

⚠ Notes

- The numerical values indicating the usable range of chemical resistance and liquid pressure and temperature of our company' s products listed in this catalog are given as a rough guide to help customers select our products. These values do not guarantee performance, durability, or useful life.
- Please refrain from using our company' s products in conditions that deviate from the usable range described in this catalog, as this may place an unexpected load on the product.
- If you are thinking about using our company' s products in an environment where there is a risk of personal injury or property damage, please make sure to consult with our sales office first.
- The useful life of products depends on a variety of factors. Therefore, please understand that even if you use products within the usable range described in this catalog, the useful life of products may change depending on the balance of multiple use conditions, environment, etc.
- Equipment that uses our company' s products must be subject to regular inspections according to conditions of use, in order to prevent damage to the products and accidents caused by or related to the product. Consult with us regarding the period and methods of inspections.
- Please understand that this catalog may be revised without prior notice due to reasons such as product improvement, design changes, or cessation of production. For this reason, please check with us that the catalog is the latest version when selecting a product.



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Distribution outlet



※Please note that standards/specifications in this catalogue are subject to change without notice in the interest of product improvement.

Glass Reinforced Polypropylene

Fuji GRP drain pipe

Two-layer reinforced polypropylene pipe



FUJIKAKO Co., LTD

Version 2024.01

Glass Reinforced Polypropylene

Low thermal expansion and High temperature resistance Fuji GRP drain pipe



Laboratory



Pharmaceutical



Hospital



Food-plant



Kitchen

GRP flange P15



Short drain pipe with core ring P16



Drain valve socket P17



Short drain pipe with flange P15



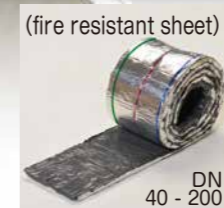
Drain tee P13



Drain 45°Y P14



Fire compartment penetration P19



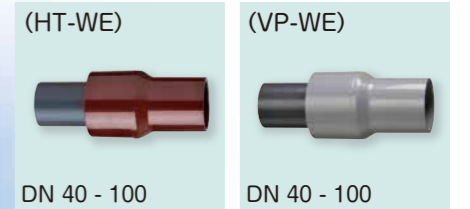
Drain electrofusion TY P13



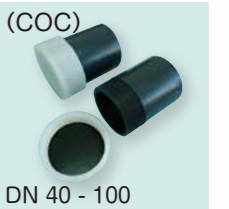
Electrofusion 45° P12



Transition adapter P19



Drain-screw-cap-type cleaning port P18



Drain-flange-type cleaning port P17



Electrofusion elbow P12



Expansion joint for drain stack P18



Electrofusion socket P11



FUJIKAWA Quality

Fuji GRP drain pipe

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1. Features of GRP drain pipe (two-layer reinforced polypropylene pipe)

The Fuji GRP drain pipes are integrally molded two-layer pipes which consist of polypropylene resin on the inside and FRTP (fiberglass reinforced thermoplastics), glass fiber reinforced polypropylene resin, on the outside.

Thus, the GRP drain pipes have characteristics of high strength and small thermal expansion coefficient.

1. Low thermal expansion

The thermal expansion coefficient is much smaller than that of the other plastic pipes and the pipe expansion is small after pipe laying. So it is most suitable for ceiling-hung piping and open piping.

■ Thermal expansion coefficients of pipe material

($\times 10^{-6} / ^\circ\text{C}$)

Pipe material	GRP pipe	PP pipe	Rigid PVC pipe	Stainless steel pipe	Steel pipe
Thermal expansion coefficient	24	110	70	17	12

2. Excellent corrosion resistance

The products can be used in high temperatures and for high concentration of kitchen detergent, acids, alkalis, and bases.

3. High and low temperature resistance

Having high low/high temperature resistance, they can be used in temperatures from -10°C to 100°C .

4. Extremely light

The products are light with specific gravity of 1.03, which is about 1/8 of that of steel pipes. It is easy to transport and install them.

5. Excellent mechanical strength

The strength reduction rate of hot areas is lower than that of other thermoplastic synthetic resin pipes because the resin is reinforced by glass fibers.

6. No electrolytic corrosion

Because the products have high electrical insulation properties, you do not need to worry about electric corrosion by any fluid transportation.

7. Excellent weather resistance

Stabilizer has been contained so that the products can withstand the long-time outdoor use.

8. Low thermal conductivity

The thermal conductivity is very low, being about 1/270 of that of steel pipes. It is hard to conduct heat.

9. No toxic gas occur during combustion

Polypropylene and additives used in raw materials do not contain toxic gas product such as halide. So the products are environmentally friendly with little incineration residue.

2. Physical properties

Please use GRP drain pipes at operating temperatures/pressures or lower in the table below.

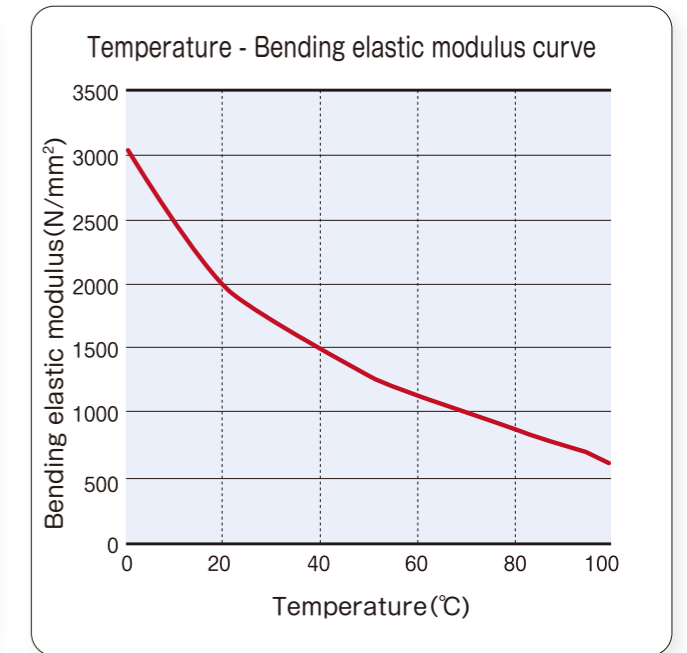
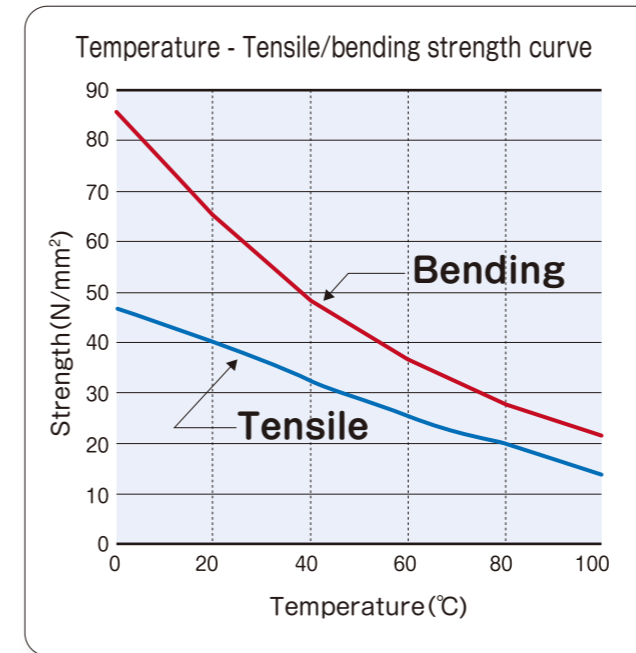
Operating temperature	-10°C~100°C
Operating pressure	No pressure (gravity flow)
Full water test	Head pressure 10 m or lower (0.1MPa-G) at normal temperature

Item	Unit	GRP pipe
Specific gravity	-	1.03
Tensile strength	N/mm ²	39.2
Bending strength	N/mm ²	63.7
Tensile elastic modulus	N/mm ²	1225.8
Bending elastic modulus	N/mm ²	1961.3
Shear strength	N/mm ²	24.5
Compressive Strength	N/mm ²	39.2
Expansion	%	>3
Poisson's ratio	-	0.40
Vicat softening point	°C	130.3
Coefficient of thermal expansion	/°C	24×10 ⁻⁶
Voltage endurance	kV/mm	30~32
Volume resistivity	Ωcm	>10 ¹⁶
Thermal conductivity	W/m·K	0.17~0.23

*The above physical property values are at normal temperature.

