NITTA

Hose, Hose couplings & Adaptors

Linemate®

B-HO-12E

Features of Nitta thermoplastic hoses

Clean and Eco-friendly

Smooth inner surface of the plastic hoses keeps the operating oil clean.

Piping on Site

With the one-touch coupling “CAMPUCKA” or assembly tool “Mark 10,” it is easy to adjust length on site.

High Durability

They are highly durable against impact pressure and repeated bending, because of the synthetic fiber reinforcement.

High Abrasion Resistance

They have high abrasion resistance because special polyurethane resin is used as the cover material.

Light

They weigh only about a quarter to half that of rubber hoses.

Compact Piping

Small outer diameter enables piping in small bending radius.

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⚠Precautions for Use

These “Precautions for Use” provide instructions for the correct use of our product to prevent damage to people and property. The instructions are classified into three categories, “danger,” “warning,” and “caution,” depending on the extent of damage from improper use. Every category contains important notes for safety so please follow these as well as ISO 4414-1982 (*1), JIS B 8370(1988)(*2), ISO4413-1979(*3), and JIS B 8361(1982)(*4).

*1 ISO4414-1982 Pneumatic fluid power ····· Recommendations for the application of equipment to transmission and control systems.
*2 JIS B 8370(1988) Pneumatic System General Rules
*3 ISO4413-1979 Hydraulic fluid power ····· General rules for the application of equipment to transmission and control systems.
*4 JIS B 8361(1982) Hydraulic System General Rules

⚠ DANGER For the limited cases of inappropriate use, where a dangerous situation leading to death or severe injury is expected and emergent warning is necessary at the occurrence of danger.

⚠ WARNING For the cases of inappropriate use, where a dangerous situation leading to death or severe injury is expected.

⚠ CAUTION For the cases of inappropriate use, where a dangerous situation leading to minor injury or light damage to property is expected.

For more safety information, please read the following carefully. Notes for each product are also given on the product page. Please read the instructions for use as well.

Notes for the products in this catalog

Notes for the use of Assembling machines Mark 9 and 10 are also given in their instruction manual.

⚠Before Selection!

⚠DANGER

- Cannot use for machines and equipment that maintain and control human life.
- Cannot use for machines and equipment that require an extremely high level of safety.

⚠WARNING

- Designers of instruments, machines, or connecting systems or those who make specifications should consider the handling of our products. In such consideration, a test or analysis should be conducted if necessary. It is their responsibility to assure the given safety and performance of the instruments, the machines, or the systems.
- Those who have sufficient knowledge and experience should handle our products.
- Please do not handle and remove our products from instruments, machines, or systems until safety is confirmed.
- Please contact us when using our products in situations and conditions that are not assumed in the specifications described in the catalog.
- Please contact us when using our products for equipment, machines, various types of vehicles, and commercial aircraft, for leisure machines and equipment to transport humans, for medical equipment that would cause human damage if the specifications were inappropriately followed, and for machines in contact with food or drinking water.

⚠When Selecting!

⚠WARNING

- Please check if the use condition satisfies the “use conditions” in the catalog.
- Do not use our products when a caustic or flammable gas is used as a fluid or is in the environment.
- Do not use our products in places where excessive vibration or impact may occur.
- Consult the “Table of chemical resistance” if chemicals are used as a fluid or in the environment.
- There are a limited group of hose couplings for each type of hose product. Please select correct combinations according to the specifications.
- Our hose products and hose couplings are not compatible with other company’s hose products and hose connectors.
- Each type of hose product allows the use of a limited type of fluid. Do not use a fluid that is not allowed.
- If use conditions are different between hose products and hose couplings, please use them following the smaller data.
- The hose product must be of an appropriate size to maintain the necessary flow volume. If the size is not appropriate, the increase in pressure drop and oil temperature could cause problems. The relation of fluid velocity, fluid volume, and hose inner diameter is given in “Nomograph.”
- The maximum impact pressure of hose products is approximately 1.5 times higher than the maximum working pressure. Since the impact pressure may affect hose life, please select appropriate hoses when the pressure exceeds the specified value.
- When electric insulation is necessary, for example in electrical works, please select “Nonconductive” hoses. Contact us for details.

⚠CAUTION

- When water or glycol-type operating oil is used, hoses work without problem but some plated types of hose couplings cannot be used. Contact us for details.
- Hose products might change their length by ±3% under pressure, so do not stretch hoses tightly.

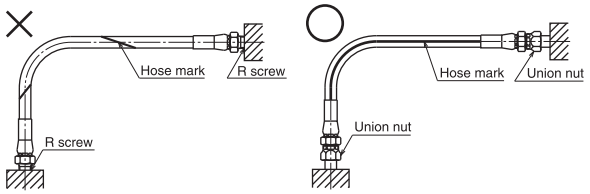
⚠When Installing!

⚠WARNING

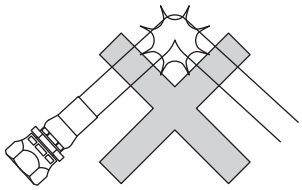
- Instructions for connecting hoses are given in a separate document. Please read it and follow the instructions for installation.
- Do not use couplings with damaged threads and seat surface.
- If you use reusable products such as reusable couplings, ensure that they are not damaged.
- We will not guarantee the products which are additionally treated, decomposed or refabricated by others .
- For installation of hoses, please fix them in a place where unexpected disconnection of hose and couplings cannot cause damage to people or property.

⚠CAUTION

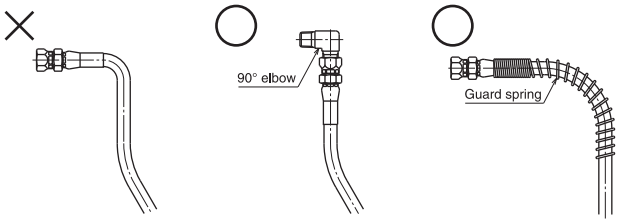
- Prevent damaging the hoses, e.g. entanglement or abrasion. It could cause flattening, destruction, and disconnection.
- Install hoses to prevent loads such as tension, torsion, rotation, and bending with a radius under the minimum bending radius.



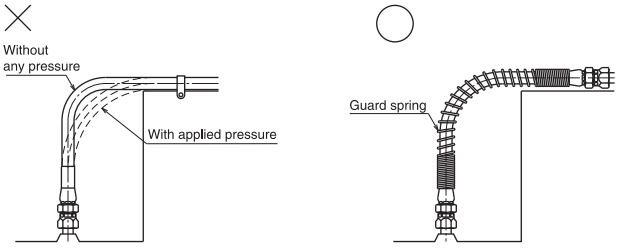
- Do not break a hose, which might cause “fatigue destruction” at the break point even under the maximum working pressure.



- When the plug-in part of the hose couplings is dirty, clean the surface.
- Do not use hoses if they have a dent or damage.
- Do not twist hose assemblies after pressure is applied. When they are twisted, it could deform the inner structure of the hoses and result in “destruction.”
- Do not throw and drop hose couplings, which might damage threads and sheets and lead to oil leakage.
- Tighten the hose coupling to the specified torque. Some material may expand or crack by the tightening, so check and confirm the strength of the part to be assembled. Sharply bending a hose near the coupling could shorten the life of the hose. When bending a hose, keep the hose straight of the length longer than the outer diameter of the hose from the asembed part.



- Pressure on hose products could cause interference with surrounding parts on which no interference exists before the pressure is applied. Please handle appropriately, e.g. introducing guard parts.
- Do not over-tighten when using clamps such as INSULOK ties to fix a hose. Concentrated stress may cause “fatigue destruction.”



- Hose products are designed to withstand inner pressure, so do not apply outer pressure to them.
- You cannot reuse hoses and hose couplings except reusable couplings.
- Protect a hose from possible outer damage by using a wire braid or guard spring.
- Hoses keep the bending shape if they are left over a certain period of time. When removing and reinstalling a hose assembly for machine exchange, circuit inspection, repair, and so forth, please attach the hose in the original position. When attaching it, clean the threads and seat of the coupling and tighten it to the specified torque.

⚠ When Using!

⚠ WARNING

- Do not touch hose products at the pressurization. If you improperly approach or touch a hose at the pressurization, it could be quite dangerous if an unexpected breakage of the hose or the coupling were to scatter fluid inside.
- Do not touch hose products when the fluid is hot. It could cause a “burn.”
- When “water” is used as a fluid, please keep it unfrozen.

⚠ When Storing!

⚠ CAUTION

- If you store unused products, keep them in a clean place to prevent dust. When fine particles such as dust enter the inside, they also enter the connecting equipment and may cause problems.
- Keep hose products in a dry place under 40°C avoiding direct sunlight.
- Store a hose in a straight position or in a coil with a larger diameter than the minimum bending diameter.
- Ty to use hoses and couplings within about one year after the production.

⚠ When Maintaining!

⚠ CAUTION

- Please conduct periodic inspection. Confirm that there is no degradation such as outer damage, corrosion, and abrasion as well as any distorted parts and replace it with a new one if necessary.
- Change the hose immeiately if the outer damage or abrasion reaches, or is about to reach the synthetic fiber braid.

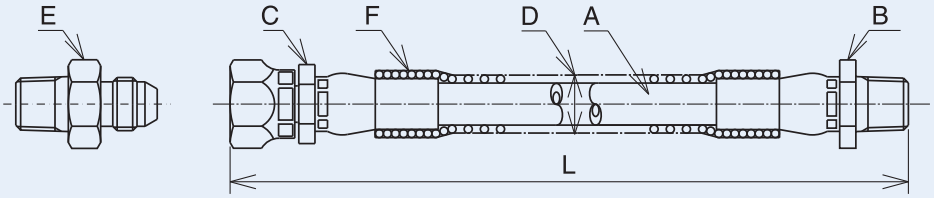
How to order

Check the following usage conditions before ordering.

1. Type and volume of working fluid
2. Working pressure (maximum working pressure and maximum impact pressure: MPa)
3. Working temperature range (temperature of fluid and environment: °C)
4. Bending radius of hose (minimum bending radius: mm)

Based on the above conditions, please follow the steps below.

1. Select the type of hose (A) and the inner diameter (D).
2. Indicate the length (L) of hose assembly. (Use the length between the edges of two couplings.)
3. Select types and materials of couplings (B and C) and adaptor (E).
4. Specify if guard spring and other accessories (F) are required.
   See P.53 for accessories.



N3130–04 1000L SA×SE+010–G1

- **A** Type of hose
- **D** Inner diameter of hose
- **L** Length of hose assembly
- **B** Type of one coupling
- **F** Fitting shape of guard parts
  (Ex) Below are the types of guard springs
  G1: Full length
  G2: Both ends (Please specify the length)
  G3: Single end (Please specify the length and the direction of installation)
- **E** Types of adaptor
- **C** Types of the other couplings

Hose selection table

◯→ Steel
Ⓢ→ Stainless
Made-to-order products are indicated by "△".
☞ Contact us for other fluids.

				Hydraulic Piping									
Page				9	13				19	21	23		
Hose series				LF70	1000	1100	1400	1500	1000 (Light gray)	F3130 (Light gray)	*1 *3 N3130	3130	3000
Size	I.D. (in.)	I.D.(mm)											
02	1/8	3.6	Max. working pressure (MPa)	—	—	—	—	—	—	20.0	—	20.0	—
03	3/16	4.8		—	—	—	—	15.0	—	—	21.0	20.0	34.0
04	1/4	6.3		7.0	10.5	10.5	14.0	—	10.5	19.5	19.5	20.0	30.0
05	5/16	7.9		—	—	—	—	—	—	—	17.5	18.0	—
06	3/8	9.5		7.0	10.5	10.5	14.0	—	10.5	16.0	16.0	18.0	24.0
08	1/2	12.7		7.0	10.5	10.5	—	—	10.5	14.0	14.0	16.0	20.0
10	5/8	15.9		—	—	—	—	—	—	—	—	—	—
12	3/4	19.0		—	—	—	—	—	—	9.0	9.0	10.0	13.0
16	1	25.4		—	—	—	—	—	—	7.0	7.0	—	10.0
Temp. range (°C)				–40 – +100	–40 – +100 (for Campucka –20 – +100)	–40 – +100	–40 – +100 (for Campucka –20 – +100)	–40 – +100	–40 – +100	–40 – +100	–40 – +100	–40 – +100	–40 – +100
Features				Super flexible, small bend radius	Thin, light	Outer wire braid	Thin, light	Thin, light	Thin, light, Campucka usable	Flexible, Campucka usable	Flexible	Reusable coupling usable	Reusable coupling usable
Application				●Machine tools ●Construction machine ●General operating machine, etc.	●Construction machine ●Farming machine ●Machine tools, etc.	●Machine tools, etc.	●Industrial vehicles ●Farming machine, etc.	●Industrial vehicles ●Farming machine, etc.	●Oil pressure of machine tools ●Coolant piping	●Oil pressure of machine tools ●Coolant piping	●Machine tools ●Industrial vehicles ●General operating machine ●Robot ●Utility piping in factory, etc.	●General industrial machine, etc.	●General industrial machine, etc.
Couplings that can be used	Types of couplings (P.9)	Shapes of couplings (P.10 – 11)											
	Swage	SA		◯	◯Ⓢ	◯Ⓢ	◯Ⓢ	◯			◯Ⓢ	◯Ⓢ	◯Ⓢ
		SE		◯	◯Ⓢ	◯Ⓢ	◯Ⓢ	◯	◯	◯	◯Ⓢ	◯Ⓢ	◯Ⓢ
		SF		◯	◯Ⓢ	◯Ⓢ	◯Ⓢ	◯			◯Ⓢ	◯Ⓢ	◯Ⓢ
		SK			△	△	△				◯	◯	◯
		SO									◯	◯	◯
		SC			◯	◯	◯				◯	◯	◯
		SLE									△	△	△
		SL			◯	◯	◯				◯	◯	◯
		AE (45° • 90°)		◯	◯	◯	◯				◯	◯	◯
		AF (45° • 90°)		◯	◯	◯	◯				◯	◯	◯
		AK (45° • 90°)			△	△	△				△	△	△
	Reusable	A										◯Ⓢ	◯Ⓢ
		E										◯Ⓢ	◯Ⓢ
		F										◯	◯
	Campucka	CA			◯		◯					◯*4	
		CE			◯		◯		◯	◯*5		◯*4	
		CF			◯		◯					◯*4	

*1 Matched to type A of JIS K 6375 (hydraulic braid-reinforced plastic hose), matched to SAE100R7.
*2 Matched to type B of JIS K 6375 (hydraulic braid-reinforced plastic hose), matched to SAE100R8.
*3 Nonconductive (electrically insulative). See P.51 for details.
*4 Campucka coupling (made-to-order) is available for 3130-02.
*5 When Campucka coupling is used, the max. working pressure is 10.5 MPa, while in case of F3130-02, 20.0MPa.
*6 Made-to-order

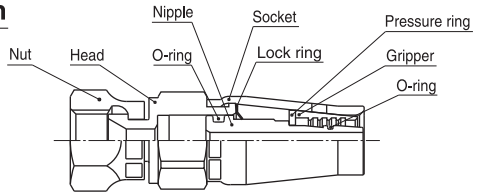
	Hydraulic Piping				For Airless-painting		For Clean Use	
	24	33		37	39		41	Page
	*1 3700	N3000	HT	*2 *3 3R80	5501	*6 3450	34PW	Hose series / Size
	—	—	—	—	—	—	20.0	02
	21.0	—	—	35.0	—	23.0	—	03
	19.5	28.0	28.0	35.0	21.0	23.0	19.5	04
	—	—	—	—	—	—	—	05
	16.0	21.0	21.0	28.0	21.0	21.0	16.0	06
	14.0	21.0	21.0	25.0	—	—	14.0	08
	—	17.5	17.5	—	—	—	—	10
	—	—	—	16.0	—	—	10.5	12
	—	—	—	14.0	—	—	10.5	16
	–55 – +100	–40 – +100	–40 – +120	–40 – +100	–10 – +60	–40 – +80	–30 – +70	Temp. range (°C)
	Eco-friendly	Flexible	Flexible, for high temp oil	High pressure	Painting (SUS braid)	Painting, light (conductive resin)	Pure water, chemicals	Features
	●Industrial vehicle, etc.	●Construction machine ●Industrial vehicle ●Injection molding machine ●Hose reel, etc.	●Construction machine ●Industrial vehicle ●Injection molding machine ●Hose reel, etc.	●Construction machine ●Hydraulic press, etc.	●Airless painting machine, etc.	●Airless painting machine, etc.	●Facility in clean room ●Urethane coating ●Desalination equipment, etc.	Application
	○Ⓢ	○Ⓢ	○	○Ⓢ				SA
	○Ⓢ	○Ⓢ	○	○Ⓢ			ⓈⓈ	SE
	○Ⓢ	○	○	○	○	○		SF
	○							SK
	○	○	○					SO
	○	○	○	○				SC
	△							SLE
	○	○	○					SL
	○	○	○					AE
	○	○	○					AF
	△							AK
				○				A
				○				E
				○				F
								CA
								CE
								CF

Push-one type

Campucka

The Campucka coupling enables push-one connection in the hose-coupling assembling
Without any swaging machine, the on-site assembling can be performed easily without fail.

Cross-sectional structure diagram



Assembling method P.57

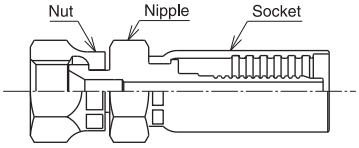
Swaging type

Swage

The swage coupling is attached to the hose by swaging.
The coupling and the hose can be easily swaged (assembled) with a manual assembling tool [Mark10], or a hydraulic assembling machine [Mark9].

☞ Some couplers and hoses have to be assembled in our factory.

Cross-sectional structure diagram



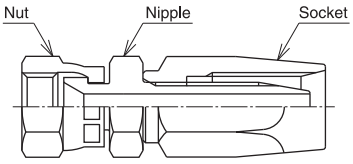
Assembling method P.59

Compression type

Reusable

The reusable coupling is used to screw in a hose. On-site assembling is possible and the detached coupling is reusable

Cross-sectional structure diagram



Assembling method P.65

List of hose connection shapes

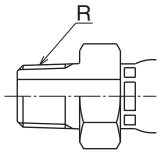
Example of part number

SE-PF-04 - (N30) - (S)

- Material
  - No indication = steel
  - Surface finishing: Campucka and Swage types: zinc electrogalvanized with color chromating (Ep-Fe/Zn5/CM2); Reusable type: zinc electrogalvanized with color chromating (Ep-Fe/Zn5/CM1)
  - ☞ F-type nipple is processed by zinc galvanization with color chromating.
  - S = SUS304, S6 = SUS316, PW = SUS316 for 34PW hose
- Hose part number (No indication = N3130, 3130, 3700, 3000, 14 = 1000,1100, 1400, 1500, N30 = N3000, HT, 55 = 5501, PW = 34PW)
- Hose size (02 = 1/8", 03 = 3/16", 04 = 1/4", 05 = 5/16, 06 = 3/8", 08 = 1/2", 10 = 5/8", 12 = 3/4", 16 = 1")
- Thread type (PT(R), PF(G), NPSM, UNF (Only size is shown))
- Type and shape of coupling (see below)

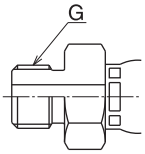
Tapered male-thread coupling

SA (Swage)
A (Reusable)
CA (Campucka)



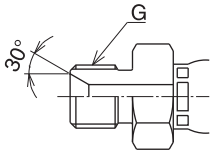
O-ring port coupling with parallel male-thread

SO (Swage)



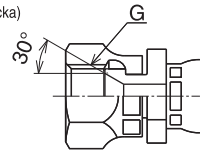
Parallel male-thread coupling (with 30° female seat)

SC (Swage)



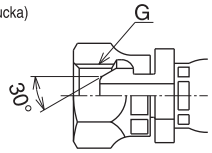
Parallel female-thread union coupling (with 30° female seat)

SE (Swage)
E (Reusable)
CE (Campucka)



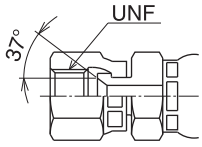
Parallel female-thread union coupling (with 30° male seat)

SF (Swage)
F (Reusable)
CF (Campucka)



Unified female-thread union coupling (with 37° female seat)

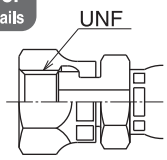
SK (Swage)



Unified female-thread ORFS union coupling

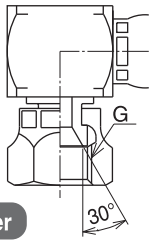
SGS (Swage)

Made-to-order
Contact us for details



Parallel female-thread union 90° elbow coupling (with 30° female seat)

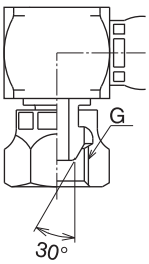
SLE (Swage)



Made-to-order

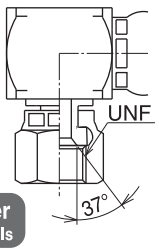
Parallel female-thread union 90° elbow coupling (with 30° male seat)

SL (Swage)



Unified external-thread union 90° elbow coupling (with 37° female seat)

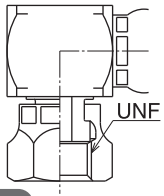
SLK (Swage)



Made-to-order
Contact us for details

Unified female-thread ORFS union 90° elbow coupling

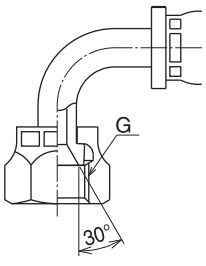
SLG (Swage)



Made-to-order
Contact us for details

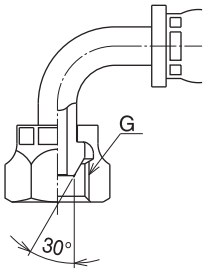
Parallel female-thread union bend coupling (with ° female seat)

AE* (Swage)
SE (Swage)



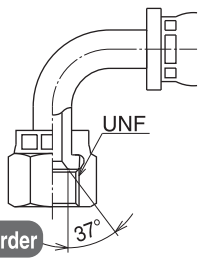
Parallel female-thread union bend coupling (with 30° male seat)

AF* (Swage)
SF (Swage)



Unified female-thread union bend coupling (with 37° female seat)

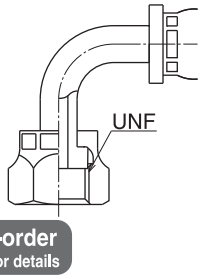
AK* (Swage)



Made-to-order

Unified female-thread ORFS union bend coupling

AG* (Swage)



Made-to-order
Contact us for details

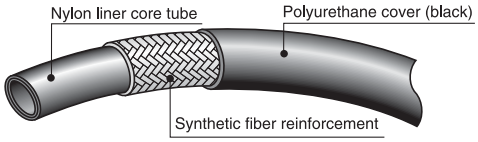
☞ The mark * at the part number of the union bend indicates the angle and select 45° or 90°.

