed - Rolls	12 - 22
R250	Semi-hard - Bars	12 - 28
R290	Hard - Bars	12 - 54
Resistance class	**Minimum traction resistance RM (MPa)**	**Minimum elongation at fracture (%)**
R220	220	40
R250	250	20
R290	290	3

The dimensions of the tube that can be used with the press systems **RapidPress Copper** and **RapidPress Copper GAS** are shown in the table below.

TABLE 5: RAPIDPRESS COPPER TUBE - DIMENSIONS AND CHARACTERISTICS - EN 1057/DVGW GW 392

Tube outside diameter x wall thickness mm	Nominal width DN	Tube inside diameter mm	Mass kg/m	Water volume l/m	Supplied condition
12 x 1	10	10	0.309	0.079	Rotolo 25/50 m (R 220)
15 x 1	12	13	0.393	0.133	
18 x 1	15	16	0.477	0.201	Barra 5 m (R 250 - R 290)
22 x 1	20	20	0.589	0.314	
28 x 1.5	25	25	1.115	0.491	Barra 5m (R 250 - R 290)
35 x 1.5	32	32	1.410	0.804	Barra 5 m (R 290)
42 x 1.5	40	39	1.704	1.194	
54 x 2	50	50	2.918	1.963	

2.10 RapidPress Copper-Nickel Press Fit

RapidPress Copper-Nickel press fittings are made in CuNi10Fe1.6Mn (WL 2.1972) Copper-Nickel from ø 15 to ø 108 mm included.

RapidPress Copper-Nickel fittings are indelibly marked with a laser system with the manufacturer name, the diameter and with an internal code.

At the press fittings swollen ends a green FKM o-ring is fitted.

Figure 8 - RapidPress Copper-Nickel press fitting

2.11 RapidPress Copper-Nickel Tube

RapidPress Copper-Nickel tube, with thin seamless walls, are in CuNi10Fe1.6Mn Copper-Nickel. Tubes in Copper-Nickel are made in compliance with the standard DIN 86019. Inner and outer surfaces are bare metal and free of annealing colours and corrosion-promoting substances. **RapidPress Copper-Nickel** tubes are classified as non combustible, belonging to class A as fire reaction. They are supplied in 6 m long bars.

TABLE 6: RAPIDPRESS COPPER-NICKEL TUBE - DIMENSIONS AND CHARACTERISTICS

Tube outside diameter x wall thickness mm	Nominal width DN	Tube inside diameter mm	Mass kg/m	Water volume l/m
15 x 1	12	13	0.392	0.133
18 x 1	15	16	0.476	0.201
22 x 1.2	20	20	0.588	0.315
28 x 1.5	25	25	1.114	0.491
35 x 1.5	32	32	1.408	0.804
42 x 1.5	40	39	1.702	1.195
54 x 1.5	50	51	2.206	2.042
76.1 x 2	65	72.1	4.146	4.080
88.9 x 2	80	84.9	4.874	5.660
108 x 2.5	100	103	7.389	8.332

2.12 Sealing Elements

2.12.1 Sealing Ring Profile

Traditional Press Fit systems use sealing rings (O-rings) with a circular section which, in the event of inappropriate processing, are easily subject to damage. **RapidPress**, on the other hand, uses a patented sealing ring with a lenticular profile which adheres perfectly to the toroidal chamber. This results in the following advantages:

- 20% enlargement of the sealing surface area;
- Major reduction of the risk of the sealing ring being pressed out or damaged;
- Makes the tube insertion easier.

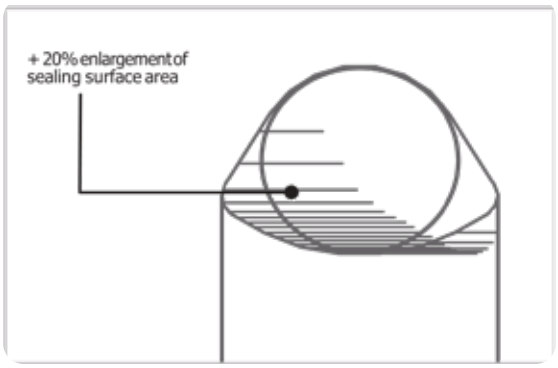


Figure 9 - Sealing ring profile

The black EPDM sealing ring from ø 15 - 54 mm is supplied with an additional safety feature that during pressure tests will lead to leakage in the case of accidentally unpressed connections.

Figure 10 - Security EPDM sealing ring (ø 15 - 54 mm).

- Tightness / pressure tests are to be carried out before the tube is covered (e.g. for insulation purposes);
- Tests are to be carried out in accordance with DVGW worksheet W534 and the ZVSHK data sheet “Tightness Tests for drinking water installations with compressed air, inert gas or water”;
- When conducting pressure tests with air, follow the technical rules for gas installations “DVGW-TRGI”;
- The correct assembly of the press fit connections is the responsibility of the installer/company. Unpressed untight is to be understood as an additional help in order to identify an assembly error – in this case the non-pressing of fittings. A precondition for that is the proper implementation of the prescribed tightness and pressure tests; it does not absolve the installer from his obligation to carry out visual and noise controls to make sure that the assembly has been done properly.

These visual and pressure checks must be noted on the respective test protocol.

2.12.2 Materials, Characteristics, Applications

Press Fit systems were originally developed for use in potable water and heating installations and were fitted with a single standardised sealing ring for these applications.

Additional fields of application such as gas, solar and steam, have been added through the use of stainless steel material at the same time motivating the development of sealing rings suitable for these applications. **RapidPress** supplies four different sealing rings; their characteristics and fields of application are shown in table 7.

The black EPDM standard sealing ring is only factory-fitted in the siliconised version in **RapidPress INOX**, **RapidPress Steel** and **RapidPress Copper-Nickel** press fittings. The green FKM sealing ring is only factory-fitted in:

- **RapidPress Copper-Nickel** press fittings
- **RapidPress INOX Extreme** press fittings

TABLE 7: SEALING RINGS - FIELDS OF APPLICATION AND TECHNICAL DATA						
Technical term	Colour	Operating temperature Min/Max degrees centigrade	Operating pressure maximum in bar	Approvals and certification Basis	Fields of application	Factory-fitted
EPDM	■	-20* / +120 °C	16	KTW W 270 DVGW W 534	Potable water, Heating, Cooling and refrigeration circuits, Treated water, Desalinated water, Rainwater, Compressed air (Classes 1-4)	YES
NBR HNBR	■	-20 / +70 °C	5	G 260HTB DVGW G 5614	Natural gas, Methane gas, LPG (gaseous state)	YES
FKM **	■	-20 / +220 °C	16	-	Solar, Compressed air (Class 5), Naval	YES (For **RapidPress Copper-Nickel** and **RapidPress INOX Extreme**)
MVQ	■	-20 / +180 °C	16	-	Industrial applications following approval by **RapidPress**	NO
STEAM ***	□	-20 / +165 °C	7 bara (6 barg)	-	S saturated steam Max. P= 7 bara (6 barg) Max. T= 165 ° C	YES (**RapidPress INOX STEAM**)

(*) Up to -30°C for occasional / non-continuous work periods
(**) Silicone free only if sold with the **RapidPress INOX Extreme** Silicone Free system
(***) Not available individually

See page 19 for the full field of application for press fit systems **RapidPress INOX/RapidPress Steel/RapidPress Copper**

With the exception of potable water, heating, solar, compressed air and gas, the figures in the table above are only for guidance; examination and approval by **RapidPress** of each individual situation is therefore required.

2.13 Pressing Tools

2.13.1 Basics

Pressing tools basically consist of the pressing machine (= drive machine) and pressing jaws or collars/chains. Many of the pressing jaws/collars can generally be used with the pressing machines from one manufacturer. Additionally, many manufacturers of pressing tools have standardised the jaw attachment that pressing jaws from other manufacturers can also be used. The pressing tools must be checked by an officially authorized repairer according to the manufacturer specifications (normally once a year or after 10.000 pressing cycles for standard pressing machine after 1.500 pressing cycles for **RapidPress INOX Oversize** pressing machine).

Press fittings in dimensions ø 12 - 35 mm must be pressed with jaws, ø 42 - 168.3 mm must be pressed with pressing collars/chains.

Principally, all metallic press fit systems have a pressing contour on the press fittings which matches the profile of the pressing jaws/collars. For this reason it is necessary to have the approval of the tooling by the manufacturer of the press fittings intended for use. In addition, it is important to follow exactly the maintenance and servicing instructions issued by the pressing tool manufacturer

Press Fit installation temperature with electrical pressing tools: from -20°C up to +40°C
Press Fit installation temperature with battery pressing tools: from -10°C up to +40°C

Figure 11 - Klauke UAP332BT

Figure 12 - Klauke UAP100120BT

Figure 13 - RapidPress ACO203BT

Figure 14 - RapidPress ACO403BT

2.13.2 Approved Pressing Tools

RapidPress approves the tools produced by Klauke and Novopress listed in the tables 8 and 9 below. These are pressing tools with the appropriate pressing jaws or collars/chains.

TABLE 8: MANUFACTURER KLAUKE

Type	Piston strength	Dimension range	Weight	Compatible with jaws from/Note
MAP1 - MAP2L	15 KN	12 - 22 mm	~ 1.7 Kg	--
MAP2L _ 19 MAP2119BT	19 KN	12 - 35 mm	~ 1.7 Kg	MAP2L _ 19 is certified for **Gas** only up to Ø 22 mm.
UAP2 - UAP3L UAP332BT	32 KN	12 - 54 mm	~ 3.5 Kg	**RapidPress** EFP2 - EFP201 - AFP201 - EFP202 - AFP202 - ECO1 - ACO1
UNP2	32 KN	12 - 54 mm	~ 3.5 Kg	**RapidPress** EFP2 - EFP201 - AFP201 - EFP202 - AFP202 - ECO1 - ACO1
UAP4 - UAP4L UAP432BT	32 KN	12 - 54 mm PN16 76.1 - 108 mm PN10	~ 4.3 Kg	**RapidPress** EFP2 - EFP201 - AFP201 - EFP202 - AFP202 - ECO1 - ACO1
UAP100 - UAP100L UAP100120BT	120 KN	76.1 - 108 mm	~ 12.7 Kg	--
AH- P7OOLS PKUAP3	32 KN	12 - 54 mm	~ 12.3 Kg	**RapidPress** EFP2 - EFP201 - AFP201 - EFP202 - AFP202 - ECO1 - ACO1 12 - 54 mm
AH- P7OOLS PKUAP4	32 KN	12 - 54 mm PN16 76.1 - 108 mm PN10	~ 12.6 Kg	**RapidPress** EFP2 - EFP201 - AFP201 - EFP202 - AFP202 - ECO1 - ACO1 12 - 54 mm
AH- P7OOLS PK100AHP	120 KN	76.1 - 108 mm	~ 20..2 K	--
EHP2/SANB	0.75 KN	76.1 - 108 mm	~ 69 Kg	--

With regard to the Klauke pressing tool UAP4/UAP4L/UAP432BT, the limitation on PN 10 is to be observed for the **RapidPress INOX Oversize** dimensions 76.1 - 108 mm outer diameter. **RapidPress INOX GAS** fittings in sizes 76.1 - 108 mm must be pressed with pressing collars/chains and UAP100/UAP100L/UAP100120BT pressing machine only (others pressing machines are not approved).

TABLE 9: MANUFACTURER NOVOPRESS

Type	Piston strength	Dimension range	Weight	Compatible with jaws from/Note
ACO102 - AC0103	19 KN	12 - 35 mm	~ 1.7 Kg	ACO102 - AC0103 are certified for Gas only up to Ø 22 mm.
EFP2	32 KN	12 - 54 mm	~ 6.1 Kg	EFP201 - AFP201 - ECO1 - ACO1
EFP201 - EFP202	32 KN	12 - 54 mm	~ 4.4 Kg	EFP2 - ECO1 - ACO1
AFP201 - AFP202	32 KN	12 - 54 mm	~ 4.3 Kg	EFP2 - ECO1 - ACO1
ECO202-ACO202 ECO203-ACO203/BT	32 KN	12 - 54 mm	~ 3.3 Kg	ECO201 - ACO201 - ECO1 - ACO1
ACO202XL ACO203XL/BT	32 KN	12 - 54 mm PN16 76.1 - 108 (*) mm PN10	~ 4.6 Kg	ECO202 - ACO202
ACO401 ACO403/BT	100 KN 120 KN	76.1 - 168.3 mm	~ 13 kg	--
ACO3	36 KN	15 - 54 mm 76.1 - 108 mm PN10	~ 5.0 Kg	ECO3
ECO301	45 KN	1 2 - 54 mm PN16 76.1 - 108 (*) mm PN10	~ 5.0 Kg	ACO3
HCP	190 KN	76.1 - 108 mm	~ 70 Kg	--

Ø 108 - it must be pressed 2 times with the following adapters: ACO202 / 203XL: ZB221 -> 1° pressing ZB222 -> 2° pressing
ECO301: ZB323 -> 1° pressing ZB324 -> 2° pressing

With RapidPress pressing tool ACO202XL/ACO203XL/ECO301, the limitation on PN 10 is to be observed for the RapidPress INOX Oversize dimensions 76.1 - 108 mm outer diameter. **RapidPress INOX GAS** fittings in sizes 76.1 - 108 mm must be pressed with pressing collars/chains and ACO401/ACO403/ACO403BT pressing machine only (others pressing machines are not approved).

VdS APPROVED PRESSING TOOLS
The list of certified pressing tools for VdS system, is indicated on the VdS certificate N° G4060006.

2.13.3 Periodical Equipment Service

Jaw and chain pressing units are to be serviced for a correct joint production. The pressing tools must be checked by an officially authorized repairer according to the manufacturer specifications (normally once a year or after 10.000 pressing cycles for standard pressing machine after 1.500 pressing cycles for **RapidPress INOX Oversize** pressing machine **ACO403BT**). Any moving part (drive rolls) and pressing jaw and chain surfaces (internal profiles) are to be daily serviced, cleaned and lubricated.

Any possible oxidation, paint or dirt in generally affect the tool reliability leading to equipment sliding problems on joints during pressing.

Figure 15 - Klauke equipment

Figure 16 - Novopress equipment

Keep the chain clean

Keep the pins lubricated with oil

Attention it can be broken

3.0 Areas of Use

TABLE 10a: FIELD OF APPLICATION FOR PRESS FIT SYSTEMS RAPIDPRESS INOX / RAPIDPRESS STEEL / RAPIDPRESS COPPER					
Application	**System**	**O-ring**	**Notes**	**PN max. (Bar)**	**T °C**
Drinking water	**RapidPress INOX** (Tube AISI 316L or Type 444)	EPDM black	-	16	0 / +120 °C
	RapidPress Copper	EPDM black	-	16	0 / +120 °C
Heating	**RapidPress Steel** (Tube 316/005)	EPDM black	Only use internally black tube. Galvanised on the outside.	16	0 / +120 °C
	RapidPress INOX (Tube AISI 316L/444/304L)	EPDM black	-	16	0 / +120 °C
	RapidPress Copper	EPDM black	-	16	0 / +120 °C
Extinguishing water [1]	**RapidPress INOX** (Tube AISI 316L/444/304L)	EPDM black	Dimensions ø 15 - 108 mm	16	Room temperature
	RapidPress Copper	EPDM black	Dimensions ø 15 - 54 mm	16	Room temperature

[1] For joints till ø 54 mm use press machines whose driving force accounts for ≥ 32 KN. For **RapidPress INOX Oversize** fittings (ø 76 - 108 mm). use press machines whose driving force accounts for ≥ 100 KN. For each country, must be checked with local laws and regulations concerning the use of the press fit in extinguishing systems and sprinkler installations.