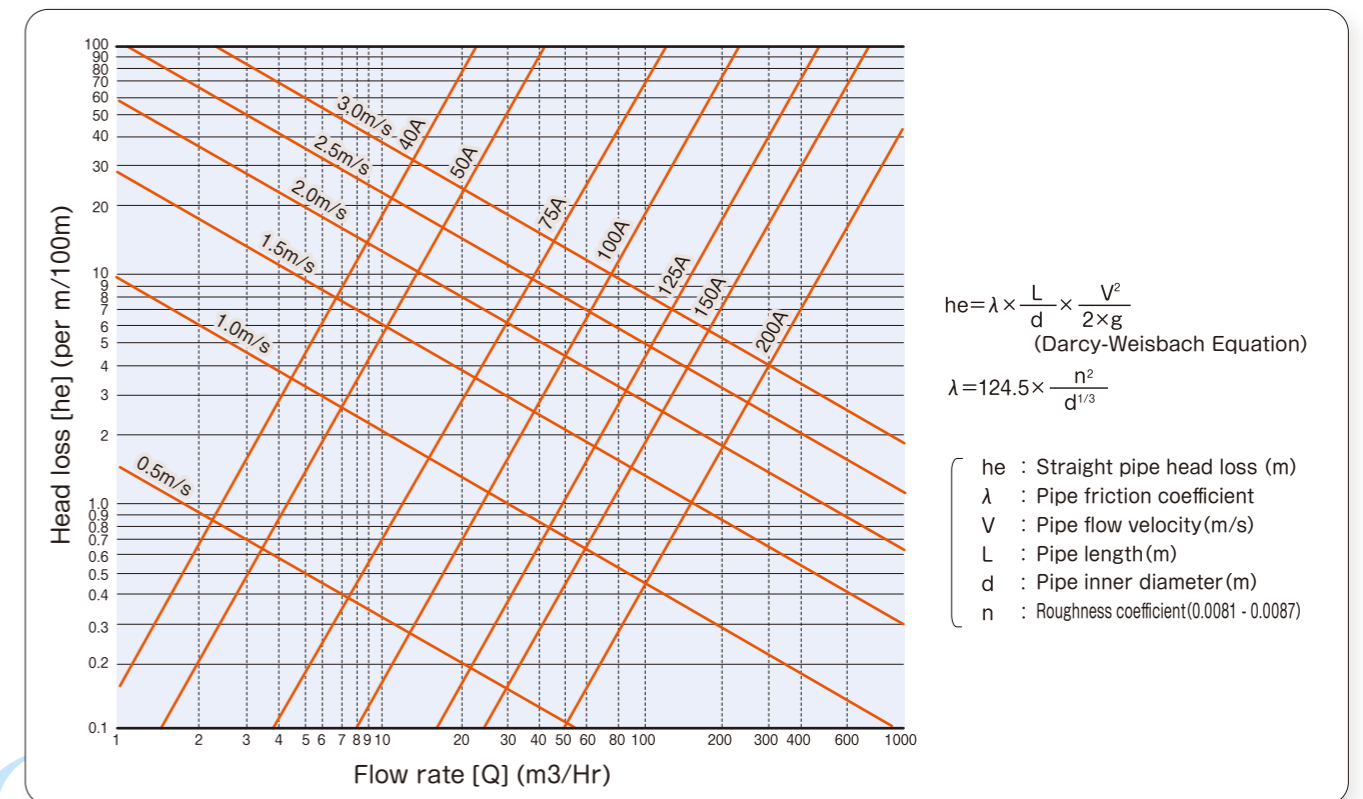
3. Temperature dependence

Because the GRP drain pipes are made of thermoplastic resin, they are easily affected by temperature changes. Special attention should be paid when designing piping or using pipes.



Head loss

The GRP drain pipes have extremely low fluid friction and smooth inner surface. Thus, substances such as scale hardly adhere to them, which prevents them from aging.



4. Chemical resistance

Name of Camical	Concentration %	Temperature (°C)					Name of Camical	Concentration %	Temperature (°C)					Name of Camical	Concentration %	Temperature (°C)				
		20	40	60	80	100			20	40	60	80	100			20	40	60	80	100
[Acids]						[alkali]						[Gasses]								
Sulfuric acid	5	[Hardly affected]					Sodium hydroxide	10	[Hardly affected]					Potassium bromide	Saturation	[Hardly affected]				
	10	[Hardly affected]						30	[Hardly affected]						Saturation	[Hardly affected]				
	30	[Hardly affected]						50	[Hardly affected]						Saturation	[Hardly affected]				
	50	[Hardly affected]						Potassium hydroxide	20	[Hardly affected]					Saturation	[Hardly affected]				
	70	[Hardly affected]					Saturation	[Hardly affected]					Saturation	[Hardly affected]						
	90	[Hardly affected]					Ammonia water	10	[Hardly affected]					Saturation	[Hardly affected]					
	98	(N/A)					30	[Hardly affected]					Saturation	[Hardly affected]						
Hydrochloric acid	10	[Hardly affected]					Barium hydroxide	Saturation	[Hardly affected]					[Organic chemicals]						
	20	[Hardly affected]					Saturation	[Hardly affected]					Benzene	100	(N/A)					
	30	[Hardly affected]					Calcium hydroxide	Saturation	[Hardly affected]					Toluene	100	(N/A)				
	38	[Hardly affected]					Magnesium hydroxide	Saturation	[Hardly affected]					Styrene	100	(N/A)				
Nitric acid	10	[Hardly affected]					[Bases]						Methyl alcohol	100	[Hardly affected]					
	15	[Hardly affected]					Sodium carbonate	Saturation	[Hardly affected]					Ethyl alcohol	100	[Hardly affected]				
	20	[Hardly affected]					Potassium carbonate	Saturation	[Hardly affected]					Glycerin	100	[Hardly affected]				
	40	[Hardly affected]					Ammonium carbonate	Saturation	[Hardly affected]					Ethyl ether	100	(N/A)				
	50	(N/A)					Sodium chlorite	10	[Hardly affected]					Ethylene glycol	100	[Hardly affected]				
Acetic acid	10	[Hardly affected]					20	[Hardly affected]					Ethyl acetate	100	[Hardly affected]					
	40	[Hardly affected]					30	[Hardly affected]					Butyl acetate	100	[Hardly affected]					
	50	[Hardly affected]					Sodium benzoate	35	[Hardly affected]					Amyl acetate	100	[Hardly affected]				
	80	[Hardly affected]					Aluminum chloride	Saturation	[Hardly affected]					Vinyl acetate	100	[Hardly affected]				
	97	[Hardly affected]					Calcium chloride	Saturation	[Hardly affected]					Trichloroethylene	100	(N/A)				
	97	[Hardly affected]					Calcium chlorate	Saturation	[Hardly affected]					Methylene chloride	40	[Hardly affected]				
Phosphoric acid	25	[Hardly affected]					Copper(I) chloride	Saturation	[Hardly affected]					Methylene chloride	40	[Hardly affected]				
	50	[Hardly affected]					Copper(II) chloride	Saturation	[Hardly affected]					Nitrobenzene	100	[Hardly affected]				
	85	[Hardly affected]					Iron(II) chloride	Saturation	[Hardly affected]					Aniline	100	[Hardly affected]				
Oxalic acid	30	[Hardly affected]					Iron(III) chloride	Saturation	[Hardly affected]					Pyridine	100	[Hardly affected]				
	55	[Hardly affected]					Potassium chloride	Saturation	[Hardly affected]					Acetaldehyde	100	[Hardly affected]				
Chromic acid	5	[Hardly affected]					Tin (I), (II) chloride	Saturation	[Hardly affected]					Formalin	35	[Hardly affected]				
	10	[Hardly affected]					Sodium chlorate	Saturation	[Hardly affected]					Acetone	100	[Hardly affected]				
	20	(N/A)					Hydrogen peroxide	1	[Hardly affected]					Cyclohexanone	100	[Hardly affected]				
Hydrofluoric acid	10	(N/A)					3	[Hardly affected]					Methyl ethyl ketone	100	[Hardly affected]					
Fluorosilicic acid	20	[Hardly affected]					10	[Hardly affected]					[Others]							
Boric acid	Saturation	[Hardly affected]					10	[Hardly affected]					Vaseline		[Hardly affected]					
Butyric acid	100	[Hardly affected]					Potassium perchlorate	10	[Hardly affected]					Olive oil		[Hardly affected]				
Carbonic acid	100	[Hardly affected]					Potassium permanganate	10	[Hardly affected]					Castor oil		[Hardly affected]				
Formic acid	100	[Hardly affected]					Lead acetate	Saturation	[Hardly affected]					Cottonseed oil		[Hardly affected]				
Oleic acid	100	[Hardly affected]					Copper cyanide		[Hardly affected]					Linseed oil		[Hardly affected]				
Citric acid	100	[Hardly affected]					Sodium cyanide		[Hardly affected]					Beer		[Hardly affected]				
Glycolic acid	100	[Hardly affected]					Silver nitrate		[Hardly affected]					Whisky		[Hardly affected]				
Succinic acid	100	[Hardly affected]					Sodium nitrate		[Hardly affected]					Wine		[Hardly affected]				
Tartaric acid	100	[Hardly affected]					Ammonium nitrate		[Hardly affected]					Seawater		[Hardly affected]				
Sulfamic acid	100	[Hardly affected]					Potassium bromate		[Hardly affected]					Water		[Hardly affected]				
Tannic acid	10	[Hardly affected]					Calcium hypochlorite	Saturation	[Hardly affected]					Syrup		[Hardly affected]				
Trichloro acid	10	[Hardly affected]					Sodium hypochlorite	Saturation	[Hardly affected]					Milk		[Hardly affected]				
Monochloro acid	100	[Hardly affected]					Sodium hypochlorite	Saturation	[Hardly affected]					Fructose	Saturation	[Hardly affected]				
Phenol	100	[Hardly affected]					Potassium bichromate	Saturation	[Hardly affected]											
Chlorosulfonic acid	100	(N/A)					Alum (various types)	Saturation	[Hardly affected]											
							Sodium dichromate	Saturation	[Hardly affected]											
							Salt water	Saturation	[Hardly affected]											
							Sodium fluoride	Saturation	[Hardly affected]											
							Potassium fluoride	Saturation	[Hardly affected]											
							Aluminum fluoride	Saturation	[Hardly affected]											

■: Hardly affected □: partially affected (can be used conditionally)

(Note) 1. The chemical resistance summary is based on the results of immersion tests on test pieces and our delivery records and it does not guarantee the performance of the products. If you have any questions, please contact our sales office.
 (Note) 2. Please do not use the products for steam piping.
 (Note) 3. If you use the products near a boiler, please inform us.

