

RIIFO



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www.riifo.com

Multilayer Plumbing Technical Catalogue

Updated on 2026.10.22

SYSTEM OVERVIEW

The RIIFO Plumbing multilayer pipe is a pipe generation that unites the advantages of a plastic and metal pipe and offers a high degree of flexibility and toughness, coupled with high pressure and temperature resistance. The RIIFO Plumbing multilayer pipe consists of a inner and outer layer in between which there is a layer of overlap welded or butt welded aluminum, and the three layers are made to form a permanent structure by means of special bonding layers. The aluminum layer ensure that the pipe maintains its shape and prevent the oxygen penetration from the atmosphere.

Advantages

- Entirely corrosion-resistant
- A barrier to the permeation of oxygen and light
- High bend flexibility and inherent stability
- Excellent hydrostatic stress performance
- Light in weight
- Smooth inner wall ensures less pressure loss
- Service life up to 50 years

Applications

RIIFO Multilayer plumbing system can be used in following applications:

- Hot and cold-water distribution.
- Industrial pipeline system for foods, electrical and chemical transportation.
- Condensed, filtered and mineral water pipeline system.
- High pressure air duct system.
- Agricultural pipe line system.

Standards

- EN ISO 21003 - Multilayer Piping Systems for Hot and Cold Water Installations Inside Buildings
- ASTM F1281 - Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe.
- BRL-K536 E - Plastics Piping Systems of PE-X/Al Intended for the Transport of Cold and Heated Drinking Water
- DVGW W 534 (P) - Pipe Connectors and Pipe Joints in Drinking Water Installation
- DVGW W 542 - Compound Pipes in the Drinking Water Installation; Requirements and Testing
- DVGW W 270 - A Method for the Assessment of Enhancement of Microbial Growth on Non-Metallic Materials in Contact with Drinking Water
- UBA KTW - About Hygienic Property of Material Odor Test
- UBA ELASTOM - Guideline for Hygienic Assessment of Elastomers in Contact With Drinking Water
- AS 4176.2 & 3 - Multilayer Piping for Pressure Applications - Multilayer Piping Systems for Hot and Cold Water Plumbing Applications- Pipes & Fittings
- XP P41-250 - Effect of Materials on the Quality of Water Intended for Human Consumption - Organic Materials
- NSF /ANSI /CAN 61 - Health Effects of Drinking Water System Components

Certificates

RIIFO multilayer plumbing piping system

- ACS - refers to XP P41-250
- AENOR - refers to EN ISO 21003
- DVGW - refers to DVGW W 534 (P), DVGW W 542, DVGW W 270, UBA KTW, UBA ELASTOM
- KIWA - refers to BRL-K536 E
- NF - refers to ISO EN ISO 21003
- NSF - refers to ASTM F1281 and NSF /ANSI /CAN 61
- QB - refers to EN ISO 21003
- STF - refers to EN ISO 21003
- WaterMark - refers to AS 4176.2 & 3
- WRAS - refers to Regulators' Specification

RIIFO Enterprise Group Co., Ltd.

- ISO 9001:2015 – Quality management system by TÜV
- ISO 14001:2015 – Environmental management system
- ISO 45001:2018 – Occupational Health and Safety Management System.



Australia



Australia



USA



USA



Germany



England



France



France



France



Netherlands



Finland



Spain

Certificates

 VTI EXPERT SERVICES OY	VTT-2TH.00506-16 (12)
TYYPPIHVÄKSYNTÄPÄÄTÖS	
	
Myöntetty 20.9.2016 Voimassa 19.9.2021	
VTI Expert Services Oy on eriksen suunnittelutoimiston luottamuskäyttämät ammattilainen (0942021) 59 nappula ja osasto toimiston luv. 2 vuorokauden kuluessa luottamuskäyttämällä luottamuskäyttämällä ammattilaisen ympäristösuojeluosaston valvonnalla (09405113) 13 valvonnalla myöntäjästä suoraan.	
Tyyppihväkseen	
TUOTE	PE-XX-APPE-XX monikerrospöytä ja järjestelmään kuuluvat seinäosat portaita/valvonnalla, malli P3 Koko 100 mm, 25 mm, 32 mm, 40 mm, 50 mm, 63 mm ja 75 mm
VALMISTAJA	Rönig Enterprise Group Co., Ltd., Kiina
HYVÄKSYNNÄN LAAJUUS	Tällä hyväksynnällä toteutetaan edellä mainittujen monikerrospöytä ja seinäosien tekninen suunnittelu, valmistus, asennus, huolto, korjaukset monikerrospöytä ja niiden osien asennus, valmistus käytössä
HYVÄKSYNNÄN ENDET	Pöydän valmistuksessa on käytetty 100% rakaa-ainetta, jolla ei ole merkittäviä ympäristövaikutuksia. Pöydän osat on valmistettu komposiitista ja rakaa-ainehyväksytty, jolla ei ole merkittäviä ympäristövaikutuksia.
Yhdisten rakaa-ainetta tulee olla 100% -merkkinä.	
Tuotteeseen käytetyt seinäosat ja asennusohjeet on luokiteltu luokkaan määrittäjä on on ollut luokitusluokitus luokkaan	
Luokitus on luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus	
Asennusohje luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus luokitus	
LAADUNVALVONNAN VARMENNUKSE Laadunvarmistaja Laadunvarmistusjohtaja	Danish Technological Institute, Tanska 12.12.2016 allekirjoitettiin ja on julkaisun pidetty laadunvarmistus luokitus on 100

[illegible]

 AENOR Product Certificate Plastics  001005975 <i>AENOR certifies that the organization</i> RIFENG ENTERPRISE GROUP, CO., LTD. <i>registered office</i> Unit 101, Building B, No. 17, Road 1, Shuangzhen, Daxing District, Beijing, China <i>applies</i> Multi-layer piping systems P3 for hot and cold water installations inside buildings <i>In conformity with standard</i> EN-ISO 9001:2015 <i>references</i> Specific Rules in Plastic <i>Certification scheme</i> <i>First issued on</i> 2016-03-20 <i>Last issued on</i> 2016-04-21 <i>Validity date</i> 2024-09-20  Rafael GARCIA HERBES <i>Chief Executive Officer</i> AENOR NORMAS SL Calle de la Plata, 10 - 28014 Madrid España Tel: +34 91 542 00 00 - www.aenor.es Product certificates may be awarded by ENAC, according to ENAC (2012) 001.	Original Certificate
--	---

			
			
Test report no.:	6400404-VI		
Customer:	Foshan Refeng Enterprises Co., Ltd. S/F, Refeng Building 18 Zumiao Road S28000 Foshan, Guangdong P. R. China		
Production plant:	Huabao Road Zhongshan West City Development District 528000 Foshan, Guangdong P. R. China		
Order:	Performing of long-term hydrostatic pressure tests on multilayer pipe made of PE-XA/HDPE-EX, nominal pipe size 1218 (1/2" i.d.) in accordance with EN ISO 1080:2003-10, in order to obtain data sets for 5 grade testing. In accordance with PPN TR-3/2004		
Letter of:	2004-02-18 and 2008-07-09	Ref.:	Jané Tiao
Test samples received:	2004-04-04	Samples taken: -	
Test period:	from 2004-04-14 to 2006-12-12		
This test report comprises	12 pages.		
Wüzburg, 2008-07-14	Ku/HH		
I.V.		I.A.	
			
Dr. Arjan Zain		Exp.-Ing. Michael Reik	
The inspection, approval or translation of this report is a service in principle for customers participating and not provided without the written approval of the customer. This report is not valid for other projects. The acceptance is on the basis of the information provided and the responsibility of the customer. The list of samples to which the test is performed is annexed to the test report or on request.			
SKZ - Institut für Technische Qualitätssicherung Techn. Büro für Qualitätssicherung Friedrich-Engel-Str. 23 91054 Würzburg	Deutschland 91054 Würzburg, F.R.G. Telefon +49 (0) 931 306-1 Telefax +49 (0) 931 306-200 skz@skz-wz.de www.skz-wz.de	Telefon +49 (0) 931 306-1 Telefax +49 (0) 931 306-200 skz@skz-wz.de www.skz-wz.de	 TÜV SÜD INSTITUT FÜR TECHNISCHE QUALITÄTSSICHERUNG Friedrich-Engel-Str. 23 91054 Würzburg

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Certificat

Certificate

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Blancas de chauffage et distribution sanitaire
Piping system for hot and cold water installations

N° 01232 de 19/02/2019
N° 01232 de 19/02/2019

Date de fin de validité / Expiry date : 19/02/2022

INFENET ENTERPRISE GROUP CO LTD
210 ZIMBAO ROAD INFENET BUILDING CH. EMBAY FREEPORT CITY

N° Industrie / No 112
Sitio de certificación / Production site
San Juan, Chile - (1210)

19/02/2019
Productive certificate /

SYSTEME MULTICOUCHES
MULTILAYER SYSTEM

Est autorisée à apposer le marquage NF sur les applications des règles générales de la marque NF et à révéler le caractère de l'application NF - Niveau de chauffage et distribution sanitaire pour toutes polymères (plastiques) en caoutchouc. Il est autorisé de afficher le NF mark sur les produits fabriqués en caoutchouc, à condition que les général rules of the NF mark and the NF - Piping system for hot and cold water installations are observed.

Cette décision atteste que vous produisez régulièrement en amont et (après certification) conformément aux normes Chile en amont et aux exigences supplémentaires après évaluation par AFNOR Certification (ce qui signifie dans le référentiel de certification NF - Niveau de chauffage et distribution sanitaire).

This decision attests that you produce regularly in advance and (after certification) conforming to the norms Chile in advance and the additional requirements after evaluation by AFNOR Certification (which means in the reference of certification NF - Niveau de chauffage et distribution sanitaire).

Les résultats obtenus par les produits certifiés conformément aux deux annexes de l'AFNOR Certification et ceux de comparer avec les standards après examen et conformément aux exigences NF mark.

The results obtained by the certified products in accordance with the general rules of the NF mark and with the standards after examination and in accordance with the requirements NF mark.

La durée de son commercialisation est de 10 ans. Commercial use is for 10 years.

Caractéristiques certifiées
Certified characteristics

- Caractéristiques de durabilité **Resistance to durability**
- Resistance à la déformation **Resistance to deformation**
- Caractéristiques dimensionnelles **Dimensional characteristics**
- Adhérence à l'assemblage **Adherence to assembly**
- Resistance à la pression **Resistance to pressure**

Certified characteristics
Characteristics of durability
Resistance to deformation
Dimensional characteristics
Adherence to assembly
Resistance to pressure

Ce certificat NF est unique et simple pour attester votre conformité.

This certificate is unique and simple to certify your conformity.

Ce certificat NF, valant son amont, est valable jusqu'à 19/02/2022 sans réserve des résultats des certificats effectués par AFNOR Certification et amont. Vous pouvez donc commercialiser conformément aux règles générales de la marque NF et à révéler le caractère de l'application NF - Niveau de chauffage et distribution sanitaire pour toutes polymères (plastiques) en caoutchouc. Il est autorisé de afficher le NF mark sur les produits fabriqués en caoutchouc, à condition que les général rules of the NF mark and with the standards after examination and in accordance with the requirements NF mark.

This NF certificate, valid in advance, is valid until 19/02/2022 without reservation of the results of the certificates issued by AFNOR Certification and in advance. You can therefore commercialize in accordance with the general rules of the NF mark and with the standards after examination and in accordance with the requirements NF mark.

afnor
Association Française de Normalisation

FRANCK LEBRUGUÉ
Director General of AFNOR Certification
Member of the Board of AFNOR Certification


19/02/2019

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afnor

NSF International

REFERENCE CERTIFICATE

Foshan Rifeng Enterprise Co., Ltd.
Factory: Foshan, China

COMPLIES WITH NSF/ANSI 14 AND THE FOLLOWING REFERENCE
STANDARDS PRODUCTS APPEARING IN THE NSF OFFICIAL
LISTING ARE AUTHORIZED TO BEAR THE NSF MARK.

ASTM F84
ASTM F1281
ASTM F1807
ASTM F876
ASTM F877
AWWA C904
CANULC S102.2
CSA B125.3
CSA B137.5
CNA B137.10
NSF/ANSI 61
NSF/ANSI 372



U.P. Code



AWWA
Certification Program
for Water Treatment
Equipment



NSF
International
Certification Program
for Water Treatment
Equipment



NSF-61



NSF-372

This certificate is supplemental to the NSF Certification Certificate and does not replace the NSF Certification Certificate. This certificate is the property of NSF International and is loaned upon request. For the most current and complete product information, please access NSF's website (www.nsf.org).

Issue Date: April 11, 2019
Certificate Validity: April 11, 2020
Certificate # 78613-118


David Perkins
General Manager, Planting

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What is EPD?

An Environmental Product Declaration (EPD) is an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products. As a voluntary declaration of the life-cycle environmental impact, having an EPD for a product does not imply that the declared product is environmentally superior to alternatives.

The relevant standard for Environmental Product Declarations is ISO 14025, where they are referred to as "type III environmental declarations". A type III environmental declaration is created and registered in the framework of a programme, such as the International EPD® System.

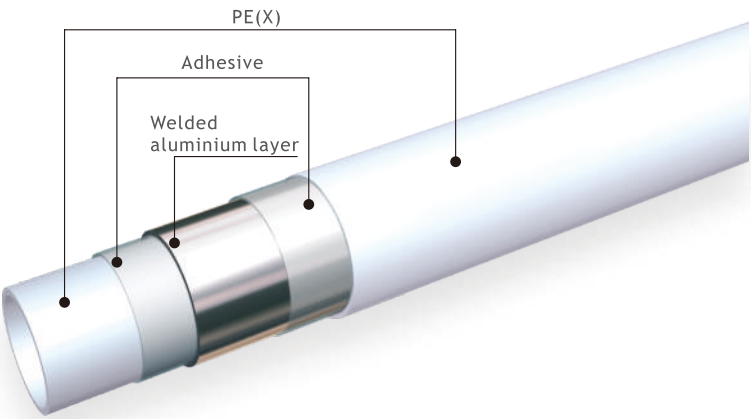
An EPD may be used for many different applications, including green public procurement (GPP) and building assessment schemes. The concept of type III environmental declarations was developed to primarily be used in business-to-business communication, but their use in business-to-consumer communication is not precluded by the standards.