LF70 Series

LF70

Features

- **Improved flexibility by 15-25% (compared to our other equivalent types)**
- **Short total length of coupling enables compact piping.**

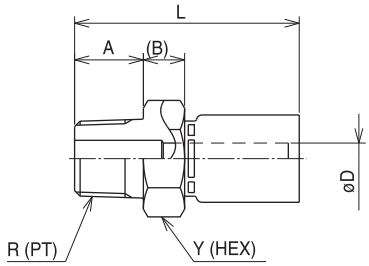


Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Suitable coupling type
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
LF70-04	04	1/4	6.4	10.3	7.0	8.8	28.0	27	60	Swage
LF70-06	06	3/8	9.5	13.9	7.0	8.8	28.0	45	90	
LF70-08	08	1/2	12.7	17.4	7.0	8.8	28.0	70	120	

- Appropriate fluid: mineral general operating oil
- Working temperature range: -40 to +100°C
- Length in a unit package: 100m

[Swage type] (For LF70)

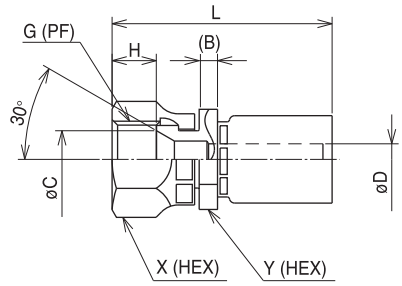
SA



Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Weight (g)	Pusher	Die
SA-PT-04-14	04	1/4	13	8.5	3.5	50	19	43	PSA-04	SP14-04-07
SA-PT-06-14	06	3/8	15	9.0	6.8	54	22	72	PSA-06	SP14-06-07
SA-PT-08-14	08	1/2	18	10.0	9.5	61	27	115	PSA-08	SP14-08

■ Material: steel
■ Adaptor: 030, 130

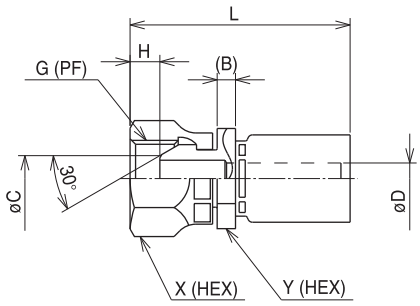
SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die
SE-PF-04-14	04	1/4	4.0	9.3	3.5	8.0	49	19	17	55	PSE-14-04	SP14-04-07
SE-PF-06-14	06	3/8	4.0	12.3	6.8	9.5	53	22	19	75	PSE-14-06	SP14-06-07
SE-PF-08-14	08	1/2	4.5	16.0	9.5	12.0	61	27	24	125	PSE-14-08	SP14-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

SF

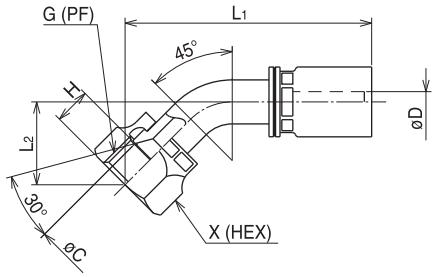


Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die
SF-PF-04-14	04	1/4	4.0	7.5	3.5	5.5	49	19	17	55	PSE-14-04	SP14-04-07
SF-PF-06-14	06	3/8	4.0	10.0	6.8	6.5	53	22	19	75	PSE-14-06	SP14-06-07
SF-PF-08-14	08	1/2	4.5	13.2	9.5	9.0	61	27	24	125	PSE-14-08	SP14-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130

[Swage type] (For LF70)

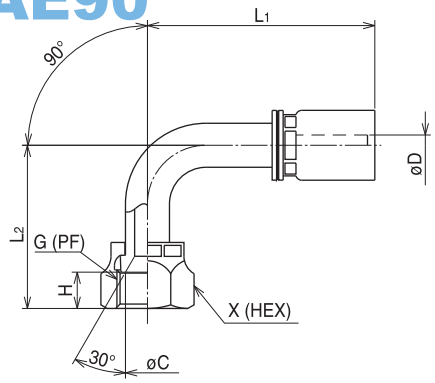
AE45



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
AE45-G-04-14	04	1/4	9.0	3.2	8.0	61	18	19	57	PFB-01+PA-04	SP14-04-07
AE45-G-06-14	06	3/8	12.0	5.6	9.5	74	25	22	90	PFB-01+PA-06	SP14-06-07

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

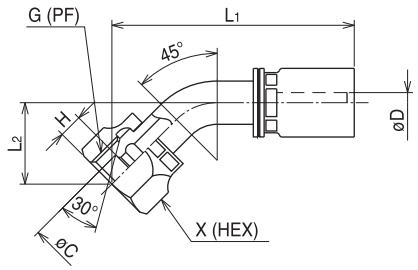
AE90



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
AE90-G-04-14	04	1/4	9.0	3.2	8.0	51	33	19	59	PFB-01+PA-04	SP14-04-07
AE90-G-06-14	06	3/8	12.0	5.6	9.5	61	45	22	98	PFB-01+PA-06	SP14-06-07

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

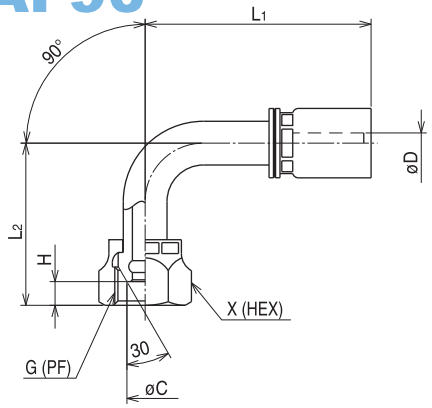
AF45



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
AF45-G-04-14	04	1/4	7.0	3.2	5.5	63	19	19	58	PFB-01+PA-04	SP14-04-07
AF45-G-06-14	06	3/8	10.0	5.6	6.5	72	23	22	90	PFB-01+PA-06	SP14-06-07

■ Material: steel
■ Adaptor: 110, 145, 190, 130

AF90



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
AF90-G-04-14	04	1/4	7.0	3.2	5.5	51	33	19	61	PFB-01+PA-04	SP14-04-07
AF90-G-06-14	06	3/8	10.0	5.6	6.5	61	45	22	100	PFB-01+PA-06	SP14-06-07

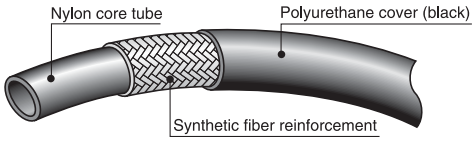
■ Material: steel
■ Adaptor: 110, 145, 190, 130

1000-1100-1400-1500 Series

1000

Features

- Small outer diameter
- Light
- Campucka coupling can be used



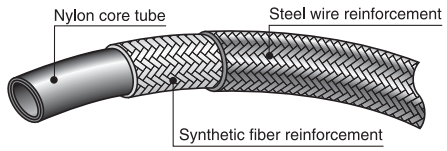
Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
1000-04	04	1/4	6.3	10.4	10.5	13.2	42.0	40	64	Campucka Swage
1000-06	06	3/8	9.5	14.0	10.5	13.2	42.0	60	90	
1000-08	08	1/2	12.7	17.4	10.5	13.2	42.0	80	131	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a unit package: 100m

1100

Features

- Outer wire reinforcement prevents the cutting powder



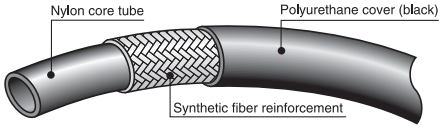
Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
1100-04	04	1/4	6.3	11.1	10.5	13.2	42.0	40	150	Swage
1100-06	06	3/8	9.5	15.1	10.5	13.2	42.0	60	220	
1100-08	08	1/2	12.7	18.8	10.5	13.2	42.0	80	300	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a unit package: 100m

1400

Features

- Small outer diameter
- Light
- Kampucka connector can be used



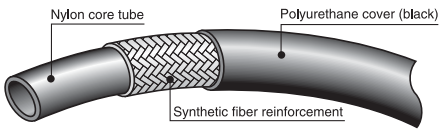
Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
1400-04	04	1/4	6.3	10.4	14.0	17.5	56.0	30	64	Campucka Swage
1400-06	06	3/8	9.5	14.0	14.0	17.5	56.0	60	90	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a unit package: 100m

1500

Features

- Small outer diameter
- Light

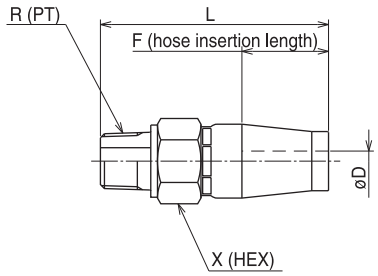


Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
1500-03	03	3/16	5.1	8.8	15.0	18.8	60.0	20	45	Swage

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a unit package: 100m

[Campucka] Hydraulic push-one coupling (For 1000, 1400)

CA

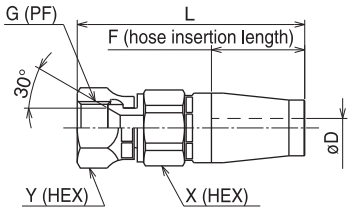


Part No.	R	Min. I.D. øD	F	L	X	Weight (g)
CA-R-04-14L	1/4	3.5	26.0	60	19	70
CA-R-06-14L	3/8	6.0	29.0	68	22	100
CA-R-08-14L	1/2	9.0	35.0	77	27	170

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

- Material: steel
- Working temperature range: –20 to +100°C
- Adaptor: 030, 130

CE

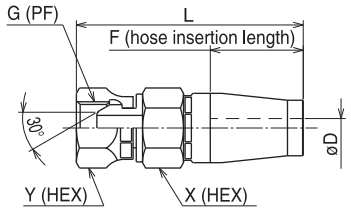


Part No.	G	Min. I.D. øD	F	L	X	Y	Weight (g)
CE-G-04-14L	1/4	3.5	26.0	64	19	19	85
CE-G-06-14L	3/8	6.0	29.0	72	22	22	115
CE-G-08-14L	1/2	9.0	35.0	83	27	27	205

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

- Material: steel
- Working temperature range: –20 to +100°C
- Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

CF



Part No.	G	Min. I.D. øD	F	L	X	Y	Weight (g)
CF-G-04-14L	1/4	3.5	26.0	64	19	19	85
CF-G-06-14L	3/8	6.0	29.0	72	22	22	115
CF-G-08-14L	1/2	9.0	35.0	83	27	27	205

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

- Material: steel
- Working temperature range: –20 to +100°C
- Adaptor: 110, 145, 190, 130

Features of Campucka and assembly mechanism

Assembling method P.57

1. Push-one connection

- Reduction of operation time (half that of our conventional product)
- Specialized swaging tool is not necessary. (Easy handling)
- Best for on-site length adjustment.
- Convenient for emergency repair.

2. Detachable hose

- Hose is detachable for length adjustment when piping.
- Detachable tool is available.

⚠Caution: Cannot be detached after pressurization.

3. Correcting hose's twisted direction

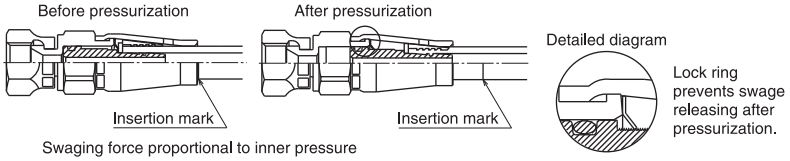
- It is possible to correct the twisted direction of a hose.

⚠ Caution: Cannot be detached after pressurization.

4. Nipple stop mechanism

- Ratchet mechanism of our original lock ring is employed.
- Steady performance even for movable piping.
- Pressure variation is accommodated.

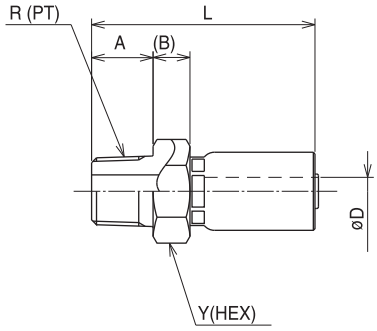
Campucka assembly mechanism



⚠ Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

[Swage] (For 1000, 1100, 1400, 1500)

SA



Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SA-PT-03-14	03	1/4	13	8.5	3.0	44	19	40	PSA-04	SP14-03
SA-PT-04-14	04	1/4	13	8.5	3.5	50	19	43	PSA-04	SP14-04
SA-PT-06-14	06	3/8	15	9.0	6.8	54	22	72	PSA-06	SP14-06
SA-PT-08-14	08	1/2	18	10.0	9.5	61	27	115	PSA-08	* SP14-08 / SP10-08

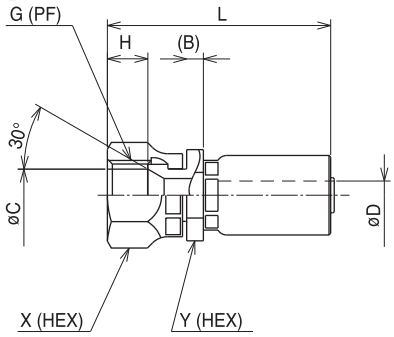
■ Material: steel
■ Adaptor: 030, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

Stainless type

Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die	
										First	Second
SA-PT-04-14-S	04	1/4	13	8.5	3.5	50	19	43	PSA-04	SPH-03	SP14-04
SA-PT-06-14-S	06	3/8	15	9.0	6.8	54	22	72	PSA-06	SP3-05-1-ST	SP14-06
SA-PT-08-14-S	08	1/2	18	10.0	9.5	61	27	115	PSA-08	SPH-06-1-ST	SP14-08

■ Material: stainless steel SUS304
■ Suitable adaptor: 030, 130

SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SE-PF-03-14	03	1/4	4.0	9.5	3.0	8.0	44	19	17	42	PSE14-04	SP14-03
SE-PF-04-14	04	1/4	4.0	9.5	3.5	8.0	49	19	17	55	PSE14-04	SP14-04
SE-PF-06-14	06	3/8	4.0	12.5	6.8	9.5	53	22	19	71	PSE14-06	SP14-06
SE-PF-08-14	08	1/2	4.5	16.0	9.5	12.0	61	27	24	125	PSE14-08	* SP14-08 / SP10-08

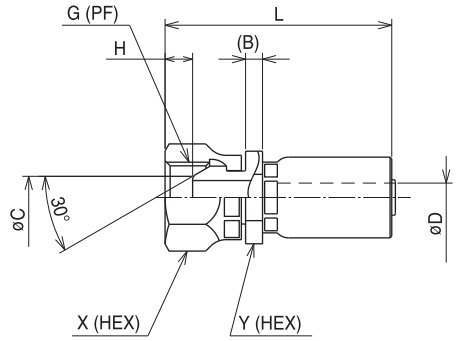
■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

Stainless type

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SE-PF-04-14-S	04	1/4	4.0	9.5	3.5	8.0	49	19	17	55	PSE-14-04	SPH-03	SP14-04
SE-PF-06-14-S	06	3/8	4.0	12.5	6.8	9.5	53	22	19	71	PSE-14-06	SP3-05-1-ST	SP14-06
SE-PF-08-14-S	08	1/2	4.5	16.0	9.5	12.0	61	27	24	125	PSE-14-08	SPH-06-1-ST	SP14-08

■ Material: stainless steel SUS304
■ Suitable adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

SF



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SF-PF-03-14	03	1/4	4.0	7.5	3.0	5.5	44	19	17	45	PSE14-04	SP14-03
SF-PF-04-14	04	1/4	4.0	7.5	3.5	5.5	49	19	17	55	PSE14-04	SP14-04
SF-PF-06-14	06	3/8	4.0	10.0	6.8	6.5	53	22	19	75	PSE14-06	SP14-06
SF-PF-08-14	08	1/2	4.5	13.2	9.5	9.0	61	27	24	125	PSE14-08	* SP14-08 / SP10-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

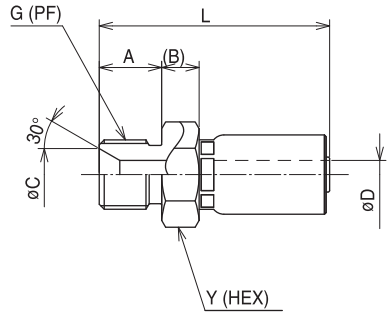
Stainless type

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SF-PF-04-14-S	04	1/4	4.0	7.5	3.5	5.5	49	19	17	56	PSE-14-04	SPH-03	SP14-04
SF-PF-06-14-S	06	3/8	4.0	10.0	6.8	6.5	53	22	19	75	PSE-14-06	SP3-05-1-ST	SP14-06
SF-PF-08-14-S	08	1/2	4.5	13.2	9.5	9.0	61	27	24	125	PSE-14-08	SPH-06-1-ST	SP14-08

■ Material: stainless steel SUS304
■ Adaptor: 110, 145, 190, 130

[Swage] (For 1000, 1100, 1400, 1500)

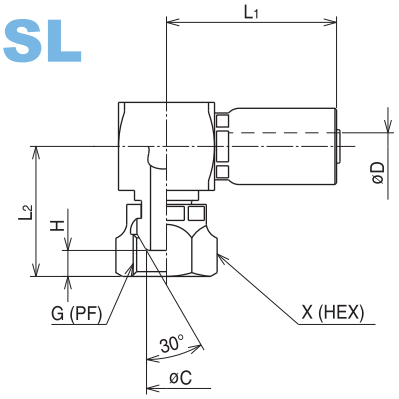
SC



Part No.	Size No.	G	A	B	C	øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SC-PF-04-14	04	1/4	14	8.5	9.5	3.5	51	19	43	PSA-04	SP14-04
SC-PF-06-14	06	3/8	15	9.0	12.5	6.8	54	22	72	PSA-06	SP14-06
SC-PF-08-14	08	1/2	18	10.0	18.0	9.5	61	27	115	PSA-08	* SP14-08 SP10-08

■ Material: steel
■ Adaptor: 060
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