Sprinkler system [2]	**RapidPress INOX** (Tube AISI 316L(3)/304L/444)	EPDM black	Dimensions ø 22 - 108 mm (3)	16	Room temperature
	RapidPress Copper	EPDM black	Dimensions ø 22 - 54 mm	16	Room temperature

[2] For joints till ø 54 mm use press machines whose driving force accounts for ≥ 32 KN. For **RapidPress INOX Oversize** fittings (ø 76 - 108 mm). use press machines whose driving force accounts for ≥ 100 KN. [3] Certified VdS PN12.5 ø 22 up to 76.1 mm - PN16 ø 88.9 mm material AISI 316L (1.4404) - wet and dry. VdS certification and EN 12845 norm define the possible areas of application for sprinkler systems. For each country, must be checked with local laws and regulations concerning the use of the press fit in extinguishing systems and sprinkler installations. [4] Only for wet plant installation hazard classes LH. OH1. OH2 and OH3.

Cooling	**RapidPress INOX** (Tube AISI 316L/444/304L)	EPDM black	-	16	-20 / +120 °C
	RapidPress Steel (Tube 316/003)	EPDM black	Only use internally black tube. Paying particularly attention to the external protection against corrosion by using a PP covered Tube + primer (paint) / bandage.	16	-20 / +120 °C
	RapidPress Copper	EPDM black	-	16	-20 / +120 °C
Solar	**RapidPress INOX** (Tube AISI 316L/444/304L)	FKM green	-	6	-20 /+220 °C
	RapidPress Steel (Tube 316/005)	FKM green	Only use internally black tube. Paying particularly attention to the external protection against corrosion by using appropriate insulation coating.	6	-20 /+220 °C
	RapidPress Copper	FKM green	-	6	-20 /+220 °C
Methane gas Natural gas LPG (gaseous state)	**RapidPress INOX GAS** (Tubo AISI 316L)	NBR / HNBR yellow	Dimensions: ø 15 - 108 mm	5	-20 / +70 °C
	RapidPress Copper GAS	NBR yellow	Dimensions: ø 15 - 54 mm	5	-20 / +70 °C

TABLE 10a: FIELD OF APPLICATION FOR PRESS FIT SYSTEMS RAPIDPRESS INOX / RAPIDPRESS STEEL / RAPIDPRESS COPPER

Application	System	O-ring	Notes	PN max. (Bar)	T °C
Compressed air	**RapidPress INOX** (Tube AISI 316L/444/304L)	EPDM black Class 1-4 (Residual oil < 5mg/m³) FKM green Class 5 (Residual oil > 5mg/m³)	Systems not silicone-free (not suitable for varnishing systems)	16	Room temperature
	RapidPress Steel	EPDM black Class 1-4 (Residual oil < 5mg/m³) FKM green Class 5 (Residual oil > 5mg/m³)	Systems not silicone free for systems requiring clean air - without dust formation the use of the **RapidPress INOX** system is recommend.	16	Room temperature
	RapidPress Copper	EPDM black Class 1-4 (Residual oil < 5mg/m³) FKM green Class 5 (Residual oil > 5mg/m³)	System not silicone-free (not suitable for varnishing systems)	16	Room temperature
Nitrogen	**RapidPress INOX** (Tube AISI 316L/444/304L)	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
	RapidPress Steel	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
	RapidPress Copper	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
Argon	**RapidPress INOX** (Tube AISI 316L/444/304L)	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
	RapidPress Steel	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
	RapidPress Copper	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
Dry carbon dioxide in gaseous state	**RapidPress INOX** (Tube AISI 316L/444/304L)	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
	RapidPress Steel	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
	RapidPress Copper	EPDM black	Only for industrial use (medicine excluded)	16	Room temperature
Saturated Steam	**RapidPress INOX** (Tube AISI 316L / 304L)	FKM green	-	Max 2 bara Max 1 barg	Max 120 °C
	RapidPress INOX Steam (7) (Tube AISI 316L / 304L)	STEAM white	-	Max 7 bara Max 6 barg	Max 165 °C
Vacuum	**RapidPress INOX** (7) (Tube AISI 316L/444/304L)	EPDM black FKM green	-	- 0.8 bar (up to a max of -0.95/-0.98 bar)	Room temperature
	RapidPress Steel	EPDM black FKM green	For systems requiring clean air - without dust formation - the use of the **RapidPress INOX** system is recommended	- 0.8 bar (up to a max of -0.95/-0.98 bar)	Room temperature
	RapidPress Copper	EPDM black FKM green	-	- 0.8 bar (up to a max of -0.95/-0.98 bar)	Room temperature

TABLE 10b: FIELD OF APPLICATION FOR PRESS FIT SYSTEMS RAPIDPRESS INOX ø 139.7 - 168.3					
Application	**System**	**O-ring**	**Notes**	**PN max. (Bar)**	**T °C**
Drinking water	**RapidPress INOX** (Tube AISI 316L)	EPDM black	-	16	0 / +120 °C
Heating	**RapidPress INOX** (Tube AISI 316L)	EPDM black	-	16	0 / +120 °C
Extinguishing water	**RapidPress INOX** (Tube AISI 316L)	EPDM black	-	16	Room temperature
Cooling	**RapidPress INOX** (Tube AISI 316L)	EPDM black	-	16	-20 / +120 °C
Compressed air	**RapidPress INOX** (Tube AISI 316L)	EPDM black Class 1-4 (Residual oil < 5mg/m³) FKM green Class 5 (Residual oil > 5mg/m³)	System not silicone-free (not suitable for varnishing systems)	16	Room temperature
Vacuum	**RapidPress INOX** (Tube AISI 316L)	EPDM black	-	- 0.8 bar (up to a max of -0.95/-0.98 bar)	Room temperature

The above mentioned information/compatibility does not exempt the planning manager of the responsibility to create a detailed implementation planning and a risk analysis in accordance with the provisions of Directive 2014/68/UE pressure systems.

3.1 Applications

3.1.1 Potable Water, Treated Water, Hydrant Systems

The **RapidPress INOX** press fit system is manufactured using high alloy austenitic Cr-Ni-Mo stainless steel with the material number AISI 316L (1.4404). Thanks to its high resistance to corrosion and suitability in terms of hygiene. **RapidPress INOX** can be used for all drinking water applications. Since this material does not release any heavy metals into the water the purity of the potable water remains unchanged by the **RapidPress INOX** press fit system.

The **RapidPress Copper** press fit system is available in Copper and Bronze and it can be used for any potable water as it is bacterialstatic, thus it inhibits the bacteria proliferation. Should Copper tubes and joints used for hydro-sanitary systems they should comply with limits imposed by the standard DIN 50930 Teil 6:

- pH ≥ 7.4 or
- 7.0 ≤ pH ≤ 7.4 e TOC ≤ 1.5 g/m³

The TOC. Total Organic Carbon is the concentration index of the total organic substances present in the water.

The black EPDM sealing ring fulfills the standards of the KTW recommendations and meets the standards in accordance with DVGW worksheet W 270.

RapidPress INOX and **RapidPress Copper** with black EPDM sealing rings are suitable for use in the fields of:

- Potable water in cold water, warm water and circulation tubing;
- Treated water such as softened decarbonated and desalinated water.
- Fire hydrant systems (reference UNI 10779/2021).

The use of anti-corrosion or antifreeze additives requires the approval of **RapidPress.**

Figure 17 - RapidPress INOX - Potable water

Figure 18 - RapidPress INOX - Industry

RapidPress INOX and **RapidPress Copper** are not suitable for applications which require a higher degree of water purity than for the quality of potable water such as for example for pharmaceutical water or purest types of water.

3.1.2 Heating

The **RapidPress INOX, RapidPress Steel** and **RapidPress Copper** press fit systems with black EPDM sealing rings is used for hot water heating systems in accordance with DIN 4751 which have a flow temperature up to max 120°C and maximum pressure PN16: closed and open versions (**RapidPress INOX** and **RapidPress Copper**). closed version (**RapidPress Steel**).

They are suitable for both on-wall and in-wall installation (with appropriate protections).

In case of floor radiator connections, it is necessary to provide for a consistent corrosion protection, with a joint sealing made according to the highest standards.

Otherwise it is possible to run the risk of washing water penetration hydrating the insulation and thus increasing the risk of corrosion.

The use of anti corrosion or antifreeze additives requires the approval of **RapidPress**. For **RapidPress Steel** press fit system **RapidPress** recommends the use of tube only galvanised on the outside.

Further information on corrosion protection can be found on page 46, chapter 7.0.

3.1.3 Cooling And Refrigeration Circuits

RapidPress INOX. **RapidPress Steel** and **RapidPress Copper** with black EPDM sealing rings are suitable for use cooling and refrigeration circuits in closed and open versions (**RapidPress INOX** and **RapidPress Copper**). in closed version (**RapidPress Steel**) with operating temperatures between -20 / +120°C.

The use of anti-corrosion or antifreeze additives requires the approval of **RapidPress** (excluding glycols on page 24, table 12). For **RapidPress Steel** press fit system. **RapidPress** recommends the use of tube only galvanized on the outside with particular attention to the external protection of the plants in **Carbon Steel** (see chapter 4.8).

For corrosion protection and insulation follow the indications in the worksheet AGI Q151.

3.1.4 Compressed Air And Inert Gas

The **RapidPress INOX**, **RapidPress Steel** and **RapidPress Copper** press fit system are suitable for pneumatic lines and inert gases. For systems with a residual oil content of class 1 to 4 (according to ISO 8573-1/2010) the black EPDM sealing ring can be used. For systems with a residual oil content of class 5 (according to ISO 8573-1/2010) the green FKM sealing ring can be used. It is loosely supplied and the factory-loaded black EPDM sealing ring is to be replaced by the processor.

If the tube must be “silicone Free” the **RapidPress INOX Extreme** system (O-ring FKM fitted in the factory) must be used.

To ensure optimal sealing of compressed air or vacuum lines, it is recommended to humidify the sealing ring with water prior to assembly. In case of necessity of clean air, in absence of dust, the use of **RapidPress INOX** system is recommended.

3.1.5 Natural Gas / LPG Installation

The **RapidPress INOX GAS** and **RapidPress Copper GAS** press fit system are suitable for natural gas and LPG following the here below subscriptions:

- **RapidPress INOX GAS** ø 15 - 108 mm OD with factory-fitted yellow NBR/HNBR sealing ring is approved for natural and liquid gases.
- **RapidPress Copper GAS** ø 15 - 54 mm OD with factory-fitted yellow NBR sealing ring is approved for natural and liquid gases.
- **RapidPress INOX GAS** and **RapidPress Copper GAS** fittings in dimensions 42 and 54 mm must be pressed with pressing collars/chains; pressing with jaws is not permitted.
- Fittings in sizes 76 - 108 mm must be pressed with pressing collars/chains and UAP100 / UAP100L / UA-P100120BT / ACO401 / ACO403 / ACO403BT pressing machine only (others pressing machines are not approved).

3.1.6 Solar, Vacuum, Steam, Condensation

RapidPress INOX, RapidPress Steel and **RapidPress Copper** with green FKM sealing rings with increased temperature and oil resistance can be used in the following fields of application:

- Solar tubing temperature range -20/+220°C. The temperature range is only permitted for solar systems with water-glycol mixture.
- Vacuum tubing up to 200 mbar absolute (- 0.8 bar relative up to a maximum of -0.95/-0.98 bar).

In order to achieve optimum sealing of compressed air and vacuum tubing, it is recommended that the sealing ring be moistened using water before assembly.

Green FKM sealing rings are supplied loose and the fitter has to use them to replace the factory-fitted black EPDM sealing rings.

RapidPress Steel press fit system **RapidPress** recommends the use of tube only galvanised on the outside.

RapidPress INOX with green FKM sealing rings can be used in the following fields of application:

- Steam and condensation tube, temperature of maximum 120°C at steam pressure of max. 2 absolute bar (1 relative bar).

For steam and condensate lines with temperatures up to 165 °C and a pressure up to 7 absolute bar (6 relative bar). **RapidPress INOX Steam** fittings can be supplied with a white sealing ring factory-fitted.

3.1.7 Industrial Applications

Due to its higher temperature resistance **RapidPress INOX** with red MVQ sealing rings is especially suitable for a multitude of media in industrial applications. An individual case approval from **RapidPress** is required in this situation.

3.1.8 Marine

RapidPress INOX and **RapidPress Copper-Nickel** are certified for different applications in Marine.

The black EPDM standard sealing ring only is factory-fitted in the siliconised version in **RapidPress INOX** press fitting.

The green FKM sealing ring only is factory-fitted in **RapidPress Copper-Nickel** press fitting.

Separate information is available if required.

Figure 19 - RapidPress Steel - refrigeration (closed circuit)

Figure 20 - RapidPress Steel - Tube PP coated

Figure 21 - RapidPress Steel - Press fittings

3.1.9 Extinguishing Systems, Sprinkler Installations

RapidPress INOX and **RapidPress Copper** systems with black EPDM sealing ring can be used in extinguishing systems (reference norm UNI 10779/2021). In addition, the Press Fit systems are suitable for wet and dry sprinkler installations (ref. EN 12845) with diameters from ø 22 up to 108 mm, according to the below table.

TABLE 11: PRESS FIT IN EXTINGUISHING SYSTEMS AND SPRINKLER INSTALLATIONS

APPLICATION	RAPIDPRESS INOX	RAPIDPRESS COPPER
Extinguishing systems	✓	✓
Sprinkler system (dry installation)	✓	✗
Sprinkler system (wet installation)	✓	✓

The press fit systems used in extinguishing systems and sprinkler installations must be only in the configuration “above ground” (underground is excluded). With reference to EN 12845, **Copper** can be used for wet sprinkler systems (no dry) with hazard classes LH. OH1. OH2 and OH3.

RapidPress INOX is certified to be used with sprinkler installations according to the VdS certification:

- Ø 22 - 76.1 mm PN12.5 bar - ø 88.9 PN16 - Material AISI 316L (1.4404) - **RapidPress INOX** with standard EPDM o-ring for dry and wet sprinkler installations.

VdS certification requires the use of press machines with driving force accounting for ≥ 32 KN up to ø 54 mm while for **RapidPress INOX Oversize** fittings (ø 76 - 108 mm) only use press machines whose driving force accounts for ≥ 100 KN (furthermore, the evidence in the VdS approval must be observed).