MULTILAYER PLUMBING PIPES

RiIFO Way Of Naming

Example:
B-12 16
Outer diameter 16mm
Inner diameter 12mm
Hot water pipe



STANDARD: ISO 21003

Nominal size(D x e)		14 × 2.0	16 × 2.0	18 × 2.0	20 × 2.0	25 × 2.5	32 × 3.0	40x4.0	50x4.5	63x6.0	75x7.5
Outside diameter (mm)		14	16	18	20	25	32	40	50	63	75
Tolerance of Outer diameter (mm)	Min	14.00	16.00	18.00	20.00	25.00	32.00	40.00	50.00	60.60	70.70
	Max	14.20	16.20	18.20	20.20	25.20	32.20	40.40	50.50	63.00	75.00
Inside diameter(mm)		10	12	14	16	20	26	32	41	51	60
Tolerance of Inner diameter (mm)	Min	9.90	11.90	13.90	15.90	19.90	25.90	30.90	39.40	49.30	57.70
	Max	10.20	12.20	14.20	16.20	20.20	26.20	31.90	40.80	50.80	59.70
Pipe thickness (mm)		2	2	2	2	2.5	3	4	4.5	6	7.5
Tolerance of pipe thickness (mm)	Min	2.00	2.00	2.00	2.00	2.40	2.90	4.00	4.50	6.00	7.50
	Max	2.25	2.25	2.25	2.25	2.70	3.20	4.60	5.20	6.80	8.50

STANDARD: ASTM F1281

Specification	3/8	1/2	5/8	3/4	1
Minimum Outside Diameter, mm(in.)	12(0.472)	16(0.630)	20(0.787)	25(0.984)	32 (1.260)
Tolerance on Minimum,mm(in.)	+0.30 (0.012)				
Minimum Aluminum Thickness, mm(in.)	0.18 (0.007)	0.18 (0.007)	0.23 (0.009)	0.23 (0.009)	0.28 (0.011)
Tolerance on Aluminum Thickness, mm(in.)	+0.09 (+0.0035)	+0.15 (+0.006)	+0.23 (+0.009)	+0.09 (+0.0035)	+0.09 (+0.0035)
Total Wall Thickness, min, mm(in.)	1.60 (0.063)	1.65 (0.065)	1.90 (0.075)	2.25 (0.089)	2.90 (0.114)
Wall Tolerance (+) mm(in.)	0.40 (0.016)	0.65 (0.022)	0.40 (0.016)	0.50 (0.020)	0.60 (0.024)

Pipe Series

Overlapped welded PEX-AL-PEX pipe (B1 series)

Application: Hot and cold potable water system,
Undrefloor heating system
Working Temperature: -40°C ~ +95°C
Max. Working Pressure: 10bar
Lifespan: 50years
Standard: ISO 21003
Physical Appearance: White



PEX-AL-PEX (B1 Series)



Specif.	Packing Specif. (m)	Color (out/in)
B1-1216	100/200	White/Transparent
B1-1620	100/200	White/Transparent
B1-2025	50/100	White/Transparent
B1-2632	50/100	White/Transparent
B1-3240	4/5.8/6	White/Transparent
B1-4150	4/5.8/6	White/Transparent
B1-5163	4/5.8/6	White/Transparent
B1-6075	4/5.8/6	White/Transparent

F7d PUSH-FIT FITTINGS

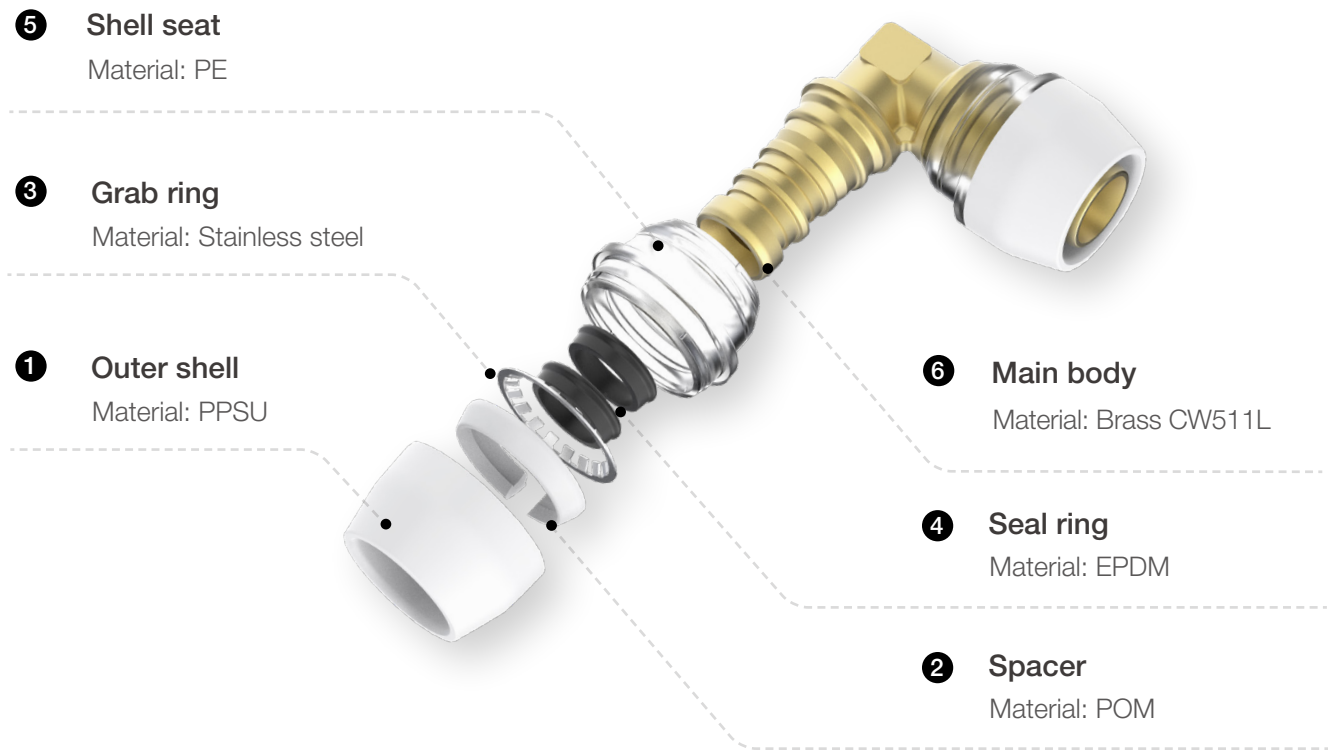




F7d PUSH-FIT FITTINGS

RIIFO F7d PUSH-FIT FITTINGS provide you with a professional and convenient solution. It is used for making connections to Multilayer pipes and PEX pipes. As a new choice for customers, F7d PUSH-FIT FITTINGS enable you plumb an entire home without any special tools. Visible inspection port allows direct checking of pipe insertion depth. Built with high quality, F7d PUSH-FIT FITTINGS use superior copper material--CW511L, which are more durable and corrosion-resistant. We believe that F7d PUSH-FIT FITTINGS will be an excellent choice for your next piping system.

Structure



Advantages



LEAD-FREE

Lead-free copper for a healthier home water supply.



ASSURANCE

Inspection port provides a visual indication that the pipe has been fully inserted.



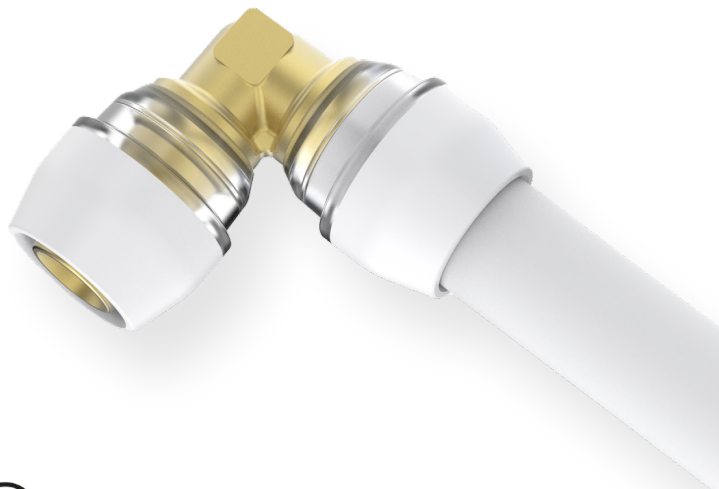
EASE OF INSTALLATION

Instantly install full-home plumbing with push-fit connections - no tools, training, or extra labor costs required.



HYGIENE

Torch-, glue- and solvent-free plumbing ensure safe drinking water and a healthy home.



DESIGN

Engineered multi-barbed teeth provide a reliable and secure connection.



SECURITY

Tool-free plumbing prevents leaks with dual-seal error-proof design.



QUALITY

Corrosion- and heat-proof materials boost performance, increasing the lifespan by five times.

Technical Data

Working media	Cold water, hot water
Working temperature	-20C°~100C°
Maximum working pressure	10Bar
Application	Class 1,2/10Bar, Class 4,5/6Bar

INSTALLATION



1. Pipe cutting
Use the cutter to cut the pipe vertically and precisely.



2. Rounding and beveling
Use RIFENG reamer to bevel and round the pipe end. Insert the pipe completely inside the reamer. Rotate the reamer in one direction several times to round the pipe end.



3. Pipe inserting into fitting
Screw the round and beveled pipe into the fitting until it can be seen through the inspection port as shown in the picture.



4. Check
Check the pipe is fully visible through the inspection port to confirm proper installation alignment.

SPECIFICATION

Tee

Description
F7d-T1216×1216×1216
F7d-T1620×1620×1620

Elbow

Description
F7d-L1216×1216
F7d-L1620×1620

End cap

Description
F7d-1216
F7d-1620

Flex female coupling

Description
F7d-S1216×1/2F H
F7d-S1620×1/2F H
F7d-S1620×3/4F H

Wall-plated female elbow

Description
F7d-L1216×1/2F Z
F7d-L1216×1/2F Z 40
F7d-L1216×1/2F Z4
F7d-L1216×3/4F Z4
F7d-L1620×1/2F Z
F7d-L1620×1/2F Z4
F7d-L1620×3/4F Z
F7d-L1620×3/4F Z4

Straight coupling

Description
F7d-S1216×1216
F7d-S1620×1620

Expansion coupling

Description
F7d-S1216×1216
F7d-S1620×1620

Reducing coupling

Description
F7d-T1216×1/2×1216

Flex female elbow

Description
F7d-L1216×1/2F H
F7d-L1620×1/2F H
F7d-L1620×3/4F H

Female tee

Description
F7d-T1216×1/2F×1216
F7d-T1216×3/4F×1216
F7d-T1620×1/2F×1620
F7d-T1620×3/4F×1620

Wall-plated male elbow

Description
F7d-L1216×1/2 Z2 Y165
F7d-L1216×1/2 Z2 Y30
F7d-L1216×1/2 Z2 Y55
F7d-L1620×1/2 Z2 Y57
F7d-L1620×1/2 Z3 Y180
F7d-L1620×3/4 Z3 Y200

Female elbow

	Description
	F7d-L1216×1/2F
	F7dL1216×3/4F
	F7d-L1620×1/2F
	F7d-L1620×3/4F

Assembly double fittings

	Description
	F7d-T1216×1/2×1216
	F7d-T1216×3/4×1216
	F7d-T1620×1/2×1620
	F7d-T1620×3/4×1620

Male tee

	Description
	F7d-T1216×1/2×1216
	F7d-T1216×3/4×1216
	F7d-T1620×1/2×1620

Male coupling

	Description
	F7d-S1216×1/2
	F7d-S1216×3/4
	F7d-S1620×1/2
	F7d-S1620×3/4

Reducing tee

	Description
	F7d-T1216×1620×1216
	F7d-T1620×1216×1216
	F7d-T1620×1216×1620
	F7d-T1620×1620×1216

Female coupling

	Description
	F7d-S1216×1/2F
	F7d-S1216×3/4F
	F7d-S1620×1/2F
	F7d-S1620×3/4F

Adapter to copper

	Description
	F7d-S1216×15U4
	F7d-S1620×20U4

Male elbow

	Description
	F7d-L1216×1/2
	F7d-L1216×3/4
	F7d-L1620×1/2
	F7d-L1620×3/4

Connector core

	Description
	F7d-1216×1/2
	F7d-1216×3/4
	F7d-1620×1/2
	F7d-1620×3/4

Reducing elbow

	Description
	F7d-L1620×1216



F18 MULTI-JAW PRESS FITTING

- Can be pressed with U/H/TH/RFZ profiles. Three O rings on the fittings, which makes for a better sealing performance.
- With a leakage indicator, if the fittings are not properly pressed, water will come out during the pressure test.

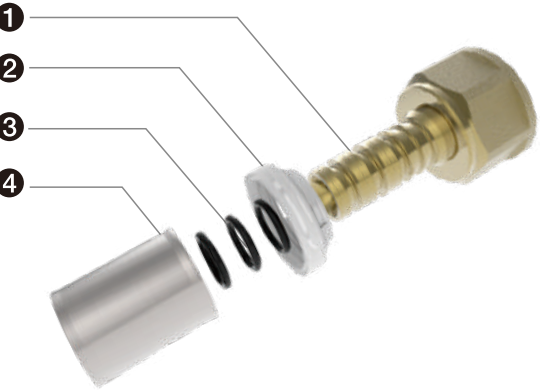
Standards

- XP P41-250
- NF EN ISO21003
- DVGW W534
- BRL K536

Certificates



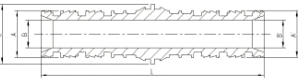
F18 Multi-jaw Press fitting (Leakage indication)



1	Body	Brass
2	Plastic block	EPDM
3	O-ring	PE
4	Sleeve	Stainless steel 304

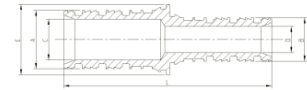
Application: Heating and potable water distribution system
Service temperature: -20°C ~ +120 °C
Pressing profile: U/H/TH/RFZ Profile
Leakage indication: YES

Straight Coupling



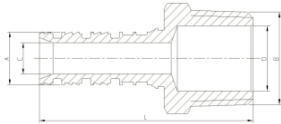
Spec.	A/A'	B/B'	C	L
F18-S1216x1216	11.75	7	15	57
F18-S1418x1418	13.75	9	17	58
F18-S1620x1620	15.75	11	19	57
F18-S2025x2025	19.75	14	23	69
F18-S2632x2632	25.75	20	29	69

Reducing Coupling



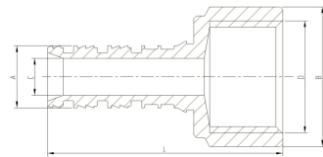
Spec.	A	B	C	D	E	L
F18-S1620x1216	15.75	11.75	11	7	19	57
F18-S2025x1216	19.75	11.75	14	7	23	63
F18-S2025x1620	19.75	15.75	14	11	23	63
F18-S2632x1620	25.75	15.75	20	11	29	63
F18-S2632x2025	25.75	19.75	20	14	29	69

Male Straight Coupling



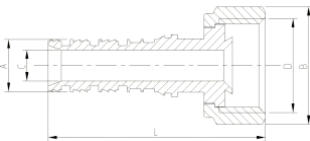
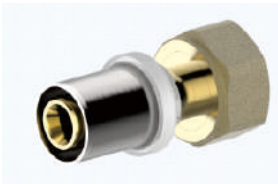
Spec.	A	B	C	D	L
F18-S1216x3/8	11.75	R3/8	7	11	45
F18-S1216x1/2	11.75	R1/2	7	14.5	48
F18-S1216x3/4	11.75	R3/4	7	19.5	49
F18-S1418x1/2	13.75	R1/2	9	14.5	48
F18-S1620x1/2	15.75	R1/2	11	14.5	48
F18-S1620x3/4	15.75	R3/4	11	19.5	49
F18-S1620x1	15.75	R1	11	25.5	51
F18-S2025x3/4	19.75	R3/4	14	19.5	55
F18-S2025x1	19.75	R1	14	25.5	57
F18-S2632x1	25.75	R1	20	25.5	56

Female Straight Coupling



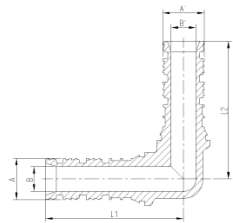
Spec.	A	B	C	D	L
F18-S1216x1/2F	11.75	26.5	7	G1/2	45
F18-S1216x3/4F	11.75	32.5	7	G3/4	46
F18-S1418x1/2F	13.75	26.5	9	G1/2	45
F18-S1620x1/2F	15.75	26.5	11	G1/2	45
F18-S1620x3/4F	15.75	32.5	11	G3/4	46
F18-S1620x1F	15.75	41	11	G1	47.5
F18-S2025x3/4F	19.75	32	14	G3/4	52
F18-S2025x1F	19.75	41	14	G1	53.5
F18-S2632x1F	25.75	41	20	G1	53.5

Demountable Female Coupling



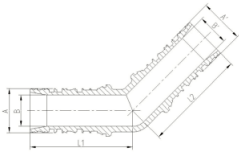
Spec.	A	B	C	D	L
F18-S1216x3/8F(H)	11.75	23	7	G3/8	50.7
F18-S1216x1/2F(H)	11.75	26.5	7	G1/2	49.5
F18-S1216x3/4F(H)	11.75	33	7	G3/4	48
F18-S1620x1/2F(H)	15.75	26.5	11	G1/2	49.5
F18-S1620x3/4F(H)	15.75	33	11	G3/4	49.5
F18-S2026x3/4F(H)	19.75	33	14	G3/4	58
F18-S2026x1F(H)	19.75	41	14	G1	56.5
F18-S2632x1F(H)	25.75	41	20	G1	56.5
F18-S2632x11/4F(H)	25.75	47	29	G11/4	63.7
F18-S2632x11/2F(H)	27.5	56	20	G11/2	71.5