SL

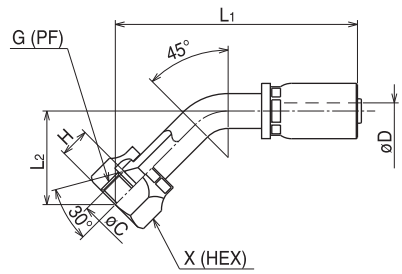


Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
SL-PF-04-14	04	1/4	7.5	3.5	5.5	39	28	19	120	PSL-04	SP14-04
SL-PF-06-14	06	3/8	10.0	6.8	6.5	42	33	22	160	PSL-06	SP14-06
SL-PF-08-14	08	1/2	13.2	9.5	9.0	47	37	27	250	PSL-08	* SP14-08 SP10-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

[Swage] (For 1000, 1100, 1400)

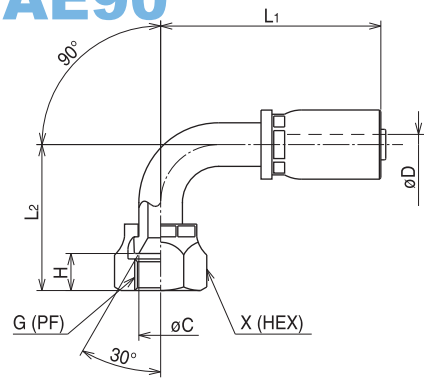
AE45



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AE45-G-04-14	04	1/4	9.0	3.2	8.0	61	18	19	57	PFB-01+PA-04	SP14-04
AE45-G-06-14	06	3/8	12.0	5.6	9.5	74	25	22	90	PFB-01+PA-06	SP14-06
AE45-G-08-14	08	1/2	15.5	8.7	12.0	87	29	27	143	PFB-01+PA-08	* SP14-08 SP10-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

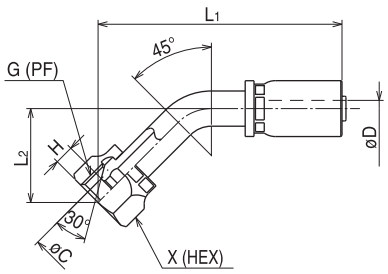
AE90



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AE90-G-04-14	04	1/4	9.0	3.2	8.0	51	33	19	59	PFB-01+PA-04	SP14-04
AE90-G-06-14	06	3/8	12.0	5.6	9.5	61	45	22	98	PFB-01+PA-06	SP14-06
AE90-G-08-14	08	1/2	15.5	8.7	12.0	68	52	27	153	PFB-01+PA-08	* SP14-08 SP10-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

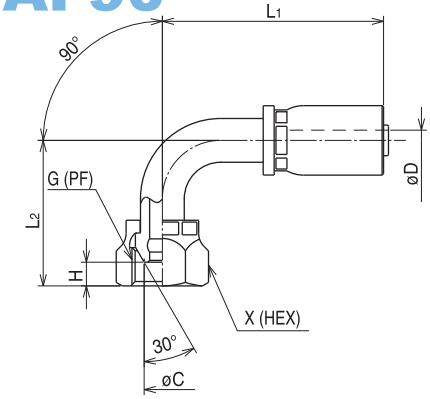
AF45



Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AF45-G-04-14	04	1/4	7.0	3.2	5.5	63	19	19	58	PFB-01+PA-04	SP14-04
AF45-G-06-14	06	3/8	10.0	5.6	6.5	72	23	22	90	PFB-01+PA-06	SP14-06
AF45-G-08-14	08	1/2	14.0	8.7	9.0	88	30	27	147	PFB-01+PA-08	* SP14-08 SP10-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

AF90



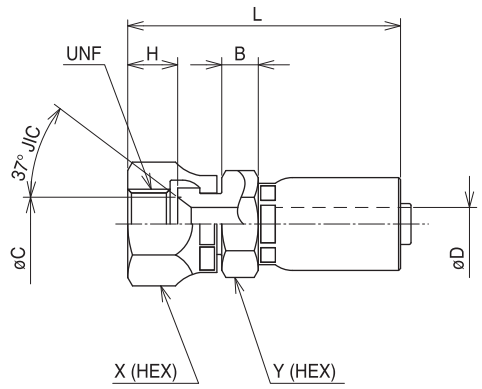
Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AF90-G-04-14	04	1/4	7.0	3.2	5.5	51	33	19	61	PFB-01+PA-04	SP14-04
AF90-G-06-14	06	3/8	10.0	5.6	6.5	61	45	22	100	PFB-01+PA-06	SP14-06
AF90-G-08-14	08	1/2	14.0	8.7	9.0	68	52	27	156	PFB-01+PA-08	* SP14-08 SP10-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

[Swage] (For 1000, 1100, 1400)

SK

Made-to-order

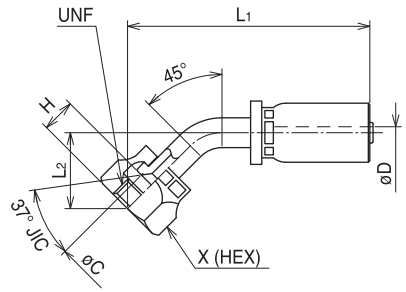


	Part No.	Size No.	UNF	B	C	øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
★	SK-7/16-04-14	04	7/16-20	6.5	7.5	3.5	9.0	51	19	17	58	PSK-04H	SP14-04
★	SK-9/16-06-14	06	9/16-18	7.5	11.0	6.8	10.0	57	22	19	82	PSK-06H	SP14-06
★	SK-3/4-08-14	08	3/4-16	4.5	14.5	9.5	11.5	57	27	22	105	PSE-14-08	* SP14-08 / SP10-08

■ Material: steel
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.
★ Made-to-order

AK45

Made-to-order

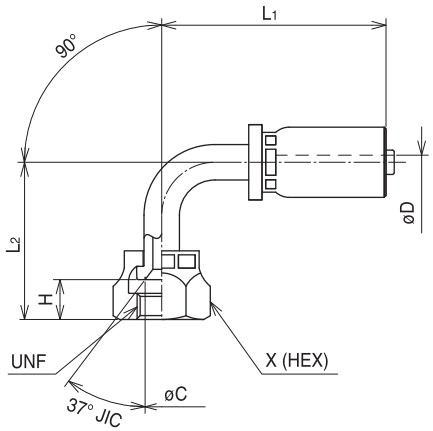


	Part No.	Size No.	UNF	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★	AK45-7/16-04-14-C	04	7/16-20	7.5	3.2	9.0	70	27	19	57	PFB-01+PA-04	SP14-04
★	AK45-9/16-06-14-C	06	9/16-18	11.0	5.6	10.0	91	39	22	90	PFB-01+PA-06	SP14-06
★	AK45-3/4-08-14-C	08	3/4-16	14.5	8.7	12.0	98	40	27	143	PFB-01+PA-08	* SP14-08 / SP10-08

■ Material: steel
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.
★ Made-to-order

AK90

Made-to-order



	Part No.	Size No.	UNF	C	Min. I.D. øD	H	L1	L	X (HEX)	Wt. (g)	Pusher	Die
★	AK90-7/16-04-14-C	04	7/16-20	7.5	3.2	9.0	51	36	19	59	PFB-01+PA-04	SP14-04
★	AK90-9/16-06-14-C	06	9/16-18	11.0	5.6	10.0	61	40	22	98	PFB-01+PA-06	SP14-06
★	AK90-3/4-08-14-C	08	3/4-16	14.5	8.7	12.0	68	57	27	153	PFB-01+PA-08	* SP14-08 / SP10-08

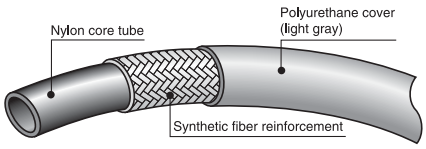
■ Material: steel
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.
★ Made-to-order

1000 (light gray) series

1000 (light gray)

Features

- **Slim, light**
- **Campucka compatible**



Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
1000-04-LGY	04	1/4	6.3	10.4	10.5	13.2	42.0	30	64	Campucka Swage
1000-06-LGY	06	3/8	9.5	14.0	10.5	13.2	42.0	60	90	
1000-08-LGY	08	1/2	12.7	17.4	10.5	13.2	42.0	80	131	

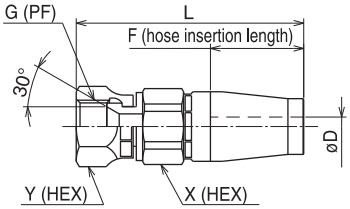
⚠ Caution: If you use Campucka, the maximum working pressure for Campucka must be applied.
- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C

☞ If you use Campucka, the working temperature range for Campucka must be applied.
- Length in a unit package: 100m

☞ Suitable hose coupling is the same as that for the 1000 series.
☞ Color code (-LGY) is appended to part Nos. "LGY" stands for light gray.

[Campucka] Hydraulic push-in coupling (For 1000 (light gray))

CE



Part No.	G	Min. I.D. øD	F	L	X	Y	Weight (g)
CE-G-04-14L	1/4	3.5	26.0	64	19	19	85
CE-G-06-14L	3/8	6.0	29.0	72	22	22	115
CE-G-08-14L	1/2	9.0	35.0	83	27	27	205

⚠ Caution: If you use Campucka, the maximum working pressure for Campucka must be applied.
⚠ Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

- Material: steel
- Maximum working pressure: 10.5MPa
- Working temperature range: –20 to +100°C
- Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Features of Campucka and assembly mechanism

Assembling method P.58

1. Push-one connection

- Reduction of operation time (half that of our conventional product)
- Specialized swaging tool is not necessary. (Easy handling)
- Best for on-site length adjustment.
- Convenient for emergency repair.

2. Detachable hose

- Hose is detachable for length adjustment when piping.
- Detachable tool is available.

⚠ Caution: Cannot be detached after pressurization.

3. Correcting hose's twisted direction

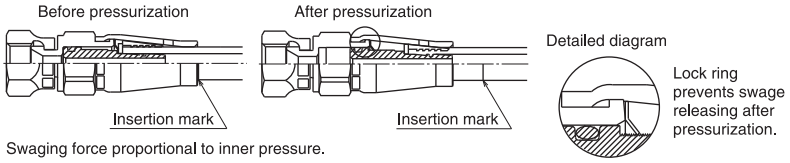
- It is possible to correct the twisted direction of a hose.

⚠ Caution: Cannot be detached after pressurization.

4. Nipple stop mechanism

- Ratchet mechanism of our original lock ring is employed.
- Steady performance even for movable piping.
- Pressure variation is accommodated.

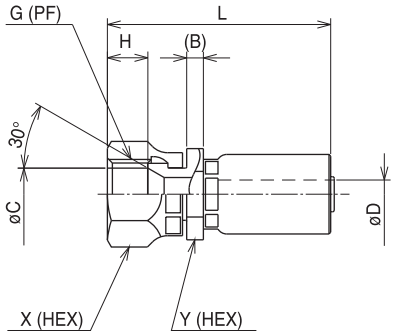
Campucka assembly mechanism



⚠ Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

[Swage]

SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SE-PF-04-14	04	1/4	4.0	9.3	3.5	8.0	49	19	17	55	PSE14-04	SP14-04
SE-PF-06-14	06	3/8	4.0	12.3	6.8	9.5	53	22	19	75	PSE14-06	SP14-06
SE-PF-08-14	08	1/2	4.5	12.3	9.5	12.0	61	27	24	125	PSE14-08	SP14-08

- Material: steel
- Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

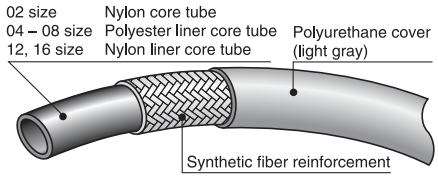
☞ Applicable hose couplings are the same as those for 1000 series.

F3130 (light gray) series

F3130

Features

- Flexible and tough
- High abrasion resistance
- Campucka (for F3130)



Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
F3130-02-LGY	02	1/8	3.6	8.3	20.0	25.0	72.0	15	45	Swage Campucka
F3130-04-LGY	04	1/4	6.3	12.5	19.5	24.4	77.0	40	105	
F3130-06-LGY	06	3/8	9.5	16.4	16.0	20.0	63.0	50	150	
F3130-08-LGY	08	1/2	12.7	20.3	14.0	17.4	56.0	75	210	
F3130-12-LGY	12	3/4	19.0	26.6	9.0	11.3	35.0	130	290	Swage
F3130-16-LGY	16	1	25.4	33.4	7.0	8.8	28.0	165	400	

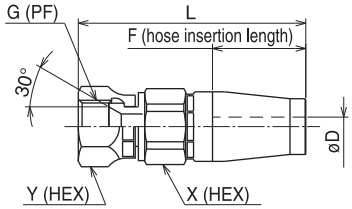
⚠ Caution: If you use Campucka, the maximum working pressure for Campucka must be applied.
- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C

☞ If you use Campucka, the working temperature range for Campucka must be applied.
- Length in a box: 100 m for sizes 02, 04, 06, 08, and 50 m for sizes 12,16.

☞ Hose coupling is the same as that for the N3130 and 3130 series.
☞ Color code (-LGY) is appended to part Nos. "LGY" stands for light gray.

[Campucka] Hydraulic push-one coupling (For F3130 (light gray))

CE (for F3130 series)



Part No.	Size No.	G	Min. I.D. øD	F	L	X	Y	Weight (g)
CE-G-02L	02	1/8	1.5	22.5	62	14	14	44
CE-G-04-F31-10L	04	1/4	3.5	28	74	19	19	105
CE-G-06-F31-10L	06	3/8	6.3	34	84	22	22	150
CE-G-08-F31-10L	08	1/2	9.4	37	92	27	27	225

⚠ Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.
- Material: steel
- Maximum working pressure: 10.5MPa (CE-G-02L: 20.0MPa)
- Working temperature range: –20 to +100°C
- Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Features of Campucka and assembly mechanism

Assembling method P.57

1. Push-one connection
- Reduction of operation time (half that of our conventional product)
- Specialized swaging tool is not necessary. (Easy handling)
- Best for on-site length adjustment.
- Convenient for emergency repair.

2. Detachable hose
- Hose is detachable for length adjustment when piping.
- Detachable tool is available.

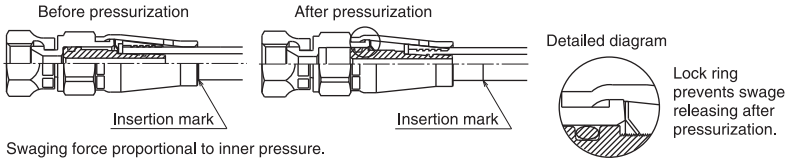
⚠ Caution: Cannot be detached after pressurization.

3. Correcting hose's twisted direction
- It is possible to correct the twisted direction of a hose.

⚠ Caution: Cannot be detached after pressurization.

4. Nipple stop mechanism
- Ratchet mechanism of our original lock ring is employed.
- Steady performance even for movable piping.
- Pressure variation is accommodated.

Campucka assembly mechanism

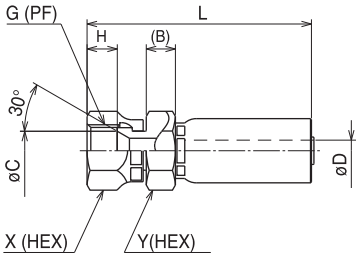


Swaging force proportional to inner pressure.

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

[Swage]

SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SSE-PF-02	02	1/8	4.0	6.8	1.8	7.0	42	14	14	25	PSE-02-001	SP3-02-001
SE-PF-04	04	1/4	8.0	9.3	3.9	8.0	64	19	17	75	PSE-04	SP3-04
SE-PF-06	06	3/8	9.5	12.3	6.8	9.5	71	22	19	100	PSE-06	SP3-06
SE-PF-08	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SP3-08
SE-PF-12	12	3/4	10.5	21.5	16.0	13.0	87	36	36	280	PSE-12	SP3-12
SE-PF-16	16	1	11.0	27.5	20.9	15.0	105	41	41	400	PSE-16	SP3-16

- Material: steel
- Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

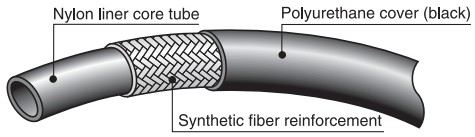
N3130·3130·3000 Series

N3130

Features

- Flexible and tough
- JIS K 6375 certificated, SAE100R7 certificated.

Nonconductive hose with high electrical insulation is also available. Contact us for details.



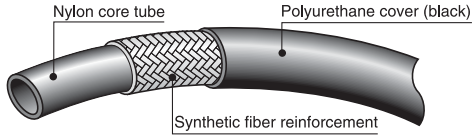
Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
N3130-03	03	3/16	4.8	10.4	21.0	26.3	84.0	20	65	Swage
N3130-04	04	1/4	6.4	12.7	19.5	24.4	77.0	40	105	
N3130-05	05	5/16	8.1	14.7	17.5	21.9	70.0	45	130	
N3130-06	06	3/8	9.8	16.4	16.0	20.0	63.0	50	150	
N3130-08	08	1/2	12.8	20.3	14.0	17.5	56.0	75	210	
N3130-12	12	3/4	19.2	26.6	9.0	11.3	35.0	130	290	
N3130-16	16	1	25.7	33.4	7.0	8.8	28.0	165	400	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a package: 100 m for sizes 03, 04, 05, 06, 08 and 50 m for sizes 12,16

3130

Features

- Excellent oil and chemical durability
- Reusable coupling can be used.



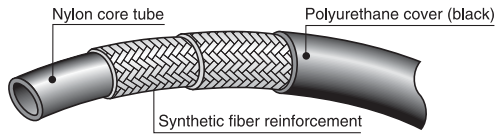
Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
3130-02	02	1/8	3.6	8.3	20.0	25.0	72.0	15	45	Swage Reusable (Campucka can be used only for size 02.)
3130-03	03	3/16	4.8	10.4	20.0	25.0	72.0	30	65	
3130-04	04	1/4	6.3	12.4	20.0	25.0	72.0	40	105	
3130-05	05	5/16	7.9	13.8	18.0	22.5	65.0	50	115	
3130-06	06	3/8	9.5	16.1	18.0	22.5	65.0	60	150	
3130-08	08	1/2	12.7	19.9	16.0	20.0	58.0	80	210	
3130-12	12	3/4	19.0	26.2	10.0	12.5	36.0	160	290	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a package: 100 m for sizes 03, 04, 05, 06, 08 and 50 m for sizes 12,16

3000

Features

- Excellent oil and chemical durability
- Reusable coupling can be used.



Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
3000-03	03	3/16	4.8	10.4	34.0	42.5	100.0	70	76	Swage Reusable
3000-04	04	1/4	6.3	12.5	30.0	37.5	90.0	75	98	
3000-06	06	3/8	9.5	16.0	24.0	30.0	70.0	120	140	
3000-08	08	1/2	12.7	19.8	20.0	25.0	60.0	160	199	
3000-12	12	3/4	19.0	26.2	13.0	16.3	38.0	250	276	
3000-16	16	1	25.4	33.0	10.0	12.5	30.0	300	366	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a package: 100 m for sizes 03, 04, 06, 08 and 50 m for sizes 12,16

Nonconductive hose

When electrical insulation is particularly necessary, e.g. for the hydraulic hose of electrical work equipment, a nonconductive hose without pin pricking (no pin hole for gas venting) is useful to prevent the reduction of electrical insulation due to external water invasion.

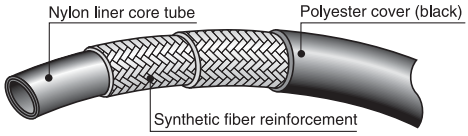
☞ Contact us if the leakage of electrical current should be controlled.