5. Corrosion resistance against kitchen detergent

detergent	Composition	Chemical resistance
A	Alkyd-amine oxide	○
	Carboxylate	○
	Alkyl polyglucoside	○
B	Propylene glycol	○
	Verdyl alcohol	○
	Monoethanolamine	○
	Alkylbenzenesulfonic acid sodium salt	○
C	Dipropylene glycol monomethyl ether	○
	Sodium hydroxide	○
	Alkyl polyglycoside	○
D	Non-ionic surfactant	○
	Organic acid salt, thickening agent, dye	○
E	Linear alkylbenzene sulfonate salt	○
	Sodium polyoxyethylene dodecyl ether sulfonate	○
F (Fryer cleaner, detergent for oil stains)	Alkyl betaine	○
	Food Red Dye No. 2	○
G (sterilization/bleaching agent)	Sodium hypochlorite 6% 20°C	○
	Sodium hypochlorite 6% 40°C	○
H (Neutral detergent)	Surfactant	○
	Polyoxyalkylene alkyl ether	○
	Coconut fatty acid alkanolamide	○
	Food Blue Dye No. 1	○
	Food Red Dye No. 106	○
I (Detergent of tableware for boiled noodles / descaling agent)	Phosphate	○
	Anionic surfactant	○
J	Sulfonate	○
K	N,N-Dimethyldodecylamine N-Oxide	○
	Sodium dodecyl sulfate	○
	Sodium poly(oxyethylene) dodecyl ether sulfonate	○
	Ethanol	○
L	Sorbitan fatty acid ester	○
	Glycerin fatty acid ester	○
M	Fatty acid sodium	○
	Glycerin	○
N	Phosphonocarboxylate	○

(Note) 1. The chemical resistance summary is based on the results of literature check and does not guarantee the performance of the product.
 (Note) 2. Please do not use the products for steam piping.

6. Thermal expansion/contraction and thermal stress

The thermal expansion coefficient of the GRP pipes is about 1/3 of that of vinyl chloride pipes. However, it is important to prevent applying excessive thermal stress on the pipes and joints by absorbing the expansion with the expansion joints and piping configuration, as with polyethylene pipes and vinyl chloride pipes.

1. Thermal expansion/contraction

$$\Delta L = L \times \alpha \times \Delta T$$

ΔL : Amount of expansion (mm)
 L : Piping length (mm)
 α : Thermal expansion coefficient of GRP pipe 24×10^{-6} (/°C)
 ΔT : Difference between outside temperature and working (design) temperature during piping installation (°C)

2. Thermal stress

If the temperature changes when both ends of the pipe are fixed, thermal stress will be applied to the pipe material.

$$\sigma T = E \times \alpha \times \Delta T$$

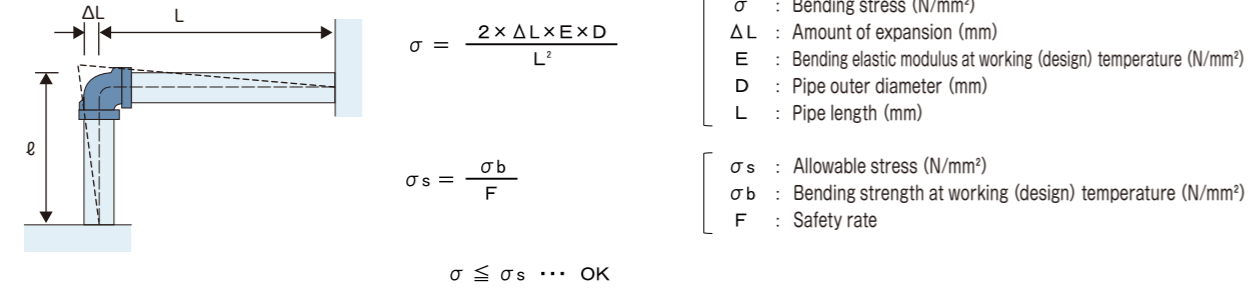
$$W = \frac{\sigma T \times \pi \times (D^2 - d^2)}{4}$$

σT : Thermal stress (N/mm²)
 E : Elastic modulus at working (design) temperature (N/mm²)
 α : Thermal expansion coefficient of GRP pipe 24×10^{-6} (/°C)
 ΔT : Difference between outside temperature and working (design) temperature during piping installation (°C)

W : Thermal load (N)
 σT : Thermal stress (N/mm²)
 D : Pipe outer diameter (mm)
 d : Pipe inner diameter (mm)

3. Measures for expansion/contraction

Because the joints are made of polypropylene which is flexible, the elbows in the piping can distribute bending stresses.



4. Pipe support interval

Pipe support interval (Fuji GRP) (m)

DN		Liquid piping								Gas piping			
		Liquid specific gravity = 1.0				Liquid specific gravity = 1.2				(Only pipe's own weight)			
		30°C	60°C	80°C	100°C	30°C	60°C	80°C	100°C	30°C	60°C	80°C	100°C
40	H-pipe	1.7	1.5	1.4	1.3	1.7	1.5	1.4	1.3	2.3	2.1	1.9	1.8
50		1.9	1.7	1.6	1.5	1.9	1.7	1.6	1.4	2.6	2.3	2.2	2.0
75		2.2	1.9	1.8	1.7	2.1	1.9	1.7	1.6	3.2	2.9	2.7	2.4
100	L-pipe	2.3	2.1	2.0	1.8	2.2	2.0	1.9	1.7	3.6	3.3	3.1	2.8
125		2.6	2.3	2.1	2.0	2.5	2.2	2.1	1.9	4.0	3.6	3.4	3.1
150		2.8	2.5	2.3	2.1	2.7	2.4	2.3	2.1	4.4	3.9	3.7	3.4
200		3.1	2.8	2.6	2.4	3.0	2.7	2.5	2.3	5.0	4.5	4.2	3.9

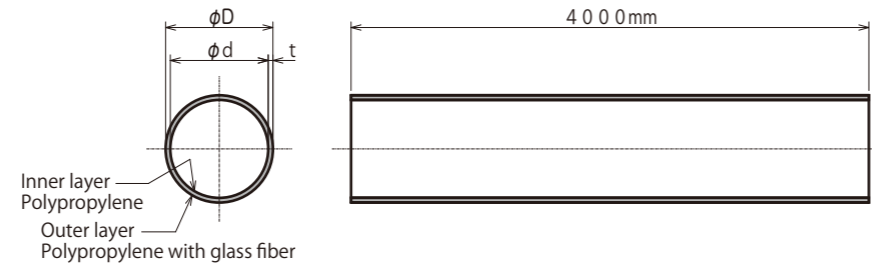
(Note) 1. Support the pipes at the interval of the above values or less.
 2. The values have been set so that the deflection amount is 10 mm or smaller under the condition of both-end simple support and uniformly distributed load.
 3. The support interval should be slightly shorter than the above values when there is vibration.
 4. The H-pipes above have the same specifications as those of Fuji GRP drain pipes (P). (However, their working pressure must satisfy the pressure specification described on P5.)