Elbow



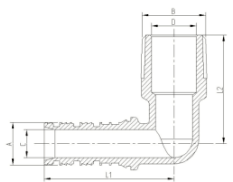
Spec.	A/A'	B/B'	L1	L2
F18-L1216x1216	11.75	7	39	39
F18-L1418x1418	13.75	9	40	40
F18-L1620x1620	15.75	11	42	42
F18-L2026x2026	19.75	14	51	51
F18-L2632x2632	25.75	20	54	54

45° Elbow



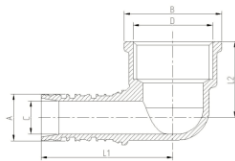
Spec.	A/A'	B/B'	L1	L2
F18-L2026x2026 (45°)	19.75	14	46	46
F18-L2632x2632 (45°)	25.75	20	48.5	48.5

Male Elbow



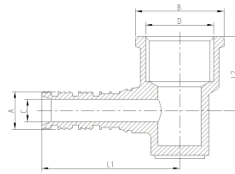
Spec.	A	B	C	D	L1	L2
F18-L1216x3/8	11.75	R3/8	7	11.5	40.5	30
F18-L1216x1/2	11.75	R1/2	7	14.5	42	34
F18-L1418x1/2	13.75	R1/2	9	14.5	42	35
F18-L1620x1/2	15.75	R1/2	11	14.5	42	36
F18-L1620x3/4	15.75	R3/4	11	19.5	45	37.5
F18-L2026x3/4	19.75	R3/4	14	19.5	51	40
F18-L2026x1	19.75	R1	14	25.5	55.5	45.5
F18-L2632x1	25.75	R1	20	25.5	55.5	45.5

Female Elbow



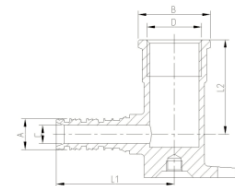
Spec.	A	B	C	D	L1	L2
F18-L1216X1/2F	11.75	27.5	7	G1/2	43	25
F18-L1620x1/2F	15.75	27.5	11	G1/2	43	24.5
F18-L1620x3/4F	15.75	33	11	G3/4	45.5	28
F18-L2026x3/4F	19.75	33	14	G3/4	51.5	27.5
F18-L2026x1F	19.75	41	14	G1	55.5	32
F18-L2632x1F	25.75	41	20	G1	55.5	32

Wall-plated Female Elbow



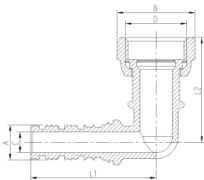
Spec.	A	B	C	D	L1	L2
F18-L1216x1/2F(Z)	11.75	27.5	7	G1/2	43	23
F18-L1418x1/2F(Z)	13.75	27.5	9	G1/2	43	40
F18-L1620x1/2F(Z)	15.75	27.5	11	G1/2	43	25
F18-L1620x3/4F(Z)	15.75	33	11	G3/4	45.5	26.5

Wall-plated Female Elbow II



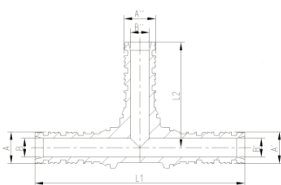
Spec.	A	B	C	D	L1	L2
F18-L1216x1/2F(Z6)	11.75	27.5	7	G1/2	45	36
F18-L1620x1/2F(Z6)	15.75	27.5	11	G1/2	43	35
F18-L1620x3/4F(Z6)	15.75	33	11	G3/4	47.5	35
F18-L2026x3/4F(Z6)	19.75	33	14	G3/4	53.5	33.5

Demountable Female Elbow



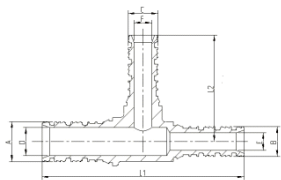
Spec.	A	B	C	D	L1	L2
F18-L1216x1/2F(H)	11.75	26.5	7	G1/2	42.5	33.5
F18-L1216x3/4F(H)	11.75	33	7	G3/4	43.5	38.5
F18-L1620x1/2F(H)	15.75	26.5	11	G1/2	42.5	37.7
F18-L1620x3/4F(H)	15.75	33	11	G3/4	42.5	38
F18-L2026x3/4F(H)	19.75	33	14	G3/4	49.5	40

Tee



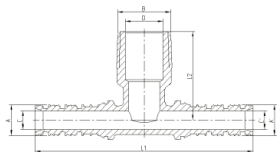
Spec.	A/A' A"	B/B' B"	L1	L2
F18-T1216x1216x1216	11.75	11.75	78	39
F18-T1418x1418x1418	13.75	13.75	82	41
F18-T1620x1620x1620	15.75	15.75	84	42
F18-T2026x2026x2026	19.75	19.75	102	51
F18-T2632x2632x2632	25.75	25.75	108	54

Reducing Tee



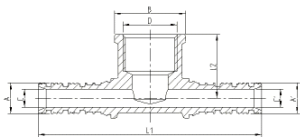
Spec.	A	B	C	D	E	F	L1	L2
F18-T1216x1620x1216	11.75	11.75	15.75	7	7	11	84	40
F18-T1620x1216x1216	15.75	11.75	11.75	11	7	7	80	42
F18-T1620x1216x1620	15.75	15.75	11.75	11	11	7	80	42
F18-T1620x1620x1216	15.75	11.75	15.75	11	7	11	84	42
F18-T1620x2026x1620	15.75	15.75	19.75	11	11	14	90	48
F18-T2026x1216x1216	19.75	11.75	11.75	14	7	7	86	44
F18-T2026x1216x1620	19.75	15.75	11.75	14	11	7	86	44
F18-T2026x1216x2026	19.75	19.75	11.75	14	14	7	94	44
F18-T2026x1620x1216	19.75	11.75	15.75	14	7	11	92	44
F18-T2026x1620x1620	19.75	15.75	15.75	14	11	11	90	45
F18-T2026x1620x2026	19.75	19.75	15.75	14	14	11	96	45
F18-T2026x2026x1216	19.75	11.75	19.75	14	7	14	96	51
F18-T2026x2026x1620	19.75	15.75	19.75	14	11	14	96	51
F18-T2026x2026x2026	19.75	19.75	15.75	14	14	11	96	45
F18-T2026x2632x2026	19.75	19.75	25.75	14	14	20	108	51
F18-T2632x1216x2632	25.75	25.75	11.75	20	20	7	94	47
F18-T2632x1620x2632	25.75	25.75	15.75	20	20	11	96	48
F18-T2632x2026x2026	25.75	19.75	19.75	20	14	14	102	54
F18-T2632x2026x2632	25.75	25.75	19.75	20	20	14	102	54

Male Tee



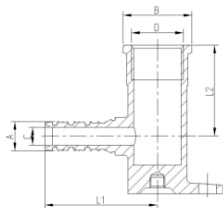
Spec.	A/A'	B	C/C'	D	L1	L2
F18-T1216x1/2x1216	11.75	R1/2	7	14.5	84	34
F18-T1620x1/2x1620	15.75	R1/2	11	14.5	84	36
F18-T1620x3/4x1620	15.75	R3/4	11	19.5	90	37.5
F18-T2026x3/4x2026	19.75	R3/4	14	19.5	102	41
F18-T2632x1x2632	25.75	R1	20	26	111	45.5

Female Tee



Spec.	A/A'	B	C/C'	D	L1	L2
F18-T1216x1/2Fx1216	11.75	27.5	7	G1/2	86	24.5
F18-T1620x1/2Fx1620	15.75	27.5	11	G1/2	86	25
F18-T1620x3/4Fx1620	15.75	33	11	G3/4	91	26
F18-T2026x1/2Fx2026	19.75	27.5	14	G1/2	98	26.5
F18-T2026x3/4Fx2026	19.75	33	14	G3/4	103	27.5
F18-T2632x1/2Fx2632	25.75	27.5	20	G1/2	98	29
F18-T2632x3/4Fx2632	25.75	33	20	G3/4	103	30.5
F18-T2632x1Fx2632	25.75	41	20	G1	111	32

Wall-plated Corner Tee



Spec.	A/A'	B	C/C'	D	L1	L2
F18-K1216x1/2F(Z6)	11.75	27.5	7	G1/2	45	36.5
F18-K1620x1/2F(Z6)	15.75	27.5	11	G1/2	45	36

RIIFO PPSU MULTI-JAW PRESS FITTING



RIIFO



RIIFO PPSU MULTI-JAW PRESS FITTING

RIIFO PPSU multi-jaw press fittings are durable and corrosion resistant, providing an ideal solution for aggressive water environments. Multiple O-ring design for more reliable connection with multi-layer pipe, it could be pressed with U/H/TH profiles at the same time, making installation easy and efficient.

As a material with excellent properties, PPSU is mainly used for potable water supply. We believe that stable, hygienic, and high-performance PPSU fittings will be an excellent choice for your next piping system.

Technical Data

F18U

• Max Transient Working Temperature: 95°C • Max Working Temperature: 70°C • Working Pressure: 1.0MPa (10bar)

B1

TYPE	B1 (PEX-AL-PEX)
Material	Cross-linked polyethylene
Roughness(mm)	0.0007
Density (g/cm³)	0.926-0.959
Modulus of elasticity(MPa)	7200
Thermal conductivity (w/mK)	0.45
Coefficient of thermal expansion (mm/mK)	0.025
Working temperature	-40°C~ +95°C
Maximum working pressure	10 bar

Structure



Advantages

Lead-free, more hygienic.

Can be pressed with U/H/TH profiles, making installation easy and efficient.

Excellent sealing performance with three O rings.

With leakage indication, if the fittings are not pressed, the water will come out during the pressure test.

More affordable than brass fittings.

PPSU material, Lead-free for better hygiene

Three O rings, Better sealing performance

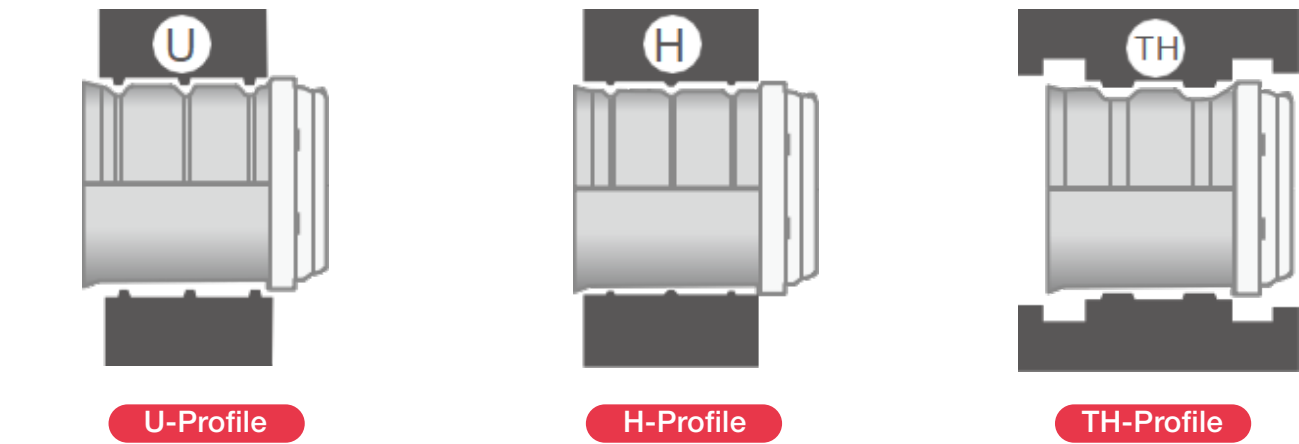
Leakage indicator, Leak before press

Hygienic, safe for use in the drinking water supply.

Corrosion and chemical resistance.

Pressing Tool Instruction:

To avoid leakage due to incorrect installation, each pressing tool should be placed at the right position before pressing. Here are the placed positions of different pressing tools.



SPECIFICATIONS

Coupling



Specif.
F18u-S1216×1216
F18u-S1620×1620
F18u-S2025×2025
F18u-S2632×2632

Elbow



Specif.
F18u-L1216×1216
F18u-L1620×1620
F18u-L2025×2025
F18u-L2632×2632

Tee



Specif.
F18u-T1216×1216×1216
F18u-T1620×1620×1620
F18u-T2025×2025×2025
F18u-T2632×2632×2632

Reducer



Specif.
F18u-S1620×1216
F18u-S2025×1216
F18u-S2025×1620
F18u-S2632×1216
F18u-S2632×2025

Tee Reducer



Specif.
F18u-T1216×1620×1216
F18u-T1620×1216×1216
F18u-T1620×1216×1620
F18u-T1620×1620×1216
F18u-T2025×1620×1620
F18u-T2025×1620×2025
F18u-T2632×1216×2632

End Cap



Specif.
F18u-D1216
F18u-D1620
F18u-D2632

Elbow Reducer



Specif.
F18u-L1620×1216

Elbow Reducer-45°



Specif.
F18u-L2025×2025-45°
F18u-L2632×2632-45°



STEP 1: Pipe cutting

Cut the pipe vertically and precisely with the RIFFO pipe cutter.



STEP 2: Pipe beveling and rounding

Use RIFFO reamer to bevel and round the pipe end. Insert the pipe completely inside the reamer. Rotate the reamer in one direction several times to round the pipe end.



STEP 3: Pipe inserting into fitting

Choose a fitting in an appropriate size. Insert the pipe into the fitting until it reaches the plastic block. Make sure the pipe is completely inserted by checking the insertion depth through the inspection holes on the sleeve shoulder



STEP 4: Pressing

Place the fitting into the jaw. Press the fitting until the jaw is fully closed. The press jaw must be placed close to the plastic gasket.