3700 Series (for low temperature environment)

3700

Features

- **High flexibility and steady performance under low temperature environment (–55°C).**
- **JIS K 6375 A certificated, SAE 100R7 certificated.**

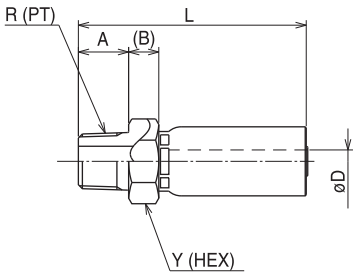


Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)						
3700-03	03	3/16	4.8	10.5	21.0	26.3	84.0	19	76	Swage
3700-04	04	1/4	6.3	12.8	19.5	24.4	77.0	32	101	
3700-06	06	3/8	9.5	16.3	16.0	20.0	63.0	51	141	
3700-08	08	1/2	12.7	20.2	14.0	17.5	56.0	76	196	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –55 to +100°C
- Length in a package: 100m

[Swage] (For N3130, 3130, 3000) (For 3700)

SA



Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SSA-PT-02	02	1/8	10	6.5	1.8	38	14	15	PSA-02	SP3-02-001
SA-PT-03	03	1/4	13	8.5	2.8	57	19	50	PSA-04	SP3-03
SA-PT-04	04	1/4	14	8.5	3.9	61	19	60	PSA-04	SP3-04
SA-PT-05	05	3/8	15	9.0	5.6	62	22	80	PSA-06	SP3-05
SA-PT-06	06	3/8	15	9.0	6.8	67	22	90	PSA-06	SP3-06
SA-PT-08	08	1/2	18	10.0	10.0	76	27	140	PSA-08	SP3-08
SA-PT-12	12	3/4	20	10.0	16.0	82	36	220	PSA-12	SP3-12
SA-PT-16	16	1	23	10.0	20.9	100	41	340	PSA-16	SP3-16

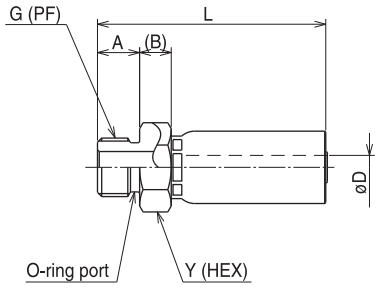
■ Material: steel
■ Adaptor: 030, 130

Stainless type

Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die	
										First	Second
SSA-PT-02-S	02	1/8	10	6.5	1.8	38	14	15	PSA-02	SP3-02-001	—
SA-PT-03-S	03	1/4	13	8.5	3.0	57	19	50	PSA-04	SP3-03-1-ST	SP3-03
SA-PT-04-S	04	1/4	13	8.5	3.9	60	19	60	PSA-04	SP3-04-1-ST	*KM-04 / SP3-04
SA-PT-06-S	06	3/8	15	9.0	6.8	67	22	90	PSA-06	SP3-06-1-ST	SP3-06
SA-PT-08-S	08	1/2	18	10.0	10.0	76	27	140	PSA-08	SP3-08-1-ST	SP3-08
SA-PT-12-S	12	3/4	20	10.0	16.0	82	36	220	PSA-12	SP3-12-1-ST	SP3-12
SA-PT-16-S	16	1	23	10.0	20.9	100	41	340	PSA-16	SP3-16-1-ST	SP3-16

■ Material: stainless steel SUS304
■ Adaptor: 030, 130
* Use KM-04 for N3130 and 3700, and SP3-04 for 3130 and 3000.

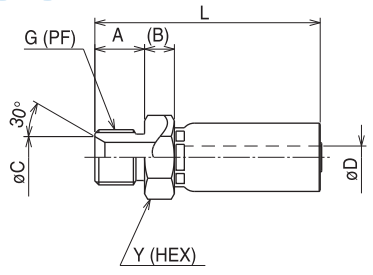
SO



Part No.	Size No.	G	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SO-PF-04	04	1/4	11	8.5	3.9	59	19	55	PSA-04	SP3-04
SO-PF-06	06	3/8	12	9.0	6.8	64	22	85	PSA-06	SP3-06
★ SO-PF-08	08	1/2	15	10.0	10.0	73	27	135	PSA-08	SP3-08

■ Material: steel
■ O-ring: 04-JIS B2401-P11, 06-JIS B2401-P14, 08-JIS B2401-P18
☞ O-ring is not mounted inside.
★ Made-to-order

SC

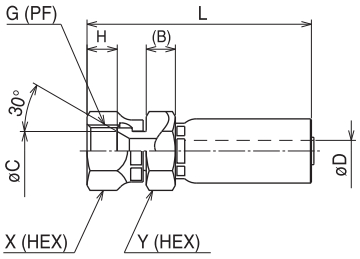


Part No.	Size No.	G	A	B	C	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SC-PF-03	03	1/4	13	8.5	9.5	2.8	57	19	50	PSA-04	SP3-03
SC-PF-04	04	1/4	13	8.5	9.5	3.9	61	19	60	PSA-04	SP3-04
SC-PF-06	06	3/8	15	9.0	12.5	6.8	67	22	90	PSA-06	SP3-06
SC-PF-08	08	1/2	18	10.0	16.5	10.0	76	27	140	PSA-08	SP3-08
SC-PF-12	12	3/4	20	10.0	21.5	16.0	82	36	220	PSA-12	SP3-12
SC-PF-16	16	1	22	10.0	27.5	20.9	99	41	340	PSA-16	SP3-16

■ Material: steel
■ Adaptor: 060

[Swage] (For N3130, 3130, 3000) (For 3700)

SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SSE-PF-02	02	1/8	4.0	6.8	1.8	7.0	42	14	14	25	PSE-02-001	SP3-02-001
SE-PF-03	03	1/4	6.0	9.5	2.8	8.0	58	19	19	70	PSE-03	SP3-03
SE-PF-04	04	1/4	8.0	9.3	3.9	8.0	64	19	17	75	PSE-04	SP3-04
SE-PF-05	05	3/8	8.5	12.0	5.6	10.0	66	22	22	100	PSE-05	SP3-05
SE-PF-06	06	3/8	9.5	12.3	6.8	10.0	71	22	19	100	PSE-06	SP3-06
SE-PF-08	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SP3-08
SE-PF-12	12	3/4	10.5	21.5	16.0	13.0	87	36	36	280	PSE-12	SP3-12
SE-PF-16	16	1	11.0	27.5	20.9	15.0	105	41	41	400	PSE-16	SP3-16

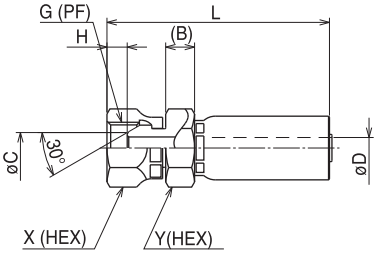
■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless type

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SSE-PF-02-S	02	1/8	4.0	7.0	1.8	7.0	42	14	14	25	PSE-02-001	SP3-02-001	—
SE-PF-03-S	03	1/4	6.0	9.0	3.0	8.0	58	19	19	70	PSE-03	SP3-03-1-ST	SP3-03
SE-PF-04-S	04	1/4	8.5	9.5	3.9	8.0	63	19	19	80	PSE-04	SP3-04-1-ST	* KM-04 / SP3-04
SE-PF-06-S	06	3/8	9.5	12.5	6.8	10.0	71	22	22	110	PSE-06	SP3-06-1-ST	SP3-06
SE-PF-08-S	08	1/2	9.0	16.0	10.0	12.0	80	27	27	170	PSE-08	SP3-08-1-ST	SP3-08
SE-PF-12-S	12	3/4	10.5	21.5	16.0	13.0	87	36	36	280	PSE-12	SP3-12-1-ST	SP3-12
SE-PF-16-S	16	1	11.0	27.5	20.9	15.0	105	41	41	400	PSE-16	SP3-16-1-ST	SP3-16

■ Material: stainless steel SUS304
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use KM-04 for N3130 and 3700, and SP3-04 for 3130 and 3000.

SF



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SSF-PF-02	02	1/8	4.0	5.0	1.8	3.0	41	14	14	25	PSE-02-001	SP3-02-001
SF-PF-03	03	1/4	6.0	7.5	2.8	5.5	58	19	19	70	PSE-03	SP3-03
SF-PF-04	04	1/4	8.5	7.5	3.9	5.5	63	19	17	75	PSE-04	SP3-04
SF-PF-05	05	3/8	8.5	10.0	5.6	6.5	66	22	22	100	PSE-05	SP3-05
SF-PF-06	06	3/8	9.5	10.0	6.8	6.5	71	22	19	100	PSE-06	SP3-06
SF-PF-08	08	1/2	9.0	14.0	10.0	9.0	80	27	27	170	PSE-08	SP3-08
SF-PF-12	12	3/4	10.5	19.0	16.0	9.5	87	36	36	280	PSE-12	SP3-12
SF-PF-16	16	1	11.0	25.4	20.9	10.0	105	41	41	410	PSE-16	SP3-16

■ Material: steel
■ Adaptor: 110, 145, 190, 130

Stainless type

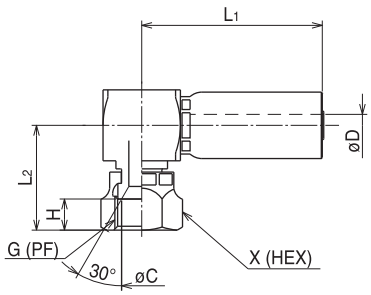
Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SSF-PF-02-S	02	1/8	4.0	5.0	1.8	3.0	41	14	14	25	PSE-02-001	SP3-02-001	—
SF-PF-04-S	04	1/4	8.5	7.5	3.9	5.5	63	19	19	80	PSE-04	SP3-04-1-ST	* KM-04 / SP3-04
SF-PF-06-S	06	3/8	9.5	10.0	6.8	6.5	71	22	22	110	PSE-06	SP3-06-1-ST	SP3-06
SF-PF-08-S	08	1/2	9.0	13.2	10.0	9.0	80	27	27	170	PSE-08	SP3-08-1-ST	SP3-08
SF-PF-12-S	12	3/4	10.5	19.0	16.0	9.5	87	36	36	280	PSE-12	SP3-12-1-ST	SP3-12
SF-PF-16-S	16	1	11.0	25.4	20.9	10.0	105	41	41	400	PSE-16	SP3-16-1-ST	SP3-16

■ Material: stainless steel SUS304
■ Adaptor: 110, 145, 190, 130
* Use KM-04 for N3130 and 3700, and SP3-04 for 3130 and 3000.

[Swage] (For N3130, 3130, 3000) (For 3700)

SLE

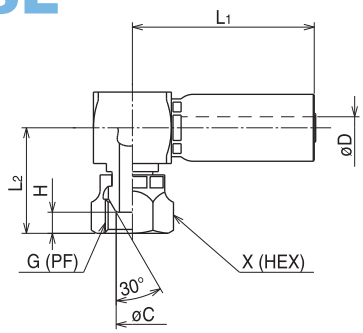
Made-to-order



	Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★	SLE-PF-04	04	1/4	9.5	3.9	8.0	49	28	19	115	PSL-04	SP3-04
★	SLE-PF-06	06	3/8	12.5	6.8	9.5	55	33	22	116	PSL-06	SP3-06
★	SLE-PF-08	08	1/2	16.0	10.0	12.0	62	37	27	255	PSL-08	SP3-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
★ Made-to-order

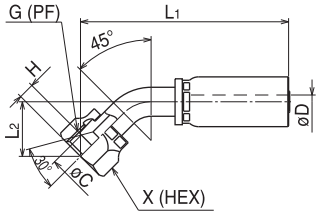
SL

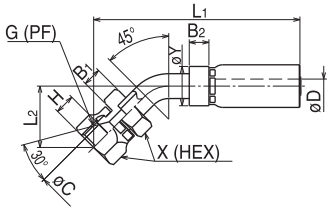


	Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
	SL-PF-04	04	1/4	7.5	3.9	5.5	54	28	19	115	PSL-04	SP3-04
	SL-PF-06	06	3/8	10.0	6.8	6.5	55	33	22	165	PSL-06	SP3-06
	SL-PF-08	08	1/2	13.2	10.0	9.0	62	37	27	255	PSL-08	SP3-08
★	SL-PF-12	12	3/4	19.0	16.0	9.5	71	43	36	550	PSL-12	SP3-12

■ Material: steel
■ Adaptor: 110, 145, 190, 130
★ Made-to-order

AE45·SE45





	Part No.	Size No.	G	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
	AE45-G-04	04	1/4	9.0	3.2	8.0	71	18	19	70	PFB-01+PA-04	SP3-04
	AE45-G-06	06	3/8	12.0	5.6	9.5	87	25	22	105	PFB-01+PA-06	SP3-06
	AE45-G-08	08	1/2	15.5	8.7	12.5	102	29	27	170	PFB-01+PA-08	SP3-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

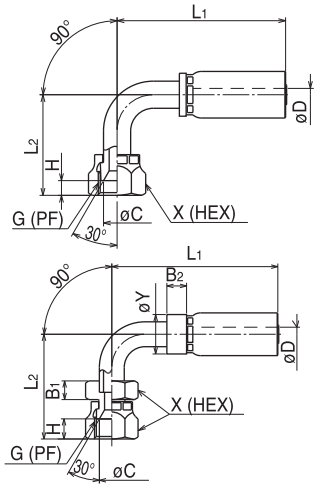
	Part No.	Size No.	G	B1	B2	C	Min. I.D. øD	H	L1	L2	X (HEX)	øY	Wt. (g)	Pusher	Die
★	SE45-PF-12	12	3/4	10.5	12.5	21.0	16.0	13.5	129	40	36	30	380	PFB-02+PHB-12	SP3-12
★	SE45-PF-16	16	1	12.5	12.5	28.0	20.9	16.5	154	47	41	36	590	PFB-02+PHB-16	SP3-16

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
★ Made-to-order

[Swage]

(For N3130, 3130, 3000) (For 3700)

AE90·SE90



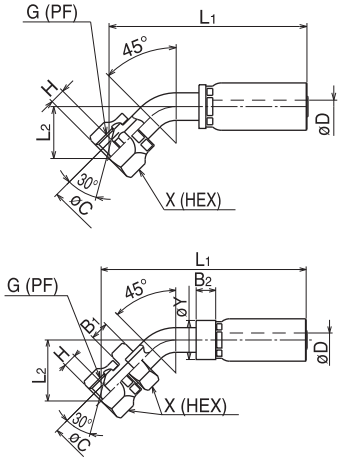
Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AE90-G-04	04	1/4	9.0	3.2	8.0	59	33	19	75	PFB-01+PA-04	SP3-04
AE90-G-06	06	3/8	12.0	5.6	9.5	74	45	22	115	PFB-01+PA-06	SP3-06
AE90-G-08	08	1/2	15.5	8.7	12.5	83	52	27	180	PFB-01+PA-08	SP3-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Part No.	Size No.	G	B1	B2	C	Min. I.D. ØD	H	L1	L2	X (HEX)	øY	Wt. (g)	Pusher	Die
SE90-PF-12	12	3/4	10.5	12.5	21.0	16.0	13.5	108	77	36	30	405	PFB-02+PHB-12	SP3-12
SE90-PF-16	16	1	12.5	12.5	28.0	20.9	16.5	127	87	41	36	645	PFB-02+PHB-16	SP3-16

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

AF45·SF45



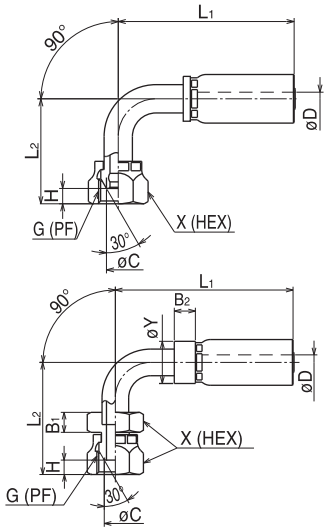
Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AF45-G-04	04	1/4	7.0	3.2	5.5	73	19	19	70	PFB-01+PA-04	SP3-04
AF45-G-06	06	3/8	10.0	5.6	6.5	85	23	22	110	PFB-01+PA-06	SP3-06
AF45-G-08	08	1/2	14.0	8.7	9.0	103	29	27	155	PFB-01+PA-08	SP3-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130

Part No.	Size No.	G	B1	B2	C	Min. I.D. ØD	H	L1	L2	X (HEX)	øY	Wt. (g)	Pusher	Die
★ SF45-PF-12	12	3/4	10.5	12.5	19.0	16.0	9.5	129	40	36	30	381	PFB-02+PHB-12	SP3-12
★ SF45-PF-16	16	1	11.0	12.5	25.4	20.9	10.0	151	60	41	36	601	PFB-02+PHB-16	SP3-16

■ Material: steel
■ Adaptor: 110, 145, 190, 130
★ Made-to-order

AF90·SF90



Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AF90-G-04	04	1/4	7.0	3.2	5.5	61	33	19	75	PFB-01+PA-04	SP3-04
AF90-G-06	06	3/8	10.0	5.6	6.5	74	45	22	115	PFB-01+PA-06	SP3-06
AF90-G-08	08	1/2	14.0	8.7	9.0	83	52	27	165	PFB-01+PA-08	SP3-08

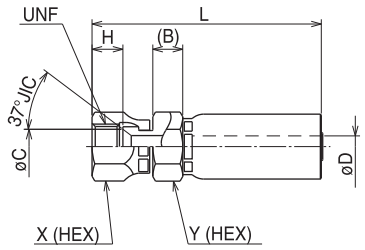
■ Material: steel
■ Adaptor: 110, 145, 190, 130

Part No.	Size No.	G	B1	B2	C	Min. I.D. ØD	H	L1	L2	X (HEX)	øY	Wt. (g)	Pusher	Die
★ SF90-PF-12	12	3/4	10.5	12.5	19.0	16.0	9.5	108	77	36	30	405	PFB-02+PHB-12	SP3-12
★ SF90-PF-16	16	1	11.0	12.5	25.4	20.9	10.0	127	86	41	36	645	PFB-02+PHB-16	SP3-16

■ Material: steel
■ Adaptor: 110, 145, 190, 130
★ Made-to-order

[Swage] (For N3130, 3130, 3000) (For 3700)

SK

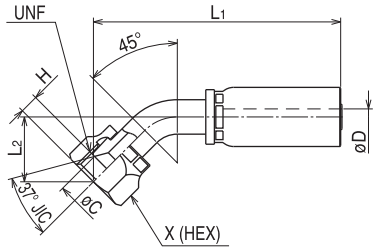


	Part No.	Size No.	UNF	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
	SK-7/16-03	03	7/16	6.5	7.5	2.8	10.0	58	15.9	14.3	50	PSK-7/16-04	SP3-03
	SK-7/16-04	04	7/16	6.5	7.5	3.9	10.0	61	15.9	15.9	60	PSK-7/16-04	SP3-04
★	SK-1/2-04	04	1/2	9.5	9.0	3.9	9.5	65	19.0	15.9	60	PSK-1/2-04	SP3-04
★	SK-9/16-04	04	9/16	7.0	11.0	3.9	10.0	65	19.0	15.9	65	PSK-9/16-04	SP3-04
	SK-9/16-06	06	9/16	9.5	11.0	6.8	10.0	72	19.0	19.0	90	PSK-9/16-06	SP3-06
★	SK-3/4-06	06	3/4	8.5	14.5	6.8	12.0	72	24.0	19.0	95	PSK-3/4-06	SP3-06
	SK-3/4-08	08	3/4	9.0	14.5	10.0	12.0	77	24.0	22.0	125	PSK-3/4-08	SP3-08
★	SK-7/8-08	08	7/8	9.0	17.3	10.0	13.0	81	27.0	22.0	145	PSE-08	SP3-08

■ Material: steel
★ Made-to-order

AK45

Made-to-order

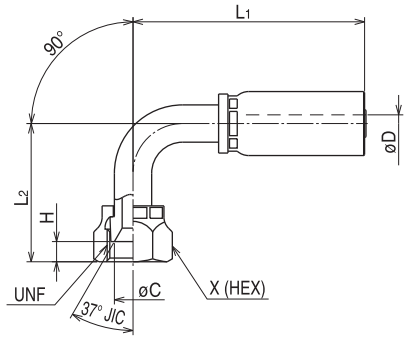


	Part No.	Size No.	UNF	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★	AK45-7/16-03	03	7/16	7.5	2.6	9.0	69	18	19	57	PFB-01+PA-04	SP3-03
★	AK45-7/16-04-C	04	7/16	7.5	3.2	9.0	72	18	19	64	PFB-01+PA-04	SP3-04
★	AK45-9/16-06-C	06	9/16	11.0	5.6	10.0	89	24	22	110	PFB-01+PA-06	SP3-06
★	AK45-3/4-08-C	08	3/4	14.5	8.7	11.5	100	27	27	161	PFB-01+PA-08	SP3-08

■ Material: steel
★ Made-to-order

AK90

Made-to-order

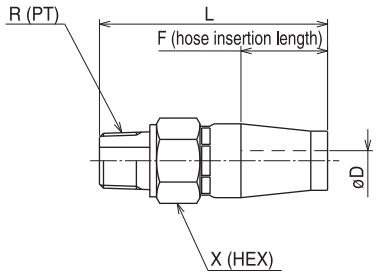


	Part No.	Size No.	UNF	C	Min. I.D. øD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★	AK90-7/16-03	03	7/16	7.5	2.6	9.0	58	32	19	62	PFB-01+PA-04	SP3-03
★	AK90-7/16-04-C	04	7/16	7.5	3.2	9.0	61	32	19	69	PFB-01+PA-04	SP3-04
★	AK90-9/16-06-C	06	9/16	11.0	5.6	10.0	74	43	22	117	PFB-01+PA-06	SP3-06
★	AK90-3/4-08-C	08	3/4	14.5	8.7	11.5	83	47	27	171	PFB-01+PA-08	SP3-08

■ Material: steel
★ Made-to-order

[Campucka] Hydraulic push-one coupling (For 3130-02)

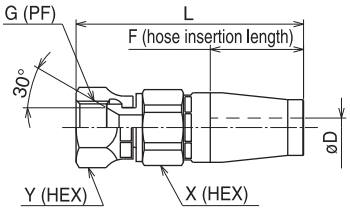
CA



Part No.	Size No.	R	Min. I.D. øD	F	L	X	Weight (g)
CA-R-02L	02	1/8	1.5	22.5	56	14	36

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.
- Material: steel
- Working temperature range: 20.0MPa
- Working temperature range: –20 to +100°C
- Adaptor: 030, 130

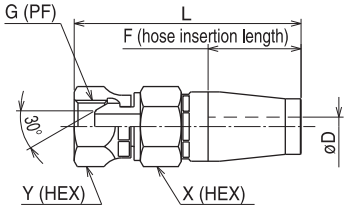
CE



Part No.	Size No.	G	Min. I.D. øD	F	L	X	Y	Weight (g)
CE-G-02L	02	1/8	1.5	22.5	62	14	14	44

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.
- Material: steel
- Working temperature range: 20.0MPa
- Working temperature range: –20 to +100°C
- Adaptor: 010, 045, 090, 150, 030

CF



Part No.	Size No.	G	Min. I.D. øD	F	L	X	Y	Weight (g)
CF-G-02L	02	1/8	1.5	22.5	62	14	14	45

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.
- Material: steel
- Working temperature range: 20.0MPa
- Working temperature range: –20 to +100°C
- Suitable adaptor: 110, 145, 190, 130

Features of Campucka and assembly mechanism

Assembling method P.57

1. Push-one connection
- Reduction of operation time (half that of our conventional product)
- Specialized swaging tool is not necessary. (Easy handling)
- Best for on-site length adjustment.
- Convenient for emergency repair.