7. Product information

Product	DN	40	50	65	75	100	125	150	200
GRP drain pipe		●	●		●	●	●	●	●
Electrofusion socket (EFS)		●	●	●	●	●	●	●	●
Electrofusion elbow (EFL)		●	●		●	●			
Drain elbow (90°-WE)							●	●	●
Electrofusion 45° (EF-45)		●	●		●	●			
Drain 45° elbow (45°-WE)							●	●	●
Drain electrofusion TY (EF-TY)		●	●		●	●			
Drain TY (TY-WE)							●	●	●
Drain tee (T-WE)		●	●		●	●	●	●	●
Drain 45°Y (Y-WE)		●	●		●	●	●	●	●
Drain reducer (RE-WE)			●	●	●	●	●	●	●
Drain valve socket (VS-WE)		●	●		●	●			
Drain-flange-type cleaning port (CO)		●	●		●	●	●	●	●
Drain-screw-cap-type cleaning port (COC)		●	●		●	●			
Short pipe with drain flange (PF-WE)		●	●	●	●	●	●	●	●
Short pipe with drain core (CRP)		●	●		●	●	●	●	●
CRP Iron flange (IF)		●	●		●	●	●	●	●
Drain blind flange (BF)		●	●		●	●	●	●	●
Expansion joint for drain stack (TEP)			●		●	●	●	●	●
Fire compartment penetration (fire resistant sheet)		●	●		●	●	●	●	●
VP conversion adapter VP (VP-WE)		●	●		●	●			
HT conversion adapter (HT-WE)		●	●		●	●			
Short pipe with different diameter flange (RF-WE)				●					
GRP flange adapter (GR-FA)		●	●		●	●			
GRP flange (GR-F)		●	●		●	●			

8.[Product list] Pipe (P) Drain pipe joint Electrofusion joint

GRP drain pipe (P)



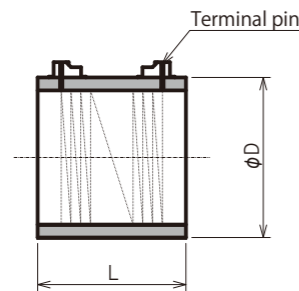
DN	Type of pipes	OD	GRP pipe					Code
			Thickness	Details of thickness		Approximate inner diameter	Reference weight	
				t	Inner layer (PP)			
40	H	48	4	1.5	2.5	40	0.55	7553016
50	H	60	5	1.5	3.5	50	0.87	7553024
75	L	89	5	1.5	3.5	79	1.32	7553077
100	L	114	5	1.5	3.5	104	1.71	7553079
125	L	140	6	2.0	4.0	128	2.51	7553081
150	L	165	7	2.3	4.7	151	3.45	7553083
200	L	216	8	2.7	5.3	200	5.18	7553085

(Note) 1.The H-pipes above have the same specifications as those of Fuji GRP drain pipes (P). (However, their working pressure must satisfy the pressure specification described on P5.)

Electrofusion socket (EFS)



DN 40 - 200



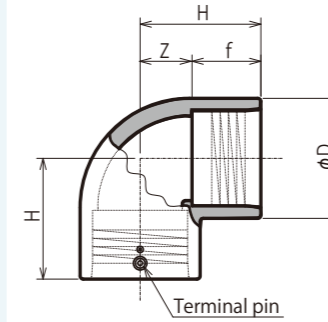
DN	φD	L	Code
40	59	80	7149202
50	73	96	7149207
75	108	121	7149217
100	135	126	7149221
125	165	163	7149226
150	194	171	7149231
200	253	215	7149236

9.[Product list] Drain pipe joint Electrofusion joint

Electrofusion elbow (EFL)



DN 40 - 100

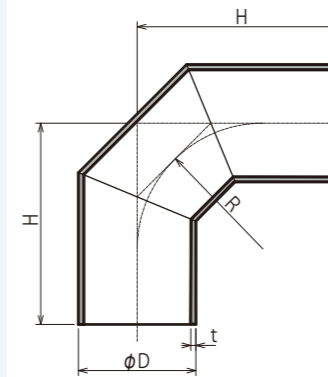


DN	H	f	Z	φD	Code
40	70	44	26	62	7149301
50	86	52	34	83	7149306
75	114	65	49	114	7149318
100	132	68	64	139	7149325

Drain elbow (90°-WE)



DN 125 - 200



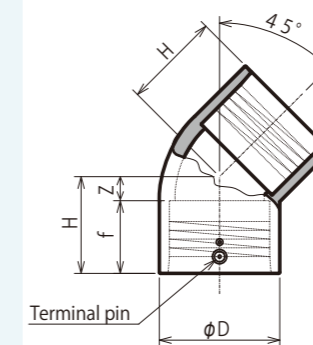
DN	H	t	φD	R	Code
125	240	6	140	150	7145592
150	270	7	165	178	7145609
200	370	8	216	232	7145617

(Note) For electrofusion, 2 pieces of EFS are needed.

Electrofusion 45° (EF-45)



DN 40 - 100

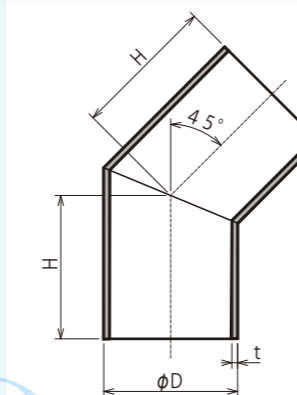


DN	H	f	Z	φD	Code
40	56	44	12	61	7150009
50	68.5	52	16.5	75	7150011
75	86.5	65	21.5	108	7150013
100	97.5	70	27.5	135	7150015

Drain 45°elbow (45°-WE)



DN 125 - 200



DN	φD	H	t	Code
125	140	150	6	7145477
150	165	170	7	7145485
200	216	200	8	7145493

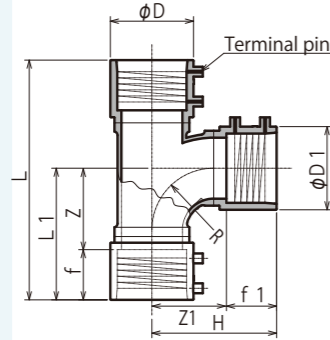
(Note) For electrofusion, 2 pieces of EFS are needed.

[Product list] Drain pipe joint Electrofusion joint

Drain electrofusion TY(EF-TY)



DN 40 - 100



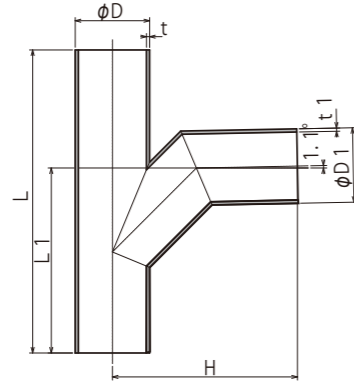
DN	L	φD	f	Z	R	φD1	f1	Z1	H	L1	Code
40×40	217.5	61	49	64	50	61	49	62	111	113	7150017
50×40	231.5	75	56	66	60	61	49	72	121	122	7150025
×50	249	75	56	76	60	75	56	74	130	132	7150019
75×40	248.5	108	65	69	80	61	49	92.5	141.5	134	7150027
×50	263	108	65	77	80	75	56	96	150	142	7150029
×75	310.5	108	65	105.5	80	108	65	96.5	161.5	170.5	7150021
100×40	241	135	58	70	100	61	49	113	162	128	7150031
×50	251	135	58	75	100	75	56	113	169	133	7150033
×75	291	135	58	101	100	108	65	116.5	181.5	159	7150035
×100	331	135	58	125	100	135	58	119.5	177.5	183	7150023

(mm)

Drain TY(TY-WE)



DN 125 - 200



DN	φD	φD1	L	H	L1	t	t1	Code
125×40	140	48	440	260	255	6	4	7148521
×50	140	60	455	265	265	6	5	7148523
×75	140	89	500	275	290	6	5	7148528
×100	140	114	530	290	315	6	5	7148530
×125	140	140	570	348	348	6	6	7146558
150×50	165	60	450	275	275	7	5	7148531
×75	165	89	490	290	280	7	5	7148534
×100	165	114	530	300	310	7	5	7148536
×125	165	140	570	358	348	7	6	7148538
×150	165	165	600	360	360	7	7	7146566
200×75	216	89	495	320	310	8	5	7148540
×100	216	114	530	325	310	8	5	7148542
×125	216	140	570	375	335	8	6	7148544
×150	216	165	600	386	360	8	7	7148545
×200	216	216	680	410	410	8	8	7146574

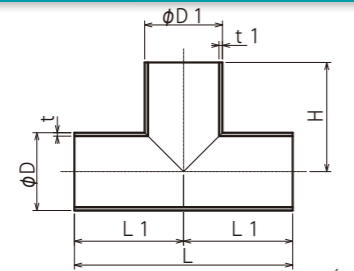
(mm)

(Note) For electrofusion, 3 pieces of EFS, EFL, EF-45, and EF-TY are needed.

Drain tee(T-WE)



DN 40 - 200



DN	φD	L	H	φD1	L1	t	t1	Code
40×40	48	200	100	48	100	4	4	7148581
50×40	60	200	90	48	100	5	4	7148593
×50	60	200	100	60	100	5	5	7148582
75×40	89	220	100	48	110	5	4	7148631
×50	89	240	110	60	120	5	5	7148633
×75	89	260	130	89	130	5	5	7148591
100×40	114	260	120	48	130	5	4	7148635
×50	114	270	130	60	135	5	5	7148637
×75	114	300	150	89	150	5	5	7148639
×100	114	320	160	114	160	5	5	7148592

(mm)

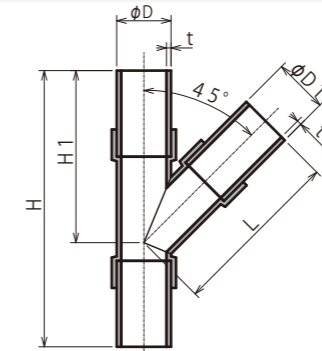
(Note) For electrofusion, 3 pieces of EFS, EFL, EF-45, and EF-TY are needed.