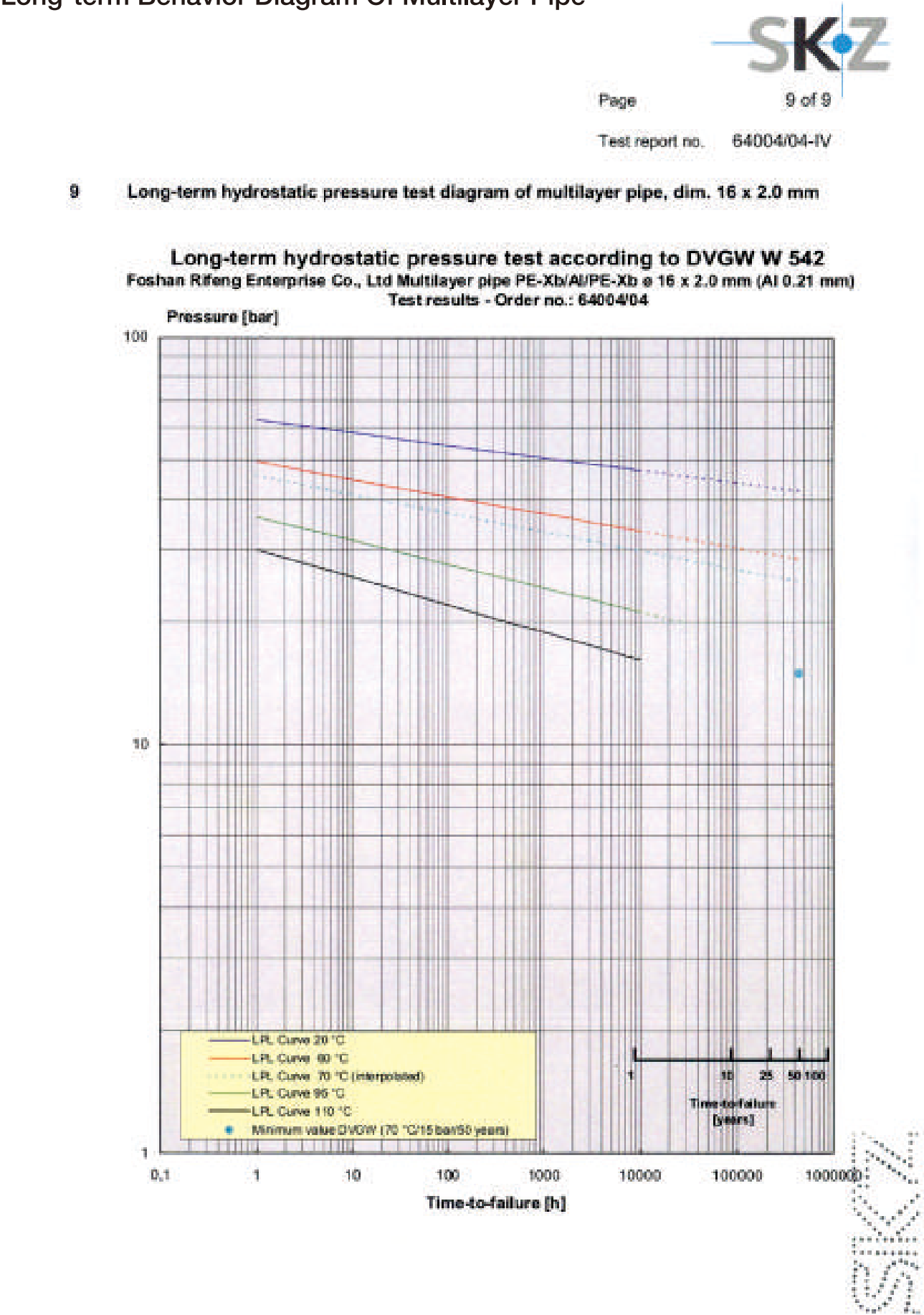


STEP 5: Checking

Open the handles and remove the pressing tool from the fitting and the installation is complete.

TECHNICAL INFORMATION

Long-term Behavior Diagram Of Multilayer Pipe



Raw Material

Material	Test item	Requirement
Polyethylene	Density	HDPE : 0.941~0.959 g/cm3 MDPE : 0.926~0.941 g/cm3
	Melt flow index	HDPE , MDPE=0.1 g/10min (190 , 2.16kg)
(PEX)	Tensile strength	HDPE=21MPa ; MDPE=14MPa
	Enlongation	=400%
	Vicat soft point	Vicat soft point=105 °C
	Cross-linking degree	=65%
	ESCR	=165h
	Moisture content	=0.15%
Color masterbatch	Appearance	Uniform granual
	Volatile content	=0.5%
catalyst	Density	=0.93 g/cm 3
	Melt flow index	=0.9 g/10min (190 °C , 5.00kg)
	Volatile content	=0.35%
Adhesive resin	Appearance	Uniform granual
	Density	=0.926 g/cm3 ;
	Melt flow index	2.0~6.0 g/10min (190 °C , 2.16kg)
	Vicat soft point	Vicat soft point=105 °C
	T peeling strength	=70N/25mm
Aluminum	Surface quality	Water brush test=class
	Tensile strength	105MPa ~ 125MPa
	Appearance	Without oil on surface
	Hardness(HV)	28 ~ 33
	T peeling strength	Minimum value=60N/25mm

Chemical Resistance

TYPE	Multilayer Pipe		
Overlapped welded	A(PE-AL-PE)	B1 (PEX-AL-PEX)	B (PERT-AL-PERT)
Roughness(mm)	0.0007	0.0007	0.0007
Melting point (°C)	135	□	127
Density (g/cm3)	0.941-0.959	0.926-0.959	0.926-0.940
Modulus of elasticity(MPa)	7200	7200	7200
Thermal conductivity (w/mK)	0.45	0.45	0.45
Coefficient of thermal expansion (mm/mK)	0.025	0.025	0.025

Pipe Press Loss

Calculation formula

$$r=f \times \frac{L}{D} \times \rho \times \frac{v^2}{2}$$

$$\frac{1}{\sqrt{f}}=-2\log\left(\frac{e}{3.7\cdot D}+\frac{2.51}{Re\cdot\sqrt{f}}\right)$$

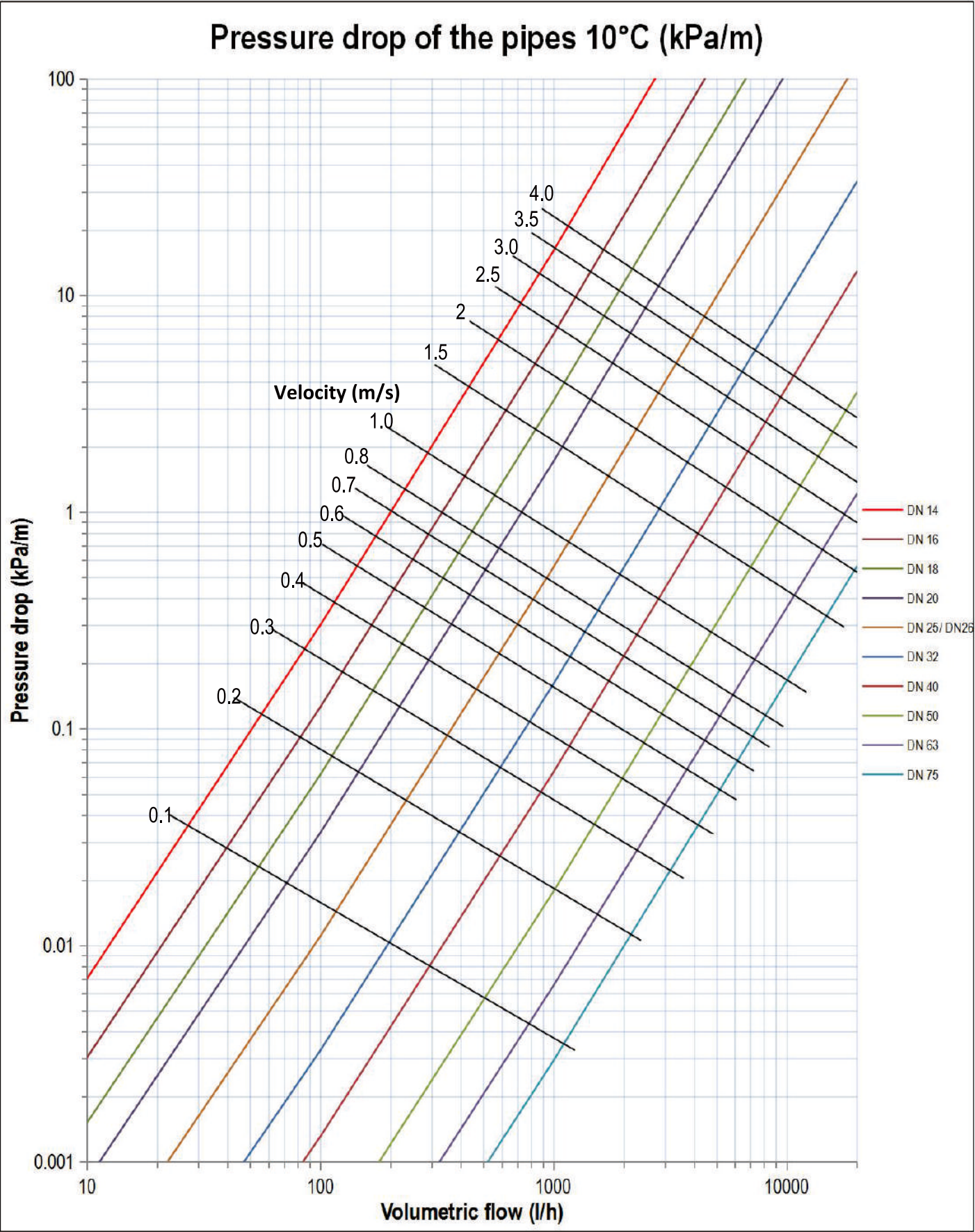
$$Re = \frac{\rho\cdot V\cdot D}{\mu}$$

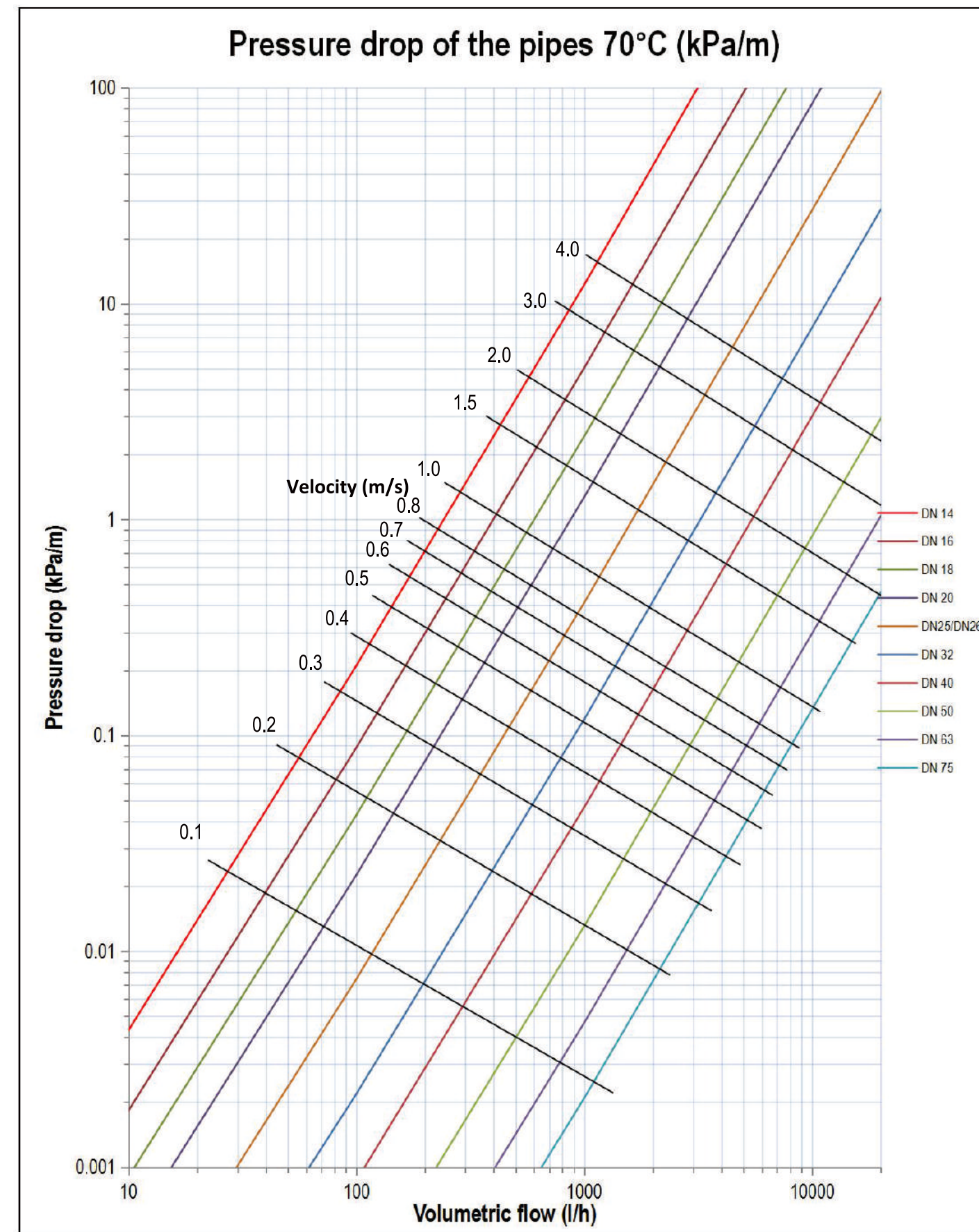
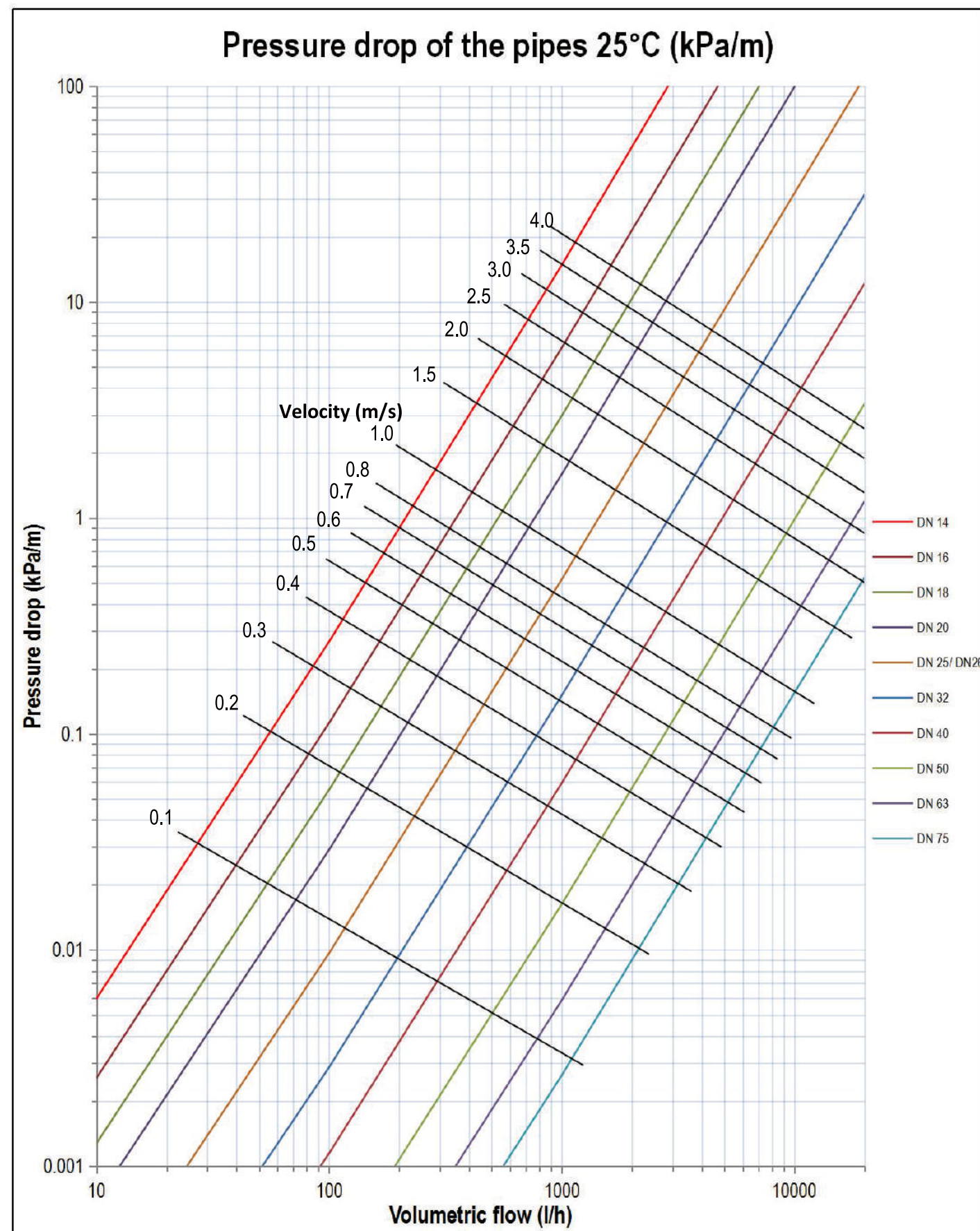
Where:

- r= head loss, Pa
- f= friction factor
- ρ = density of the fluid, kg/m3
- V= the mean velocity of the fluid, m/s
- D= the pipe inter diameter, m
- L=pipe length,m
- e=relative roughness
- Re=Reynolds number
- μ=dynamic viscosity, Pa·s