2. Detachable hose
- Hose is detachable for length adjustment when piping.
- Detachable tool is available.

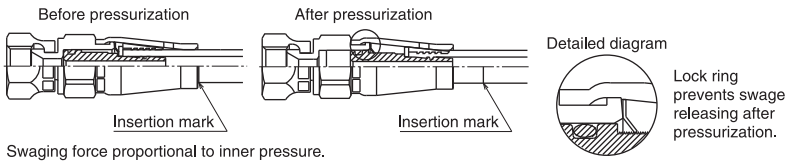
⚠Caution: Cannot be detached after pressurization.

3. Correcting hose's twisted direction
- It is possible to correct the twisted direction of a hose.

⚠Caution: Cannot be detached after pressurization.

4. Nipple stop mechanism
- Ratchet mechanism of our original lock ring is employed.
- Steady performance even for movable piping.
- Pressure variation is accommodated.

Campucka assembly mechanism

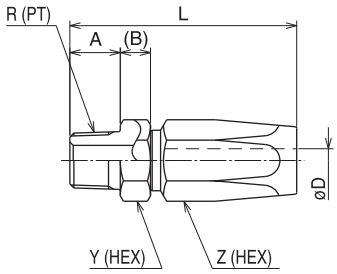


Swaging force proportional to inner pressure.

⚠Caution: Handle with care not to drop couplings as an inner nipple could be self locked by pushing-out action to inlet of coupling.

[Reusable] (For 3130, 3000)

A



	Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Z (HEX)	Weight (g)
	A-PT-02	02	1/8	10	6.5	2.8	42	12	12	25
	A-PT-03	03	1/4	14	7.0	3.4	51	17	14	45
	A-PT-04	04	1/4	14	7.0	5.0	57	17	17	60
	A-PT-05	05	3/8	15	9.0	6.0	65	21	19	100
	A-PT-06	06	3/8	15	9.0	7.0	68	21	21	120
	A-PT-08	08	1/2	18	10.0	9.6	79	26	26	210
	A-PT-12	12	3/4	20	12.0	16.5	85	35	35	370
★	A-PT-16	16	1	23	13.0	21.5	92	41	41	500

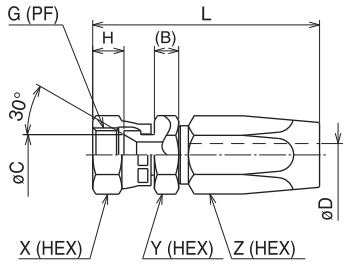
■ Material: steel
■ Adaptor: 030, 130
★ Made-to-order

Stainless type

	Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Z (HEX)	Weight (g)
	A-PT-02-S	02	1/8	10	6.5	2.8	42	12	12	25
	A-PT-04-S	04	1/4	14	7.0	5.0	57	17	17	60
	A-PT-06-S	06	3/8	15	9.0	7.0	68	21	21	120
★	A-PT-08-S	08	1/2	18	10.0	9.6	79	26	26	210
★	A-PT-12-S	12	3/4	20	12.0	16.5	85	35	35	370

■ Material: stainless steel SUS304
■ Adaptor: 030, 130
★ Made-to-order

E



	Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Z (HEX)	Weight (g)
	E-PF-02	02	1/8	6.5	7.0	2.8	7.0	48	14	12	12	35
	E-PF-03	03	1/4	6.5	9.5	3.4	8.0	54	17	17	14	60
	E-PF-04	04	1/4	6.5	9.5	5.0	8.5	59	17	17	17	70
	E-PF-05	05	3/8	6.5	12.5	6.0	9.5	66	21	21	19	110
	E-PF-06	06	3/8	7.5	12.5	7.0	9.5	70	21	21	21	130
	E-PF-08	08	1/2	7.5	16.0	9.6	12.5	82	26	26	26	220
	E-PF-12	12	3/4	9.5	21.5	16.5	13.0	86	35	35	35	400
	E-PF-16	16	1	9.5	27.5	21.5	16.5	92	41	41	41	530

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

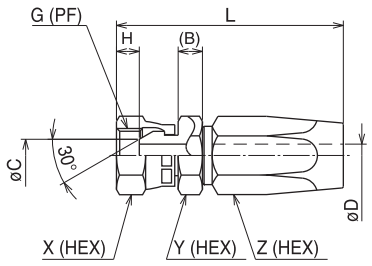
Stainless type

	Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Z (HEX)	Weight (g)
	E-PF-02-S	02	1/8	6.5	7.0	2.8	7.0	48	14	12	12	35
	E-PF-04-S	04	1/4	6.5	9.5	5.0	8.5	59	17	17	17	70
	E-PF-06-S	06	3/8	7.5	12.5	7.0	9.5	70	21	21	21	130
★	E-PF-08-S	08	1/2	7.5	16.0	9.6	12.5	82	26	26	26	220
★	E-PF-12-S	12	3/4	9.5	21.5	16.5	13.0	86	35	35	35	400

■ Material: stainless steel SUS304
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
★ Made-to-order

[Reusable] (For 3130, 3000)

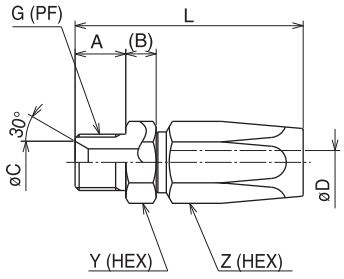
F



	Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Z (HEX)	Weight (g)
	F-PF-02	02	1/8	6.5	5.0	2.8	3.0	48	14	12	12	35
	F-PF-03	03	1/4	6.5	7.0	3.4	6.0	54	17	17	14	60
	F-PF-04	04	1/4	6.5	7.0	5.0	6.0	59	17	17	17	70
	F-PF-05	05	3/8	6.5	10.0	6.0	7.0	66	21	21	19	110
	F-PF-06	06	3/8	7.5	10.0	7.0	7.0	70	21	21	21	130
	F-PF-08	08	1/2	7.5	14.0	9.6	8.5	82	26	26	26	220
	F-PF-12	12	3/4	9.5	19.0	16.5	9.0	86	35	35	35	410
★	F-PF-16	16	1	9.5	25.0	21.5	10.5	92	41	41	41	570

■ Material: steel
■ Adaptor: 110, 145, 190, 130
★ Made-to-order

C



	Part No.	Size No.	G	A	B	C	Min. I.D. øD	L	Y (HEX)	Z (HEX)	Weight (g)
	C-PF-02	02	1/8	10	6.5	7.0	2.8	42	12	12	25
★	C-PF-03	03	1/4	14	7.0	9.5	3.4	51	17	14	45
	C-PF-04	04	1/4	14	7.0	9.5	5.0	57	17	17	60
	C-PF-06	06	3/8	15	9.0	12.5	7.0	68	21	21	120
	C-PF-08	08	1/2	18	10.0	16.5	9.6	79	26	26	210
	C-PF-12	12	3/4	20	12.0	22.0	16.5	85	35	35	500

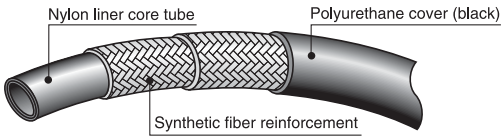
■ Material: steel
■ Adaptor: 060
★ Made-to-order

N3000 Series

N3000

Features

● **Flexible and tough**



Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
N3000-04	04	1/4	6.3	13.3	28.0	37.3	112.0	50	120	Swage
N3000-06	06	3/8	9.5	17.5	21.0	28.0	84.0	65	190	
N3000-08	08	1/2	12.7	21.3	21.0	28.0	84.0	80	280	
N3000-10	10	5/8	15.9	25.5	17.5	23.3	70.0	120	355	

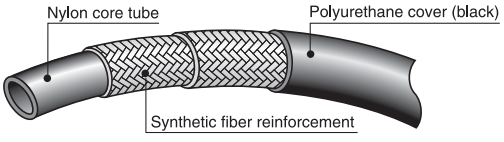
● Appropriate fluid: mineral general operating oil
● Working temperature range: –40 to +100°C

HT (High Temperature) Series

HT (High Temperature)

Features

● **High temperature (120°C) oil can be used.**



Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
HT-04	04	1/4	6.3	13.3	28.0	37.3	112.0	40	125	Swage
HT-06	06	3/8	9.5	17.5	21.0	28.0	84.0	60	180	
HT-08	08	1/2	12.7	21.3	21.0	28.0	84.0	80	255	
HT-10	10	5/8	15.9	25.5	17.5	23.3	70.0	120	335	

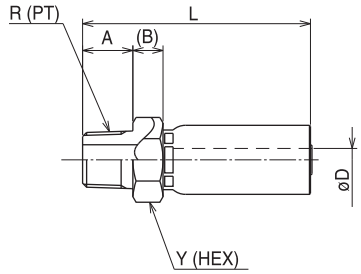
● Appropriate fluid: mineral general operating oil
● Working temperature range: –40 to +120°C

[Swage]

⚠ Caution: The size 04 coupling for N3130 can also be used, but the swage die must be used for N3000 and HT.

(For N3000) (For HT)

SA



Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SA-PT-04	04	1/4	13	8.5	3.9	61	19	60	PSA-04	SPN-04
SA-PT-06-N30	06	3/8	15	9.0	6.8	67	22	90	PSA-06	SPN-06
SA-PT-08-N30	08	1/2	18	10.0	10.0	76	27	140	PSA-08	SPN-08
SA-PT-10-N30	10	3/4	20	10.0	13.0	80	32	180	PSA-10	SPN-10

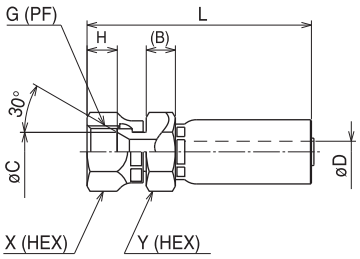
■ Material: steel
■ Adaptor: 030, 130

Stainless type

Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die	
										First	Second
SA-PT-04-S	04	1/4	14	8.5	3.9	61	19	60	PSA-04	SPH-04-1-ST	SPN-04
SA-PT-06-N30-S	06	3/8	15	9.0	6.8	67	22	90	PSA-06	SPH-06-1-ST	SPN-06
SA-PT-08-N30-S	08	1/2	18	10.0	10.0	76	27	140	PSA-08	SPH-08-1-ST	SPN-08

■ Material: stainless steel SUS304
■ Adaptor: 030, 130

SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SE-PF-04	04	1/4	8.0	9.3	3.9	8.0	64	19	17	75	PSE-04	SPN-04
SE-PF-06-N30	06	3/8	9.5	12.3	6.8	9.5	71	22	19	110	PSE-06	SPN-06
SE-PF-08-N30	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SPN-08
SE-PF-10-N30	10	3/4	10.5	21.0	13.1	13.0	84	32	32	220	PSE-10	SPN-10

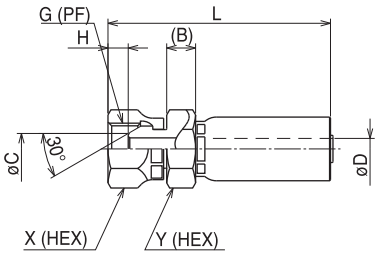
■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless type

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SE-PF-04-S	04	1/4	8.0	9.0	3.9	8.0	64	19	19	80	PSE-04	SPH-04-1-ST	SPN-04
SE-PF-06-N30-S	06	3/8	9.5	12.5	6.8	9.5	71	22	22	110	PSE-06	SPH-06-1-ST	SPN-06
SE-PF-08-N30-S	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SPH-08-1-ST	SPN-08

■ Material: stainless steel SUS304
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

SF

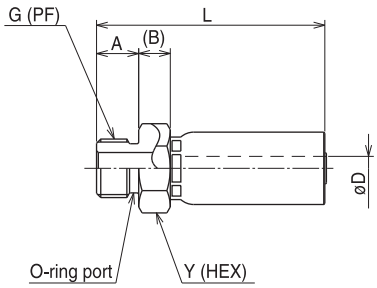


Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SF-PF-04	04	1/4	8.5	7.5	3.9	5.5	63	19	17	75	PSE-04	SPN-04
SF-PF-06-N30	06	3/8	9.5	10.0	6.8	6.5	71	22	19	110	PSE-06	SPN-06
SF-PF-08-N30	08	1/2	9.0	14.0	10.0	9.0	80	27	27	170	PSE-08	SPN-08
SF-PF-10-N30	10	3/4	10.5	19.0	13.1	9.5	84	32	32	220	PSE-10	SPN-10

■ Material: steel
■ Adaptor: 110, 145, 190, 130

[Swage] ⚠ Caution: The size 04 coupling for N3130 can also be used, but the swage die must be used for N3000 and HT. (For N3000) (For HT)

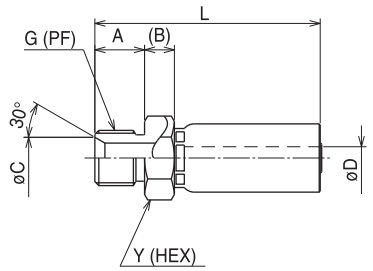
SO



Part No.	Size No.	G	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SO-PF-04	04	1/4	11	8.5	3.9	59	19	55	PSA-04	SPN-04
SO-PF-06-N30	06	3/8	12	9.0	6.8	64	22	85	PSA-06	SPN-06
SO-PF-08-N30	08	1/2	15	10.0	10.0	73	27	135	PSA-08	SPN-08

■ Material: steel
■ O-ring: 04-JIS B2401-P11, 06-JIS B2401-P14, 08-JIS B2401-P18
☞ O-ring is not mounted inside.

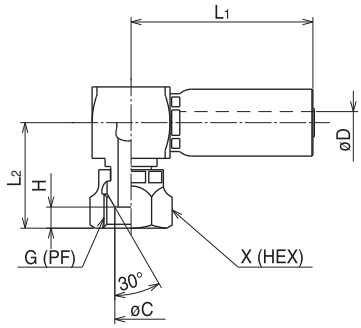
SC



	Part No.	Size No.	G	A	B	C	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
	SC-PF-04	04	1/4	13	8.5	9.5	3.9	61	19	60	PSA-04	SPN-04
	SC-PF-06-N30	06	3/8	15	9.0	12.5	6.8	67	22	90	PSA-06	SPN-06
★	SC-PF-08-N30	08	1/2	18	10.0	16.5	10.0	76	27	140	PSA-08	SPN-08
★	SC-PF-10-N30	10	5/8	20	10.0	22.0	13.0	80	32	180	PSA-10	SPN-10

■ Material: steel
■ Adaptor: 060
★ Made-to-order

SL



Part No.	Size No.	G	C	Min. I.D. øD	H	L_1	L_2	X (HEX)	Wt. (g)	Pusher	Die
SL-PF-04	04	1/4	7.5	3.9	5.5	54	28	19	115	PSL-04	SPN-04
SL-PF-06-N30	06	3/8	10.0	6.8	6.5	55	33	22	160	PSL-06	SPN-06
SL-PF-08-N30	08	1/2	13.2	10.0	9.0	62	37	27	255	PSL-08	SPN-08
SL-PF-10-N30	10	3/4	19.0	13.1	9.5	69	42	32	490	PSL-12	SPN-10

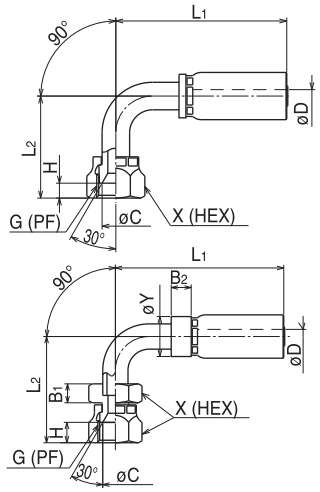
■ Material: steel
■ Adaptor: 110, 145, 190, 130

[Swage]

⚠ Caution: The size 04 coupling for N3130 can also be used, but the swage die must be used for N3000 and HT.

(For N3000) (For HT)

AE90·SE90



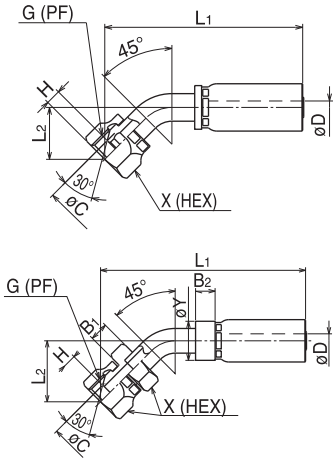
Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AE90-G-04	04	1/4	9.0	3.2	8.0	59	33	19	75	PFB-01+PHB-04	SPN-04
AE90-G-06-N30	06	3/8	12.0	5.6	9.5	73	45	22	122	PFB-01+PHB-06	SPN-06
AE90-G-08-N30	08	1/2	15.5	8.7	12.5	83	52	27	189	PFB-01+PHB-08	SPN-08

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★ SE90-PF-10-N30	10	3/4	21.0	13.1	13.0	105	76	32	354	PFB-02+PHB-12	SPN-10

■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030
★ Made-to-order

AF45·SF45



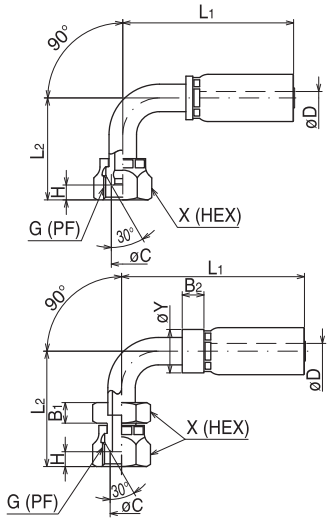
Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AF45-G-04	04	1/4	7.0	3.2	5.5	73	19	19	70	PFB-01-PAF-04	SPN-04
AF45-G-06-N30	06	3/8	10.0	5.6	6.5	85	23	22	115	PFB-01+PHB-06	SPN-06
AF45-G-08-N30	08	1/2	14.0	8.7	9.0	103	29	27	185	PFB-01+PHB-08	SPN-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130

Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★ SF45-PF-10-N30	10	3/4	19.0	13.1	9.5	126	40	32	335	PFB-02+PHB-12	SPN-10

■ Material: steel
■ Adaptor: 110, 145, 190, 130
★ Made-to-order

AF90·SF90



Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
AF90-G-04	04	1/4	7.0	3.2	5.5	61	33	19	75	PFB-01-PAF-04	SPN-04
AF90-G-06-N30	06	3/8	10.0	5.6	6.5	74	45	22	125	PFB-01+PHB-06	SPN-06
AF90-G-08-N30	08	1/2	14.0	8.7	9.0	83	52	27	190	PFB-01+PHB-08	SPN-08

■ Material: steel
■ Adaptor: 110, 145, 190, 130

Part No.	Size No.	G	C	Min. I.D. ØD	H	L1	L2	X (HEX)	Wt. (g)	Pusher	Die
★ SF90-PF-10-N30	10	3/4	19.0	13.1	9.5	105	77	32	360	PFB-02+PHB-12	SPN-10

■ Material: steel
■ Adaptor: 110, 145, 190, 130
★ Made-to-order

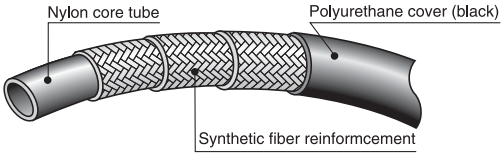
3R80 Series

3R80

Features

- **Excellent oil and chemical durability**
- **JIS K 6375 A certified, SAE 100R8 certified.**

Nonconductive hose with high electrical insulation is also available. Contact us for details.



Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
3R80-03	03	3/16	4.8	12.7	35.0	46.6	140.0	38	115	Swage
3R80-04	04	1/4	6.3	15.5	35.0	46.6	140.0	51	175	
3R80-06	06	3/8	9.5	19.1	28.0	37.3	112.0	64	221	
3R80-08	08	1/2	12.7	22.2	25.0	33.3	98.0	102	283	
3R80-12	12	3/4	19.0	28.6	16.0	21.3	63.0	165	380	
3R80-16	16	1	25.4	36.9	14.0	18.7	56.0	254	572	

- Appropriate fluid: mineral general operating oil
- Working temperature range: –40 to +100°C
- Length in a package: 100 m for sizes 03, 04, 06, 08, and 50 m for sizes 12,16

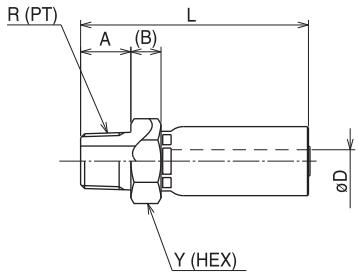
☞ Reusable connector is made-to-order.

[Swage]

⚠ Caution: The size 06 and 08 coupling for N3000 can also be used, but the swage die must be used for 3R80.

(For 3R80)

SA



Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
SA-PT-03-3R	03	1/4	13	8.5	2.8	53	19	50	PSA-03	SPH-03
SA-PT-04-3R	04	1/4	13	8.5	3.9	61	19	60	PSA-04	SPH-04
SA-PT-06-N30	06	3/8	15	9.0	6.8	67	22	90	PSA-06	SPH-06
SA-PT-08-N30	08	1/2	18	10.0	10.0	76	27	140	PSA-08	SPH-08
SA-PT-12-3R	12	3/4	20	10.0	16.0	83	36	220	PSA-12	SPH-12
SA-PT-16-3R	16	1	23	10.0	20.9	100	41	340	PSA-16	SPH-16

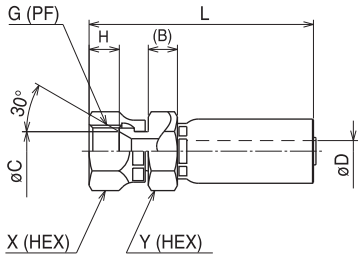
■ Material: steel
■ Adaptor: 030, 130

Stainless type

Part No.	Size No.	R	A	B	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die	
										First	Second
SA-PT-04-3R-S	04	1/4	14	8.5	3.9	61	19	72	PSA-04	SPH-04-1-ST	SPH-04
SA-PT-06-N30-S	06	3/8	15	9.0	6.8	67	22	90	PSA-06	SPH-06-1-ST	SPH-06
SA-PT-08-N30-S	08	1/2	18	10.0	10.0	76	27	140	PSA-08	SPH-08-1-ST	SPH-08

■ Material: stainless steel SUS304
■ Adaptor: 030, 130

SE



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SE-PF-03-3R	03	1/4	6.0	9.5	2.8	8.0	55	19	19	60	PSE-03	SPH-03
SE-PF-04-3R	04	1/4	8.5	9.5	3.9	8.0	63	19	19	80	PSE-04	SPH-04
SE-PF-06-N30	06	3/8	9.5	12.3	6.8	9.5	71	22	19	110	PSE-06	SPH-06
SE-PF-08-N30	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SPH-08
SE-PF-12-3R	12	3/4	10.5	21.5	16.0	13.0	87	36	36	280	PSE-12	SPH-12
SE-PF-16-3R	16	1	11.0	27.5	20.9	15.0	105	41	41	400	PSE-16	SPH-16

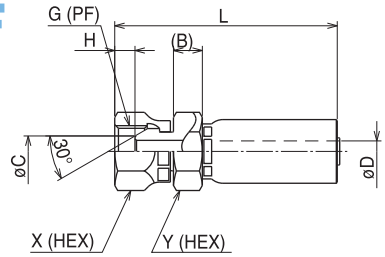
■ Material: steel
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless type

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SE-PF-04-3R-S	04	1/4	8.5	9.5	3.9	8.0	63	19	19	80	PSE-04	SPH-04-1-ST	SPH-04
SE-PF-06-N30-S	06	3/8	9.5	12.5	6.8	9.5	71	22	22	110	PSE-06	SPH-06-1-ST	SPH-06
SE-PF-08-N30-S	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SPH-08-1-ST	SPH-08
SE-PF-12-3R-S	12	3/4	10.5	21.5	16.0	13.0	87	36	36	280	PSE-12	SPH-12-1-ST	SPH-12
SE-PF-16-3R-S	16	1	11.0	27.5	20.9	15.0	105	41	41	400	PSE-16	SPH-16-1-ST	SPH-16

■ Material: stainless steel SUS304
■ Adaptor: 010, 045, 090, 150, 020, 025, 064, 069, 030

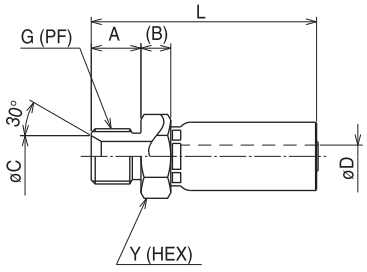
SF



Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SF-PF-03-3R	03	1/4	6.0	7.5	2.8	5.5	55	19	19	60	PSE-03	SPH-03
SF-PF-04-3R	04	1/4	8.5	7.5	3.9	5.5	63	19	19	80	PSE-04	SPH-04
SF-PF-06-N30	06	3/8	9.5	10.0	6.8	6.5	71	22	19	110	PSE-06	SPH-06
SF-PF-08-N30	08	1/2	9.0	14.0	10.0	9.0	80	27	27	170	PSE-08	SPH-08
SF-PF-12-3R	12	3/4	10.5	19.0	16.0	9.5	87	36	36	280	PSE-12	SPH-12
SF-PF-16-3R	16	1	11.0	25.4	20.9	10.0	105	41	41	410	PSE-16	SPH-16

■ Material: steel
■ Adaptor: 110, 145, 190, 130

SC



	Part No.	Size No.	G	A	B	C	Min. I.D. øD	L	Y (HEX)	Wt. (g)	Pusher	Die
★	SC-PF-03-3R	03	1/4	13	8.5	9.5	2.8	53	19	50	PSA-04	SPH-03
	SC-PF-04-3R	04	1/4	13	8.5	9.5	3.9	61	19	60	PSA-04	SPH-04
	SC-PF-06-N30	06	3/8	15	9.0	12.5	6.8	67	22	90	PSA-06	SPH-06
★	SC-PF-08-N30	08	1/2	18	10.0	16.5	10.0	76	27	140	PSA-08	SPH-08

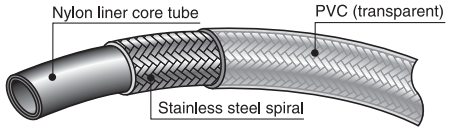
■ Material: steel
■ Adaptor: 060
★ Made-to-order

5501 Series of electrostatic-free type

5501

Features

- Electrostatic free
- Excellent chemical durability
- Flexible and tough
- External-damage durability due to stainless wire braid in the reinforcement layer



Part No.	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	Max. working press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
5501-04-CL	04	1/4	6.0	10.6	21.0	84.0	50	110	Swage
5501-06-CL	06	3/8	9.5	14.8	21.0	84.0	80	220	

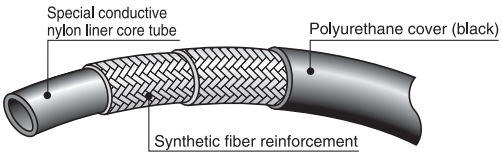
- Appropriate fluid: paint, thinner
- Assembly operation should be done at Aitta Moor e factory.

☞ "-CL" stands for clear.

3450 Series of conductive polymer structure type

Features

- Wireless structure in conductive polymer layer
- Light
- High chemical durability



	Part No.	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	Max. working press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
★	3450-03	03	3/16	4.8	10.8	23.0	92.0	25	71	Swage
★	3450-04	04	1/4	6.3	13.2	23.0	92.0	25	95	
★	3450-06	06	3/8	9.5	18.5	21.0	84.0	60	195	

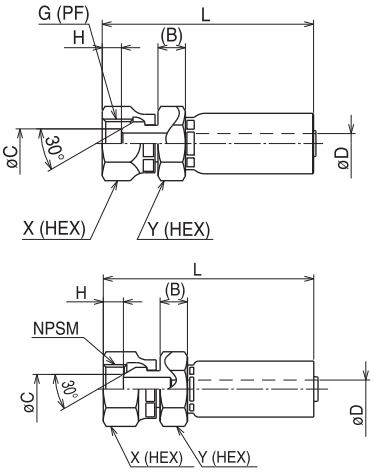
- Appropriate fluid: paint, thinner
- Working temperature range: –40 to +80°C

★ Made-to-order

[Swage]

(For 5501)

SF < For 5501 >

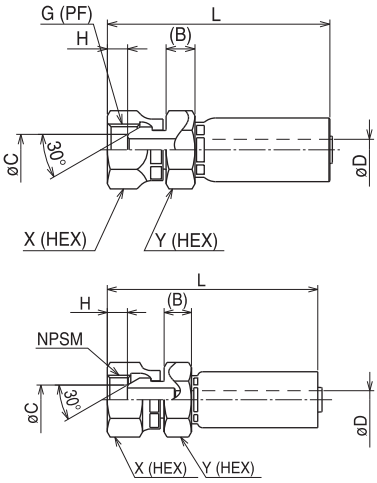


Part No.	Size No.	G or NPSM	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Weight (g)
SF-PF-04-55	04	G1/4	8.5	7.5	3.3	5.5	60	19	17	80
SF-NPSM-04-55	04	NPSM1/4	8.5	7.5	3.3	5.5	60	19	17	80
SF-PF-06-5501	06	G3/8	9.5	10.0	6.2	6.5	71	22	22	110
SF-NPSM-06-5501	06	NPSM3/8	9.5	10.0	6.2	6.5	71	22	22	110

■ Material: steel
■ Adaptor: 110, 145, 190, 130 *Not suitable for NPSM
■ Assembly of couplings with hose is to be done at our factory.

(For 3450)

SF < For 3450 >



	Part No.	Size No.	G or NPSM	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Weight (g)
	SF-PF-03	03	G 1/4	6.0	7.5	2.8	5.5	58	19	19	70
★	SF-NPSM-03-3450	03	NPSM1/4	6.0	7.5	3.0	4.0	56	19	19	70
	SF-PF-04	04	1/4	8.5	7.5	3.9	5.5	63	19	17	75
★	SF-NPSM-04	04	NPSM1/4	8.5	7.5	4.0	5.5	63	19	19	80
	SF-PF-06-N30	06	3/8	9.5	10.0	6.8	6.5	71	22	19	110

■ Material: steel
■ Adaptor: 110, 145, 190, 130
■ Assembly of couplings with hose is to be done at our factory.
★ Made-to-order

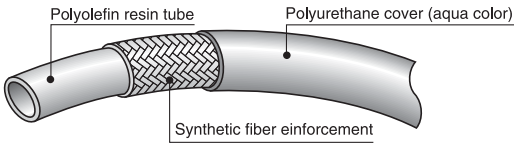
34PW Series

For pure water, urethane forming m/c, food, or drinking water

34PW

Features

- **High water-barrier performance**
- **Excellent chemical durability**
- **Anti-taint property**
- **Sanitary, because of the material that matches the FDA standard and complies with No.20 of the Ministry of welfare, Japan.**



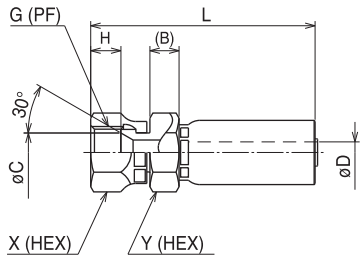
Part No.	Size				Max. working press. (MPa)	Max. impact press. (MPa)	Min. destruction press. (MPa)	Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D.		O.D. (mm)						
		(in.)	(mm)							
34PW-02-LBU	02	1/8	3.6	8.3	20.0	25.0	80.0	25	45	Swage
34PW-04-LBU	04	1/4	6.3	12.5	19.5	24.4	78.0	30	95	
34PW-06-LBU	06	3/8	9.5	16.4	16.0	20.0	64.0	50	134	
34PW-08-LBU	08	1/2	12.7	20.3	14.0	17.5	56.0	75	201	
34PW-12-LBU	12	3/4	19.0	28.7	10.5	13.2	42.0	125	368	
34PW-16-LBU	16	1	25.4	36.5	10.5	13.2	42.0	200	554	

- Appropriate fluid: pure water, chemicals (isocyanate), etc.
- Working temperature range: –30 to +70°C
- Assembly operation should be done at our factory.

☞ Each pressure in the above table represents a pressure with the use of a PW coupling.
☞ "-LBU" stands for light blue.

[Swage] (For 34PW)

SE < PW coupling >

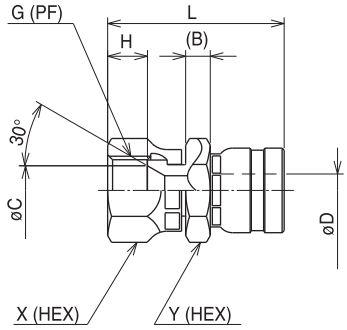


Stainless (SUS316)

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SE-G-04-PW	04	1/4	8.5	9.0	4.0	8.0	63	19	19	80	PSE-04	SP3-04-VC	—
SE-G-06-PW	06	3/8	9.5	12.0	6.9	9.0	71	22	22	110	PSE-06	SP3-06-VC	—
SE-G-08-PW	08	1/2	9.0	15.5	10.0	12.5	80	27	27	170	PSE-08	SP3-08-VC	—
SE-G-12-PW	12	3/4	10.0	21.0	16.0	13.5	86	36	36	270	PSE-12	SPH-12-I-ST	SPH-12-VC
SE-G-16-PW	16	1	11.0	28.0	20.9	16.5	105	41	41	410	PSE-16	SPH-16-I-ST	SPH-16-37VC

■ Material: stainless steel SUS316
■ Assembly of couplings with hose is to be done at our factory.
☞ Ultrasonic cleaning is available only for the couplings, if required. Contact us for details.
☞ As for the steel couplings; sizes 04, 06, and 08 for N3130 series, and sizes 12 and 16 for 3R80 can also be used.

SE < PWL coupling > for under 7.0 MPa

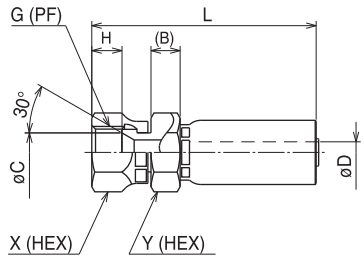


Stainless (SUS316)

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die
SE-G-04-PWL	04	1/4	6.0	9.0	5.0	8.0	42	19	19	60	PSE-04-PWL	SPP-04-VC
SE-G-06-PWL	06	3/8	6.0	12.0	8.0	9.5	44	22	22	70	PSE-06-PWL	SPP-06-VC
SE-G-08-PWL	08	1/2	8.0	15.5	11.0	12.5	54	27	27	130	PSE-08-PWL	SPP-08-VC
SE-G-12-PWL	12	3/4	10.0	21.0	16.0	13.5	64	36	36	230	PSE-12-PWL	SPP-12-VC
SE-G-16-PWL	16	1	10.0	28.0	22.0	16.5	67	41	41	310	PSE-16-PWL	SPP-16-VC

■ Maximum working pressure (static pressure): 7.0MPa
■ Material: stainless steel SUS316
■ Assembly of couplings with hose is to be done at our factory.
☞ Ultrasonic cleaning is available only for the couplings, if required. Contact us for details.
☞ As for the steel couplings; sizes 04, 06, and 08 for N3130 series, and sizes 12 and 16 for 3R80 can also be used.

SE

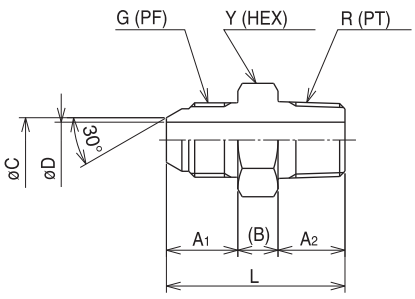


Stainless (SUS304)

Part No.	Size No.	G	B	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Wt. (g)	Pusher	Die	
												First	Second
SSE-PF-02-S	02	1/8	4.0	7.0	1.8	7.0	42	14	14	25	PSE-02-001	SP3-02-001	—
SE-PF-04-S	04	1/4	8.5	9.5	3.9	8.0	63	19	19	80	PSE-04	SP3-04-1-ST	SP3-04
SE-PF-06-S	06	3/8	9.5	12.5	6.8	9.5	71	22	22	110	PSE-06	SP3-06-1-ST	SP3-06
SE-PF-08-S	08	1/2	9.0	16.0	10.0	12.0	80	27	27	170	PSE-08	SP3-08-1-ST	SP3-08
SE-PF-12-3R-S	12	3/4	10.5	21.5	16.0	13.0	87	36	36	280	PSE-12	SPH-12-1-ST	SPH-12
SE-PF-16-3R-S	16	1	11.0	27.5	20.9	15.0	105	41	41	400	PSE-16	SPH-16-1-ST	SPH-16

■ Material: stainless steel SUS304
■ Assembly of couplings with hose is to be done at our factory.
☞ Ultrasonic cleaning is available only for the couplings, if required. Contact us for details.
☞ As for the steel coupling, size 02 for 3130 series, sizes 04, 06, and 08 for N3130 series, and sizes 12 and 16 for 3R80 can also be used.

Adaptor for 34PW



Stainless (SUS316)

Part No.	Size No.	G	R	A_1	A_2	B	C	Min. I.D. øD	L	Y (HEX)	Wt. (g)
010-04-04-PW	04	1/4	1/4	13	14	8.0	7.0	5.5	35	19	40
010-06-06-PW	06	3/8	3/8	16	15	9.0	10.0	8.0	40	22	60
010-08-08-PW	08	1/2	1/2	19	18	10.0	13.0	11.0	47	27	100
010-12-12-PW	12	3/4	3/4	21	20	12.0	19.0	16.0	53	36	180
010-16-16-PW	16	1	1	23	23	13.0	25.0	22.0	59	41	250

■ Material: stainless steel SUS316
☞ Ultrasonic cleaning is available only for the couplings, if required. Contact us for details.