[Product list] Drain pipe joint

Drain 45°Y(Y-WE)



DN 40, 50



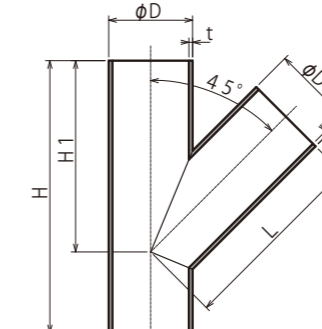
DN	φD	φD1	H	L	H1	t	t1	Code
40×40	48	48	265	160	164	4	4	7150101
50×40	60	48	280	170	175	5	4	7150151
×50	60	60	305	190	190	5	5	7150103

(mm)

(Note) For electrofusion, 3 pieces of EFS, EFL, EF-45, and EF-TY are needed.



DNr 75 - 200



DN	φD	φD1	H	L	H1	t	t1	Code
75×40	89	48	225	170	160	5	4	7148446
×50	89	60	245	180	170	5	5	7148450
×75	89	89	310	210	210	5	5	7147195
100×40	114	48	270	175	205	5	4	7148454
×50	114	60	290	180	220	5	5	7148456
×75	114	89	330	215	240	5	5	7148460
×100	114	114	370	260	260	5	5	7147196
125×40	140	48	290	210	220	6	4	7148462
×50	140	60	455	220	325	6	5	7148463
×75	140	89	500	245	350	6	5	7148468
×100	140	114	530	280	360	6	5	7148470
×125	140	140	570	370	380	6	6	7147150

(mm)

DN	φD	φD1	H	L	H1	t	t1	Code
150×50	165	60	450	240	330	7	5	7148471
×75	165	89	490	260	350	7	5	7148474
×100	165	114	530	295	370	7	5	7148476
×125	165	140	570	390	395	7	6	7148478
×150	165	165	600	400	415	7	7	7147168
200×75	216	89	495	300	380	8	5	7148480
×100	216	114	530	330	400	8	5	7148482
×125	216	140	570	420	420	8	6	7148484
×150	216	165	600	440	430	8	7	7148485
×200	216	216	680	460	475	8	8	7147176

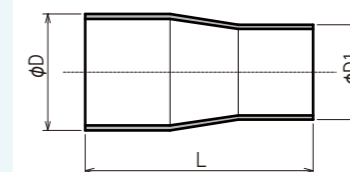
(mm)

(Note) For electrofusion, 3 pieces of EFS, EFL, EF-45, and EF-TY are needed.

Drain reducer(RE-WE)



DN 50 - 200



DN	φD	φD1	L	Code
50×40	60	48	179	7150371
75×50	89	60	237	7150375
100×50	114	60	267	7150379
×75	114	89	241	7150381
125×75	140	89	300	7150383
×100	140	114	274	7150385
150×75	165	89	340	7150387
×100	165	114	314	7150389
×125	165	140	298	7150391
200×100	216	114	413	7150393
×125	216	140	395	7150395
×150	216	165	371	7150397

(mm)

(Note) For electrofusion, 2 pieces of EFS, EFL, EF-45, and EF-TY are needed.

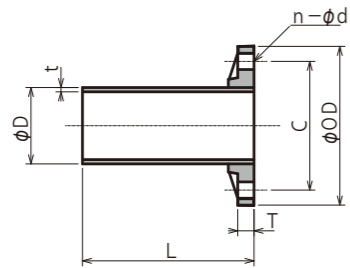
[Product list] Drain pipe joint

For FF (flat face)

Short pipe with drain flange(PF-WE)



DNr 40 - 100



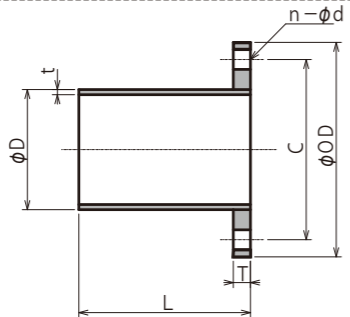
DN	φOD	φD	L	T	C	t	n	φd	Code
40	140	48	150	17	105	4	4	19	7149351
50	155	60	150	17	120	5	4	19	7149356
75	185	89	200	19	150	5	8	19	7149368
100	210	114	200	19	175	5	8	19	7149373

(Note) 1. The size of the outer diameter, pitch circle diameter, and bolt hole diameter conforms to JIS-10k.
 2. Torque value of the nominal-diameter-40 pipe is 14.7N·m(1.5kgf·m) and torque value of the nominal-diameter-50-or-larger pipe is 19.6N·m(2.0kgf·m).
 3. For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY is needed.

*JIS5K: Built-to-order product



DN 125 - 200

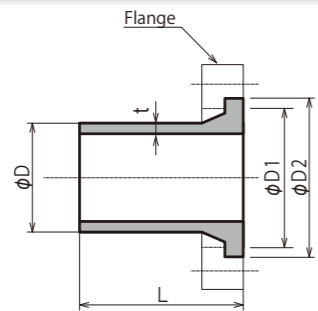


DN	φOD	φD	L	T	C	t	n	φd	Code
125	250	140	200	20	210	6	8	23	7149376
150	280	165	200	20	240	7	8	23	7149381
200	330	216	200	20	290	8	12	23	7149386

(Note) 1. The size of the outer diameter, pitch circle diameter, and bolt hole diameter conforms to JIS-10k.
 2. Torque value of the nominal-diameter-40 pipe is 14.7N·m(1.5kgf·m) and torque value of the nominal-diameter-50-or-larger pipe is 19.6N·m(2.0kgf·m).
 3. For electrofusion, 1 piece of EFS is needed.

*JIS5K: Built-to-order product

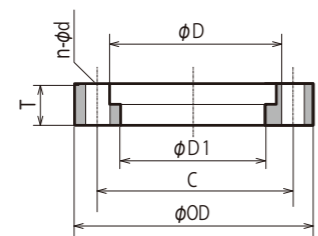
GRP flange adapter (GR-FA)



DN	φD	φD1	φD2	L	t	Code
40	48	60	74	100	4	7151051
50	60	75	91	110	5	7151053
75	89	102	125	130	5	7151061
100	114	121	151	140	5	7151065

(Note) 1. For bonding, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.

GRP flange (GR-F)



DN	φOD	C	T	φD	φD1	n	φd	Code
40	140	105	21	74	63	4	19	7151001
50	155	120	21	93	79	4	19	7151003
75	185	150	30	128	111	8	19	7151007
100	210	175	34	153	135	8	19	7151009

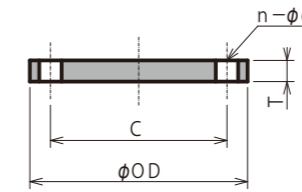
(Note) 1. Torque value is 20 N·m or higher.
 2. Use gaskets with double seal rings.
 3. When using the RF, combine the short pipe with drain core and iron flange.
 4. The combination of the GRP flange adapter and CRP iron flange (GR-FA) and the combination of the short pipe with drain core and GRP flange (GR-F) cannot be used.

[Product list] Drain pipe joint

Drain blind flange (BF)



DN 40 - 200



DN	φOD	C	T	n	φd	Code
40	140	105	16	4	19	7141341
50	155	120	16	4	19	7141343
75	185	150	18	8	19	7141347
100	210	175	18	8	19	7141349
125	250	210	20	8	23	7141351
150	280	240	20	8	23	7141353
200	330	290	20	12	23	7141355

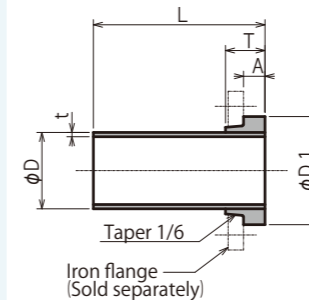
(Note) 1. The size of the outer diameter, pitch circle diameter, and bolt hole diameter conforms to JIS-10k.
 2. It cannot be used for CRP.

For RF (raised flange)

Short pipe with drain core (CRP)



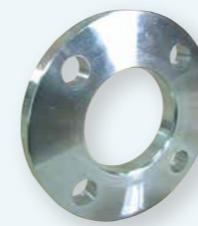
DN 40 - 200



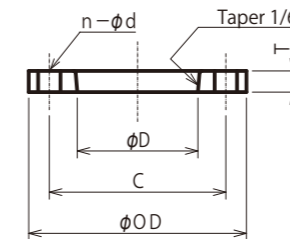
DN	φD1	φD	L	T	A	t	Code
40	80	48	150	39	20	4	7140906
50	90	60	150	39	20	5	7140914
75	126	89	200	46	25	5	7140935
100	146	114	200	46	25	5	7140951
125	181	140	200	48	25	6	7140958
150	211	165	200	50	25	7	7140966
200	258	216	200	50	25	8	7140974

(Note) For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.

CRP Iron flange (IF)



(Material)
 ○SS + Zn (plating)
 ○SUS304: Built-to-order product
 DN 40 - 200



DN	φOD	C	T	φD	n	φd	Code
40	140	105	16	61.5	4	19	1170169
50	155	120	16	73.5	4	19	1170171
75	185	150	18	102.5	8	19	1170175
100	210	175	18	127.5	8	19	1170177
125	250	210	20	153.5	8	23	1170179
150	280	240	22	178.5	8	23	1170181
200	330	290	22	229.5	12	23	1170183

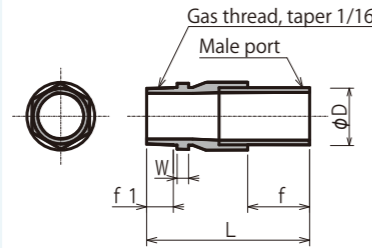
(Note) The size of the outer diameter, pitch circle diameter, and bolt hole diameter conforms to JIS-10k.