Pressure loss table of PEX/AL/PEX Pipe water temperature = 25° C																							
	1014		1216		1418		1620		2025		2026		2632		3240		4150		5163		6075		
Q L/S	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	
0.02	0.15	0.26	0.06	0.18	0.03	0.13	0.02	0.10															
0.04	0.50	0.52	0.21	0.36	0.10	0.27	0.05	0.20	0.02	0.13	0.02	0.13											
0.06	1.01	0.79	0.42	0.54	0.20	0.40	0.11	0.31	0.04	0.19	0.04	0.19	0.01	0.11									
0.08	1.66	1.05	0.69	0.73	0.34	0.53	0.18	0.41	0.06	0.25	0.06	0.25	0.02	0.15	0.01	0.10							
0.10	2.45	1.31	1.02	0.91	0.49	0.67	0.26	0.51	0.09	0.32	0.09	0.32	0.02	0.19	0.01	0.13							
0.12	3.37	1.57	1.40	1.09	0.68	0.80	0.36	0.61	0.12	0.38	0.12	0.38	0.03	0.23	0.01	0.15							
0.14	4.41	1.84	1.83	1.27	0.89	0.94	0.47	0.71	0.15	0.45	0.15	0.45	0.04	0.26	0.02	0.18							
0.16	5.58	2.10	2.32	1.45	1.12	1.07	0.59	0.82	0.19	0.51	0.19	0.51	0.06	0.30	0.02	0.20	0.01	0.12					
0.18	6.86	2.36	2.85	1.63	1.38	1.20	0.72	0.92	0.24	0.57	0.24	0.57	0.07	0.34	0.03	0.23	0.01	0.13					
0.20	8.27	2.62	3.43	1.81	1.66	1.34	0.87	1.02	0.28	0.64	0.28	0.64	0.08	0.38	0.03	0.26	0.01	0.15					
0.30	16.96	3.94	7.01	2.72	3.39	2.01	1.78	1.53	0.58	0.95	0.58	0.95	0.17	0.57	0.07	0.38	0.02	0.22	0.01	0.15			
0.40			11.69	3.63	5.64	2.67	2.96	2.04	0.96	1.27	0.96	1.27	0.28	0.76	0.11	0.51	0.03	0.30	0.01	0.19	0.00	0.14	
0.50					8.39	3.34	4.39	2.55	1.43	1.59	1.43	1.59	0.41	0.95	0.16	0.64	0.05	0.37	0.02	0.24	0.01	0.17	
0.60					11.61	4.01	6.08	3.06	1.97	1.91	1.97	1.91	0.57	1.13	0.22	0.77	0.06	0.45	0.02	0.29	0.01	0.21	
0.70							8.00	3.57	2.59	2.23	2.59	2.23	0.75	1.32	0.29	0.89	0.08	0.52	0.03	0.34	0.01	0.24	
0.80							10.15	4.08	3.29	2.55	3.29	2.55	0.95	1.51	0.37	1.02	0.10	0.60	0.04	0.39	0.02	0.28	
0.90									4.05	2.86	4.05	2.86	1.17	1.70	0.46	1.15	0.13	0.67	0.05	0.44	0.02	0.31	
1.00									4.89	3.18	4.89	3.18	1.41	1.89	0.55	1.28	0.15	0.75	0.05	0.49	0.02	0.35	
1.20									6.78	3.82	6.78	3.82	1.95	2.27	0.76	1.53	0.21	0.90	0.08	0.58	0.03	0.41	
1.40													2.56	2.65	1.00	1.79	0.28	1.05	0.10	0.68	0.04	0.48	
1.60													3.26	3.03	1.27	2.04	0.35	1.20	0.13	0.78	0.06	0.55	
1.80													4.02	3.40	1.56	2.30	0.44	1.35	0.15	0.87	0.07	0.62	
2.00													4.86	3.78	1.89	2.55	0.53	1.50	0.19	0.97	0.08	0.69	
2.20													5.49	4.16	2.24	2.81	0.62	1.65	0.22	1.07	0.10	0.76	
2.40															2.62	3.06	0.73	1.80	0.26	1.16	0.12	0.83	
2.60															2.88	3.32	0.84	1.95	0.30	1.26	0.13	0.90	
2.80															3.29	3.57	0.96	2.10	0.34	1.36	0.15	0.97	
3.00															3.73	3.83	1.09	2.24	0.39	1.46	0.17	1.04	
3.20															4.39	4.08	1.22	2.39	0.43	1.55	0.19	1.11	
3.40																	1.30	2.54	0.48	1.65	0.21	1.18	
3.60																	1.44	2.69	0.53	1.75	0.24	1.24	
3.80																	1.59	2.84	0.59	1.84	0.26	1.31	
4.00																	1.74	2.99	0.65	1.94	0.29	1.38	
4.20																	1.99	3.14	0.67	2.04	0.31	1.45	
4.40																	2.17	3.29	0.73	2.13	0.34	1.52	
4.60																	2.35	3.44	0.79	2.23	0.37	1.59	
4.80																	2.53	3.59	0.85	2.33	0.40	1.66	
5.00																	2.73	3.74	0.96	2.43	0.41	1.73	
5.20																	2.93	3.89	1.03	2.52	0.44	1.80	
5.40																	3.13	4.04	1.11	2.62	0.47	1.87	
5.60																			1.18	2.72	0.50	1.94	
5.80																			1.26	2.81	0.53	2.01	
6.00																			1.34	2.91	0.59	2.07	
6.20																			1.42	3.01	0.63	2.14	
6.40																			1.50	3.10	0.67	2.21	
6.60																			1.59	3.20	0.70	2.28	
6.80																			1.68	3.30	0.74	2.35	
7.00																			1.77	3.40	0.78	2.42	

Pressure loss table of PEX/AL/PEX Pipe water temperature = 70° C																									
	1014			1216		1418		1620		2025		2026		2632		3240		4150		5163		6075			
Q L/S	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	i KPa/m	V m/s	
0.02	0.12	0.26	0.05	0.18	0.02	0.13	0.01	0.10																	
0.04	0.40	0.52	0.16	0.36	0.08	0.27	0.04	0.20	0.01	0.13	0.01	0.13													
0.06	0.81	0.79	0.33	0.54	0.16	0.40	0.09	0.31	0.03	0.19	0.03	0.19	0.01	0.11											
0.08	1.34	1.05	0.56	0.73	0.27	0.53	0.14	0.41	0.05	0.25	0.05	0.25	0.01	0.15	0.01	0.10									
0.10	1.99	1.31	0.82	0.91	0.40	0.67	0.21	0.51	0.07	0.32	0.07	0.32	0.02	0.19	0.01	0.13									
0.12	2.75	1.57	1.14	1.09	0.55	0.80	0.29	0.61	0.09	0.38	0.09	0.38	0.03	0.23	0.01	0.15									
0.14	3.61	1.84	1.49	1.27	0.72	0.94	0.38	0.71	0.12	0.45	0.12	0.45	0.04	0.26	0.01	0.18									
0.16	4.42	2.10	1.89	1.45	0.91	1.07	0.48	0.82	0.16	0.51	0.16	0.51	0.05	0.30	0.02	0.20	0.00	0.12							
0.18	5.47	2.36	2.25	1.63	1.13	1.20	0.59	0.92	0.19	0.57	0.19	0.57	0.06	0.34	0.02	0.23	0.01	0.13							
0.20	6.63	2.62	2.72	1.81	1.31	1.34	0.71	1.02	0.23	0.64	0.23	0.64	0.07	0.38	0.03	0.26	0.01	0.15							
0.30	13.83	3.94	5.67	2.72	2.72	2.01	1.42	1.53	0.46	0.95	0.46	0.95	0.14	0.57	0.05	0.38	0.01	0.22	0.01	0.15					
0.40			9.57	3.63	4.59	2.67	2.39	2.04	0.77	1.27	0.77	1.27	0.22	0.76	0.09	0.51	0.02	0.30	0.01	0.19	0.00	0.14			
0.50					6.88	3.34	3.59	2.55	1.15	1.59	1.15	1.59	0.33	0.95	0.13	0.64	0.04	0.37	0.01	0.24	0.01	0.17			
0.60					9.59	4.01	4.99	3.06	1.60	1.91	1.60	1.91	0.46	1.13	0.18	0.77	0.05	0.45	0.02	0.29	0.01	0.21			
0.70							6.61	3.57	2.12	2.23	2.12	2.23	0.60	1.32	0.23	0.89	0.06	0.52	0.02	0.34	0.01	0.24			
0.80							8.42	4.08	2.70	2.55	2.70	2.55	0.77	1.51	0.30	1.02	0.08	0.60	0.03	0.39	0.01	0.28			
0.90										3.35	2.86	3.35	2.86	0.95	1.70	0.37	1.15	0.10	0.67	0.04	0.44	0.02	0.31		
1.00										4.05	3.18	4.05	3.18	1.16	1.89	0.45	1.28	0.12	0.75	0.04	0.49	0.02	0.35		
1.20										5.65	3.82	5.65	3.82	1.61	2.27	0.62	1.53	0.17	0.90	0.06	0.58	0.03	0.41		
1.40														2.13	2.65	0.82	1.79	0.23	1.05	0.08	0.68	0.04	0.48		
1.60														2.71	3.03	1.05	2.04	0.29	1.20	0.10	0.78	0.05	0.55		
1.80														3.36	3.40	1.30	2.30	0.36	1.35	0.13	0.87	0.06	0.62		
2.00														4.08	3.78	1.58	2.55	0.44	1.50	0.15	0.97	0.07	0.69		
2.20																1.87	2.81	0.52	1.65	0.18	1.07	0.08	0.76		
2.40																2.20	3.06	0.61	1.80	0.21	1.16	0.09	0.83		
2.60																2.54	3.32	0.70	1.95	0.25	1.26	0.11	0.90		
2.80																2.91	3.57	0.80	2.10	0.28	1.36	0.13	0.97		
3.00																3.30	3.83	0.91	2.24	0.32	1.46	0.14	1.04		
3.20																3.49	4.08	1.02	2.39	0.36	1.55	0.16	1.11		
3.40																		1.14	2.54	0.40	1.65	0.18	1.18		
3.60																		1.27	2.69	0.45	1.75	0.20	1.24		
3.80																		1.40	2.84	0.49	1.84	0.22	1.31		
4.00																		1.54	2.99	0.54	1.94	0.24	1.38		
4.20																		1.58	3.14	0.59	2.04	0.26	1.45		
4.40																		1.73	3.29	0.64	2.13	0.28	1.52		
4.60																		1.87	3.44	0.70	2.23	0.31	1.59		
4.80																		2.03	3.59	0.75	2.33	0.33	1.66		
5.00																		2.19	3.74	0.76	2.43	0.36	1.73		
5.20																		2.35	3.89	0.82	2.52	0.39	1.80		
5.40																		2.52	4.04	0.88	2.62	0.41	1.87		
5.60																				0.94	2.72	0.44	1.94		
5.80																				1.00	2.81	0.47	2.01		
6.00																				1.07	2.91	0.47	2.07		
6.20																				1.14	3.01	0.50	2.14		
6.40																				1.21	3.10	0.53	2.21		
6.60																				1.28	3.20	0.56	2.28		
6.80																				1.35	3.30	0.59	2.35		
7.00																				1.42	3.40	0.63	2.42		



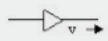
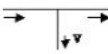


Fitting Pressure Loss

Pressure loss - Compression Fitting

F1 Compression fittings for water supply												
Inside Dimension [mm]/ Outside Dimension [mm]	0912		1216		1620		2025		2026		2632	
Zeta values ζ (-)/equivalent Pipe length eL [m]	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL
Press Elbow 90	-	-	1.20	0.60	1.07	0.71	1.08	0.90	1.08	0.90	1.00	1.08
Equal Straight Union	1.16	0.43	0.76	0.38	0.62	0.41	0.62	0.52	0.62	0.52	0.54	0.58
Straight at flow speed	-	-	0.80	0.40	0.66	0.44	0.67	0.56	0.67	0.56	0.59	0.63
Branch at flow speed	-	-	1.71	0.86	1.57	1.05	1.58	1.32	1.58	1.32	1.50	1.62

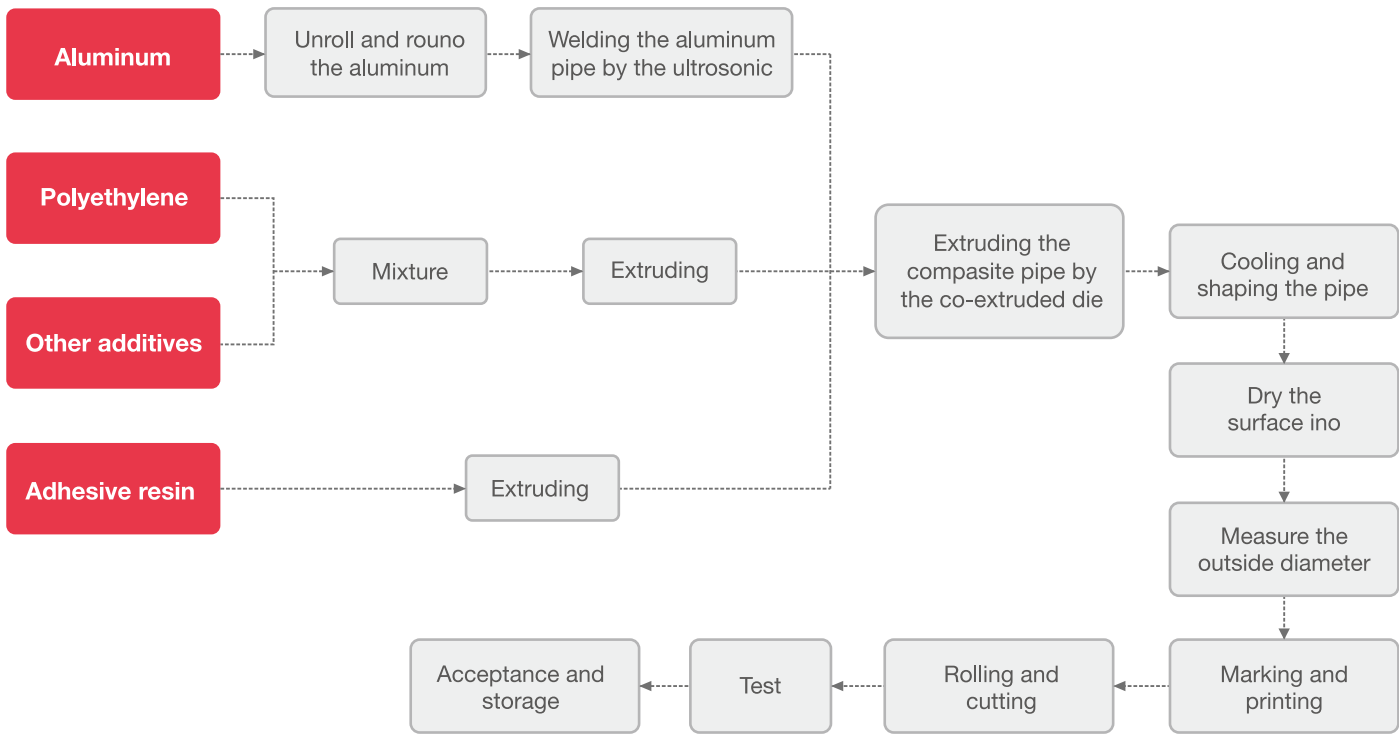
Pressure loss - Press Fitting

F5 u-profile press fittings for water supply																								
Inside Dimension [mm] Outside Dimension [mm]	0912		1014		1216		1418		1620		2025		2026		2632		3240		4150		5163		6075	
Zeta values ζ (-)/equivalent Pipe length eL [m]	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL	ζ	eL
Press Elbow 90 	1.20	0.60	1.07	0.71	1.08	0.90	1.08	0.90	1.00	1.08	1.06	1.41	0.97	1.66	0.94	2.00	0.93	2.31	1.08	0.90	1.08	0.90	1.20	0.60
Equal Straight Union 	0.76	0.38	0.62	0.41	0.62	0.52	-	-	0.54	0.58	0.56	0.73	0.51	0.87	0.48	1.02	0.46	1.16	0.62	0.52	-	-	0.76	0.38
Straight at flow speed 	0.80	1.71	0.66	1.57	0.67	1.58	0.67	1.58	0.59	1.50	0.65	1.56	0.56	1.47	0.53	1.44	0.51	1.42	0.67	1.58	0.67	1.58	0.80	1.71
Branch at flow speed 	0.40	0.86	0.44	1.05	0.56	1.32	0.56	1.32	0.63	1.62	0.87	2.08	0.95	2.51	1.12	3.06	1.28	3.56	0.56	1.32	0.56	1.32	0.40	0.86
Equal Tee "Y" type 	-	-	1.19	0.79	1.20	1.00	1.20	1.00	-	-	-	-	-	-	-	-	-	-	1.20	1.00	1.20	1.00	-	-

PRODUCTION AND QUALITY CONTROL

Production Of Pipe

Process of multilayer pipe overlap-welded by aluminum



Why and how to boil the pipes?