How to assemble
P.72

Specification

Material: Steel, SUS304, SUS316

Usage conditions

Appropriate fluid: Mineral hydraulic oil

Maximum working pressure: It changes with the size of G- and R-threads, and when different sizes exist in one product, the larger one is to be counted.
02 to 08 : 35.0MPa
12 : 27.5MPa
16 : 20.5MPa

Working temperature range: -55°C to +120°C

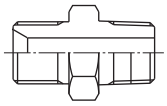
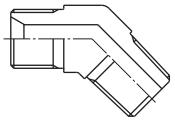
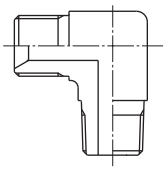
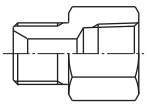
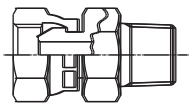
Example of part number

010 - 04 - 04 -(S)

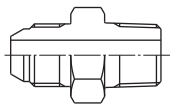
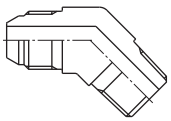
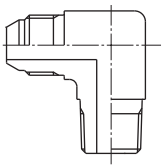
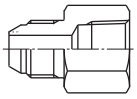
- (S): Material
- 04: Size of R(PT) or G(PF) (02=1/8", 04=1/4", 06=3/8", 08=1/2", 12=3/4", 16=1")
- 04: Size of G(PF) thread (02=1/8", 04=1/4", 06=3/8", 08=1/2", 12=3/4", 16=1")
- 010: Adaptor shape (see the next page)

Adaptor shapes chart

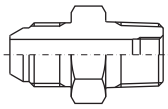
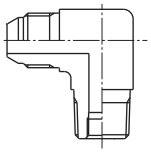
Taper thread type to equipment side (with 30° female seat)

Straight type	45° elbow type	90° elbow type	Femalel-thread straight type	Parallel male-thread type
110	145	190	130	060
				

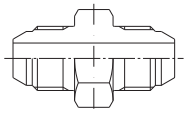
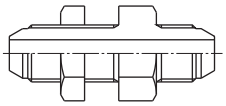
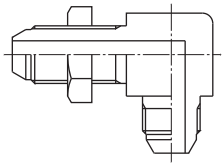
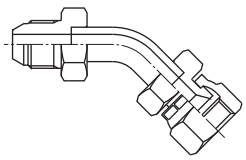
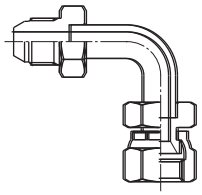
Taper thread type to equipment side (with 30° male seat)

Straight type	45° elbow type	90° elbow type	Femalel-thread straight type
010	045	090	030
			

Taper thread screw type to equipment side (with 30° malel seat)

Straight type	90° elbow type	Thread screw bolt
010-001	090-001	007
		

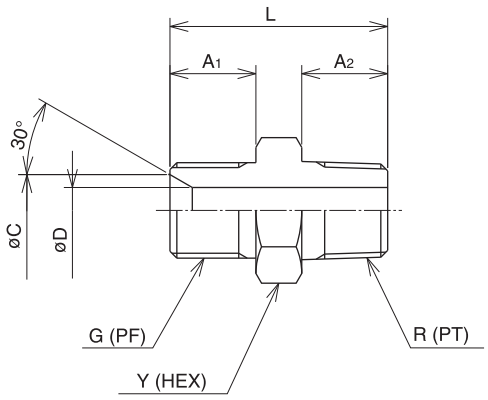
Interconnection type (with 30° male seat)

Straight type	Panel touch straight type	Panel touch 90° straight type	45° bend type	90° bend type
150	020	025	064	069
				

☞ Contact us for other shapes.

Taper thread type to equipment side (with 30° female seat)

110



Part No.	G	R	A1	A2	C	Min. I.D. øD	L	Y (HEX)	Weight (g)
110-02-02	1/8	1/8	10	10	7.0	3.0	28	14	20
110-02-04	1/8	1/4	10	13	7.0	3.0	31	17	30
110-04-02	1/4	1/8	13	10	9.0	5.5	31	19	30
110-04-04	1/4	1/4	13	13	9.5	5.0	34	19	35
110-04-06	1/4	3/8	13	15	9.0	5.5	36	22	50
110-06-04	3/8	1/4	15	13	12.5	5.0	36	22	50
110-06-06	3/8	3/8	15	15	12.5	8.0	38	22	55
110-06-08	3/8	1/2	15	18	12.5	8.0	43	27	90
110-08-06	1/2	3/8	18	15	15.5	11.0	43	27	90
110-08-08	1/2	1/2	18	18	16.0	11.0	46	27	100
110-08-12	1/2	3/4	18	20	15.5	10.0	50	36	165
110-12-08	3/4	1/2	20	18	21.0	16.0	50	36	165
110-12-12	3/4	3/4	20	20	21.5	16.0	52	36	175
110-12-16	3/4	1	20	22	21.0	16.0	54	41	235
110-16-12	1	3/4	22	20	27.5	22.0	56	41	235
110-16-16	1	1	22	22	27.5	22.0	57	41	245

■ Material: steel

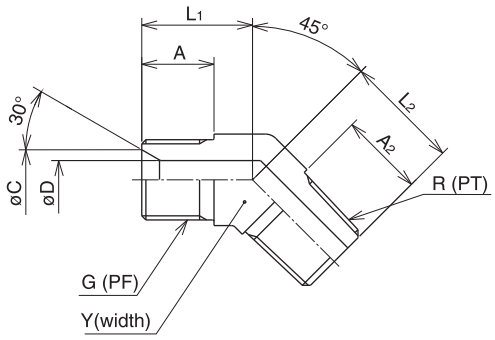
Stainless type

Part No.	G	R	A1	A2	C	Min. I.D. øD	L	Y (HEX)	Weight (g)
110-02-02-S	1/8	1/8	10	10	7.0	3.0	28	14	20
110-04-04-S	1/4	1/4	13	13	9.5	5.0	34	19	35
110-06-06-S	3/8	3/8	15	15	12.5	8.0	38	22	55
110-08-08-S	1/2	1/2	18	18	16.0	11.0	46	27	100
110-12-12-S	3/4	3/4	20	20	21.5	16.0	52	36	175
110-16-16-S	1	1	22	22	27.5	22.0	57	41	245

■ Material: stainless steel SUS304

Hose couplings:
SF, SL, SF45, SF90, AF45, AF90, CF, F

145



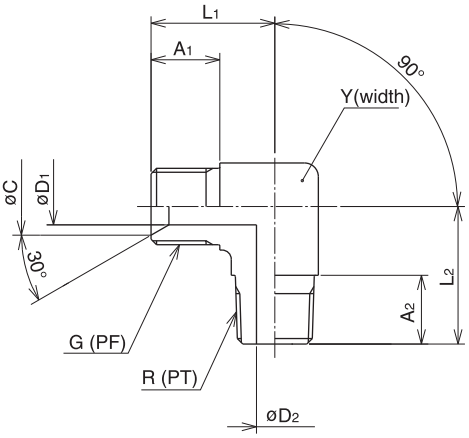
Part No.	G	R	A1	A2	C	Min. I.D. øD	L1	L2	Y (width)	Weight (g)
145-02-02	1/8	1/8	14	14	7.0	3.0	18	18	14	20
★ 145-02-04	1/8	1/4	10	13	7.0	3.0	18	20	17	35
★ 145-04-02	1/4	1/8	13	14	9.0	5.5	19	20	17	36
145-04-04	1/4	1/4	13	14	9.0	5.5	19	20	17	40
★ 145-04-06	1/4	3/8	13	18	9.0	8.0	18	24	19	55
★ 145-06-04	3/8	1/4	15	14	12.5	8.0	23	21	19	57
145-06-06	3/8	3/8	15	15	12.5	8.0	23	24	19	65
★ 145-06-08	3/8	1/2	15	18	12.5	11.0	23	27	24	99
★ 145-08-06	1/2	3/8	18	15	16.0	11.0	26	24	24	95
145-08-08	1/2	1/2	18	22	15.5	11.0	26	27	24	100
★ 145-08-12	1/2	3/4	18	20	16.0	16.0	26	32	30	170
★ 145-12-08	3/4	1/2	20	18	21.5	16.0	32	27	30	170
145-12-12	3/4	3/4	20	20	21.5	16.0	32	32	30	190
★ 145-12-16	3/4	1	20	22	21.5	22.0	32	34	36	264
★ 145-16-12	1	3/4	22	20	27.5	22.0	35	32	36	250
145-16-16	1	1	22	22	28.0	22.0	35	34	36	275

■ Material: steel
★ Made-to-order

Hose couplings:
SF, SL, SF45, SF90, AF45, AF90, CF, F

Taper thread type to equipment side (with 30° female seat)

190



Part No.	G	R	A1	A2	C	D1	D2	L1	L2	Y (width)	Weight (g)
190-02-02	1/8	1/8	9	14	7.0	3.0	4.0	18	22	14	30
190-02-04	1/8	1/4	10	13	7.0	3.0	5.0	20	27	17	50
190-04-02	1/4	1/8	13	10	9.5	6.0	4.0	25	20	17	45
190-04-04	1/4	1/4	13	13	9.5	5.0	5.0	23	27	17	50
190-04-06	1/4	3/8	13	18	9.0	5.5	8.0	25	30	19	80
190-06-04	3/8	1/4	15	16	12.5	8.0	5.5	27	28	19	75
190-06-06	3/8	3/8	15	15	12.5	8.0	8.0	27	30	19	145
190-06-08	3/8	1/2	15	22	12.5	8.0	11.0	28	38	24	140
190-08-06	1/2	3/8	18	20	15.5	11.0	8.0	31	32	24	140
190-08-08	1/2	1/2	18	18	16.0	11.0	11.0	31	38	24	165
190-08-12	1/2	3/4	18	24	15.5	11.0	16.0	34	43	30	250
190-12-08	3/4	1/2	20	22	21.0	16.0	11.0	36	41	30	250
190-12-12	3/4	3/4	20	20	21.5	16.0	16.0	36	43	30	265
190-12-16	3/4	1	20	22	21.5	16.0	22.0	42	46	36	400
190-16-12	1	3/4	22	20	27.5	22.0	16.0	42	43	36	400
190-16-16	1	1	22	27	27.5	22.0	22.0	42	46	36	460

■ Material: steel

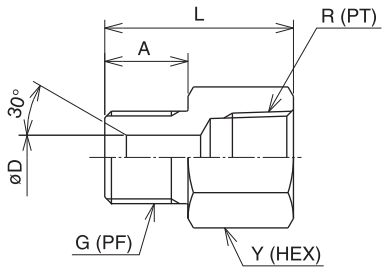
Stainless type

Part No.	G	R	A1	A2	C	D1	D2	L1	L2	Y (HEX)	Weight (g)
190-02-02-S	1/8	1/8	9	14	7.0	3.0	4.0	18	22	14	30
190-04-04-S	1/4	1/4	13	13	9.5	5.0	5.0	23	27	17	50
190-06-06-S	3/8	3/8	15	15	12.5	8.0	8.0	27	30	19	145
190-08-08-S	1/2	1/2	18	18	16.0	11.0	11.0	31	38	24	165
190-12-12-S	3/4	3/4	20	20	21.5	16.0	16.0	36	43	30	265

■ Material: stainless steel SUS304

Hose couplings:
SF, SL, SF45, SF90, AF45, AF90, CF, F

130

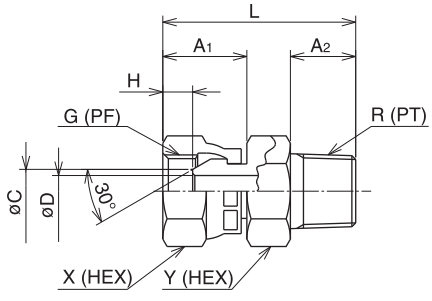


Part No.	G	R	A	C	Min. I.D. øD	L	Y (HEX)	Weight (g)
130-02-02	1/8	1/8	10	7.0	3.0	25	14	18
130-04-04	1/4	1/4	13	9.0	5.5	30	19	36
130-06-06	3/8	3/8	15	12.5	8.0	34	22	52
130-08-08	1/2	1/2	18	15.5	11.0	40	27	88
130-12-12	3/4	3/4	20	21.0	16.0	45	36	175
130-16-16	1	1	22	28.0	22.0	50	41	221

■ Material: steel

Hose couplings: SA, SF, SL, SF45, SF90, AF45, AF90, CA, CF, A, F

060



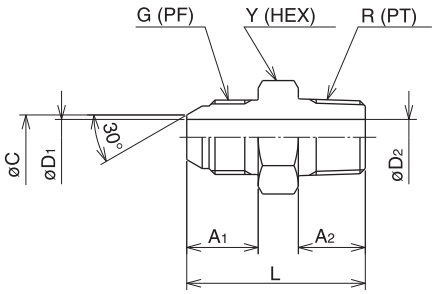
Part No.	G	R	A1	A2	C	Min. I.D. øD	H	L	X (HEX)	Y (HEX)	Weight (g)
060-02-02	1/8	1/8	16.0	11	5.0	2.8	3.0	35	14	14	25
060-04-04	1/4	1/4	17.0	13	7.0	5.0	5.5	38	19	19	50
060-06-06	3/8	3/8	19.0	15	10.0	7.2	6.5	44	22	22	80
060-08-08	1/2	1/2	23.5	18	13.2	11.0	9.5	52	27	27	115
060-12-12	3/4	3/4	23.5	21	19.0	16.0	9.5	57	36	36	220
060-16-16	1	1	27.0	23	25.4	21.5	10.0	63	41	41	300

■ Material: steel

Hose couplings: SC

Taper thread type to equipment side (with 30° female seat)

010



Part No.	G	R	A1	A2	C	D1	D2	L	Y (HEX)	Weight (g)
010-02-02	1/8	1/8	12	10	4.5	3.0	3.0	30	14	20
010-02-04	1/8	1/4	12	13	4.5	3.0	5.5	34	17	30
010-04-02	1/4	1/8	14	10	7.5	5.5	3.0	32	19	30
010-04-04	1/4	1/4	14	13	7.5	5.5	5.5	35	19	35
010-04-06	1/4	3/8	14	15	7.5	5.5	8.0	37	22	50
010-06-04	3/8	1/4	16	13	10.0	8.0	5.5	39	22	50
010-06-06	3/8	3/8	16	15	10.0	8.0	8.0	40	22	55
010-06-08	3/8	1/2	16	18	10.0	8.0	11.0	44	27	85
010-08-06	1/2	3/8	19	15	13.0	11.0	8.0	44	27	85
010-08-08	1/2	1/2	19	18	13.0	11.0	11.0	47	27	95
010-08-12	1/2	3/4	19	20	13.0	11.0	16.0	53	36	160
010-12-08	3/4	1/2	21	18	19.0	16.0	11.0	51	36	160
010-12-12	3/4	3/4	21	20	19.0	16.0	16.0	53	36	170
010-12-16	3/4	1	21	22	19.0	16.0	22.0	56	41	230
010-16-12	1	3/4	23	20	25.0	22.0	16.0	56	41	230
010-16-16	1	1	23	22	25.0	22.0	22.0	58	41	235

■ Material: steel

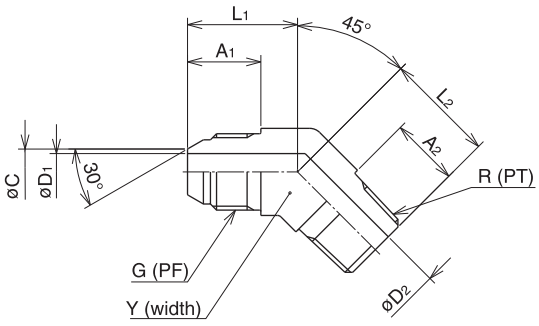
Stainless type

Part No.	G	R	A1	A2	C	D1	D2	L	Y (HEX)	Weight (g)
010-02-02-S	1/8	1/8	12	10	4.5	3.0	3.0	30	14	20
010-04-04-S	1/4	1/4	14	13	7.5	5.5	5.5	35	19	35
010-06-06-S	3/8	3/8	16	15	10.0	8.0	8.0	40	22	55
010-08-08-S	1/2	1/2	19	18	13.0	11.0	11.0	47	27	95
010-12-12-S	3/4	3/4	21	20	19.0	16.0	16.0	53	36	170
010-16-16-S	1	1	23	22	25.0	22.0	22.0	58	41	235

■ Material: stainless steel SUS304

Hose couplings:
SE, SLE, SE45, SE90, AE45, AE90, CE, E

045



Part No.	G	R	A1	A2	C	D1	D2	L1	L2	Y (width)	Weight (g)
045-02-02	1/8	1/8	12	10	4.5	3.0	3	18	18	14	20
045-02-04	1/8	1/4	12	13	4.5	3.0	5	20	20	17	35
045-04-02	1/4	1/8	16	14	7.0	5.5	3	22	18	17	35
045-04-04	1/4	1/4	14	13	7.5	5.0	5	22	20	17	40
045-04-06	1/4	3/8	16	18	7.0	5.5	8	22	24	19	60
045-06-04	3/8	1/4	16	13	10.0	8.0	5	24	20	19	60
045-06-06	3/8	3/8	16	15	10.0	8.0	8	24	24	19	65
045-06-08	3/8	1/2	17	22	10.0	8.0	11	24	27	24	90
045-08-06	1/2	3/8	20	18	13.0	11.0	8	27	24	24	90
045-08-08	1/2	1/2	19	18	13.0	11.0	11	27	27	24	100
045-08-12	1/2	3/4	20	23	13.0	11.0	16	27	32	30	160
045-12-08	3/4	1/2	21	22	19.0	16.0	11	32	27	30	170
045-12-12	3/4	3/4	21	23	19.0	16.0	16	32	32	30	190
045-12-16	3/4	1	21	26	19.0	16.0	22	32	34	36	265
045-16-12	1	3/4	23	23	25.0	22.0	16	35	32	36	265
045-16-16	1	1	23	22	25.0	22.0	22	35	34	36	295

■ Material: steel

Stainless type

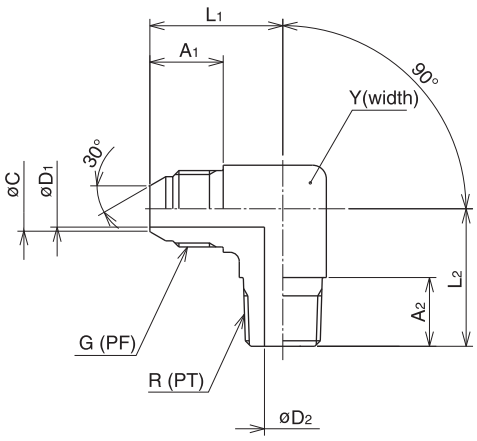
	Part No.	G	R	A1	A2	C	D1	D2	L1	L2	Y (width)	Weight (g)
★	045-04-04-S	1/4	1/4	14	13	7.5	5.0	5	22	20	17	40
★	045-06-06-S	3/8	3/8	16	15	10.0	8.0	8	24	24	19	65
★	045-08-08-S	1/2	1/2	19	18	13.0	11.0	11	27	27	24	100
★	045-12-12-S	3/4	3/4	21	23	19.0	16.0	16	32	32	30	190
★	045-16-16-S	1	1	23	22	25.0	22.0	22	35	34	36	295

■ Material: stainless steel SUS304
★ Made-to-order

Hose couplings:
SE, SLE, SE45, SE90, AE45, AE90, CE, E

Taper thread type to equipment side (with 30° male seat)

090



Part No.	G	R	A1	A2	C	D1	D2	L1	L2	Y (width)	Weight (g)
090-02-02	1/8	1/8	14	12	4.5	3.0	4	22	22	14	30
090-02-04	1/8	1/4	12	13	4.5	3.0	5	23	27	17	45
090-04-02	1/4	1/8	14	10	7.5	5.0	3	24	23	17	45
090-04-04	1/4	1/4	14	13	7.5	5.0	5	24	27	17	50
090-04-06	1/4	3/8	16	18	7.5	5.5	8	29	30	19	80
090-06-04	3/8	1/4	16	13	10.0	8.0	5	29	27	19	75
090-06-06	3/8	3/8	16	15	10.0	8.0	8	29	30	19	80
090-06-08	3/8	1/2	16	18	10.0	8.0	11	29	38	24	145
090-08-06	1/2	3/8	20	18	13.0	11.0	8	33	30	24	140
090-08-08	1/2	1/2	20	22	13.0	11.0	11	33	38	24	165
090-08-12	1/2	3/4	20	24	13.0	11.0	16	36	43	30	250
090-12-08	3/4	1/2	21	22	19.0	16.0	11	36	38	30	250
090-12-12	3/4	3/4	21	20	19.0	16.0	16	36	43	30	265
090-12-16	3/4	1	23	25	19.0	16.0	22	42	46	36	400
090-16-12	1	3/4	23	24	25.0	22.0	16	42	43	36	400
090-16-16	1	1	23	22	25.0	22.0	22	42	46	36	400

■ Material: steel

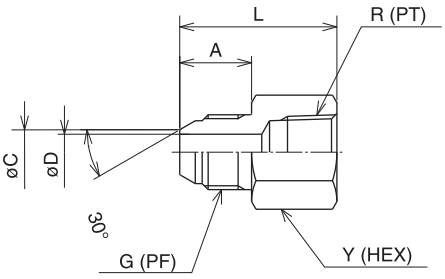
Stainless type

Part No.	G	R	A1	A2	C	D1	D2	L1	L2	Y (width)	Weight (g)
090-02-02-S	1/8	1/8	14	12	4.5	3.0	4	22	22	14	30
090-04-04-S	1/4	1/4	14	13	7.5	5.0	5	24	27	17	50
090-06-06-S	3/8	3/8	16	15	10.0	8.0	8	29	30	19	80
090-08-08-S	1/2	1/2	19	18	13.0	11.0	11	33	38	24	165
090-12-12-S	3/4	3/4	21	20	19.0	16.0	16	36	43	30	265