For each country, must be checked with local laws and regulations concerning the use of the press fittings in extinguishing systems and sprinkler installations.

3.1.10 Glycols For Installation

The following table lists some glycols normally used for heating systems, cooling and solar systems. Should glycols be used which are not listed in the table, please contact the technical office of **RapidPress**

TABLE 12: CHEMICAL COMPATIBILITY OF GLYCOLS

GLYCOL	Manufacturer	Areas of use
GLYKOSOL N	Pro Kühlsole GmbH	Heating, Cooling cycles
PEKASOL L	Pro Kühlsole GmbH	Heating, Cooling cycles
PEKASOLar 50	Pro Kühlsole GmbH	Solar
PEKASOLar 100	Pro Kühlsole GmbH	Solar
PEKASOLar F	BMS Energy	Solar
TYFOCOR	Tyforop Chemie GmbH	Heating, Cooling cycles
TYFOCOR L	Tyforop Chemie GmbH	Heating, Cooling cycles & Solar
TYFOCOR LS	Tyforop Chemie GmbH	Solar
CosmoSOL	Tyforop Chemie GmbH	Heating, Cooling cycles & Solar
Antifrogen N	Clariant	Heating, Cooling cycles
Antifrogen L	Clariant	Heating, Cooling cycles
Antifrogen SOL-HT	Clariant	Solar
DOWNCAL 100	DOW	Heating, Cooling cycles
DOWNCAL 200	DOW	Heating, Cooling cycles
SOLARLIQUID L	STAUB & CO. – SILBERMANN GmbH	Solar
STAUBCO® COOL N	STAUB & CO. – SILBERMANN GmbH	Heating, Cooling cycles
STAUBCO® COOL L	STAUB & CO. – SILBERMANN GmbH	Heating, Cooling cycles
Glysofor N	WITTIG Umweltchemie GmbH	Heating, Cooling cycles
Glysofor L	WITTIG Umweltchemie GmbH	Heating, Cooling cycles

NOTE: please follow the manufacturer's utilization notes. EPDM sealing o-ring with maximum 40% glycol and 60% water. For **RapidPress Steel**, please only use internally black tube.

4.0 Processing

4.1 Storage And Transport

RapidPress INOX / **RapidPress Steel** / **RapidPress Copper** / **RapidPress Copper-Nickel** system components have to be protected against dirt and damage during transport and storage. The ends of the tube are factory-fitted with plugs/caps to prevent dirt.

The tube must be stored in a device with a protective coating or plastic alloy, so that they do not come in contact with other materials. Tube as well as press fittings must be stored in a covered area protected against effects of humidity in order to prevent corrosion and/or oxidation of the surface to avoid (particularly in the area of the **RapidPress Steel** press fit systems).

4.2 Tube - Cutting To Length, Deburring, Bending

The tube should be cut to length using professional tube cutters which are suitable for the material in use. Alternatively, fine-tooth hacksaws or suitable electric saws may be used. The cut has to be perpendicular to avoid negative impact on the mechanical resistance between fitting and tube.

Only use suitable tools that are suitable for the material to be processed. Particular attention must be paid for example, to the choice of the right saw blades or cutting wheels that are used.

The cutting and deburring tools must be clean, free from adherence or chips. After cutting / deburring, the cutting edges or tube ends must be cleaned or freed from chips or impurities.

Not permitted are:

- Tools which cause tarnishing during the cutting operation;
- Oil-cooled saws;
- Flame cutting or angle grinders.

To avoid damaging the sealing ring when inserting the tube into the press fitting, the tube must be carefully deburred, both inside and outside, following cutting to length. This can be carried out using manual deburring tools which are suitable for the material in use, whilst for larger dimensions suitable electrical tube deburring tools or files can be used. The tube can be bent by means of conventional bending tools up to 22 mm outer diameter (R ≥ 3.5xD). Copper tube according to EN 1057 can be bended with the

Following minimum bending radius:

DN 12 - R=45 mm
DN 15 - R=55 mm
DN 18 - R=70 mm
DN 22 - R=77 mm

No tube hot bending allowed

Figure 22 - Cutting the tube to length

Figure 23 - Deburring the tube

BENDING MACHINES

DN	Radial bending Allowed	Axial bending Not Allowed
12 mm		
15 mm		
18 mm		
22 mm		

The instructions of use and operation of the bending machines have to be carefully observed.

4.3 Marking The Insertion Depth / Stripping

Sufficient mechanical strength of the press fit connection will only be achieved if the insertion depths shown in table 13 are adhered to. These insertion depths are valid for tube or fittings with insertion ends (i.e. fittings without press fit end) and must be marked using a suitable marking tool.

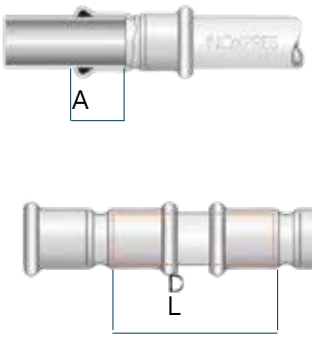
The marking of the insertion depth on the tube must be visible directly next to the press fit formed end following pressing. The distance of the fitting from the press fit formed end may not exceed 10% of the required insertion depth, since otherwise the mechanical stability of the connection cannot be guaranteed. In the case of **RapidPress Steel** PP coated tube, the insertion depth is defined through the stripping of the plastic coating using a suitable stripping tool.

When stripping the PP-sheathed tubes, use suitable tools which do not damage the raw surface.

TABLE 13: INSERTION DEPTH AND MINIMUM DISTANCES

Tube outside diameter mm	A (*) mm	D mm	L mm
12	18	20	56
15	20	20	60
18	20	20	60
22	21	20	62
28	23	20	66
35	26	20	72
42	30	40	100
54	35	40	110
76.1	55	60	170
88.9	60	60	180
108	75	60	210
139.7	95	100	290
168.3	113	100	326

(*) Tolerance: ± 2 mm



A = insertion depth
D = minimum distance
L = minimum tube length tube

Figure 24 - Insertion depth and minimum dimensions

Figure 25 - Marking the insertion depth

Figure 26 - Checking the sealing ring

4.4 Press Fit Seal Ring Check

Before assembling the fittings, it is advisable to check that the sealing ring is correctly inserted in its seat and that it is not dirty or damaged. If necessary, it must be replaced.

Additionally, the fitter should check whether the ring in position is suitable for the special application, or whether another sealing ring needs fitting.

4.5 Making The Press Connection ø 12 - 108 mm

Using light pressure and making a turning movement at the same time, press the tube into the press fitting up to the marked insertion depth. If the tolerances are so narrow that additional force is required to insert the tube into the press fitting, then water or soapy water may be used as a lubricant.
Pressing is carried out using suitable electromechanical/electro hydraulic pressing tools and dimension-matching pressing

Oil and grease are not permitted for use as lubricants.

Jaws or collars / chains. Tested and approved pressing tools or pressing jaws/collars/chains are listed under table 8 - 9 approved pressing tools.

The matching pressing jaw is mounted in the pressing machine, or the appropriate collar/chain mounted on the fitting, depending on the dimensions of the press fitting. The slot of the pressing jaw/collar must be positioned exactly over the press fit formed end.

Following pressing, the complete connection should then be checked to ensure that the work has been carried out correctly and that the insertion depth is correct.

The fitter should also ensure that all connections have actually been pressed. React immediately in the event of an unusual press pattern.

Completely pressed systems with faulty press patterns or profiles cannot be fully recognized as a complaint.

Figure 27 - Inserting tube into the press fitting

Following completed pressing, the pressing points may not be subjected to further mechanical loading. The positioning and straightening of the tube and the sealing of threaded connections must therefore take place before the pressing is carried out. Slight movement and lifting of tube, for example for painting work is permitted.

Figure 28 - Making the press connection

Figure 29 - Making the press connection

4.6 RapidPress INOX Oversize Range ø 139-168 mm

Unlike diameters up to 108 mm the pressing phases of the **Oversize** 139.7 and 168.3 mm dimensions must be carried out in two distinct pressing phases.

1st PRESSING PHASE

1. Open the chain and place it around the fitting: the groove of the chain must be positioned exactly above the toroidal chamber of the fitting.
2. Close the chain and press the lock button.
3. Rotate the latch inwards and engage the lock.
4. Carry out pressing operation n^{0}1.
5. Unhook and rotate the latch, open the chain and remove it from the fitting.

Figure 30 - Press assembly phase 1

2nd PRESSING PHASE

1. Position the chain around the tube socket aligning it with the appropriate guides above the containment groove of the o-ring.
2. Close the chain and press the lock button.
3. Rotate the latch inwards and engage the lock.
4. Carry out pressing operation n^{0}2.
5. Unhook and rotate the latch, open the chain and remove it from the fitting.

Figure 31 - Press assembly phase 2

After pressing, the connection must be checked to ensure that the work has been carried out correctly and that the insertion depth is correct.

The fitter must also ensure that all connections have been adequately pressed.

Once pressing has been complete, the connections must not be subjected to further mechanical loads.

The alignment of the tubeline and the fixing of the threaded connections must therefore be carried out before pressing. Slight movement and lifting of tube, E.g. for painting work is permitted.

Figure 32 - Visual inspection of oversize pressing

4.7 Protection Of Tube lines And Connections From External Corrosion General

All tubes with hot or cold liquids must be protected externally by appropriate coatings to avoid any unwanted incidents, such as:

- Condensation;
- Condensation with external
- Corrosion; corrosion by external
- Influences; thermal dispersion.

Tube and connections must be protected with varnish, plastic coatings, press-on tyres with adhesive tape and thermal insulation (see chapter 5.4 of the guide)

Figure 33 - Varnishing of the connections and tube with primer.

To prevent external corrosion of **RapidPress Steel** systems especially where condensation water could increasingly occur (e.g. air conditioning and cooling units) - the following is recommended:

- Use tubes with a propylene coating if tubes of non-alloy steel are used;
- Proper protection of tubes/connections with the help of a coating with primer;
- Proper protection of tubes/connections with the help of viscoelastic tape consisting of butanolmastic supported by a film made of high-density polyethylene (entire thickness approx. 0.8 mm).

The butanol-adhesive tape has high tensile and high adhesive strength and is self-fluxing. It requires no adherent primer, lets surfaces perfectly repel water and insulates against atmospheric influences and free chemicals. The high tensibility provides the tapes with comprehensive applicability for all types of surfaces, even for irregular surfaces such as bends, T-piece, sleeves, etc.

For the application, it is sufficient that the surface is clean but not wet. The tape must be under pressure and cleaned depending on the situation. It extends over 700% compared to its original length while the width at the end depends on the extension. It is recommended to overlap the tape with at least 10% of the tape width.

A coating protection with the help of tapes and/or varnish must always occur after a trial run of the system.

Important: the choice and the implementation of the type of protection against external corrosion is responsibility of the planner and installer.

Figure 34 - Protection of the connectors with butanol adhesive tape

Figure 35 - Protection against external corrosive materials:
1. Tube with PP-coating
2. Varnish with primer
3. Protection with butanol adhesive tape

4.8 Minimum Distances And Space Requirement For Pressing

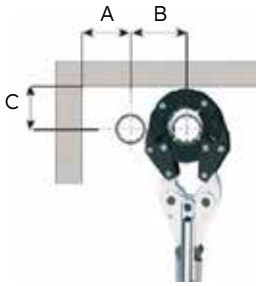
To carry out pressing correctly, there must be a minimum distance between the tube and the building and from tube to tube, as shown in tables 14 and 15.

TABLE 14: MINIMUM DISTANCES AND SPACE REQUIREMENT 12 - 35 mm

Tube	Figure 36		Figure 37			Figure 38				Figure 39	
Ø	A	D	A	D	D1	A	C	D	D1	D	E
12	56	30	75	30	35	85	155	30	35	40	60
15	56	30	75	30	35	85	155	30	35	40	60
18	60	30	75	30	40	85	165	30	40	40	60
22	75	40	80	40	40	85	165	40	40	40	61
28	82	40	90	40	45	90	180	40	45	40	63
35	85	40	90	40	45	90	180	40	45	40	66

TABLE 15: MINIMUM DISTANCES 42 - 168.3 mm

Tube Ø	A	B	C
42	150	150	110
54	150	150	110
76.1	170	210	170
88.9	190	260	190
108	200	320	280
139.7	250	350	250
168.3	260	350	250



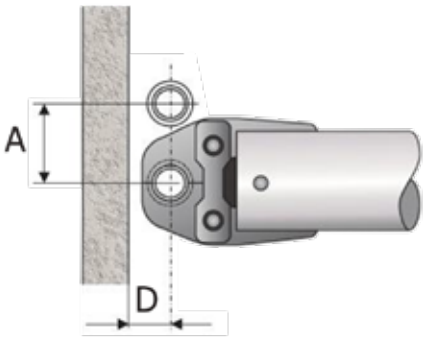


Figure 36 - Minimum distances and space requirements

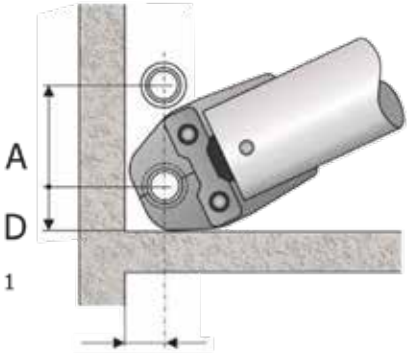


Figure 37 - Minimum distances and space requirements

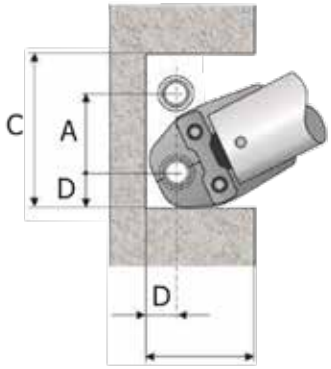


Figure 38 - Minimum distances and space requirements

4.9 Thread Or Flange Connections

Press fittings can be connected using normal trade threaded fittings in accordance with ISO 7-1 (thread standard DIN2999) or ISO 228 (thread standard DIN259) or with fittings made of **Stainless Steel** or non-ferrous metals.

The flanges available from the **RapidPress INOX/RapidPress Steel/RapidPress Copper-Nickel** range can be connected to normal flanges at pressure stage PN6/10/16. During installation, first the thread/flange connection must be completed, then the press connection.

When sealing threaded connections, no sealant containing chloride (example Teflon tapes) may be used.

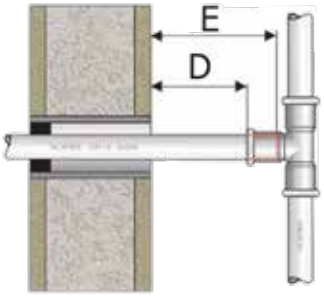


Figure 39 - Minimum distances and space requirements

IMPORTANT

For security reasons, the transition from **RapidPress Press Fit** systems' to the multilayer tube systems' should be realized through a threaded connection. All that, in order to avoid single cases of losses after pressing caused by fittings' matching of different manufacturers and of different materials (brass/steel).