This process only apply to the PEX/AL/PEX and PEX pipe. PEX (cross-linking polyethylene) is one polyethylene structure within which the polymer chains are interconnected by chemical bonds to create a three-dimensional polymer network, and cross-linking degree is one important performance parameter of the PEX.

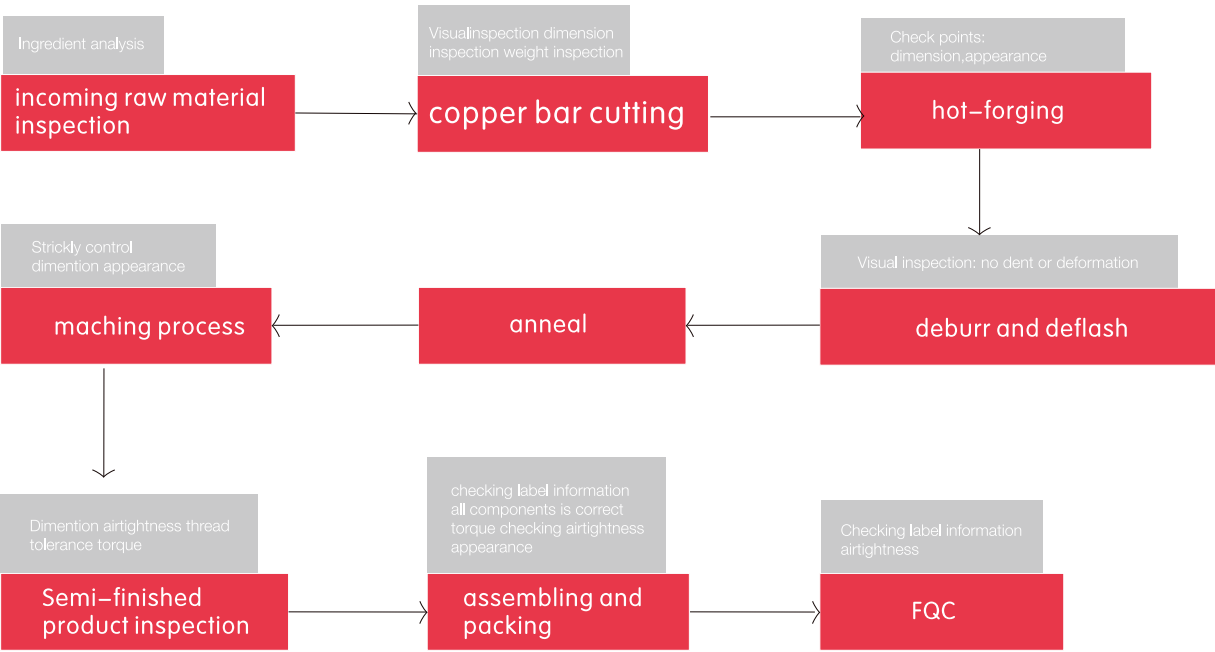
The cross linking degree must be over than 65% for silane cross-linking polyethylene our pipes used. The procedure of cross-linking is one hydrolyzable process(i.e. complete the cross-linking with the presence of water), It can shorten the cross-linking time with hot water to ensure the performance of our pipes before leaving factory.

The process is given as follows: pull the pipes into the steam room, pass the hot water into the pipe and keep certain time.

Test

Test Item	Requirement
Dimension	Comply with standard or customer requiements
Appearance and marking	The sruface of inner and external should be smooth, no bubble, hole, nick and other defection etc.
Tensile strength	Comply with required force > 2500 N
Pressure strength	Measure and calculate in accordance with ISO 9080 standard.
Thermal durability	50 % of the stress for a 1 year test, without ductile failure occurring.
Delamination	Fpull 15 N/cm, no delamination
Internal pressure test	Tested in accordance with ISO 1167, Resistance to internal pressure 95°C ,1000 h ,15bar , the joint assembly shall not leak.
Bending test	Tested with required radius bending, the joint shall not leak.
Pull-out test	The joint assemblies shall withstand the pull-out force without being separated, force calculated by $F=\pi/4*d_n^2*P_D$
Thermal cycling test	The pipes, fittings or joints shall withstand the test without leakage after 5000 cycles at 10bar between 20°C and 95°C.
Pressure cycling test	Tested with cycles between 15bar and 0.5bar, the joint assembly shall not leak.
Vacuum test	The change in vacuum pressure shall not be greater than 0.05 bar
Hygienic test	Shall be in compliance with national Regulations

Production Of Fitting



Test

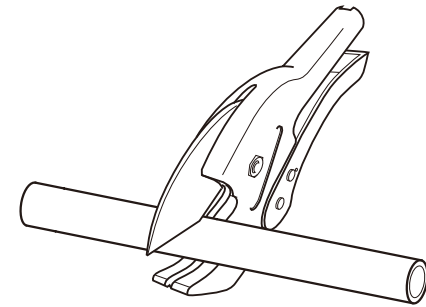
Test Item	Requirements					
Appearance	Pipe should be no crack, no delamination, no crack and no core body deformation phenomenon.					
	Threads are not allowed to have shortages, crushed or tooth profile is not complete.					
	Fittings should be acute blunt, no burr, no sand holes and no uneven phenomenon.					
	Fittings shall not be wrong, missing or incomplete.					
	The processed surface shall not have scratches, grooves, steps or collision scars and unprocessed black fur.					
	Fittings should be clean, the surface color should be consistent, no blackening, no mildew, no oxidation, no rust;					
	Marking such as trademark patterns, specifications, models, identification codes and anti-counterfeiting labels shall be clear and correct on fittings.					
	For fittings whose surface is shot blasting, the shot blasting size should be uniform and the surface of pipe fittings should be flat. The fittings for nickel plating should not be spalling, leaking plating, bubbling, exposing copper and so on.					
	The axis of the connecting end should coincide with the central axis of the fitting, and no eccentricity, no asymmetry, or no perpendicularity shall be allowed.					
	The o-ring of pipe fitting shall be completely installed in the sealing groove of fitting. The O-ring of pipe fitting shall not be shifted.					
Size	The dimension of tolerance marked on the drawing is the dimension of inspection control.					
	The thread gauge shall be rotated to pass the whole thread section, and the stop gauge shall not pass completely;					
	Thread spacing should be no more than 2.5 mm.					
	The wall thickness shall not be less than 1.5mm except the fitting part.					
Air tightness	At room temperature, the test pressure shall be no less than 0.6 Mpa for 10s, no leakage shall occur to the pipe fitting.					
Torsional moment tes	Specification of pipe thread	3/8	1/2	3/4	1	1 1/4
	Torque (Nm)	35	75	100	125	160
Stress corrosion resistance	Testing according to ISO 6957“Copper alloys - Ammonia test for stress corrosion resistance” in a solution of pH 9.5.					
Assembling	The pipe fittings shall not be short of O-rings, retainers, steel sleeves and other parts of specifications.					
	The O-ring of pipe fitting shall be completely installed in the sealing groove of pipe fitting. The O-ring of pipe fitting shall not be shifted.					
Package	The package quantity and package mark should be correct. Short package number, mixed package, no package mark or unclear package mark should be allowed. The printing patterns of packing boxes and boxes should be clear and correct, the surface should be clean and level, and no twisting and damage should occur.					

INSTALLATION

Compression Fitting

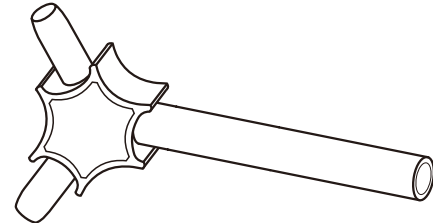
Step1:

Cut the pipe vertically by RIIFO pipe cutter. Make sure to cut it quickly and precisely.



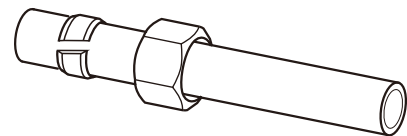
Step2:

Use a plastic reamer to round and bevel the end holes of the pipe.



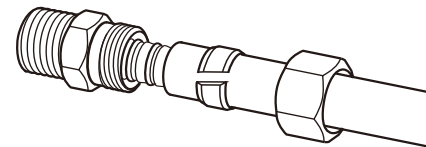
Step3:

Insert the nut and the compression ring into the pipe in turn, and note that the end of the threaded opening faces the end face of the pipe.



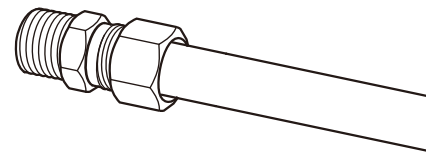
Step2:

Insert the fitting core into the tube bore along the tube axis to ensure complete insertion. During the insertion process, care must be taken not to damage the O-ring on the core.



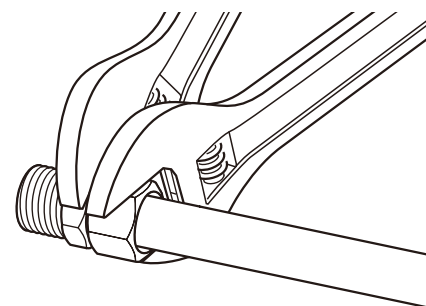
Step3:

Finger tight the screw nut.



Step4:

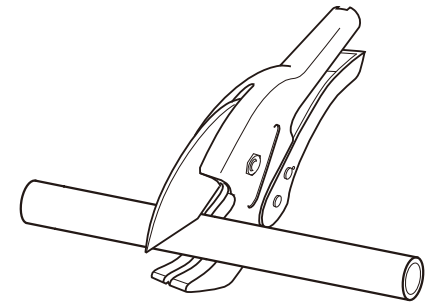
Tighten the nut with a wrench



Press Fitting

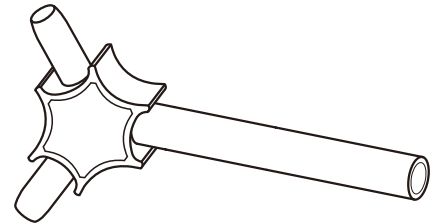
Step1:

Cut the pipe vertically by RIIFO pipe cutter. Make sure to cut it quickly and precisely.



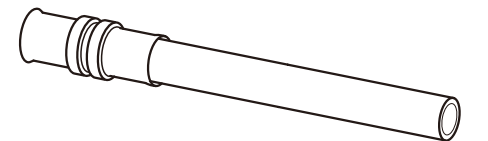
Step2:

Use a plastic reamer to round and bevel the end holes of the pipe.



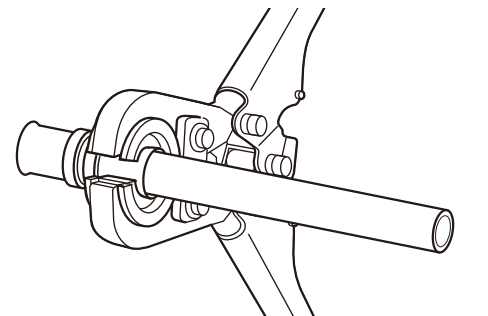
Step3:

Choose the right size sleeved-fitting for the pipe and aim the pipe end at the ring-shape hole of the fitting integrated with stainless steel sleeve. Push the pipe into the fitting up to the shoulder. Check the inserting depth by looking through the inspection holes on the sleeve shoulder, to ensure that the pipe is completely inserted.



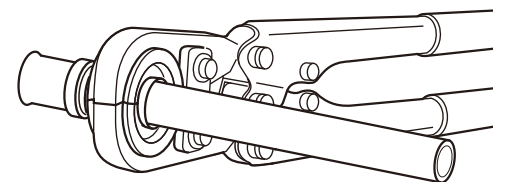
Step4:

Open the pressing tool and position the tool right onto the stainless steel sleeve.



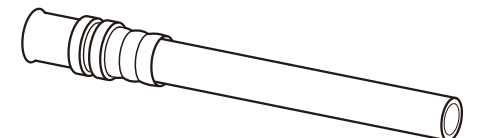
Step5:

F5(U profile)The margin of the block must be placed against the press section.
F9(TH profile)The margin of the block must be placed into the groove of the press section.



Step6:

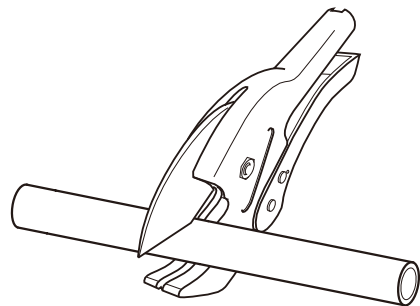
While the jaw is completely closed, the handles will be locked. Open the handles and remove the pressing tool from the fitting and the installation is complete.



Push-fit Fitting

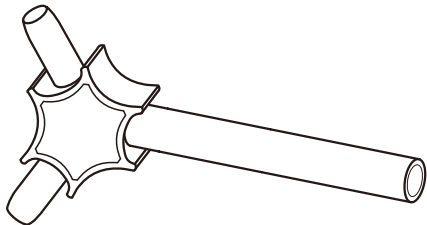
Cutting

Cut the pipe vertically by RIIFO pipe cutter. Make sure to cut it quickly and precisely.



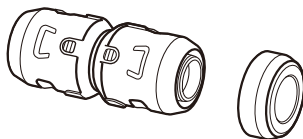
Reaming

Use a plastic reamer to round and bevel the end holes of the pipe.



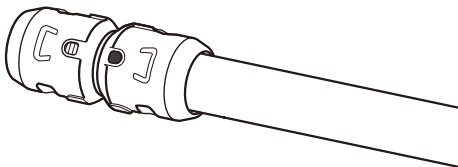
Removing

Removing the protective cap from the fitting. Make sure that both the fitting and pipe are clean and free of dirt and debris before making a connection.



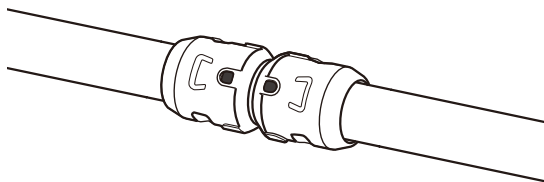
Inserting

Choose the right size push-fitting for the pipe, push the pipe into the fitting firmly. Pay attention not to insert the pipe at an angle.



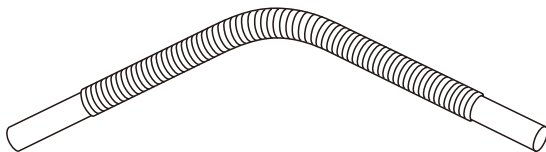
Checking

Checking the installed fitting, it is indicating that the fitting is properly installed if the green indicator ring can be seen through the inspection holes.