[Product list] Drain pipe joint

Drain valve socket (VS-WE)



DN 40, 50

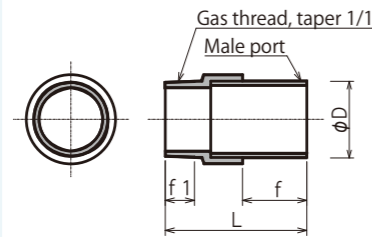


(mm)							
DN	ϕD	L	f	f1	W	Code	
40	48	145	55	25	10	7150351	
50	60	171	65	28	12	7150353	

(Note) For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.
1.Wrap a sealing tape (Teflon tape) around the thread of the joint about 2 times.
2.After tightening the bolt by 2 crests manually, screw it in by using a tool.



DN 75, 100



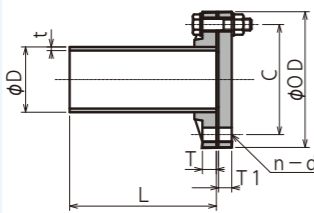
(mm)							
DN	ϕD	L	f	f1	W	Code	
75	89	165	75	34	-	7150359	
100	114	215	90	40	-	7150361	

(Note) For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.
1.Wrap a sealing tape (Teflon tape) around the thread of the joint about 2 times.
2.After tightening the bolt by 2 crests manually, screw it in by using a tool.

Drain-flange-type cleaning port (CO)



DN 40 - 100



(mm)												
DN	ϕOD	ϕD	L	T	T1	C	t	n	d	Bolt size	Code	
40	140	48	150	17	16	105	4	4	19	M16×65L	7145867	
50	155	60	150	17	16	120	5	4	19	M16×65L	7145869	
75	185	89	200	19	18	150	5	8	19	M16×70L	7145885	
100	210	114	200	19	18	175	5	8	19	M16×70L	7145887	

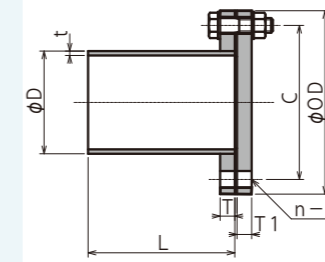
(Note) 1.The size of the outer diameter, pitch circle diameter, and bolt hole diameter conforms to JIS-10k.
2.Bolt material: SS + Zn (plating)
3.Gasket material : EPDM
4.Torque value of the nominal-diameter-40 pipe is 14.7N·m(1.5kgf·m) and torque value of the nominal-diameter-50-or-larger pipe is 19.6N·m(2.0kgf·m).
5.For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.

[Product list] Drain pipe joint

Drain-flange-type cleaning port (CO)



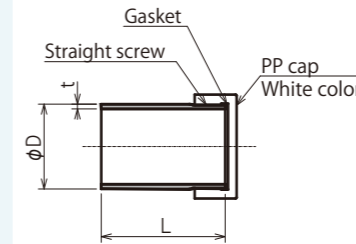
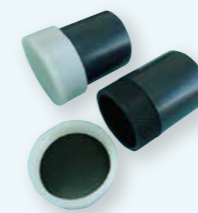
DN 125 - 200



(mm)												
DN	ϕOD	ϕD	L	T	T1	C	t	n	d	Bolt size	Code	
125	250	140	200	20	20	210	6	8	23	M20×75L	7145876	
150	280	165	200	20	20	240	7	8	23	M20×75L	7145877	
200	330	216	200	20	20	290	8	12	23	M20×75L	7145879	

(Note) 1.The size of the outer diameter, pitch circle diameter, and bolt hole diameter conforms to JIS-10k.
2.Bolt material: SS + Zn (plating)
3.Gasket material: EPDM
4.Torque value of the nominal-diameter-40 pipe is 14.7N·m(1.5kgf·m) and torque value of the nominal-diameter-50-or-larger pipe is 19.6N·m(2.0kgf·m).
5.For electrofusion, 1 piece of EFS is needed.

Drain-screw-cap-type cleaning port (COC)



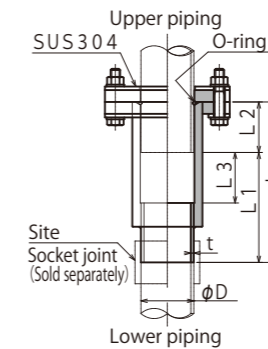
(mm)					
DN	ϕD	L	t	Code	
40	48	100	4	7149401	
50	60	110	5	7149406	
75	89	130	5	7149426	
100	114	140	5	7149431	

(Note) 1.Gasket material: EPDM
2.Perform tightening with belt tongs in the full water test.
3.For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.

Expansion joint for drain stack (TEP)



Built-to-order product
DN 50 - 150



(mm)							
DN	ϕD	t	L	L1	Amount of contraction		Code
					L2	L3	
50	60	5	265	180	85	85	7141372
75	89	5	295	210	85	85	7141374
100	114	5	310	225	85	85	7141375
125	140	6	355	270	85	85	7141378
150	165	7	410	310	100	100	7141380

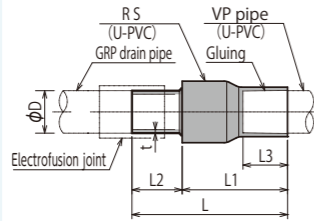
(Note) 1.This product is built-to-order.
2.Do not dedicated stack pipes for use horizontal piping.
3.For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.
4.Bolt material: SUS304
5.O-ring: fluororubber

[Product list] Drain pipe joint

VP conversion adapter (VP-WE)



DN 40 - 100



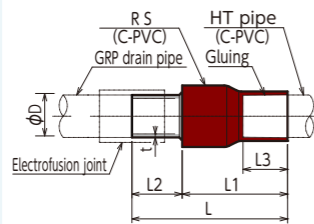
DN	φD	t	L	L1	L2	L3	Code
40	48	4	199	136	63	55	7150901
50	60	5	220	149	71	63	7150903
75	89	5	268	190	78	64	7150905
100	114	5	309	229	80	84	7150907

(Note) 1. For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.

HT conversion adapter (HT-WE)



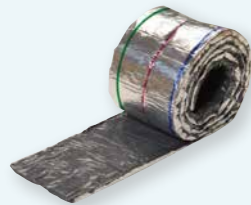
DN 40 - 100



DN	φD	t	L	L1	L2	L3	Code
40	48	4	170	110	60	47	7150931
50	60	5	220	149	71	63	7150933
75	89	5	268	190	78	64	7150935
100	114	5	406	326	80	84	7150937

(Note) 1. For electrofusion, 1 piece of EFS, EFL, EF-45, and EF-TY are needed.

Fire compartment penetration (fire resistant sheet)



DN	Length	Width	Thickness	Code
40~200	1.6 m/roll	110	8.5	1574701

[Product list] Drain pipe joint

Bolt/Nut



(Material)
 ○SS + Zn (plating)
 ○SUS304

DN	Number of bolts (piece)	DN	Example of dimension of a combination (mm)		
			PF+IF	CRP+IF+IF	GR-F+GR-FA+IF
40	4	M16	60	75	70
50	4	M16	60	75	70
75	8	M16	65	85	80
100	8	M16	65	85	85
125	8	M20	70	85	-
150	8	M20	75	95	-
200	12	M20	75	95	-

(Note) Prepare 2 washers for each bolt.

Electrofusion tools

Electrofusion machine (for EFS, EFL, EF-45, and EF-TY)



FKBC-01

(Our lease product) *Bar code type, 100V power supply



FKBC-02

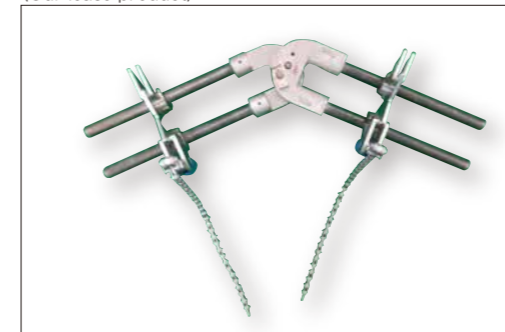


NTEF-100-FK

DN	Code
40	The electrofusion machine is applicable to all sizes with only 1 unit.
50	
75	
100	
125	
150	
200	
Code	
9210250	

Fixture (for EFS, EFL, EF-45, and EF-TY)

(Our lease product)



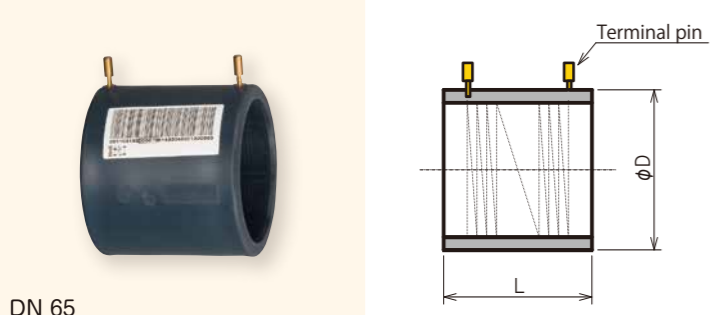
DN	Code
40	The fixture is applicable to 40A to 100A, with only 1 unit.
50	
75	
100	
Code	
9210255	

(Note) We do not offer fixtures for 125A to 200A. Because the 125A - 200A electrofusion joint contains a stopper, no fixture is needed for installation.