5.0 Planning

5.1 Tube Fixing And Distances Between Clamps

Tube supports serve to fix the tube to the ceiling or wall and should take up changes in length which result from temperature variations. Through the setting of fixed and sliding points the length variations in the tube are steered in the required direction. For fixing and installing the tube, please follow the UNI EN 806-4 standards and the supplementary national standard

Tube supports may not be mounted on fittings, Sliding supports must be positioned that they do not prevent the tubing from moving.

DIN 1988-200. Crucial are also the fluids and the temperature. For gas / sprinkler installations and firefighting waters the dimensions mentioned in table 16 are not valid.

The maximum permitted support distances for **RapidPress INOX** / **RapidPress Steel** / **RapidPress Copper** / **RapidPress Copper-Nickel** tubes are shown in table 16.

TABLE 16: MAXIMUM PERMITTED DISTANCES BETWEEN SUPPORTS - EN 806-4

DN	Tube outside diameter (mm)	Horizontal spacing in meters (recommended)	Vertical spacing in meters (recommended)
10	12	1.2	1.8
12	15	1.2	1.8
15	18	1.2	1.8
20	22	1.8	2.4
25	28	1.8	2.4
32	35	2.4	3.0
40	42	2.4	3.0
50	54	2.7	3.6
65	76.1	3.0	3.6
80	88.9	3.0	3.6
100	108	3.0	3.6
125	139.7	3.6	4.2
150	168.3	3.6	4.2

5.2 Expansion Compensation

Metal materials expand in different ways under the influence of heat. The longitudinal change under various temperature differences in the tube is shown for **RapidPress INOX**, **RapidPress Steel**, **RapidPress Copper** and **RapidPress Copper-Nickel** in table 17.

The longitudinal change can be compensated through the correct setting of fixed and sliding points, the installation of compensator's, s-bends, u-bends or expansion compensator's and by the creation of sufficient expansion spaces.

Typical installations are shown in figures 40 a - c.

TABLE 17: LENGTH VARIATIONS RAPIDPRESS INOX / RAPIDPRESS STEEL / RAPIDPRESS COPPER / RAPIDPRESS COPPER-NICKEL

	L [m]	Δt [°K]									
		10	20	30	40	50	60	70	80	90	100
RAPIDPRESS INOX	3	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	4	0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	6.6
	5	0.8	1.7	2.5	3.3	4.1	5.0	5.8	6.6	7.4	8.3
	6	1.0	2.0	3.0	4.0	5.0	5.9	6.9	7.9	8.9	9.9
	7	1.2	2.3	3.5	4.6	5.8	6.9	8.1	9.2	10.4	11.6
	8	1.3	2.6	4.0	5.3	6.6	7.9	9.2	10.6	11.9	13.2
	9	1.5	3.0	4.5	5.9	7.4	8.9	10.4	11.9	13.4	14.9
	10	1.7	3.3	5.0	6.6	8.3	9.9	11.6	13.2	14.9	16.5
	12	2.0	4.0	5.9	7.9	9.9	11.9	13.9	15.8	17.8	19.8
	14	2.3	4.6	6.9	9.2	11.6	13.9	16.2	18.5	20.8	23.1
	16	2.6	5.3	7.9	10.6	13.2	15.8	18.5	21.1	23.8	26.4
	18	3.0	5.9	8.9	11.9	14.9	17.8	20.8	23.8	26.7	29.7
	20	3.3	6.6	9.9	13.2	16.5	19.8	23.1	26.4	29.7	33.0
RAPIDPRESS STEEL	3	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	3.6
	4	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	4.8
	5	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
	6	0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	7.2
	7	0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	8.4
	8	1.0	1.9	2.8	3.8	4.8	5.8	6.7	7.7	8.6	9.6
	9	1.1	2.2	3.2	4.3	5.4	6.5	7.6	8.6	9.7	10.8
	10	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
	12	1.4	2.9	4.3	5.8	7.2	8.4	10.1	11.5	13.0	14.4
	14	1.6	3.4	5.1	6.7	8.4	10.1	11.8	13.4	15.1	16.8
	16	1.9	3.8	5.7	7.7	9.6	11.5	13.4	15.4	17.3	19.2
	18	2.2	4.3	6.4	8.6	10.8	13.0	15.1	17.3	19.4	21.6
	20	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0
RAPIDPRESS COPPER / RAPIDPRESS COPPER-NICKEL	3	0.5	1.0	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1
	4	0.7	1.4	2.0	2.7	3.4	4.1	4.8	5.4	6.1	6.8
	5	0.9	1.7	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5
	6	1.0	2.0	3.1	4.1	5.1	6.1	7.1	8.2	9.2	10.2
	7	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9
	8	1.4	2.7	4.1	5.4	6.8	8.2	9.5	10.9	12.2	13.6
	9	1.5	3.1	4.6	6.1	7.7	9.2	10.7	12.2	13.8	15.3
	10	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	17.0
	12	2.0	4.1	6.1	8.2	10.2	12.2	14.3	16.3	18.4	20.4
	14	2.4	4.8	7.1	9.5	11.9	14.3	16.7	19.0	21.4	23.8
	16	2.7	5.4	8.2	10.9	13.6	16.3	19.0	21.8	24.5	27.2
	18	3.1	6.1	9.2	12.2	15.3	18.4	21.4	24.5	27.5	30.6
	20	3.4	6.8	10.2	13.6	17.0	20.4	23.8	27.2	30.6	34.0

Linear expansion in general
$\Delta L = L \times \alpha \times \Delta t$
ΔL = linear expansion in mm
L = tube length in m
α = linear expansion coefficient

RapidPress INOX α = 0.0165 mm /(m x °K)
RapidPress Steel α = 0.0120 mm/(m x °K)
RapidPress Copper/RapidPress Copper-Nickel α = 0.017 mm/(m x °K)
Δt = temperature difference in °K

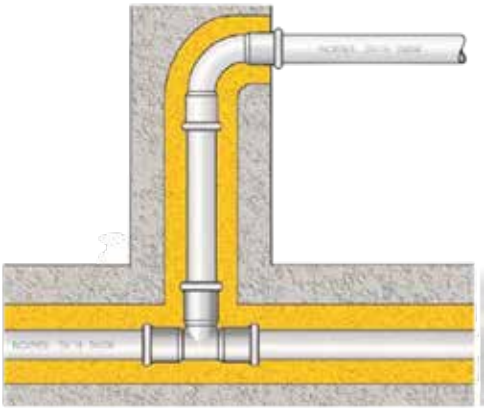


Figure 40a - Creation of expansion spaces

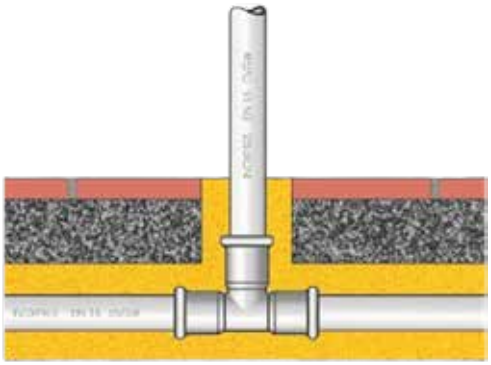


Figure 40b - Creation of expansion spaces

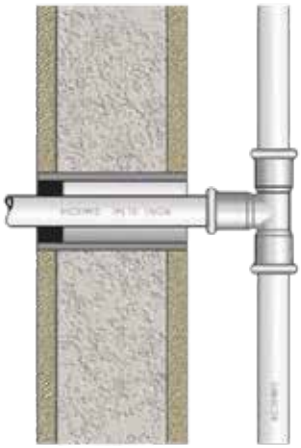


Figure 40c - Creation of expansion spaces

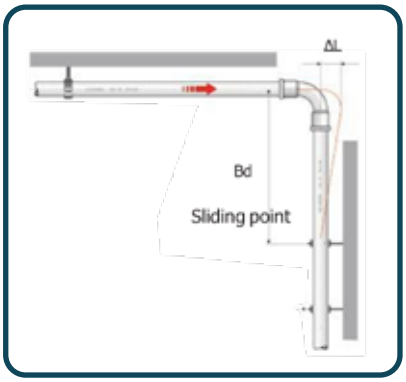


Figure 41 - Orthogonal-shaped expansion reach

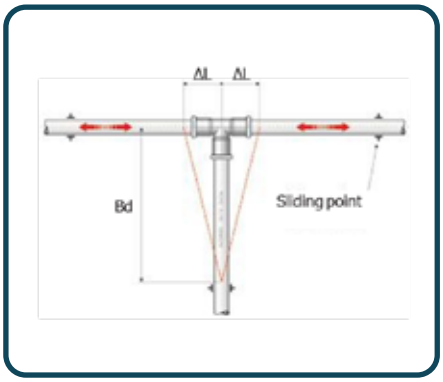


Figure 42 - Expansion compensation branch

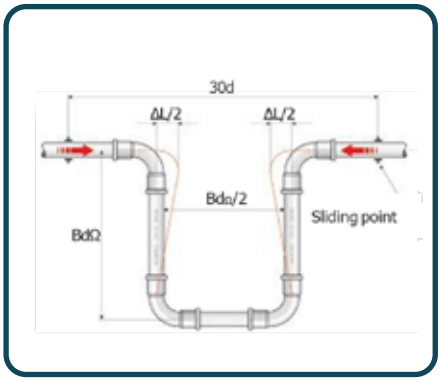


Figure 43 - U-bend BdΩ = Bd / 1.8

Calculation formula Orthogonal - bend and T - junction (figure 41 and 42)

Bd = k x$\sqrt{(da \times \Delta L)}$ [mm]

k = constant material
RapidPress INOX = 60 for ª (sigma) 190 N/mm²
RapidPress Steel = 57 for ª (sigma) 190 N/mm²
RapidPress Copper = 51 for ª (sigma) 140 N/mm²
RapidPress Copper-Nickel = 63 for ª (sigma) 105 N/mm2

da = outer diameter tube in mm
ΔL = linear expansion in mm

Calculation formula U bend (figure 43)

BdΩ = k x$\sqrt{(da \times \Delta L)}$ [mm] or BdΩ = Bd / 1,8

k = constant material
RapidPress INOX = 34 for ª (sigma) 190 N/mm²
RapidPress Steel = 32 for ª (sigma) 190 N/mm²
RapidPress Copper = 28 for ª (sigma) 140 N/mm²
RapidPress Copper-Nickel = 35 for ª (sigma) 105 N/mm2