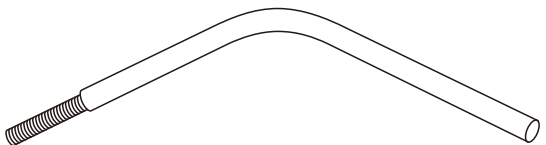


Bending Pipes

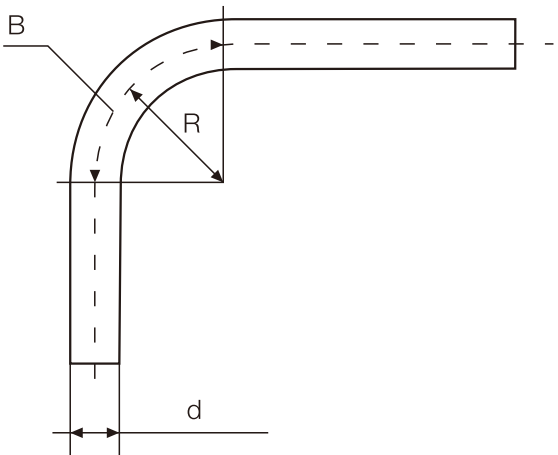
1) For pipes with a nominal diameter D_e not greater than 32mm, the pipe itself should be used for direct bending when turning. The bending radius of the direct bend, centered on the pipe axis, should not be less than 5 times the size of the pipe.



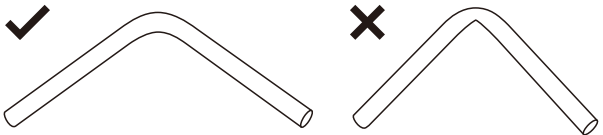
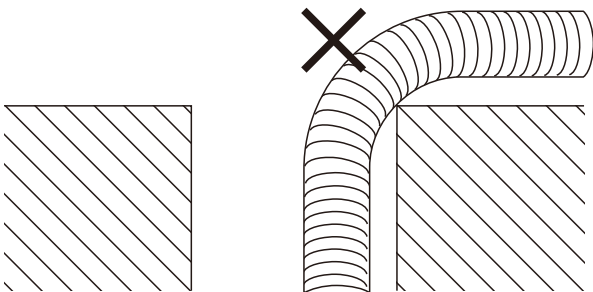
2) The minimum outer diameter of the bent pipe is measured from the center of the pipe, as shown in Figure below.



3) After bending the pipe, ensure that there is no twisting knot, wrinkle or crack, and the outer layer of PE and aluminum is not damaged.



4) Pipes installed through ceiling and wall openings must not bend at the edges



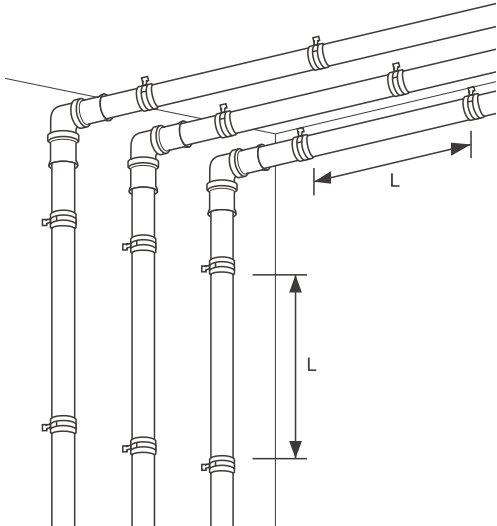
CONSTRUCTION STANDARD

When Mounting Pipes On Surfaces

RIIFO recommends that you use straight lengths of pipes when mounting on surfaces. Pipe brackets must be used when fixing multilayer pipes to the wall or ceiling. The suspension brackets are made from a synthetic material or from metal and have a rubber inlay for protecting the pipe. The specified maximum distance between the brackets must be adhered to. See table below.

Maximum support spacing of pipeline

Nominal outer diameter	Standpipe support spacing (mm)	Crosspipe support spacing (mm)
12	500	400
14	600	400
16	700	500
18	800	500
20	900	600
25	1000	700
32	1100	800
40	1300	1000
50	1600	1200
63	1800	1400
75	2000	1600



Compensate For Linear Expansion

- 1) For pipes with a nominal diameter of 32mm, there is no compensation when laying directly or non-directly.
- 2) For pipes with a nominal diameter 40mm, the pipe should be turned as far as possible to compensate for expansion and contraction with free arms.
- 3) For pipes with a nominal outer diameter of 40mm or more, when the distance between cold water pipes is 6m, and the distance between hot water pipes is 3m. When the fixing bracket is fixed, the pipe retractor may not be provided.
- 4) Free-arm should be set at the branch pipe part of the indoor pipe leading from the main pipe to the water supply equipment or container.
- 5) The pipe sections buried in indoor pipes may not be provided with pipe expansion compensation devices.

$$\Delta L = L \cdot \alpha (0.65 \Delta t_s + 0.1 \Delta t_g)$$

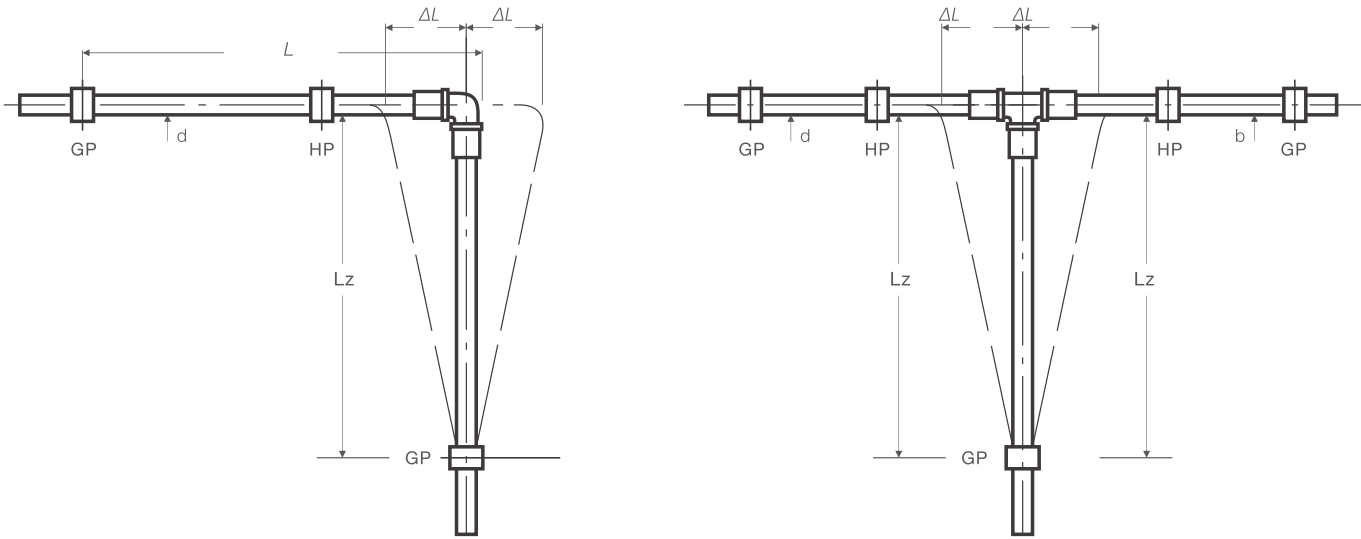
ΔL = Telescopic length of the pipe, mm
 α = Linear expansion coefficient of the pipe, mm / m.°C, take 0.025
 L = Length of the pipe, m
 Δt_s = Maximum temperature change of water in the pipe, °C
 Δt_g = Maximum environment temperature change of the outside the pipe, °C

Compensation For Pipeline

Expansion bends

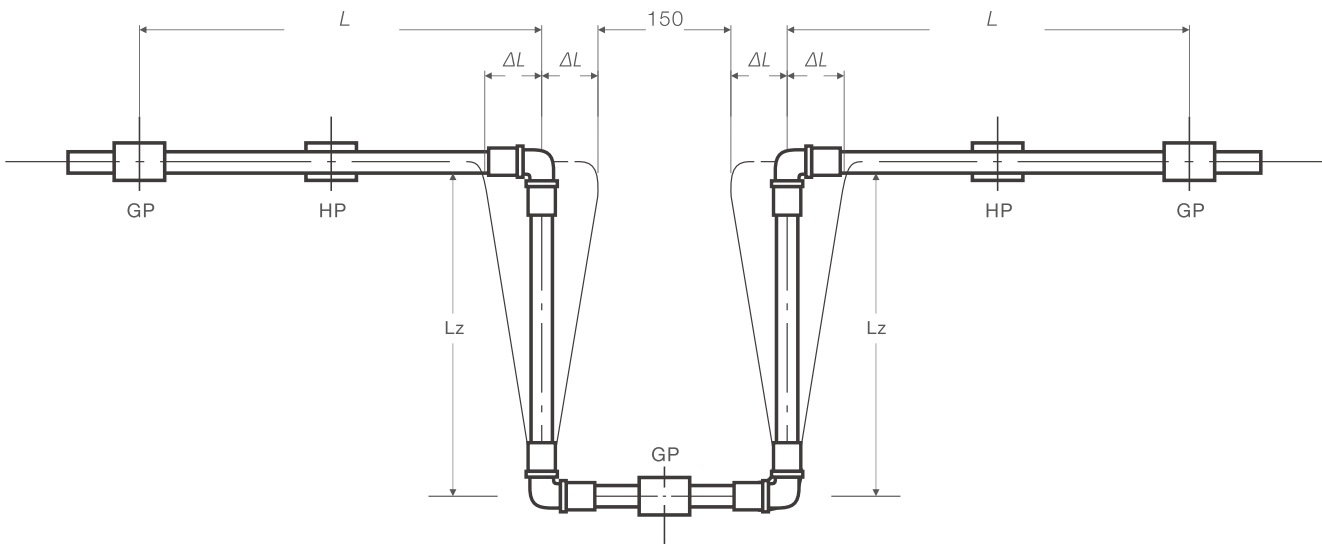
It is very important that sliding points and fixed points are positioned correctly when you use expansion bends and expansion loops. You should use expansion bends whenever the pipe changes direction. We recommend that you always use fittings to make the direction change. For pipes with a diameter of 32 mm orgreater this is compulsory

L= length of the pipe
Lz=Minimum free arm
 ΔL = change in length
GP =fixed point
HP = sliding point
Expansion bend for L (L_b)



Expansion loops

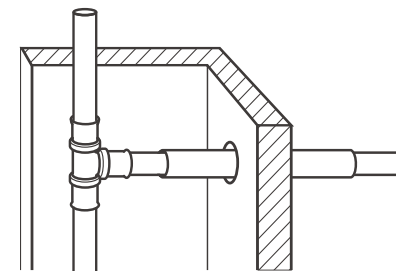
When a long pipe does have any change of direction, you should use expansion loops. An expansion loop is also called a lyra or omega bend. The drawing shows an expansion bend more clearly. The expansion loop is formed in principle from two expansion bends. A fixed point must therefore be provided at the bottom in the middle of the loop



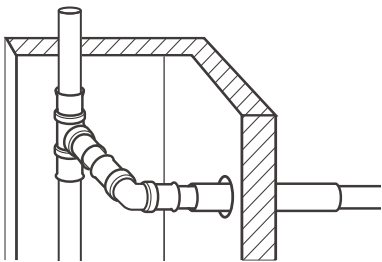
Pipe Laying In The Wall

- 1) The pipe sheath tube laid in the wall should not be larger than 25mm, the wall should be solid wall, and the surface of the pipeline should have a protective sleeve. There is no joint in the middle of the embedded pipe. The height of the horizontal pipe from the ground should not be greater than 0.45m, with the hot water pipe up and the cold water pipe down.
- 2) The groove of the pipeline directly buried in the leveling layer of the floor (ground) in the residence should not be greater than 25mm.
- 3) When the entrance pipe passes through the outer wall, holes should be added, and the height of the hole should be determined according to the building. In general, the clear height above the pipe top should not be less than 100mm. Pipes with a nominal length De of not less than 40mm should be bent into the house after horizontal bending.
- 4) The load-bearing displacement of the foundation at the bottom of the buried pipeline trough is less than 80kN/ , and there must be no sharp, hard protrusions. When backfilling pipe trenches, the filling within 100 mm around the pipe shall not contain sharp hard stones larger than 10 mm.
- 5) In addition to the freezing depth, the depth of the soil layer on the top of the underground buried pipeline on the non-traveling ground should not be less than 300mm, and the depth of the traveling ground should not be less than 600mm.
- 6) Where the pipe protrudes from the indoor floor, it should be a metal sleeve with a length of not less than 100mm, and the root of the sleeve should be inserted into the ground by 30-50mm.

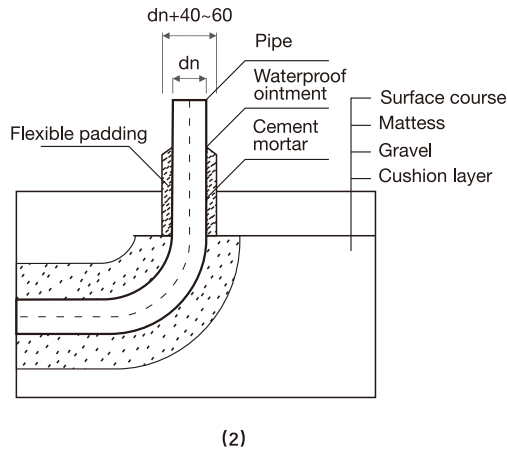
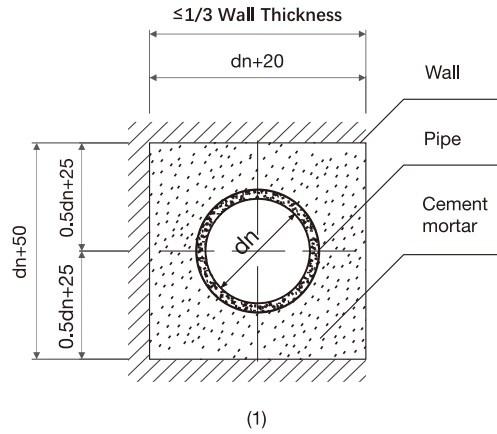
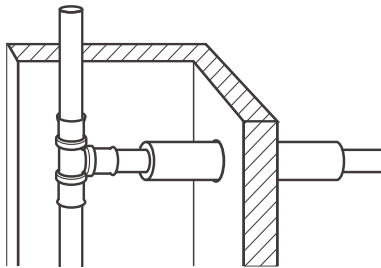
It should be ensured that the pipeline can move freely when passing through the riser in the shaft between floors. In this case, the change in length can also be achieved here by expanding the elbow. The expansion elbow will then adapt to the upward and downward movement.



If there is room to accommodate the expansion bends, it is sufficient to install the sheath tube on the pipe passing through the wall.



If the shaft is too small to fit the expansion bends, the hole in the wall must be made larger to allow enough room for the pipe to move. Pipes must provide insulation when passing through walls.



Non-direct Buried

Expansion loops

Aluminum-plastic pipes can be laid in pipeline wells, suspended ceilings, behind decorative panels, and overhead floors on the floor.



Expansion loops

Aluminum-plastic pipes can also be exposed, but when exposed, they must not pass through bedrooms, storage rooms, substations, computer rooms, and other rooms where water or water may damage equipment or items. Toilet bowl. Protective measures should be taken in places where collision, freezing or direct sunlight is possible.

Installation Exposed To Uv And Illuminant

The aluminum-plastic composite pipe should not be exposed outdoors. When it is required to be exposed outdoors:

- (1) The surface-mounted pipes outside shall be arranged in a place that is not directly exposed to sunlight or have shading measures.
- (2) Frost prevention measures shall be taken when the pipes are installed outdoors in freezing areas.



Potential Equalization

(1) RIIFO aluminum-plastic piping system cannot be embedded with grounding conductors.



(2) After replacing the existing metal pipes with RIIFO aluminum-plastic piping system, the potential equalization and the effect of the electrical protection device must be verified by an electrician.