10.[Product list] Nominal diameter 65 Switch joint

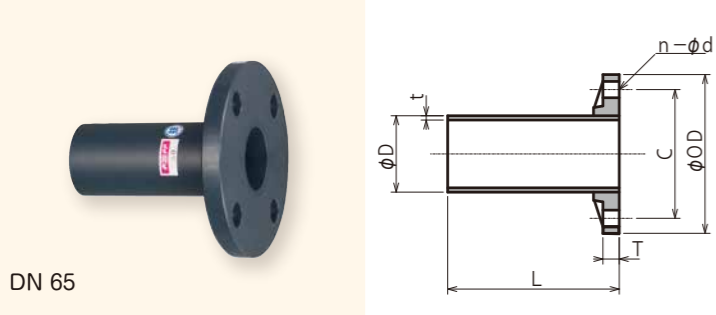
Production of the nominal-diameter-65 GRP drain pipe ended at the end of September 2019. Please use the joints on this page for renewal work of the existing piping or the connection of the nominal-diameter-65 GRP pipe.

Electrofusion socket(EFS)



DN	φD	L	Code
65	93	72	7149211

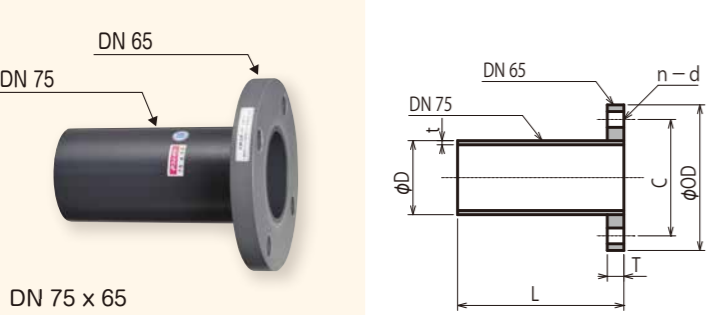
Short pipe with drain flange(PF-WE)



DN	φOD	φD	L	T	C	t	n	φd	Code
65	175	76	200	25	140	6.2	4	19	7149361

(Note) 1.The size of the outer diameter, pitch circle diameter, and bolt hole diameter is JIS-10k.
2.Torque value is 19.6N·m(2.0kgf·m).
3.JISSK: Built-to-order product
4.For electrofusion, 1 piece of EFS is needed.

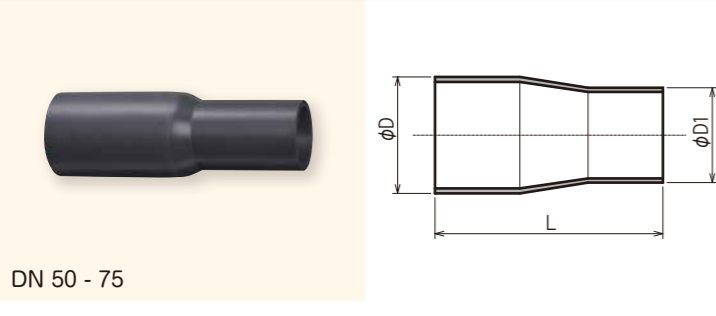
Short pipe with different diameter flange(RF-WE)



DN	φOD	φD	L	T	C	t	n	φd	Code
75x65	175	89	200	20	140	5	4	19	7150401

(Note) 1.The size of the outer diameter, pitch circle diameter, and bolt hole diameter is JIS-10k.
2.Torque value is 19.6N·m(2.0kgf·m).
3.JISSK is not applicable.
4.For electrofusion, 1 piece of EFS is needed.

Drain reducer(RE-WE)



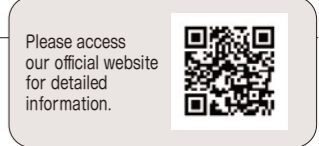
DN	φD	φD1	L	Code
65x50	76	60	202	7150373
75x65	89	76	230	7150377

(Note) 1.For electrofusion, 2 pieces of EFS, EFL, EF-45, and EF-TY are needed.

11.Installation method

Electrofusion welding

Please check the QR code of the installation procedure video.



[Electrofusion joint]

- ①Prepare jigs and tools (electrofusion machine etc) necessary for electrofusion.
- ②Remove dirt and liquid from the part to be fused. Dirt on the fused part causes electrofusion failure. Clean the part with acetone or anhydrous ethanol .
- ③Mark a point of the length of the joint insertion on the pipe. Insert the joint.
- ④Check whether the joint is correctly inserted in the pipe.
- ⑤Prepare the electrofusion machine. Insert the electrofusion machine of the output cable in the terminal pin of the joint to the end.
- ⑥Read the bar code on the joint with the bar code reader.
- ⑦After checking the contents displayed on the liquid crystal panel (LCP), recheck the status of the pipe insertion . Then press the start button.
The power-supply time displayed on the LCP is reducing while power is supplied normally.
- ⑧After the power supply is completed, confirm that the indicator of the joint has been raised.
Cool it down for 10 minutes or more.

*For the handling of the electrofusion machine, please refer to the instruction manual provided with the electrofusion machine.

Insertion length of the pipe in the joint (mm)

DN	40	50	65	75	100	125	150	200
EFS(Socket)	40	48	36	60	63	81	85	107
EFL(Elbow)	44	52	-	65	68	-	-	-
EF-45(Elbow)	44	52	-	65	70	-	-	-
EF-TY(TY)	49	56	-	65	58	-	-	-

Power-supply time of electrofusion (second)

DN		Power-supply time				Cool-down time
		-5°C	20°C	23°C	40°C	
EFS (Socket)	40	204	170	167	150	600
	50	300	250	244	210	600
	65	492	410	401	353	600
	75	382	318	313	286	600
	100	378	315	307	265	600
	125	631	515	506	453	600
EFL (Elbow)	150	619	550	548	539	600
	200	891	810	788	664	600
	40	200	170	166	146	600
	50	425	354	347	304	600
	75	392	320	314	282	600
	100	324	270	265	238	600
EF-45 (Elbow)	40	234	195	193	183	600
	50	398	325	321	299	600
	75	354	295	291	266	600
	100	342	285	279	245	600
EF-TY (TY)	40	300	245	238	201	600
	50	282	230	224	189	600
	75	336	280	275	246	600
	100	374	305	300	268	600



12.Fire compartment penetration method (fire resistant sheet)

Fuji GRP fire resistant sheet

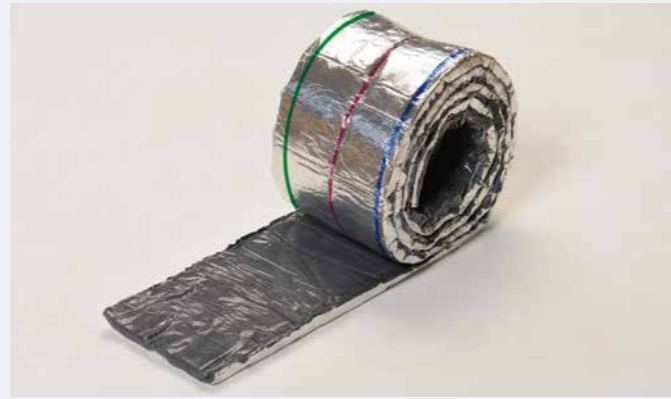
Certified by Japan's Minister of Land, Infrastructure, Transport and Tourism

[Wall] PS060WL-0952

[Single wall] PS060WL-1055

[Floor] PS060FL-0978

Applicable piping size **Wall/Floor 40~200A**



Certified by Japan's Minister of Land, Infrastructure, Transport and Tourism

Accredited by the minister of the MLIT	Structure	Thickness	Opening diameter	Space factor	Filler	GRP drain pipe dimensions
PS060WL-0952 (Wall)	Iron-reinforced concrete (RC) Autoclaved lightweight concrete (ALC) Hollow wall	100 mm or more	φ260mm or less	86.7% or less	Silicone sealant (JIS A5758)	Outer diameter: φ216 mm or less Thickness: 12.0 mm or less
PS060WL-1055 (Single wall)	Two-ply application of one-side-reinforced plasterboard / Partition wall with light-gauge steel	42 mm or more	φ270mm or less	85.3% or less	Silicone sealant (JIS A5758)	Outer diameter: φ216 mm or less Thickness: 8.0 mm or less
PS060FL-0978 (Floor)	Iron-reinforced concrete (RC) Autoclaved lightweight concrete (ALC)	100 mm or more	φ400mm or less	51.9% or less	Cement mortar	Outer diameter: φ216 mm or less Thickness: 8.0 mm or less

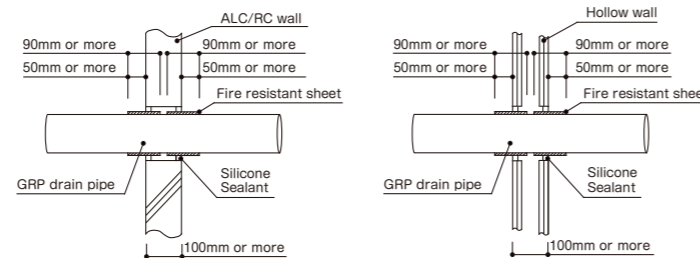
Installation conditions / Cross section

RC/ALC/hollow wall

Number of wrapping of the sheet

Wrapping 1 time or more on the circumference of the pipe for both sides of the wall.