da = outer diameter tube in mm
ΔL = linear expansion in mm

TABLE 18a: CALCULATION OF THE EXPANSION REACH
ø 15 ÷ 168.3 mm (Bd) RAPIDPRESS INOX

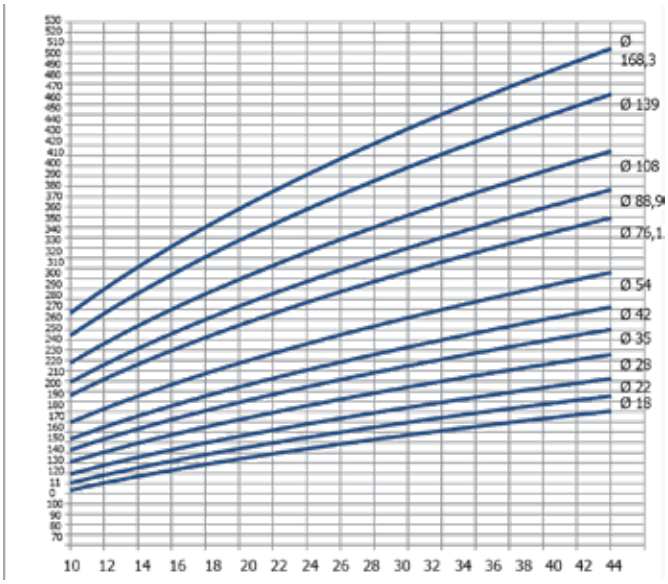


TABLE 18b: EXPANSION PIECE FOR U-BEND
ø 15 ÷ 108 mm (BdΩ) RAPIDPRESS INOX

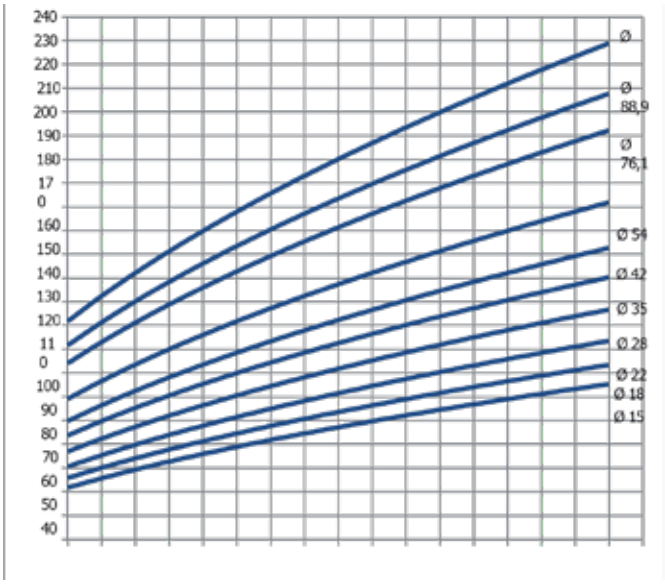


TABLE 19a: CALCULATION OF THE EXPANSION REACH
ø 12 ÷ 108 mm (Bd) RAPIDPRESS STEEL

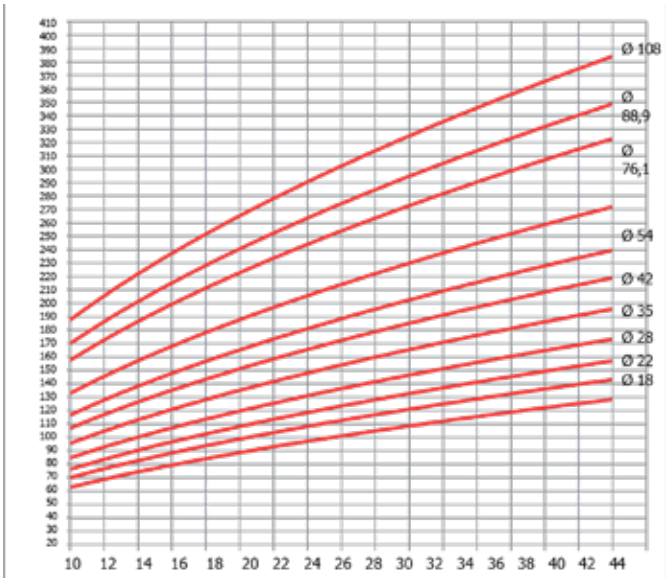


TABLE 19b: EXPANSION PIECE FOR U-BEND
ø 12 ÷ 108 mm (BdΩ) RAPIDPRESS STEEL

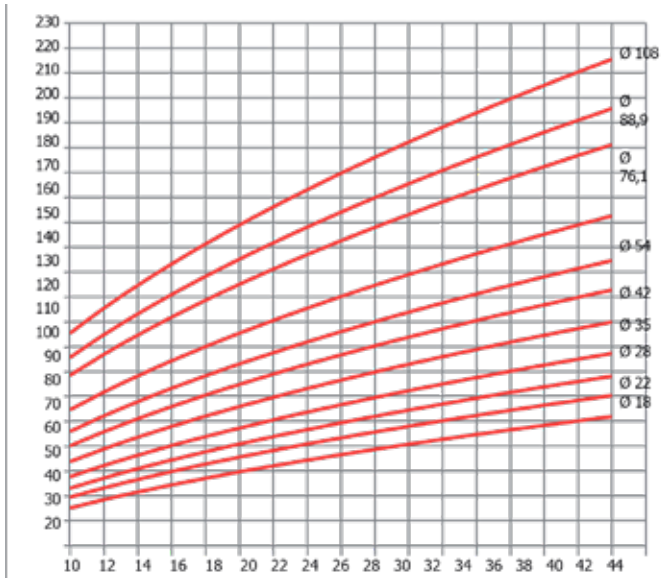


TABLE 20a: CALCULATION OF THE EXPANSION REACH
ø 12 ÷ 54 mm (Bd) RAPIDPRESS COPPER

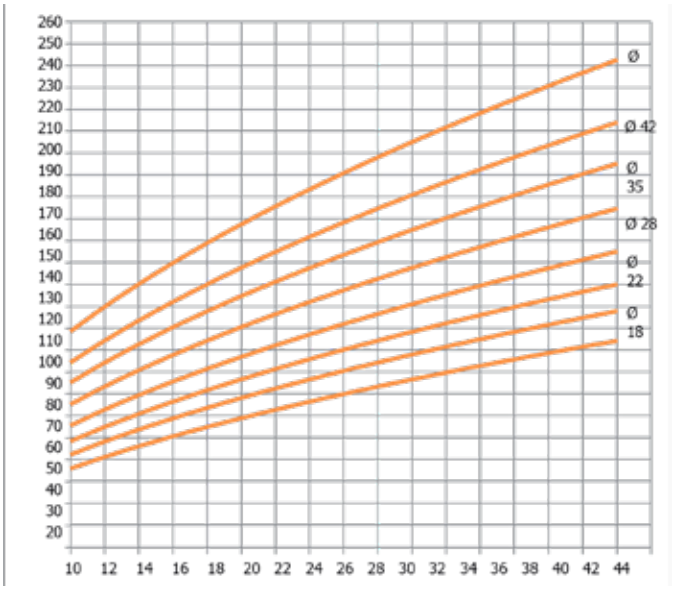


TABLE 20b: EXPANSION PIECE FOR U-BEND
ø 12 ÷ 54 mm (BdΩ) RAPIDPRESS COPPER

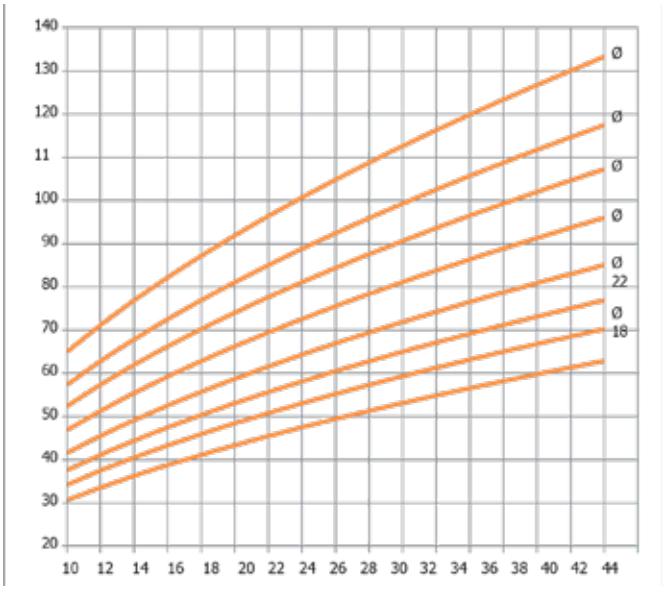


TABLE 21a: CALCULATION OF THE EXPANSION REACH
ø 15 ÷ 108 mm (Bd) RAPIDPRESS COPPER-NICKEL

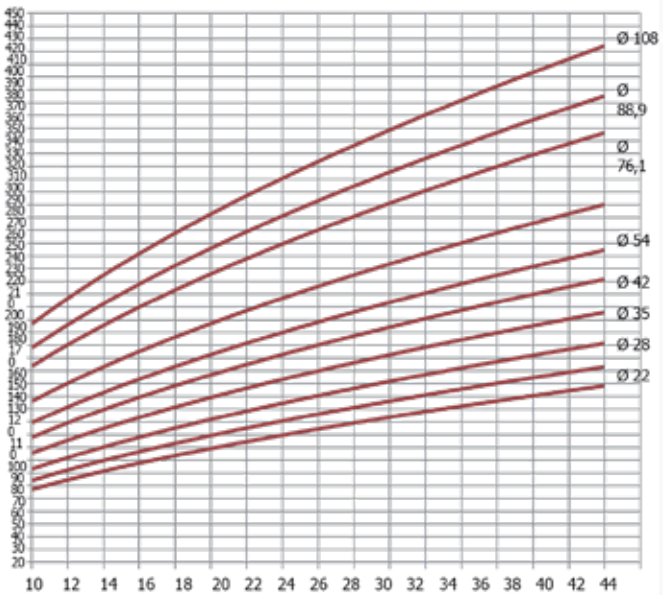
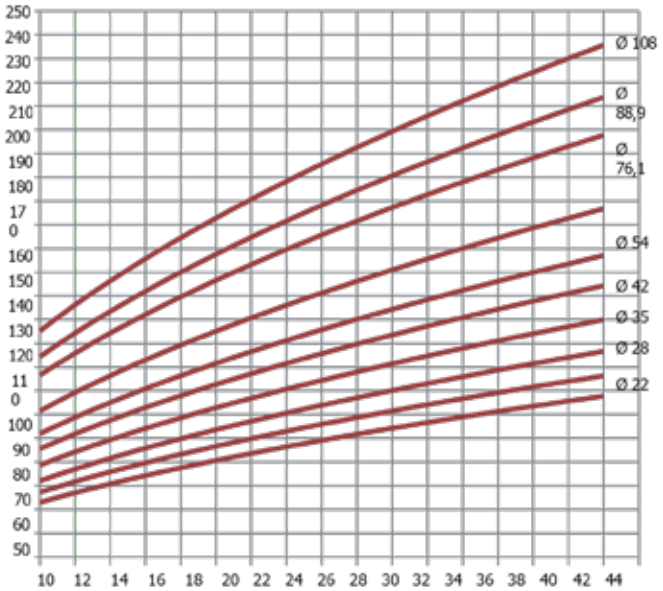


TABLE 21b: EXPANSION PIECE FOR U-BEND
ø 15 ÷ 108 mm (BdΩ) RAPIDPRESS COPPER-NICKEL



5.3 Thermal Emission

Depending on temperature difference, warm tubing releases heat into the environment. The thermal emission from **RapidPress INOX** / **RapidPress Steel** tubes can be seen in tables 22 and 23.

TABLE 22: THERMAL EMISSION FROM RAPIDPRESS INOX / RAPIDPRESS STEEL TUBE (W/m) UNCOVERED

d x s (mm)		ΔT TEMPERATURE DIFFERENCE (˚K)									
-	12 x 1.2	3.7	7.5	11.2	14.9	18.6	22.4	26.1	29.8	33.5	37.3
15 x 1	15 x 1.2	4.7	9.3	14.0	18.6	23.3	28.0	32.6	37.3	41.9	46.6
18 x 1	18 x 1.2	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4	55.9
22 x 1.2	22 x 1.5	6.8	13.7	20.5	27.4	34.2	41.0	47.9	54.7	61.5	68.4
28 x 1.2	28 x 1.5	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3	87.1
35 x 1.5		10.9	21.8	32.7	43.5	54.4	65.3	76.2	87.1	98.0	108.8
42 x 1.5		13.1	26.1	39.2	52.3	65.3	78.4	91.4	104.5	117.6	130.6
54 x 1.5		16.8	33.6	50.4	67.2	84.0	100.8	117.6	134.4	151.2	168.0
76 x 1.2		23.7	47.3	71.0	94.7	118.4	142.0	165.7	189.4	213.1	236.7
88.9 x 2		27.7	55.3	83.0	110.6	138.3	165.9	193.6	221.2	248.9	276.6
108 x 2		33.6	67.2	100.8	134.4	168.0	201.6	235.2	268.8	302.4	336.0
139.7 x 2 • 139.7 x 2.6		43.4	86.8	130.3	173.7	217.1	260.5	304.0	347.4	390.8	434.2
168.3 x 2 • 168.3 x 2.6		52.3	104.6	156.9	209.3	261.6	313.9	366.2	418.5	470.8	523.2

External inlet-coefficient $^{\alpha e}$ = 10 W/(m² x °K)

TABLE 23: THERMAL EMISSION FROM RAPIDPRESS STEEL Tube IN PP (W/m) COVERED

S dxs (mm)	ΔT TEMPERATURE DIFFERENCE (˚K)									
	10	20	30	40	50	60	70	80	90	100
12 x 1.2	3.7	7.5	11.2	15.0	18.7	22.5	26.2	30.0	33.7	37.5
15 x 1.2	4.6	9.1	13.7	18.2	22.8	27.3	31.9	36.5	41.0	45.6
18 x 1.2	5.4	10.7	16.1	21.5	26.8	32.2	37.6	42.9	48.3	53.7
22 x 1.5	6.4	12.9	19.3	25.8	32.2	38.7	45.1	51.5	58.0	64.4
28 x 1.5	8.1	16.1	24.2	32.2	40.3	48.4	56.4	64.5	72.5	80.6
35 x 1.5	9.9	19.9	29.8	39.8	49.7	59.7	69.6	79.6	89.5	99.5
42 x 1.5	11.8	23.7	35.3	47.3	59.2	71.0	82.8	94.7	106.5	118.3
54 x 1.5	15.1	30.1	45.2	60.3	75.3	90.4	105.5	120.5	135.6	150.7
76.1 x 2	21.0	42.0	63.1	84.1	105.1	126.1	147.1	168.1	189.2	210.2
88.9 x 2	24.5	48.9	73.4	97.9	122.3	146.8	171.3	195.7	220.2	244.7
108 x 2	29.6	59.2	88.8	118.5	148.1	177.7	207.3	236.9	266.5	296.1

External inlet-coefficient $^{\alpha e}$ = 10 W/(m² x °K)

Thermal emission of **RapidPress Copper** and **RapidPress Copper-Nickel** tubes are shown in the following table.

TABLE 24: THERMAL EMISSION FROM RAPIDPRESS COPPER AND RAPIDPRESS COPPER-NICKEL (W/m) UNCOVERED

A - M d x s (mm)	ΔT TEMPERATURE DIFFERENCE (˚K)									
	10	20	30	40	50	60	70	80	90	100
15 x 1	5.1	10.2	15.4	20.5	25.6	30.7	35.9	41.0	46.1	51.2
18 x 1	6.1	12.3	18.4	24.6	30.7	36.9	43.0	49.2	55.3	61.5
22 x 1	7.5	15.0	22.6	30.1	37.6	45.1	52.6	60.1	67.7	75.2
28 x 1.5	9.6	19.1	28.7	38.3	47.8	57.4	67.0	76.5	86.1	95.7
35 x 1.5	12.0	23.9	35.9	47.8	59.8	71.8	83.7	95.7	107.6	119.6
42 x 1.5	14.4	28.7	43.1	57.4	71.8	86.1	100.5	114.8	129.2	143.5
54x1.5•54x2	18.5	36.9	55.4	73.8	92.3	110.8	129.2	147.7	166.1	184.6
76.1 x 2	26.0	52.0	78.0	104.0	130.1	156.1	182.1	208.1	234.1	260.1
88.9 x 2	30.4	60.8	91.2	121.6	151.9	182.3	212.7	243.1	273.5	303.9
108 x 2.5	36.9	73.8	110.7	147.6	184.6	221.5	258.4	295.3	332.2	369.1

External inlet-coefficient ᵅe = 11 W/(m² x ºK)

5.4 Insulation

To minimise the unwanted thermal emission from tubing, the minimum insulation thicknesses should be maintained. The following rules must be observed:

- DIN 4108 Thermal insulation in buildings;
- Energy Saving Ordinance (EnEV);
- Thermal Insulation Ordinance (WSchutzV).

Furthermore, national regulations should be observed as necessary.

In addition, insulating the tube can prevent water condensing, outside corrosion, unwanted warming of the medium being transported and unwanted noise production and transmission. Cold water tube must be insulated so that the potable water quality is not affected through warming.

The installer is responsible for the correct and professional insulation execution.

It is extremely important to ensure that the transitions, joints and fittings of the installation are sealed/glued to prevent humidity from penetrating in any condition.

For the insulation of **RapidPress INOX** tube only insulation materials which contain less than 0.05% water soluble chloride ions may be used. Insulation materials of AS quality in accordance with AGI-Q135 are well below this value and thus suitable for use with **RapidPress INOX**.

Guideline values for minimum insulation material thickness are shown in table 25.

E 25: MINIMUM INSULATION MATERIAL THICKNESS FOR TUBING			
Tubing cold water		Tubing hot water	
Type of installation	Insulation material thickness in mm λ = 0,040 W/ (m x °K)	OD in mm	Insulation material thickness in mm λ = 0,040 W/ (m x °K)
Tubing uncovered, not heated (i.e. cellar)	4	12	20
Tubing uncovered without hot water lines	9	15	20
Tubing in channel, no hot water lines	4	18	20
Tubing in channel, along with hot water	13	22	20
Tubing in wall slit, risers	4	28	30
Tubing in wall gap, along with hot water	13	35	40
Tubing on concrete floor	4	42	40
		54	50
		76.1	65
		88.9	80
		108	100
		139.7	100
		168.3	100

5.5 Soundproofing (DIN 4109)

Noise in potable water and heating installations is produced mainly in tap fittings and sanitary items. The tubing can then transfer this sound to the building itself, subsequently producing the irritating airborne sound.

By using soundproofed holders and by soundproofing the tube, the sound transfer can be greatly reduced.