Exposure To High Temperatures

The water supply pipeline should be far away from the heat source. The clear distance from the riser to the stove side should not be less than 0.4m, the distance from the gas water heater should not be less than 0.4m, and the distance from the electric water heater should not be less than 0.2m. Insulation measures should be taken when this requirement is not met.



During construction, for maintenance or repair operations near heat sources, care must be taken not to expose aluminum-plastic pipes to open flames (heat welding), floodlights, or other local heat sources, otherwise the service life will be severely shortened and the pipeline system may be permanently damaged.

Antifreeze, Heat Insulation

- (1) The buried lead-in pipe of the building shall not be less than 300mm in depth.
- (2) The thermal conductivity of the aluminum-plastic composite pipe can be calculated as 0.45 (W/m·K). Directly buried hot water pipes need not be insulated. For hot water pipes with open or indirect burying and dark application, the size of the system can be calculated to determine whether an insulation layer is required.



- (3) Cold water pipes that may freeze should be insulated.
- (4) The insulation layer of outdoor exposed pipelines should have measures to prevent rainwater from penetrating into the insulation layer.
- (5) In areas where cold water pipes are condensed, a dew-proof and cold insulation layer should be used.
- (6) Outdoor exposed pipes without insulation or cold insulation layer should be protected from sunlight and can be wrapped with black polyvinyl chloride film.

Installation Variations

Loop installation

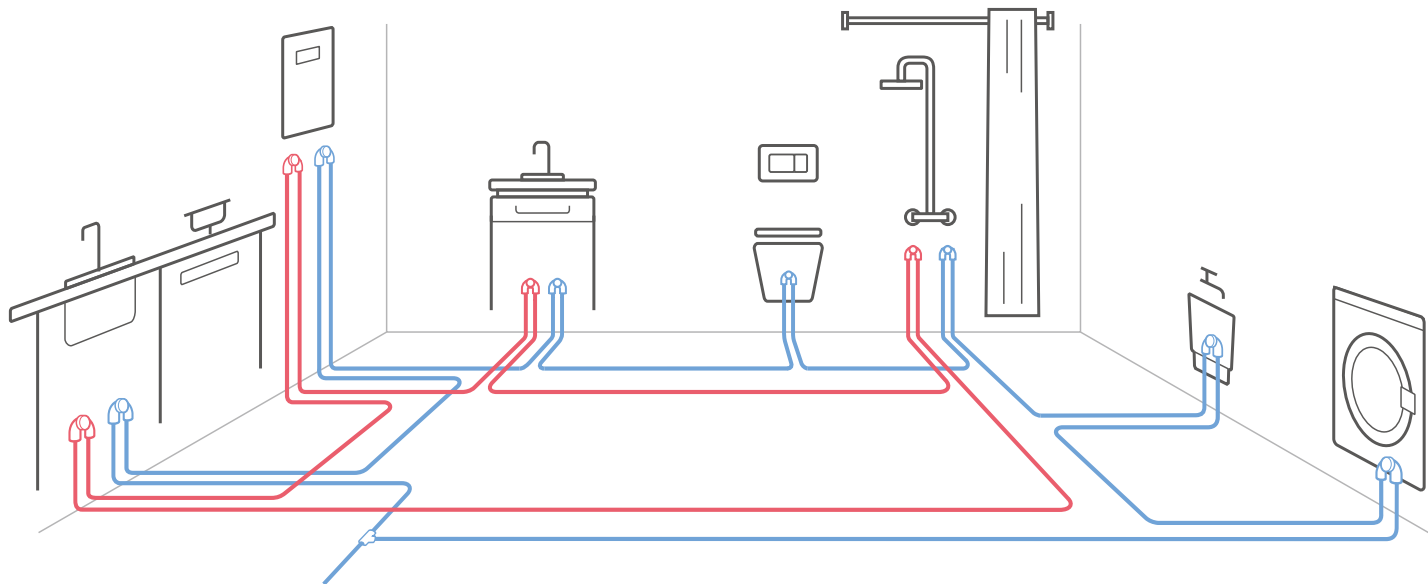
T-fitting installation, as the most commonly deployed installation method, the set up usually starts with a larger dimension that is reduced gradually up to the last tap. It is necessary to install a single pipe from the T-fitting to the tap even though the piping efforts are minor.

The installation variant with T-fittings should only be used for taps that are in use on a daily or regular basis; however, a minimum risk to hygiene cannot be safely excluded due to stagnating water.

Initially larger pipe dimensions could minimized the pressure losses in the installation system.

Even at a low operational pressure, consumers could still benefit from a high level of comfort at the tap.

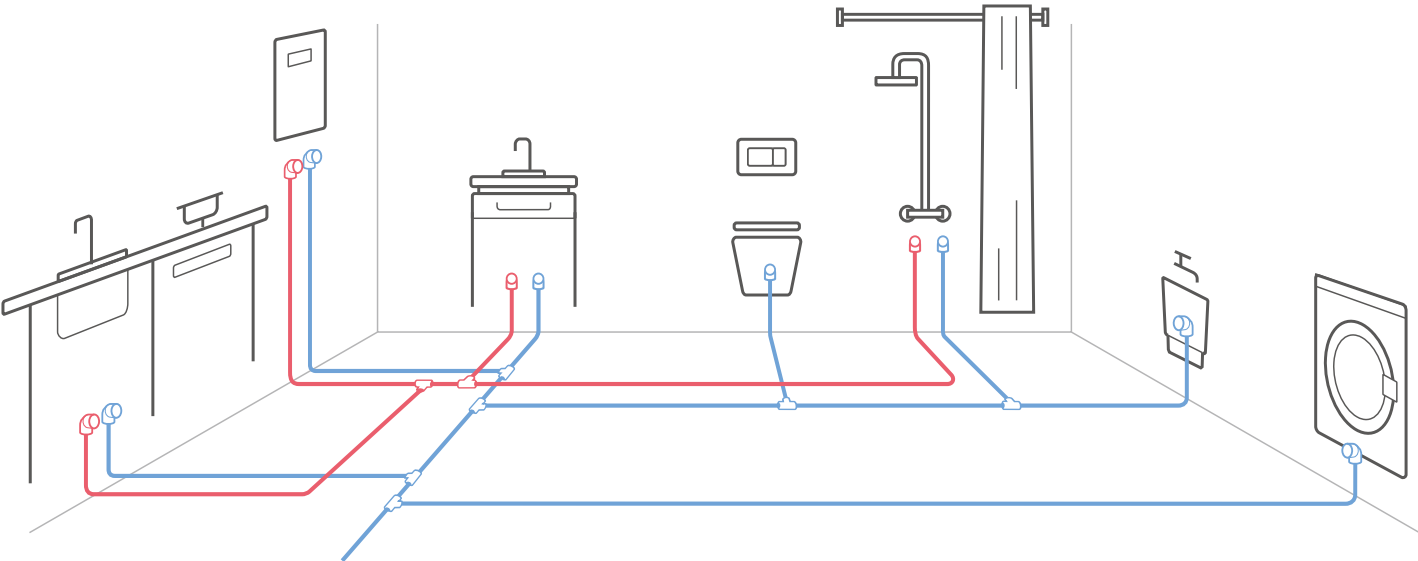
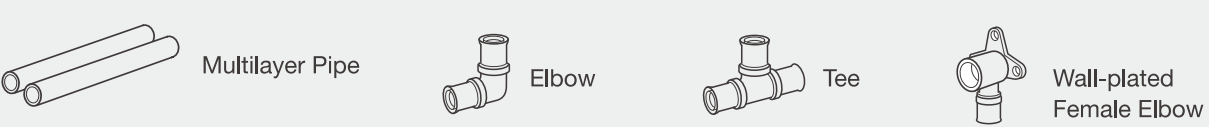
The advantage of the entire scene installation is that it can effectively reduce costs.



T-fitting installation

The U-profile Tap Elbow is used as the connection of the taps to the loop installation and route the PPR pipe directly to the next tap. However, the piping will be routed back to the riser from the last object. Therefore, due to the optimized water circulation in the piping, the ring installation system is impeccable in terms of hygiene. In order to achieve a consistent hygienic flow in the loop installation, it is recommended to choose pipes with the same diameter as far as possible and less than that of the serial installation, as the objects are supplied from both sides.

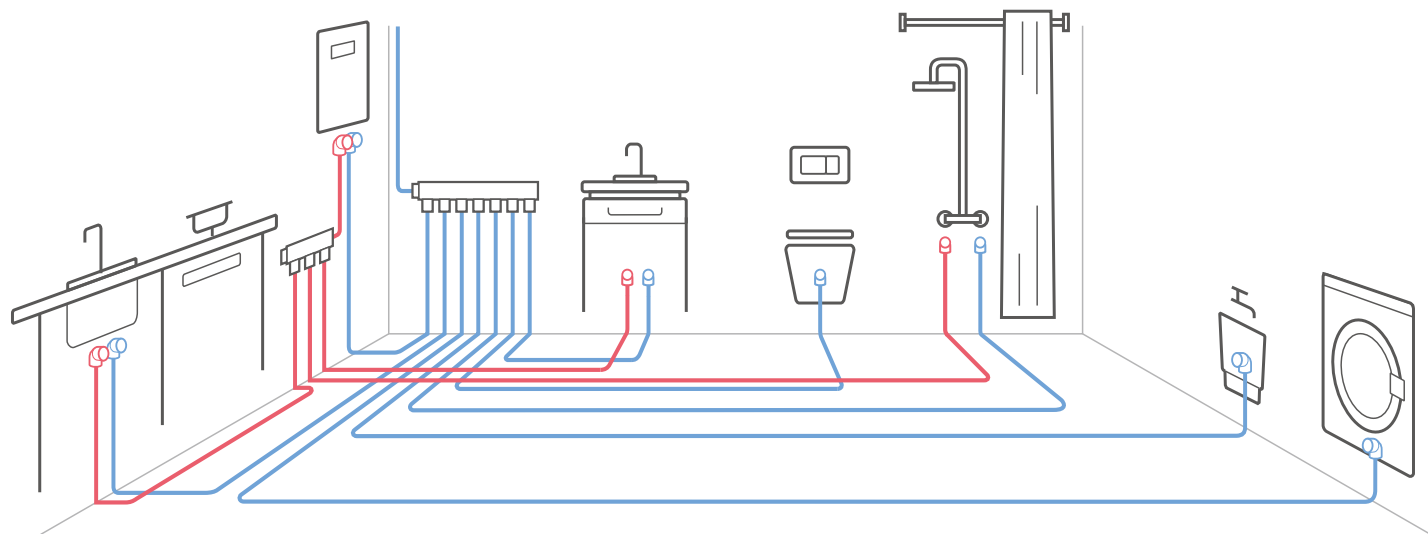
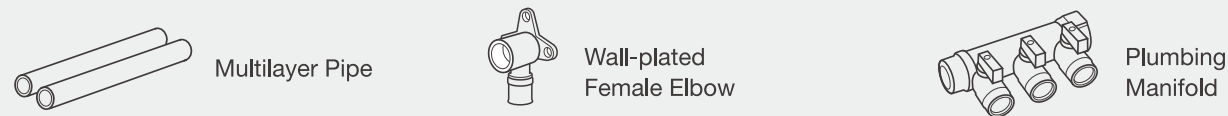
New U-profile tap elbow perfectly fits into hygiene oriented and water flow rate optimized installations using different loop installation methods.



Manifold installation

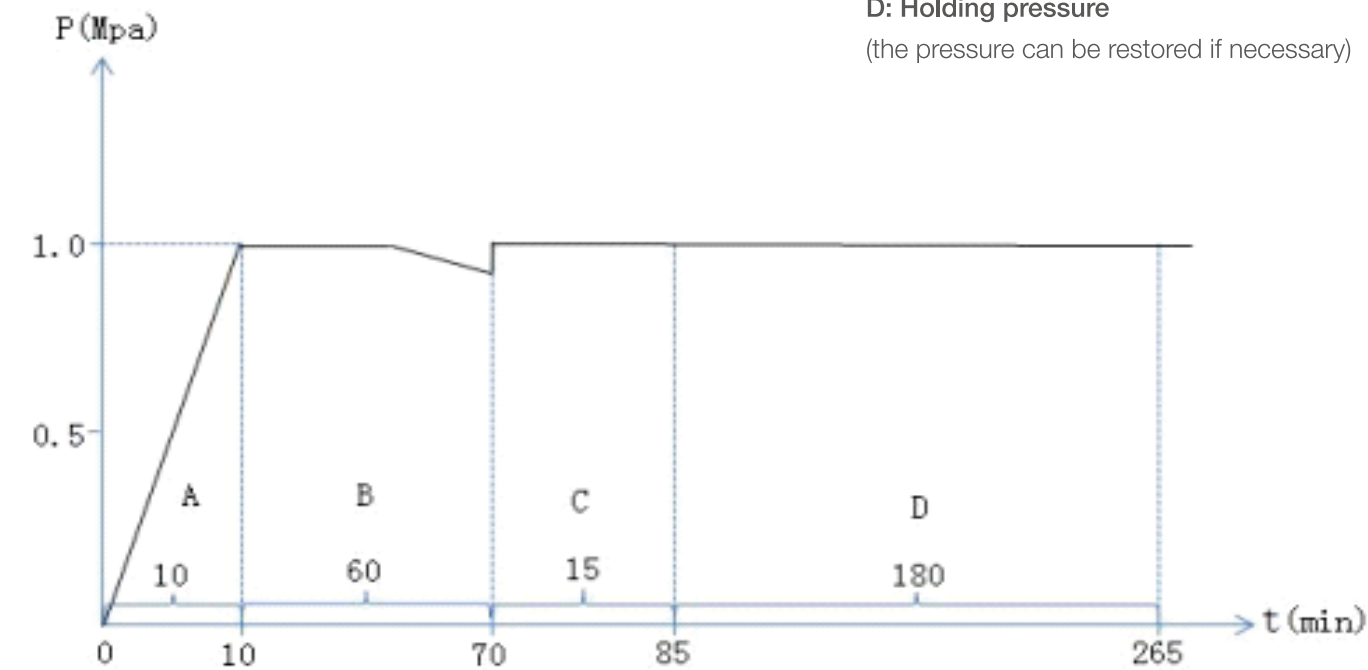
The plumbing manifolds system consists of separate manifold chambers for hot and cold water distribution. The cold water manifold feed the water through main service line, and hot water flows from the water heater and separate from the cold water line.

The water pressure is maintained by main service line, and the manifolds system offer an end to end installation that can reduce the use of pipe fittings, thereby reducing the risk of pressure drop, and the risk of leakage will also be greatly reduced.



Pressure Testing

The pressure testing should be carried before the acceptance check. Testing standard differs from different regions. Here shows a reference:



- A: Slowly pressurization**
- B: Pressure stabilization**
(recover pressure if necessary)
- C: Pressure test time**
- D: Holding pressure**
(the pressure can be restored if necessary)

- Using a manual pressure pump to slowly pressurize the pipeline to 1.0 MPa. During this pressurization process, the time should not be less than 10 minutes.
 - If the difference between ambient temperature and water temperature exceeds 10 °C, wait 30 minutes.
 - After pressurizing, maintain the pressure for 60 minutes, and check that there is no leakage in the pipe and all connection in the piping system.
 - After maintaining the pressure for 60 minutes, the pressure may decrease. It is necessary to raise it to the specified test pressure.
 - Within 15 minutes, the pressure drop should not exceed 0.05MPa.
 - After the pressure test is completed, the holding pressure test is performed again. Pressurize the system to the test pressure again for 180 minutes.
 - During the test, visually inspect all connection and pipes for leaks
 - Record the pressure in the pipeline system during the test time. If the test pressure decreases and exceeds the specified value:
 - Check the installation, outlet and connection again.
 - After resolving the cause of the pressure drop, repeat steps 1-7 when no leaks are found in the visual inspection, the pressure test ends.
- The above guidance serves as reference. In actual usage, it is recommended to follow the local custom or the specified project requirements.