Dimension of the gap between the piping and wall (clearance): 8 - 22 mm

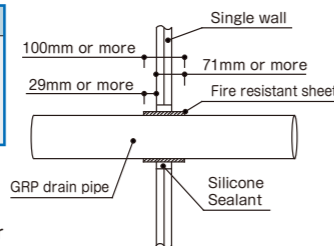


Two-ply application of one-side-reinforced plasterboard

Number of wrapping of the sheet

When the outer diameter of the pipe is φ114 mm or less
Wrap the circumference of the pipe 1 time or more
When the outer diameter of the pipe is over φ114 mm
Wrap the circumference of the pipe 2 times or more

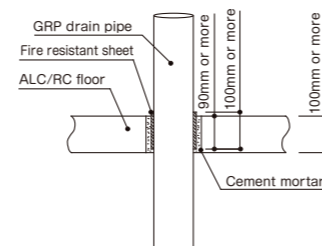
Dimension of the gap between the piping and wall (clearance): 9 - 28 mm when the outer diameter of the pipe is φ114 mm or less
18 - 27 mm when the outer diameter of the pipe is over φ114 mm



RC/ALC floor

Number of wrapping of the sheet

When the outer diameter of the pipe is φ114 mm or less
Wrap the circumference of the pipe 1 time or more
When the outer diameter of the pipe is over φ114 mm
Wrap the circumference of the pipe 2 times or more



Number of sites in which the work can be performed with 1 roll of the sheet

GRP drain pipes		Number of sites in which the work can be performed (site)		
DN	OD	PS060WL-0952 (Wall)	PS060WL-1055 (Single wall)	PS060FL-0978 (Floor)
40	48	3	7	7
50	60	3	6	6
65	76	2	5	5
75	89	2	4	4
100	114	1	3	3
125	140	1	1	1
150	165	1	1	1
200	216	1	1	1

Fire compartment penetration method (fire resistant sheet)

RC/ALC/hollow wall - Instration method

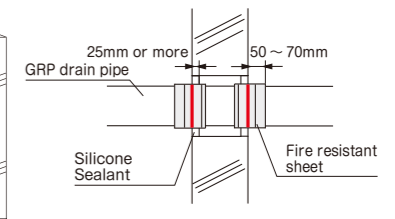
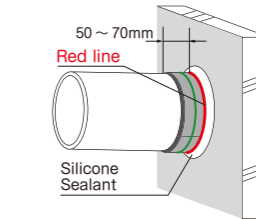
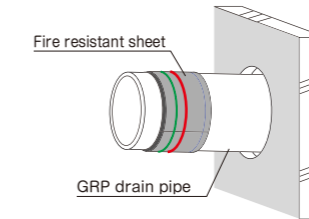
1.Installation on opening

●Confirm that the size of the opening is suitable for the pipe size. Please refer to the table below.

GRP drain pipes		Applicable opening diameter
DN	OD	PS060WL-0952 (Wall)
40	48	70~90
50	60	80~100
65	76	100~120
75	89	110~130
100	114	135~155
125	140	160~180
150	165	185~205
200	216	240~260

2.Wrapping of fire resistant sheet

●Wrap the sheet on the circumference of the pipe 1 time or more. (It is acceptable if the sheet is overlapped.)
●Match the **red line** to the wall surface.
Install the pipe so that the fire resistant sheet protrude by 50 - 70 mm from the wall surface. (Install the pipe so that the **blue line** is inside the wall.)



3.Backfilling / Work completion

●Fill openings on both sides of the wall by 25 mm or more from the wall surface by using silicone sealant. Please use construction sealant (JIS A 5758).
●Perform the same work on the other side of the wall. This completes the work.

Single wall - Work procedures

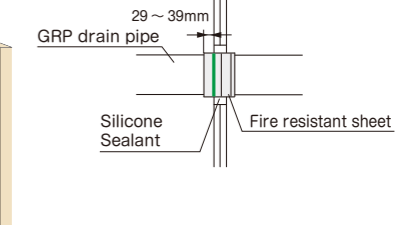
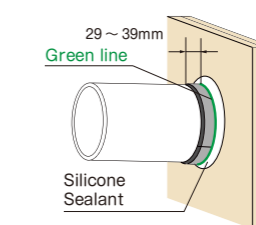
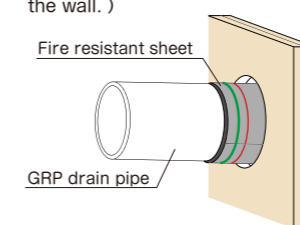
1.Installation on opening

●Confirm that the size of the opening is suitable for the pipe size. Please refer to the table below.

GRP drain pipes		Applicable opening diameter
DN	OD	PS060WL-1055 (Single wall)
40	48	70~100
50	60	80~115
65	76	100~130
75	89	110~145
100	114	135~170
125	140	180~190
150	165	205~215
200	216	255~270

2.Wrapping of fire resistant sheet

●Wrap the circumference of the pipe 1 time or more when the outer diameter of the pipe is φ114 mm or less. Wrap the circumference of the pipe 2 time or more when the outer diameter of the pipe is over φ114 mm. (It is acceptable if the sheet is overlapped.)
●Match the **green line** to the wall surface. Install the pipe so that the fire resistant sheet protrude by 29 - 39 mm from the wall surface. (Install the pipe so that the **red line** is inside the wall.)



3.Backfilling / Work completion

●Fill openings adequately by the wall thickness with silicone sealant. Please use construction sealant (JIS A 5758).

RC/ALC floor - Work procedures

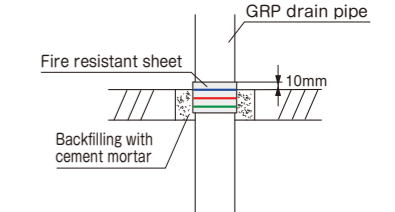
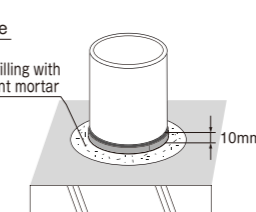
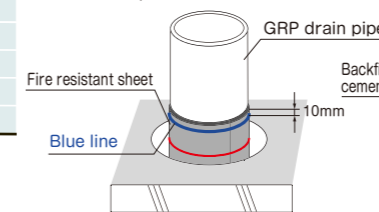
1.Installation on opening

●Confirm that the size of the opening is suitable for the pipe size. Please refer to the table below.

GRP drain pipes		Applicable opening diameter
DN	OD	PS060FL-0978 (Floor)
40	48	70 or more
50	60	85 or more
65	76	110 or more
75	89	125 or more
100	114	160 or more
125	140	195 or more
150	165	230 or more
200	216	300 or more

2.Wrapping of fire resistant sheet

●Wrap the circumference of the pipe 1 time or more when the outer diameter of the pipe is φ114 mm or less. Wrap the circumference of the pipe 2 time or more when the outer diameter of the pipe is over φ114 mm. (It is acceptable if the sheet is overlapped.)
●Match the **blue line** to the floor surface. Install the pipe so that the fire resistant sheet protrude by 10 mm from the floor surface. (Install the pipe so that the **red line** is inside the floor.)



3.Backfilling / Work completion

●Backfill the openings with cement mortar.

*The opening diameter is φ400mm or less.

13.Handling

- Do not throw, drop, roll, drag, or do other things that may damage the pipe.
- Use cushioning materials as necessary during transportation to prevent damage to piping materials. When securing or hoisting the product, use a fiber belt such as a nylon sling, and hoist the pipe at two points that divide the length of the pipe into approximately three equal parts. When using steel wires, be sure to insert cushioning materials where they come into contact with the product.

Storage

- To prevent damage, store in a place where there is no risk of impact from the outside. When the products are stored outdoors, cover them with sheets to avoid UV rays, wind, rain, and adhesion of earth/sand and oil.
- Cover the product with a sheet to protect it from ultraviolet light, wind and rain, and to prevent dirt, oil, etc. from adhering to it.
- When storing the products stacked, pile them up to 3 stacks at most.
- Since it is a combustible material, store it in a place where there is no danger of fire spreading. If foreign matter adheres, wipe it off by using acetone, alcohol, and the like.
- Store pipes and joints on sleepers or pallets, not directly on the ground. When using sleepers, be sure to provide 1m or less support joints and stack them in 3 levels or less.



Processing

- When cutting the pipe
The GRP drain pipes can be cut easily with a cutter or saw.
Draw a cutting line to prevent the displacement of the axis by using thick paper and the like.
- When chamfering the pipe ends
Chamfer the pipe ends by using a reamer or cutter.
Remove chips and burr after chamfering.