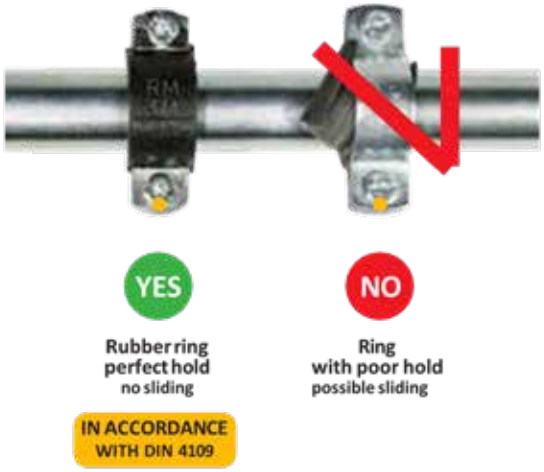


Figure 44 - Rubber ring PRATIKO in conformity with DIN 4109 (Unit RapidPress Series 355/G - 351/G - 555/G - 156/G)

5.6 Fire Prevention

RapidPress INOX / **RapidPress Steel** / **RapidPress Copper** / **RapidPress Copper-Nickel** tubes are classed as a non-flammable material in building material class A in accordance with DIN 4102-1. **RapidPress Steel** tube with PP coating are classed as a non-flammable dripping material in building material class B2 in accordance with DIN 4102-1. Further national requirements in terms of fire prevention are most effectively fulfilled by use of fire-retarding sealing techniques.

5.7 Potential Equalisation

According to DIN VDE 0100, all parts of metallic water and gas tubing which can conduct electricity have to be included in the main potential equalisation of a building.

RapidPress INOX, **RapidPress Steel**, **RapidPress Copper** and **RapidPress Copper-Nickel** are conductive systems and must therefore be included in the potential equalisation.

The responsibility for this work lies with the persons installing the electrical system.

5.8 Dimensioning

The objective of tube system calculation is to achieve perfect functioning of the system with economical tube diameters. The following regulations should particularly be observed:

Potable water installations:

- DIN 1988 part 300
- EN 806 2008:2012
- DVGW W531-553
- VDI guideline 6023

It is also important to respect the CEN / TR 16355: 2012 standard (Recommendations for prevention of Legionella growth in installations inside buildings conveying water for human consumption).

Heating installations:

- UNI EN 12828:2014
- DIN 4751

Gas installations:

- TRGI / TRF

The tube friction pressure drop for **RapidPress INOX**/**RapidPress Steel**/**RapidPress Copper**/**RapidPress Copper-Nickel** tube is shown in table 26 a - d.

5.9 Trace Heating

When trace heating is used, the temperature of the tube inside wall may not exceed 60 °C.

For thermal disinfection purposes a temporary temperature increase to 70 °C (1 hour per day) is permitted. Tube which is fitted with drainage valves or back-flow prevention valves must be protected against excessive pressure increase resulting from warming. The fitting instructions issued by trace heating manufacturers are to be followed exactly.

TABLE 26a : TUBE FRICTION PRESSURE DROP RAPIDPRESS INOX

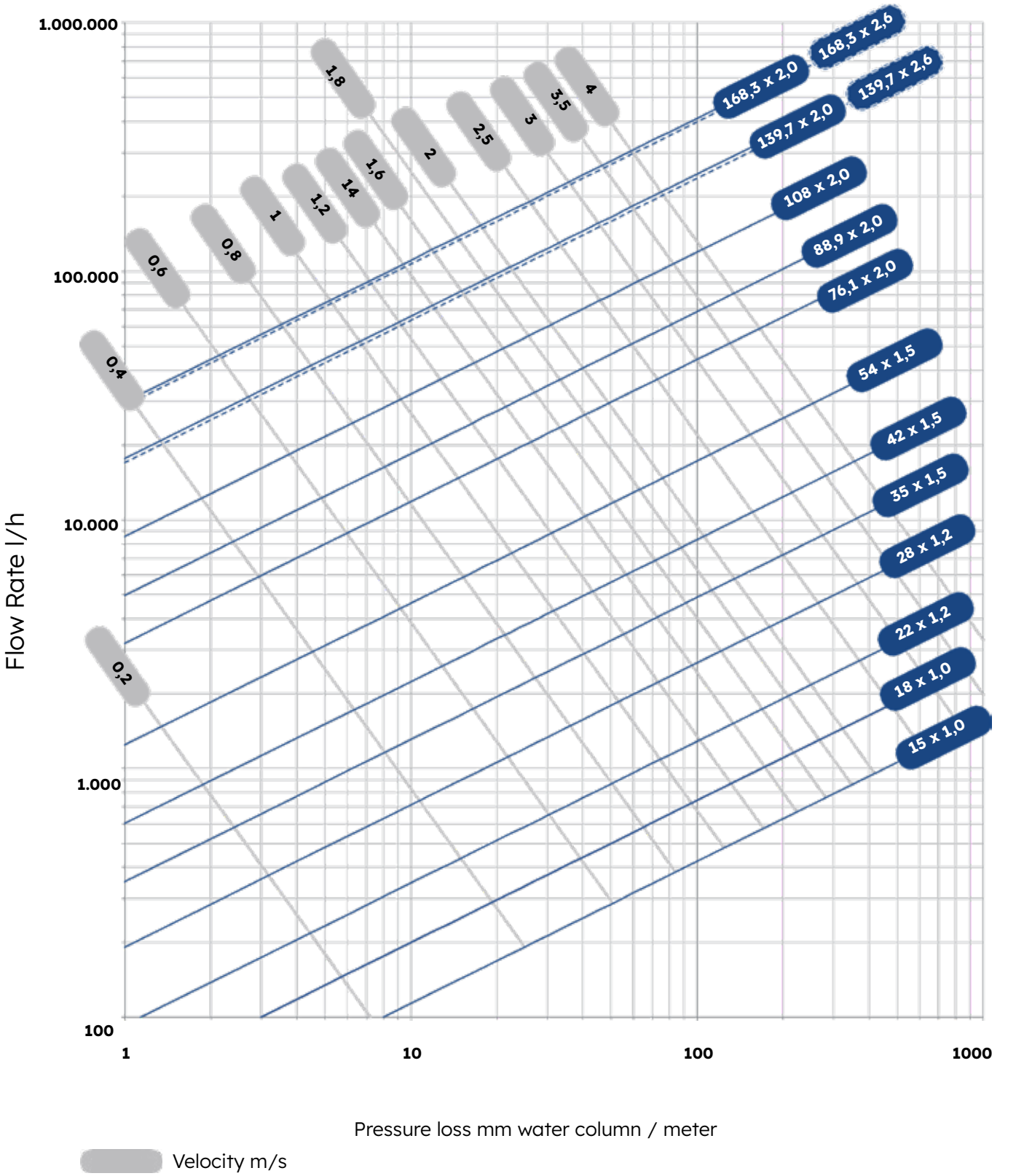


TABLE 26b : TUBE FRICTION PRESSURE DROP RAPIDPRESS STEEL

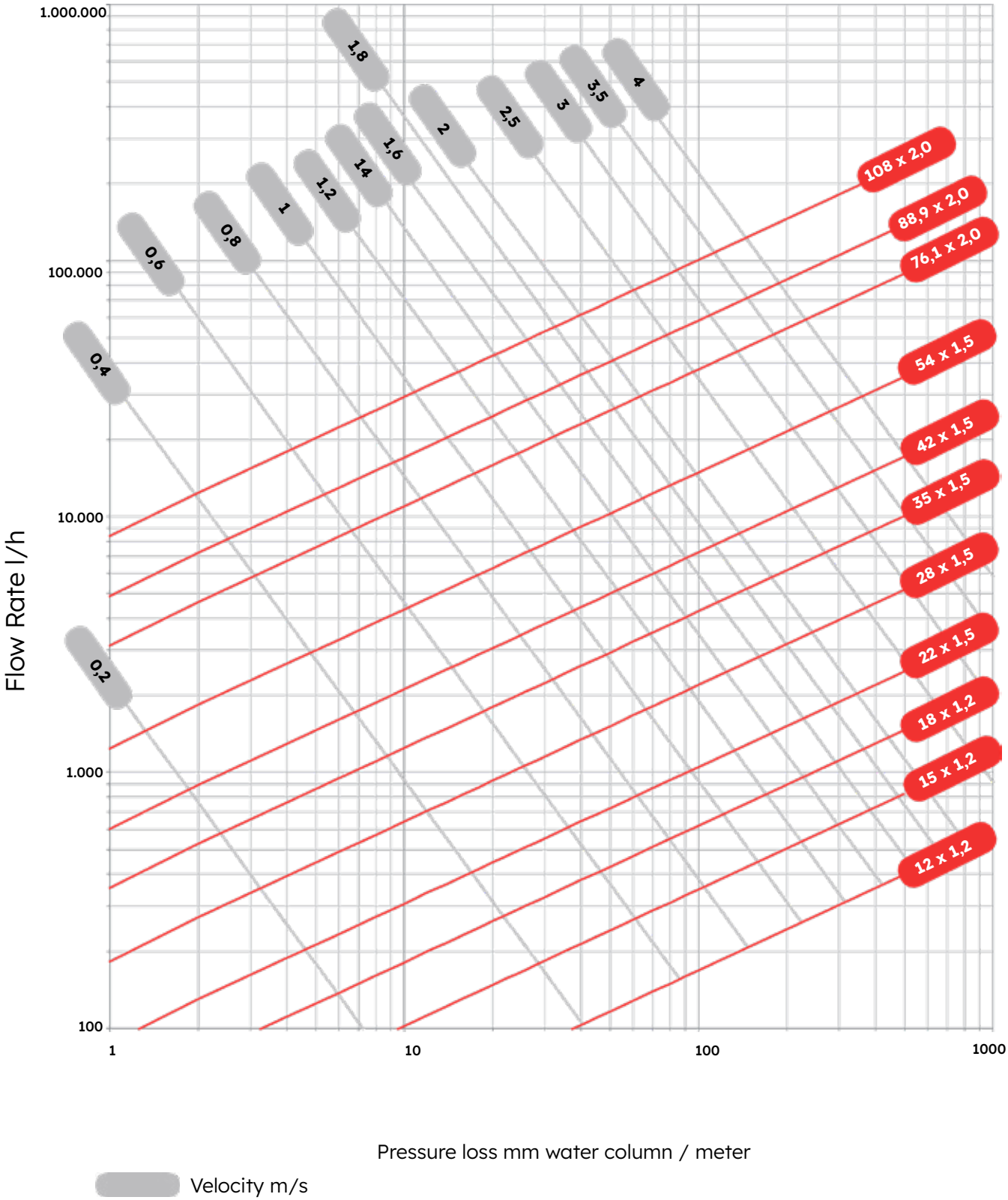


TABLE 26c : TUBE FRICTION PRESSURE DROP RAPIDPRESS COPPER

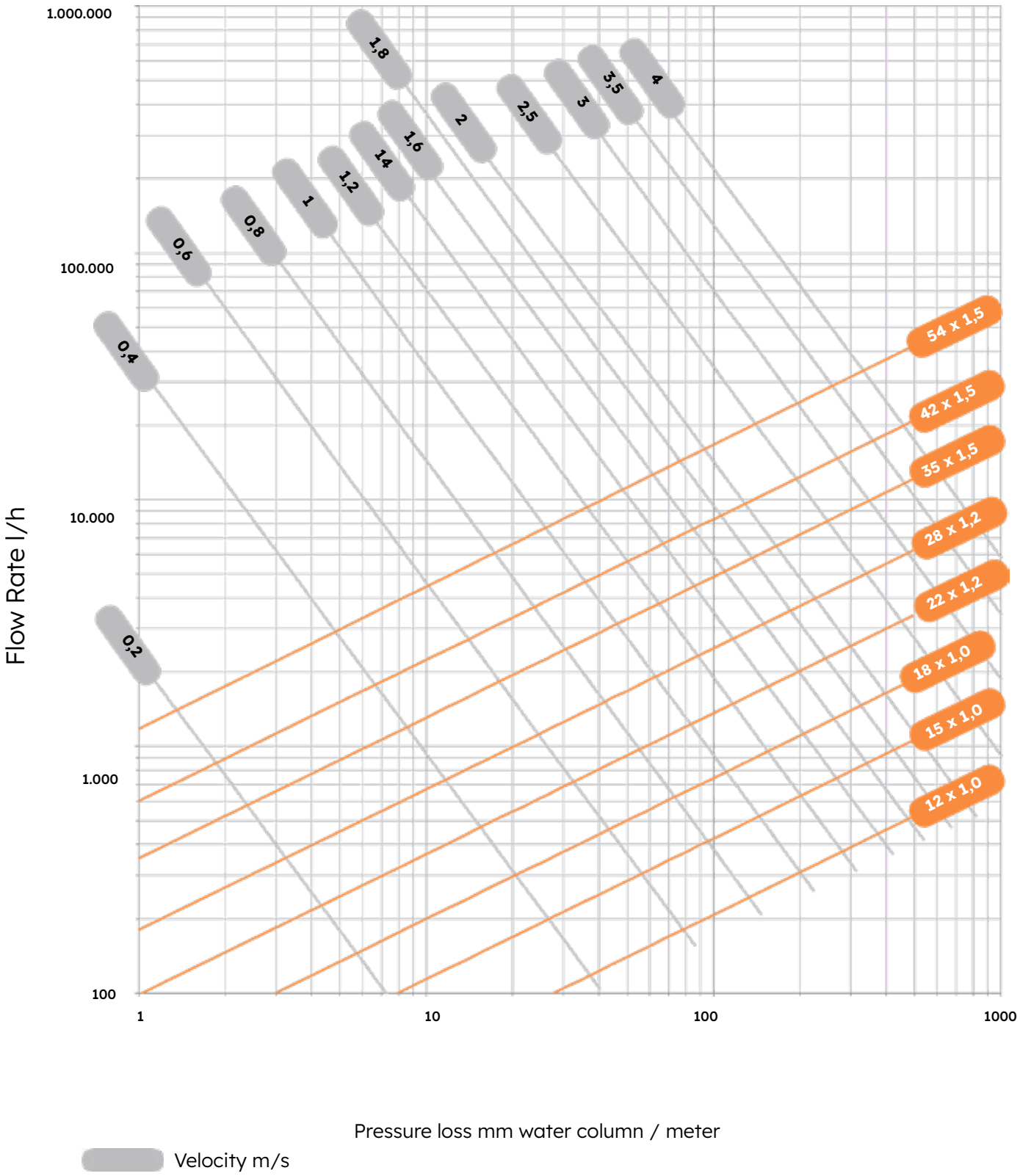
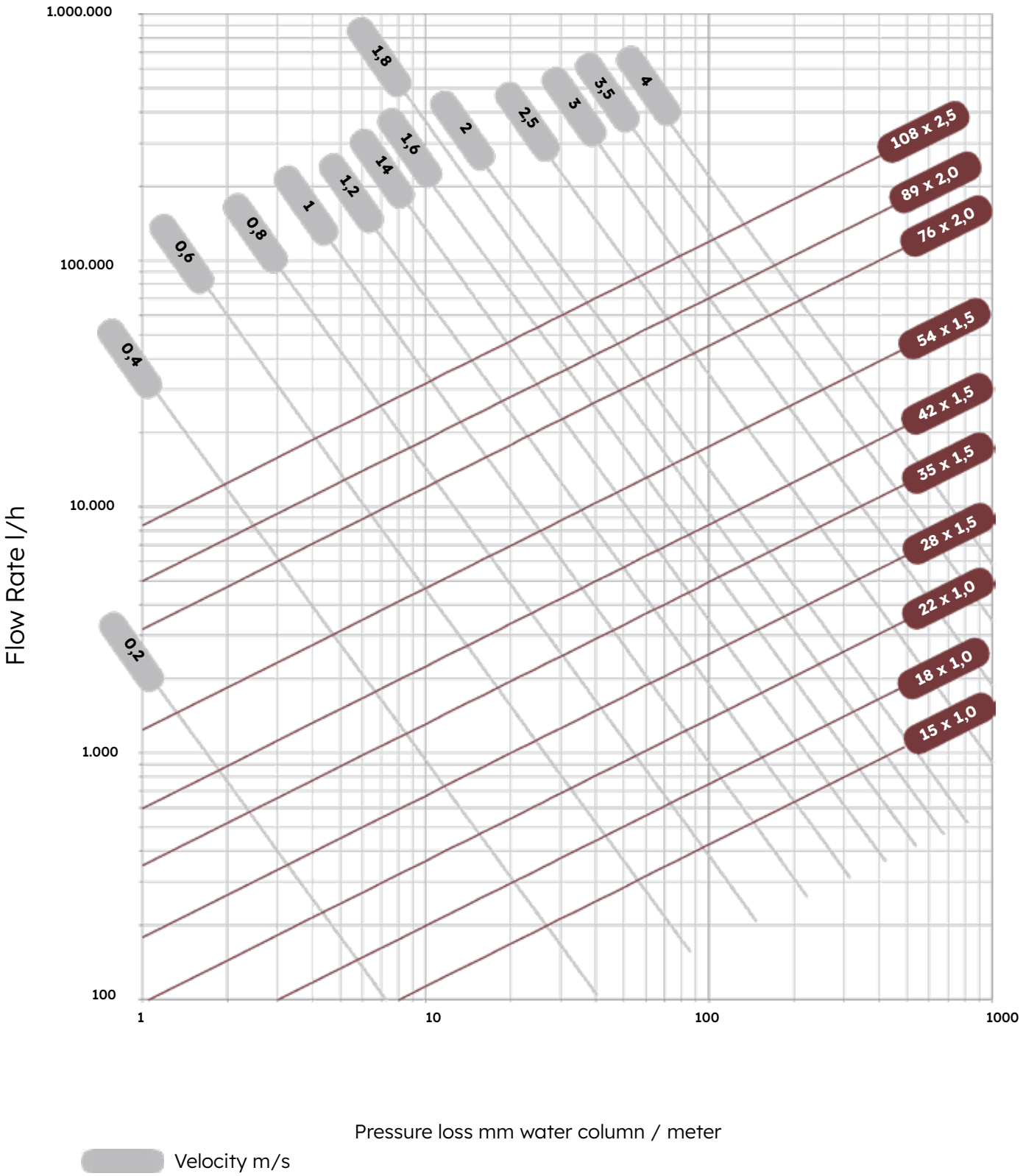


TABLE 26d : TUBE FRICTION PRESSURE DROP RAPIDPRESS COPPER-NICKEL



6.0 Start-Up

The following guidelines have to be taken into account when carrying out the start-up and pressure testing:

Potable water systems:	**DIN** 1988 part 100 **ZVSHK** worksheet "Tightness Testing of Potable Water Tubing with Compressed Air, Inert Gas or Water" **BTGA** rule 5.001 **VDI** 6023
Heating systems	**DIN-VOB** 18380
Gas systems:	**DVGW** G 600 **TRGI** (technical regulations for gas installation) **TRF** (technical regulations for liquid gas)

6.1 Pressure Testing

Correct pressure testing of potable water tubing should be done according to DIN EN 806. DIN 1988 part 100 and worksheet GW534 using filtered potable water. The system should remain filled with water to prevent corrosion due to residual water and air exposure. If not used soon after pressure testing, compressed air or inert gases should be used for the testing.

- Tightness/pressure tests are to be carried out before the tubes are covered
- Tests are to be carried out in accordance with DVGW worksheet W534 and the ZVSHK data sheet "Tightness Tests for drinking water installations with compressed air, inert gas or water"
- When conducting pressure tests with air, follow the technical rules for gas installations "DVGW-TRGI";
- The correct assembly of the press fit connections is the responsibility of the installer/company. Unpressed-untight is to be understood as an additional help in order to identify an assembly error – in this case the non-pressing of fittings. A precondition for that is the proper implementation of the prescribed tightness and pressure tests; it does not absolve the installer from his obligation to carry out visual and noise controls to make sure that the assembly has been done properly.

These visual and noise controls are to be duly recorded on the respective test certificate.

6.2 Flushing The System And Starting Up

According to DIN 1988 Part 100. EN 1717 and VDI 6023 is to prevent corrosion in potable water tube, rinsing with a water-air mixture is required. From a corrosion point of view **RapidPress INOX** potable water installations. However, only require simple flushing with filtered potable water, since thanks to the special connection technique no additional substances such as cutting oil and fluids are required. Stagnant water from the house supply tubing must not access the potable water installation.

For hygienic reasons a high standard system flushing procedure may be required (for example, hospital, and care centres). In this situation the ZVSHK / BTGA data sheets should be applied. The pressure testing, flushing and start-up of the system have to be documented. The system operator has to be instructed with regard to correct working practices.

6.3 Regular Checks

Maintenance of the potable water quality can only be assured by regular monitoring of the system; for this reason the operator should be offered a maintenance contract.

7.0 Corrosion

7.1 RapidPress INOX

The corrosion behaviours of the **RapidPress INOX** press fit system is dictated by the material used. The corrosion behaviour of **RapidPress INOX** press fit systems is determined by the Cr-Ni-Mo steel with material AISI 316L (1.4404) and Cr-Mo AISI 444 (1.4521). The following properties result from it:

- Suitability for all potable water;
- Regulations; absolutely hygienic;
- Suitable for mixed installations;
- Suitable for treated, softened and desalinated water.

7.1.1 Bi Metal Corrosion (Mixed Installation) - Din 1988 Part 200

RapidPress INOX can be combined with all non-ferrous metals (Copper, Brass, Red Brass) in one mixed installation without taking flow rules into account.

Bimetal corrosion can only appear on zinc-coated components if they are in direct contact with **RapidPress INOX** components. Bimetal corrosion can be prevented by installing a spacing section made of non-ferrous material > 80 mm (for example a shut-off valve).

7.1.2 Crevice, Pitting Corrosion (Three Phase Corrosion)

Unacceptably high chloride content in potable water and building materials can lead to corrosion traces on stainless steels. Crevice or pitting corrosion can occur in water with a chloride content which is above the levels of the potable water legislation (max. 250 mg/l). The chloride content of the potable water can be obtained from the local water company. It must be considered that, although the chloride limit for drinking water is equal to 250 mg/l, on the basis of laboratory and construction site experiences, it is recommended not to exceed 100 mg/l. Situations of stagnation of the circulating fluid and dead branches in the system must be properly evaluated when planning and when managing the installation, taking into consideration the parameters about the quality of the water and all the conditions of the installation environment, which may generate corrosion phenomena. As per drinking water systems, it is important to grant a continuous flow, avoiding dead branches and stagnation conditions (EN 806-1). These conditions of application and use, help to preserve the materials of **RapidPress INOX** range during the time, helping their durability.

RapidPress INOX components are in danger of crevice or pitting corrosion if:

- Following pressure testing the system is emptied and some water remains in the tubing which is open to the atmosphere. The slow evaporation of the remaining water may lead to an unacceptable increase in the chloride content level and thus initiate pitting (three phase corrosion) at the 'water-material-air' interface. If the system cannot be put into operation shortly after pressure testing with water, then the pressure testing should be carried out using air. See section 6.1 Pressure testing for more details;
- An increase in the water temperature is caused from the outside via the tube wall (for example electrical trace heating). There may be an increase in chloride ions in the deposits which form on the inside tube wall during this type of operation. See section 5.9 Trace heating for more information;
- Non-approved sealants or plastic tapes containing chloride are used. The transfer of chloride ions from sealant materials to the potable water can lead to local increase in chloride and thus to crevice corrosion. See section 4.9 Thread or flange connections for more information;
- If the material is sensitised through incorrect heating. Any heating of the material which leads to tarnishing changes the micro structure of the material and can lead to inter crystalline corrosion. Hot bending or cutting the tube using a grinder is not permitted.

7.1.3 Outside Corrosion

RapidPress INOX components are in danger of outside corrosion if:

- Non-approved insulation materials or lagging are used. Only those insulation materials and lagging are approved which are of AS quality in accordance with AGI Q 135, having a percentage weight of max 0.05% in water soluble chloride ions;
- **RapidPress INOX** is subjected to contact with gases or fumes containing chloride (e.g. Galvanising shops, and swimming pools);
- **RapidPress INOX** comes into contact with building materials which contain chloride, together with dampness;
- A concentration of chloride develops through water evaporation on warm tubing (swimming pool atmosphere).

RapidPress INOX components can be protected against outside corrosion by means of:

- Closed cell insulation material or lagging;
- Coating;
- Painting;
- Avoiding installation in areas where the risk of corrosion is higher (e.g. Floor without cellar space underneath).

The planner or the fitter carries the responsibility for the selection and installation of the corrosion protection measures.

7.2 RapidPress INOX GAS

The corrosion behaviour of **RapidPress INOX GAS** press fit systems is defined by the material used; Cr-Ni-Mo steel with the material AISI 316L (1.4404).

In the case of **RapidPress INOX GAS** components no further corrosion protection is normally required, except where special protection from corrosive agents is required.

7.2.1 Outside Corrosion

RapidPress INOX GAS components are in danger from outside corrosion if:

- Non-approved insulation materials or lagging are used. Only those insulation materials and lagging are approved which are of AS quality in accordance with AGI Q 135, having a percentage weight of max 0.05% in water soluble chloride ions;
- **RapidPress INOX GAS** comes into contact with gases or fumes containing chloride (e.g. Galvanising shops and swimming pools);
- **RapidPress INOX GAS** comes into contact with building materials which contain chlorides, under the influence of dampness;
- **RapidPress INOX GAS** must be inserted in the main equipotential bonding (connection to be carried out by skilled personnel).

RapidPress INOX GAS components can be protected against outside corrosion by means of:

- Installing closed cell insulation materials or
- Lagging; coating;
- Painting;
- Avoiding installation in areas where the risk of corrosion is higher (e.g. Floor without cellar space underneath).

7.3 RapidPress Steel

The corrosion behaviour of the **RapidPress Steel** press fit system is defined by the unalloyed **Carbon Steel** used and is suitable for:

- Closed heating systems;
- Closed cooling and refrigeration circuits; compressed air system;
- Closed solar cycles.

7.3.1 Inside Corrosion

Closed heating and cooling systems do not have air, thus no risk of corrosion. The small amount of oxygen that enters the system during filling does not cause any problems as it reacts with the entire metallic surface inside the system and is reduced. Additionally, oxygen is released when heating water is heated and through valves in the system.

The systems must be filled in accordance with VDI 2035. Oxygen increase can also be prevented by the use of oxygen binding materials. However, these must be approved by **RapidPress** beforehand. When filling the systems, the pH value must not fall below 7.2 (drinking water).

7.3.2 Bi Metal Corrosion

In closed circuit of heating/cooling installations executed with **RapidPress Steel,** it is possible to insert single fittings made from different raw materials, including **RapidPress INOX** components in any order.

Closed circuit networks entirely executed with **RapidPress Steel** (tube and fittings) must be separated from stretches made with **RapidPress INOX** (tube and fittings) through the use of shut-off valves or bronze nipples (> 80 mm) for protection against corrosion.

7.3.3 Outside Corrosion

RapidPress Steel tube and fittings are externally galvanized, but this galvanization does not provide permanent protection against corrosion.

The use of **RapidPress Steel** tube with PP coating (ø 12 - 108 mm) offers better protection against corrosion, while individual protection is needed for fittings. **RapidPress Steel** parts are only suitable for use in permanently dry environments as humidity can lead to external corrosion over time.

The RapidPress Steel system should be installed in a location with low humidity to prevent corrosion. If installed in areas exposed to high humidity, additional corrosion protection should be applied to the tube and fittings to prevent external moisture and contact with building materials during and after installation.

Contact with building materials can lead to corrosion.

RapidPress Steel components can be protected against outside corrosion by means of:

- Corrosion protection binding;
- Closed cell insulation or lagging;
- Coating;
- Painting;
- Avoiding installation in areas where the risk of corrosion is higher (e.g. Floor without cellar space underneath)

RapidPress Steel components should not be subjected to permanent dampness. For this reason felt lagging or coverings are not approved, since they retain water.

7.4 RapidPress Copper / RapidPress Copper-Nickel

Corrosion behaviour of the **RapidPress Copper**/**RapidPress Copper-Nickel** systems depends on the main material quality - **Copper** - consisting of alloys of the two systems to be pressed.

The **RapidPress Copper** system stands out for the following features:

- Suitable for drinkable waters;
- Hygienically safe as copper and its alloys prevent bacteria proliferation on their surfaces (bacterial-static action);
- Suitable for mixed installations;
- Suitable for treated, softened and desalinated water.

The **RapidPress Copper-Nickel** system is mainly suggested for application where chlorides are present, as in the case of saline water transportation.

7.4.1 Bi Metal Corrosion (Mixed Installation)

RapidPress Copper and **RapidPress Copper-Nickel** systems can be matched with different materials, ferrous and not. It is important to pay attention to the ratio between cathode and anode areas as not to lead to conditions favourable to corrosion. **Copper** in fact in general is under cathode conditions and can lead to the component corrosion.

In the case of open loop installations, as to avoid corrosion in mixed installations, it is important to comply with the following general rules:

- Consider the water flow, install **Copper** and **Copper Alloys** downstream the installations made with ferrous materials;
- Add non ferrous separators > 80 mm (ex. Check valves, bronze or brass joints) between the two sections of different materials.

7.4.2 Perforating Corrosion

The dotted corrosion (pinhead tube holing). depends on the growing water pollution in the last decades strictly linked to industrialization. Such an issued was totally solved with the introduction of **Copper** tubes with no carbon residues.

7.4.3 Outside Corrosion

Copper and **Copper Alloys** stand the outside corrosion risk and nothing is to be done at the protection level, while in the presence of sulphurs, nitrites and ammonia, tubes are to be protected. It is necessary to protect **RapidPress Copper**/ **RapidPress Copper-Nickel** details against external corrosion as follows:

- Closed cell insulators;
- Coating;
- Painting;
- Avoiding installation in areas where the risk of corrosion is higher (e.g.. floor without cellar space underneath).

The planner or the fitter carries the responsibility for the selection and installation of the corrosion protection measures.

7.5 RapidPress Copper GAS

The high resistance of **RapidPress Copper GAS** joint to outside corrosion does not require any additional anti corrosion standard protection, except where special protection from corrosive agents is required.

RapidPress Copper GAS components can be protected against outside corrosion by means of:

- Installing closed cell insulation materials or lagging;
- Coating;
- Painting;
- Avoiding installation in areas where the risk of corrosion is higher (e.g.. floor without cellar space below).

The planner or the fitter carries the responsibility for the selection and installation of the corrosion protection measures.

7.6 Material Compatibility - Two-Metal Matching

Summary table of the couplings between different materials in open and closed circuit systems is shown below.

TABLE 27: MATERIAL COMPATIBILITY - TWO-METAL MATCHING

PRESS FITTING		TUBES			
Systems		Stainless Steel	Carbon Steel	Copper	Copper-Nickel
RAPIDPRESS INOX	Open circuit				
	Close circuit		2)		
RAPIDPRESS STEEL	Open circuit				
	Close circuit	1)		1)	1)
RAPIDPRESS COPPER	Open circuit				
	Close circuit		2)		
RAPIDPRESS COPPER-NICKEL	Open circuit				
	Close circuit		2)		

Accepted matching Attention to the enclosed notes Forbidden matching

Notes:

1. To separate **Stainless Steel, Copper**, or **Copper-Nickel** systems from **Carbon Steel**, use a non-ferrous transition spacer such as a valve or bronze/brass joint. Single **Stainless Steel**, **Copper**, or **Copper-Nickel** joints are allowed in carbon installations.
2. To separate a **Carbon Steel** system from **Stainless Steel**, use a non-ferrous transition spacer. Single carbon fittings are not allowed in **Stainless Steel, Copper**, or **Copper-Nickel.**

The compatibility table refers to water transportation under standard conditions (PN 16 bar. T 20°C).
The table is not binding and actual compatibility should be assessed based on the surfaces of the different components and operating conditions.

7.7 Chemical Compatibility of RapidPress Tube And O-Rings

Refer to the **RapidPress** Technical Department to obtain confirmation of suitability of individual liquids of food process applications.

As every aspect of an application may not be known by the supplier, applications remain the responsibility of the user.

FLUID	304L STAINLESS	316L STAINLESS	EPDM	GAS	EXTREME
Acetic acid 20%	B	A	A	D	D
Acetone 100 %	A	A	A	D	D
Acetylene	A	A	A	A	A
Ammonia dry	C	A	A	A	D
Ammonium chloride 1%	C	A	A	A	A
Ammonium nitrate 10-50%	A	A	A	A	A
Ammonium phosphate 10%	B	C	A	A	D
Ammonium sulfate 10%	B	C	A	A	D
Aniline	A	A	B	A	C
Aqua regia, aqua fortis	D	A	C	D	B
Battery acid	X	A	B	X	A
Benzene	B	A	D	D	A
Boric acid 5%	B	A	A	A	A
Butane	A	A	D	A	A
Butanol	A	A	A	D	A
Calcium Hydroxide ≤ 10°C	B	C	A	A	A
Calcium Hypochlorite	C	D	B	B	A
Carbon dioxide	A	A	B	A	A
Caustic soda ≤ 50%	X	A	B	B	C
Chlorine (dry)	A	B	A	B	A
Citric acid 5%	B	A	A	A	A
Compressed air > 5mg/m3	A	A	D	A	A
Compressed air < 5mg/m3	A	A	A	A	A
Copper chloride	D	D	A	A	A
Copper nitrate	A	A	A	A	A
Copper sulfate 10%	B	A	A	A	A
Engine oil	X	A	D	A	A
Ethane	A	A	D	A	A
Ethylene glycol	B	A	A	A	A
Ethylene Oxide	B	A	C	D	D
Ferric chloride, watery	D	D	A	A	A
Ferric sulfate	B	C	A	A	A
Formaldehyde	C	A	A	B	D
Formic acid	B	C	A	D	D
Gas oil	X	A	D	A	A
Gasoline	A	A	D	A	A
Gear oil	X	A	D	A	A
Hexane	A	A	B	D	A
Hydrochloric acid 100%	D	D	D	A	A
Hydrogen fluoride	D	D	D	D	D
Hydrogen peroxide 10%	B	A	A	D	A
Kerosene	A	A	D	A	A

FLUID	304L STAINLESS	316L STAINLESS	EPDM	GAS	EXTREME
Linseed oil	B	A	D	D	A
Lubricating oils	A	A	D	A	A
Machine oil	X	A	D	A	A
Magnesium chloride ≤20%	D	A	A	A	A
Magnesium hydroxide 100°C	B	C	A	B	A
Magnesium sulfate <40%	A	A	A	A	A
Methane	A	A	D	A	A
Methanol	A	A	A	B	D
Mineral oil	A	A	D	A	A
Naphtha	A	A	D	B	A
Naphthalene	A	A	D	X	A
Nickel chloride 10-30%	D	C	A	A	A
Nitrogen N_2	A	A	A	A	A
Nitric acid ≤20%	A	A	D	B	A
Paraffin	A	A	D	A	A
Phosphoric acid	D	A	A	D	A
Potassium chloride	B	A	A	A	A
Potassium hydroxide ≤ 50°C	B	C	A	B	D
Potassium sulfate 10%	B	A	A	A	A
Propane (liquefied)	A	A	D	A	A
Prussic acid	X	C	A	X	A
Sea water	C	A	A	A	A
Sodium bicarbonate	A	A	A	A	A
Sodium chloride 5%	B	A	A	A	A
Sodium nitrate ≤ 40%	B	A	A	B	A
Sodium phosphate	B	C	A	A	A
Sodium sulfate 10%	B	A	A	A	A
Sulfuric acid 10% 60°C	D	D	B	X	A
Sulfuric acid, smoking	D	D	D	X	A
Sulfuric acid 100%. moist	C	C	C	X	A
Sulphur dioxide (dry)	X	C	A	D	B
Tannin	B	A	A	X	A
Tanning agents for leather	A	A	B	A	A
Tartaric Acid 10% 100°C	C	A	B	X	A
Toluol 20°C	X	A	A	D	D
Trichloroethylene	B	C	D	D	A
Turpentine	A	C	D	A	B
Water ≤ 100°C	A	A	A	A	B
Water, deionised	A	A	B	B	A
Water, distilled	A	A	A	A	A
Zinc chloride	B	A	A	A	A
Zinc sulfate 10%	B	A	A	A	A

A: Excellent - Material not affected
B: Good - Material slightly affected but suitable
C: Fair - Some degree of reaction but suitable

D: Severe effect - Not recommended
X: No data available, refer to **RapidPress** Technical Department

8.0 Disinfection

The disinfection of potable water systems may be required in case:

- Germs are detected;
- Of increased hygienic requirements.

The **RapidPress INOX** press fitting system must be disinfected using hydrogen peroxide (H_2O_2) in accordance with DVGW worksheet W 291 - disinfection of water supply systems.

If disinfection is carried out using chlorine, then the prescribed concentrations and disinfection periods shown in the overview below must be strictly adhered to.

Chlorine content (free chlorine)	**50 mg/l**	**100 mg/l**
Disinfection period	**Max. 24 h**	**Max. 16 h**

The disinfection treatment must also be extended to existing lines if they be expanded or repaired. The ZVSHK leaflet

The working temperature of the disinfectant substance must never exceed 25 °C in any point of the plant.

Following disinfection with chlorine the system must be flushed thoroughly with potable water until a residue free chlorine value of < 1 mg/l in the entire potable water system is reached.

Due to the danger of corrosion through incorrect disinfection measures using chlorine, we do recommend either disinfection using hydrogen peroxide or thermal disinfection.

Disinfection measures should always be carried out by experienced, trained professional staff only.

“Flushing, disinfecting and commissioning of drinking water installations” must be used and observed.

9.0 Hygiene

The implementation of the new potable water regulations (TrinkwV) places great emphasis on the hygiene conscious planning, realisation and operation of potable water systems. It is necessary to put particular attention to the to the applicable regulations in each country where the installation is done, with particular reference to aspects of plant level, sanitizing and maintenance.

The following measures are suitable both for the assurance of the required potable water quality and the minimising of the danger of germs occurring:

- Material choice in accordance with DIN 50930-6;
- When calculating the tube network, select the smallest possible widths;
- Hygiene-conscious system layout (looped systems); Are to avoid “dead branches” and branches that appear to be unidirectional critical from the point of view of hygiene;
- No stagnation tubing (drainage tube, collective safety devices);
- Single safety devices are preferable;
- Separate extinguisher systems from potable water network;
- Ensure target temperature is reached in entire potable water heater;
- Install circulation tubing with dimensions are in accordance with W 553;
- Verify the possibility of inserting traits bypass on the main line in cases of complex lines, so that it is possible to make a thorough washing without stopping the system thus increasing the effectiveness of the disinfection treatment;
- Protect cold water tubing against heating;
- Hygiene-conscious handling of materials;
- Document the tubing system;
- Maintain the system regularly (maintenance contract).

10.0 Form Request Of Compatibility

DATA OF THE APPLICANT	
Applicant / Company	
Name	
Address	
Contact person	
Date	

DATA OF THE PROJECT	
Description	
Set-up of the system	
Tube diameter	
Design manager	
Specification	

SYSTEM FOR WHICH COMPATIBILITY IS REQUESTED

RAPIDPRESS INOX ☐	RAPIDPRESS STEEL ☐	RAPIDPRESS INOX GAS ☐	RAPIDPRESS COPPER ☐
Tube AISI 316L ☐	Tube of gal/internally black (316/005) ☐	Tube AISI 316L ☐	**Copper** tube ☐
Tube AISI 444 ☐	Tube of gal/internally gal. (316/002) ☐	RAPIDPRESS COPPER GAS ☐	RAPIDPRESS COPPER-NICKEL ☐
Tube AISI 304L ☐	Tube of gal/internally black + PP coating (316/003) ☐	**Copper** tube ☐	**Copper-Nickel** tube ☐

MEDIUM WHOSE COMPATIBILITY NEEDS TO BE REVIEWED

Attachments	Technical data sheet	☐
	Safety sheet	☐
	Chemical analysis	☐

Treatment of systems (e.g. cleaning, anti-corrosion, foil, etc.)

SYSTEM
Description/working environment

OPERATING CONDITIONS				
Temperature	Min	°C	Max	°C
Pressure	Min	bar	Max	bar
PH		Min	Max	
Medium proportion		% Min	% Max	

OTHERS SUBSTANCES		
Type of cycle	Open	Closed
Installation	Outside closed spaces	Inside closed spaces

TEST REPORT WITH WATER FOR DRINKING WATER SYSTEMS

SYSTEM: _____

CUSTOMER: _____

PERFORMER: _____

Following the test it is hereby declared that:

- ☐ The entire system was visually checked to make sure that all connections have been made in accordance with the best working standards.
- ☐ The filling water is filtered and does not contain particles ≥ 150µm.
- ☐ The tube work has been completely aired out.
- ☐ The operating pressure equals 10 bar.

- Water temperature = _____ °C
- Room temperature = _____ °C
- Temperature difference ΔT = _____ °C (must be ≤ 10°C)

PRELIMINARY TEST

Test Pressure = _____ Bar

(Must be ≥ 10 bar*)

Duration of the test = _____ Minutes

(Must be ≥ 120minutes)

☐ The ducts are watertight (Δp = 0)

MAIN TEST

Test Pressure = _____ Bar

(Must be ≥ 10 bar*) (must be 1.5 times operating pressure*)

Duration of the test = _____ Minutes

(Must be 3 x 10minute periods then left under load for a period of ≥ 1 hour)

☐ The ducts are watertight (Δp = 0)

*If higher than PN16, please consult **RapidPress** technical department.

Place _____

Signature of the customer or representative: _____

Date _____

Signature of the performer or representative: _____

TEST REPORT WITH AIR OR INERT GAS FOR DRINKING WATER AND HEATING SYSTEMS

SYSTEM: _____

CUSTOMER: _____

FIRST PERFORMER _____

SECOND PERFORMER: _____

Following the test it is hereby declared that:

☐ The entire system was visually checked to make sure that all connections have been made in accordance with the best working standards.

☐ The system was tested internally in n. _____ Sections

- Test fluid used: ☐ Air ☐ Nitrogen ☐ _____
- Fluid temperature = _____ °C
- Room temperature = _____ °C
- Temperature difference ΔT= _____ °C (must be ≤ 10°C)

PRELIMINARY TEST

Test Pressure = _____ Bar

(Must be 1.5 times operating pressure*)

Duration of the test = _____ Minutes

(Must be ≥ 120minutes)

☐ The ducts are watertight (Δp = 0)

MAIN TEST

Test Pressure = _____ Bar

(Must be 1.5 times operating pressure*

Duration of the test = _____ Minutes

(Must be 3 x 10minute periods then left under load for a period of ≥ 1 hour

☐ The ducts are watertight (Δp = 0)

*If higher than PN16, please consult **RapidPress** technical department.

Place _____

Date _____

_____

Signature of the customer or representative:

_____

Signature of the performer or representative:

_____

Signature of the performer or representative:

TEST REPORT FOR HOT WATER HEATING SYSTEMS

SYSTEM: _____

CUSTOMER: _____

PERFORMER: _____

Following the test it is hereby declared that:

- ☐ The entire system was visually checked to make sure that all connections have been made in accordance with the best working standards.
- ☐ After the initial filling a waiting period of at least 30 minutes for temperature equilibration will be observed
- ☐ Test accuracy of the pressure gauge 0.1 bar
- ☐ The filling water is filtered and does not contain particles ≥ 150µm.

- Water temperature = _____ °C
- Room temperature = _____ °C
- Temperature difference ΔT = _____ °C (must be ≤ 10°C)

PRELIMINARY TEST

Test Pressure = _____ Bar

(Must be 1.5 times operating pressure*)

Duration of the test = _____ Minutes

(Must be ≥ 45minutes)

☐ The ducts are watertight (Δp = 0)

MAIN TEST

Test Pressure = _____ Bar

(Must be 1.5 times operating pressure*

Duration of the test = _____ Minutes

(Must be 3 x 10minute periods then left under load for a period of ≥ 1 hour

☐ The ducts are watertight (Δp = 0)

*If higher than PN16, please consult **RapidPress** technical department.

Place _____ Signature of the customer or representative: _____

Date _____ Signature of the performer or representative: _____

NOTES

NOTES

RAPIDPRESS®

Bends

Spigot Bends

BSP Elbows

BSP Bends

Tees

Couplers

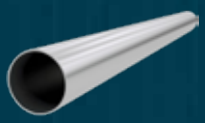
Unions

Tri Clover/ RJT Unions

BSP Adapters

RJT & Tri Clover Adapters

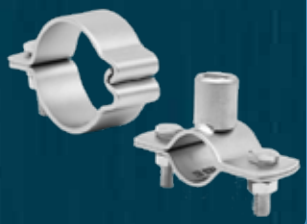
Tube 304 & 316



Valves

Flanges

Clamps



BSP Spigots

BSP Wall Brackets

FlexiFlow Hose

End Caps

Reducers

Camlocks

View our entire range at **www.themetalcompany.co.nz/RapidPress**

THEMETALCOMPANY