■ Material: stainless steel SUS304

Hose couplings:
SE, SLE, SE45, SE90, AE45, AE90, CE, E

030



Part No.	G	R	A	C	Min. I.D. øD	L	Y (HEX)	Weight (g)
030-02-02	1/8	1/8	12	4.5	3.0	27	14	20
030-04-04	1/4	1/4	14	7.5	5.5	30	19	25
030-06-06	3/8	3/8	16	10.0	8.0	35	22	55
030-08-08	1/2	1/2	19	13.0	11.0	41	27	75
030-12-12	3/4	3/4	21	19.0	16.0	46	36	160
030-16-16	1	1	23	25.0	22.0	51	41	220

■ Material: steel
■ Surface finishing: zinc electro-galvanized with color chromating (Ep-Fe/Zn 5/CM2)

Stainless type

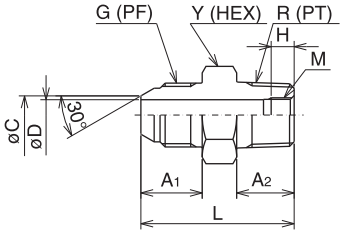
	Part No.	G	R	A	C	Min. I.D. øD	L	Y (HEX)	Weight (g)
★	030-02-02-S	1/8	1/8	12	4.5	3.0	27	14	20
★	030-04-04-S	1/4	1/4	14	7.5	5.5	30	19	25
★	030-06-06-S	3/8	3/8	16	10.0	8.0	35	22	55
★	030-08-08-S	1/2	1/2	19	13.0	11.0	41	27	75
★	030-12-12-S	3/4	3/4	21	19.0	16.0	46	36	160
★	030-16-16-S	1	1	23	25.0	22.0	51	41	220

■ Material: stainless steel SUS304
★ Made-to-order

Hose couplings: SA, SE, SLE, SE45, SE90, AE45, AE90, CA, CE, A, E

Taper thread screw type to equipment side (with 30° male seat)

010 screw

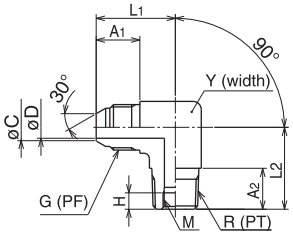


	Part No.	G	R	A_1	A_2	C	Min. I.D. øD	H	L	M	Y (HEX)	Weight (g)
★	010-04-04-001	1/4	1/4	14	13	7.5	5.5	6.0	35	M7 x 0.75	19	35
★	010-06-06-001	3/8	3/8	16	15	10.0	8.0	6.0	40	M9 x 0.75	22	55
★	010-08-08-001	1/2	1/2	19	18	13.0	11.0	7.5	47	M12 x 1	27	90
★	010-12-12-001	3/4	3/4	21	23	19.0	16.0	8.5	53	M17 x 1	36	170

■ Material: steel
★ Made-to-order

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

090 screw

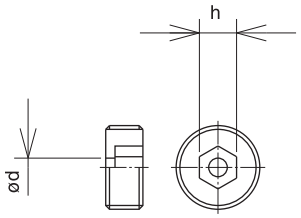


	Part No.	G	A_1	A_2	C	Min. I.D. øD	H	L_1	L_2	Y (width)	M	Weight (g)
★	090-04-04-001	1/4	14	13	7.5	5	6.0	24	27	17	M7 x 0.75	50
★	090-06-06-001	3/8	16	15	10.0	8	6.0	29	30	19	M9 x 0.75	90
★	090-08-08-001	1/2	19	18	13.0	11	7.5	33	38	24	M12 x 1	145
★	090-12-12-001	3/4	21	20	19.0	16	8.5	36	43	30	M17 x 1	260

■ Material: steel
★ Made-to-order

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

Bolt for fixed screw adaptor

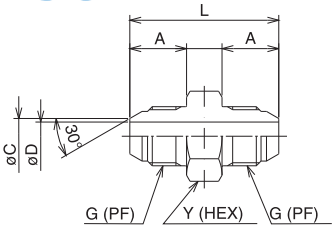


	Part No.	Adaptor 1	Adaptor 2	h	ød	Weight (g)
★	007-04-0.5	010-04-04-001	090-04-04-001	3	0.5	1.0
★	007-04-0.7	010-04-04-001	090-04-04-001	3	0.7	1.0
★	007-04-1.0	010-04-04-001	090-04-04-001	3	1.0	1.0
★	007-04-1.5	010-04-04-001	090-04-04-001	3	1.5	1.0
★	007-04-2.0	010-04-04-001	090-04-04-001	3	2.0	1.0
★	007-06-0.5	010-06-06-001	090-06-06-001	4	0.5	1.5
★	007-06-0.7	010-06-06-001	090-06-06-001	4	0.7	1.5
★	007-06-1.0	010-06-06-001	090-06-06-001	4	1.0	1.5
★	007-06-1.5	010-06-06-001	090-06-06-001	4	1.5	1.5
★	007-08-0.5	010-08-08-001	090-08-08-001	6	0.5	3.0
★	007-08-0.7	010-08-08-001	090-08-08-001	6	0.7	3.0
★	007-08-1.0	010-08-08-001	090-08-08-001	6	1.0	3.0
★	007-08-1.5	010-08-08-001	090-08-08-001	6	1.5	3.0
★	007-08-2.0	010-08-08-001	090-08-08-001	6	2.0	3.0
★	007-08-2.5	010-08-08-001	090-08-08-001	6	2.5	3.0
★	007-12-1.5	010-12-12-001	090-12-12-001	8	1.5	8.0
★	007-12-2.0	010-12-12-001	090-12-12-001	8	2.0	8.0
★	007-12-2.5	010-12-12-001	090-12-12-001	8	2.5	8.0
★	007-12-3.0	010-12-12-001	090-12-12-001	8	3.0	8.0

■ Material: brass
★ Made-to-order

Interconnection type (with 30° male seat)

150

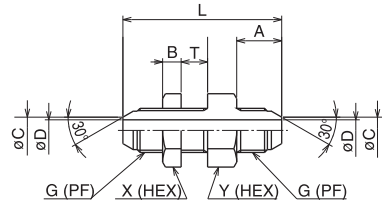


Part No.	G	A	C	Min. I.D. øD	L	Y (HEX)	Weight (g)
150-02-02	1/8	12	4.5	3.0	31	14	15
150-04-04	1/4	14	7.5	5.5	36	19	50
150-06-06	3/8	16	10.0	8.0	42	22	75
150-08-08	1/2	19	13.0	11.0	48	27	85
150-12-12	3/4	21	19.0	16.0	54	36	160
150-16-16	1	23	25.0	22.0	59	41	230

■ Material: steel

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

020 panel touch

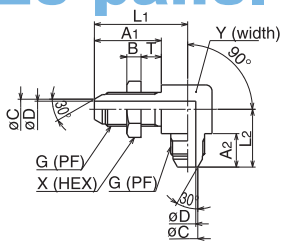


	Part No.	G	A	B	C	Min. I.D. øD	L	T (max. panel thickness)	X (HEX)	Y (HEX)	Mounting nut	Weight (g)
★	020-04-04-001	1/4	14	7.0	7.5	5	54	10	22	22	NP04	75
★	020-06-06-001	3/8	17	7.0	10.0	8	60	10	24	24	NP06	105
★	020-08-08-001	1/2	19	10.0	13.0	11	71	10	30	30	NP08	190
★	020-12-12-001	3/4	21	10.0	19.0	16	79	10	41	41	NP012	365
★	020-16-16-001	1	23	12.0	25.0	22	87	10	46	46	NP016	505

■ Material: steel
★ Made-to-order

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

025 panel touch

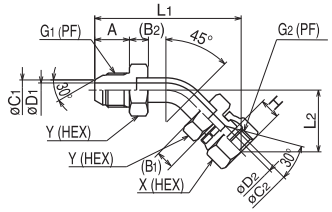


	Part No.	G	A1	A2	B	C	Min. I.D. øD	L1	L2	T (max. panel thickness)	X (HEX)	Y (width)	Mounting nut	Weight (g)
★	025-04-04	1/4	32	15	7.0	7.0	5.5	45	26	10	22	22	NP04	125
★	025-06-06	3/8	33	16	7.0	10.0	8.0	46	29	10	24	24	NP06	160
★	025-08-08	1/2	40	19	10.0	13.0	11.0	59	35	10	30	30	NP08	320

■ Material: steel
★ Made-to-order

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

064

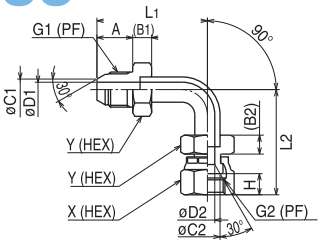


	Part No.	G1	G2	A	B1	B2	C1	C2	D1	D2	H	L1	L2	X (HEX)	Y (HEX)	Pipe size	Weight (g)
★	064-04	1/4	1/4	15	8.5	8.5	9.0	9.0	5.0	5.0	8.0	63	26	19	19	ø10 x t2	85
★	064-06	3/8	3/8	17	9.0	9.0	12.0	12.0	7.0	7.0	9.5	72	30	22	22	ø12 x t2	120
★	064-08	1/2	1/2	20	9.5	9.5	15.5	15.5	10.0	10.0	12.5	82	32	27	27	ø15 x t2.5	200
★	064-12	3/4	3/4	21	11.0	10.5	19.0	21.0	16.0	16.0	13.5	95	40	36	36	ø20 x t2.5	350
★	064-16	1	1	23	12.5	12.5	28.0	28.0	21.5	21.5	16.5	108	47	41	41	ø28 x t3.5	515

■ Material: steel
★ Made-to-order

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

069



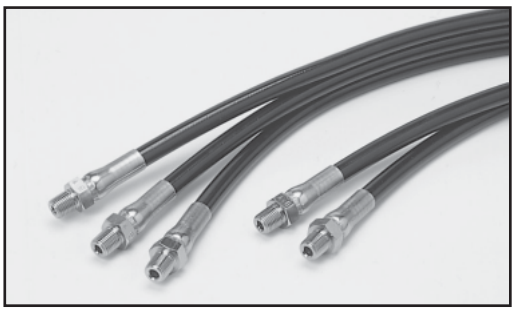
	Part No.	G1	G2	A	B1	B2	C1	C2	D1	D2	H	L1	L2	X (HEX)	Y (HEX)	Pipe size	Weight (g)
★	069-04	1/4	1/4	15	8.5	8.5	7.0	9.0	5.0	5.0	8.0	46	45	19	19	ø10 x t2	90
★	069-06	3/8	3/8	17	9.0	9.0	10.0	12.0	7.0	7.0	9.5	53	50	22	22	ø12 x t2	125
★	069-08	1/2	1/2	20	9.5	9.5	13.0	15.5	10.0	10.0	12.5	62	55	27	27	ø15 x t2.5	205
★	069-12	3/4	3/4	21	11.0	10.5	19.0	21.0	16.0	16.0	13.5	74	76	36	36	ø20 x t2.5	375
★	069-16	1	1	23	12.0	12.5	25.0	28.0	21.5	21.5	16.5	83	87	41	41	ø28 x t3.5	565

■ Material: steel
★ Made-to-order

Hose couplings: SE, SLE, SE45, SE90, AE45, AE90, CE, E

Double hoses and triple hoses

Made-to-order



● Two hoses can be adhered together.

If you use double hoses,

❍ the piping space can be made compact.

❍ a single reel pulley suffices.

❍ hose flopping at pressurization can be minimized.

☞ Adhesion of more than three hoses or adhesion with tubes is also possible. Contact us for details.

Nonconductive (electric insulating) processing

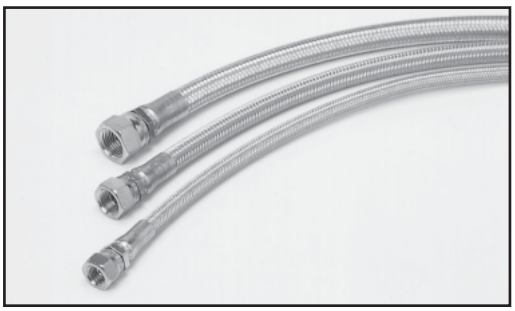
Made-to-order

Although plastic hoses are generally electrically insulated, sometimes leakage current is regulated for hydraulic hoses of electrical work equipment or for the hoses that are especially required to be insulated. When electrical insulation is required, we can make a hose cover with no pin-pricking processing (no pin hole processing for gas venting) in order to prevent the reduction of electrical insulation due to external water invasion.

☞ Contact us for details.

Outer braid processing

Made-to-order

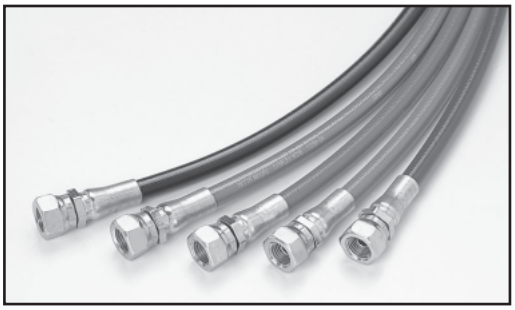


● Processing of steel wire braid and stainless wire braid is possible.

❍ Guarding hose against powderly metal.
❍ Maintaining electric conductivity
❍ Guarding hose against damage

Colored hose

Made-to-order



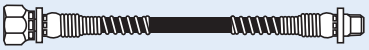
● Hose cover can be colored.

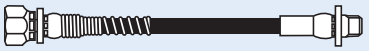
❍ Coloring hoses (blue, red, gray, green, aqua color, etc)

☞ Contact us for details.

Hose guard parts attached

① Covering whole hose  The whole hose is covered.

② Covering both ends  Both ends of the coupling are covered
Please specify the length.

③ Covering single end  One end of the coupling is covered.
Please specify the length and direction.

☞ For more details, see "How to order horse assembly" on page 6.

Guard spring

Material: steel

☞ • Expand the spring 2-2.5 times the original length when in use
• Attach the spring by screwing over the coupling socket with the hand.
• The spring can also be made of SUS304 or SUS316 , please consult us if you need them.

Features

• It prevents kinks and flattening of the hose.
• It prevents abrasion and damage to the hose.

Working temperature range

Same as the working temperature range of the hose.

Part number

G1: For whole hose G2: For both ends G3: For single end

☞ Specify the length for G2 and G3.

For single part order

☞ Contact us.

Unit length: 1.7 m in contracted state

For LF70 series

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YM10-04-1700L-MCH	04	15.8	1.6
YM10-06-1700L-MCH	06	19.6	2.0

For 1000, 1400, 1500 series

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YM10-03-1700L-MCH	03	12.9	1.4
YM10-04-1700L-MCH	04	15.8	1.6
YM10-06-1700L-MCH	06	19.6	2.0
YM10-08-1700L-MCH	08	23.0	2.0

For 1100 series

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YM11-04-1700L-MCH	04	15.8	1.6
YM11-06-1700L-MCH	06	19.6	2.0
YM11-08-1700L-MCH	08	23.7	2.0

For N3130, 3130, 3700, 3000, 34PW (04,06,08) series

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YMS-02-1700L-MCH	02	11.6	1.4
YMS-03-1700L-MCH	03	15.4	1.6
YMS-04-1700L-MCH	04	18.2	2.0
YMS-05-1700L-MCH	05	19.6	2.0
YMS-06-1700L-MCH	06	21.2	2.0
YMS-08-1700L-MCH	08	25.1	2.0
YMS-12-1700L-MCH	12	34.7	2.6
YMS-16-1700L-MCH	16	39.1	2.6

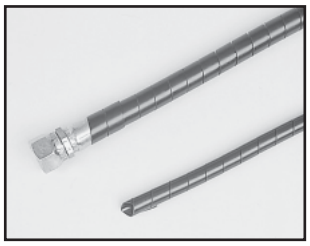
For N3000, HT series

Part number	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YMS-04-1700L-MCH	04	18.2	2.0
YMSN-06-1700L-MCH	06	22.4	2.0
YMSN-08-1700L-MCH	08	26.2	2.0
YMSN-10-1700L-MCH	10	31.7	2.6

For 3R80, 34PW (12,16) series

Part number	Suitable hose size	Spring outer diameter (mm)	Spring wire diameter (mm)
YMSH-03-1700L-MCH	03	17.3	2.0
YMSH-04-1700L-MCH	04	20.5	2.0
YMSH-06-1700L-MCH	06	23.7	2.0
YMSH-08-1700L-MCH	08	28.1	2.6
YMSH-12-1700L-MCH	12	35.6	2.9
YMSH-16-1700L-MCH	16	43.2	2.9

Nylon spiral tube



Material: nylon

☞ Polyethylene spiral tube is also available.
Contact us for details.

Color: black

Features

- It prevents abrasion and damage to the hose.
- Light
- It can be attached after piping.
- For binding hoses
- Excellent chemical durability

Working temperature range

(nylon) -40°C to +105°C
(polyethylene) -40°C to +85°C

Part number

S1: For whole hose S2: For both ends S3: For single end

☞ Specify the length for S2 and S3.

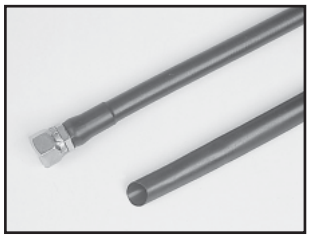
For single part order

☞ Contact us.

Unit length: SPN-06-0 100M
SPN-11-0, SPN-18-0 50M

Part No.	Outer x inner diameters (mm)	Thickness (mm)	Pitch (mm)	Recommended hose size
SPN-06-0-100M	5.5 x 4	0.75	10	02 to 04
SPN-11-0-50M	10.6 x 9	0.8	12	03 to 08
SPN-18-0-50M	16.6 x 15	0.8	18	08 to 16

Heat contraction tube



Material: EPR
Color: black

Features

- As an insulator from outside.
- For binding multiple hoses.
- For preventing abrasion and damage to the hose.

Working temperature range

-50°C to +80°C

Part number

E1: For whole hose E2: For both ends E3: For single end

☞ Specify the length for E2 and E3.

For single part order

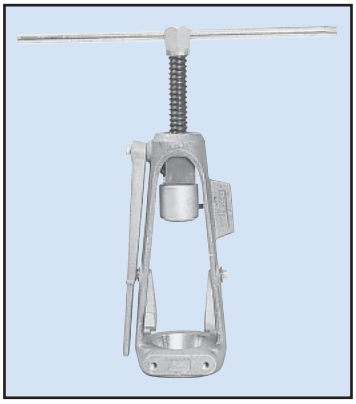
☞ Contact us.

Unit length: 5M

Part No.	Inner diameter before heat contraction (mm)	Inner diameter after heat contraction (mm)	Thickness after heat contraction (mm)
H990-NT200-5M	20	10.0	1
H990-NT250-5M	25	12.5	1
H990-NT300-5M	30	15.0	1
H990-NT400-5M	40	20.0	1

Although Nitta plastic hoses and couplings are produced under thorough quality control, they should be correctly assembled to maximize the full potential. Please read the instructions for the use of assembling machines, tools, pushers, and dies, and assemble the hose parts with care. For details, please see the product instruction manual.

Assembling tool Mark 10



Patent No.888644

Manual tool

Features

- Light and easy to carry.
- Anywhere, anyplace, for assembling operation

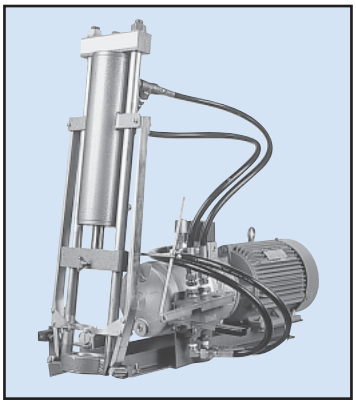
■ Specifications

Weight : 4kg
Size : W118 x L118 x H330mm
Material : aluminum die casting
Mark 10 can be used in the following three ways:
① Fixed on a vice
② Laid on the floor (with rear cushion arm and ratchet wrench HEX32)

Assembling method P.59

⚠ Caution Since it is aluminum die casting, strong impact incurred when dropped will cause damage to the body. Please handle with care.

Assembling machine Mark 9



Hydraulic full-automatic machine

Features

- Significant reduction of the operation time
- Beneficial for assembling a large quantities.

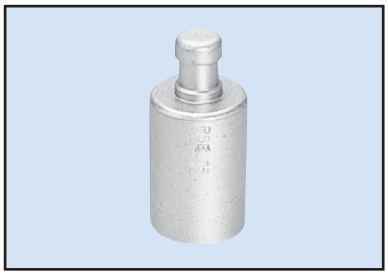
■ Specifications

Motor power : 200V, three-phase, 2.2 kw (3 horse power)
Hydraulic pump : Max pressure 14.3 MPa
Working pressure 11.2 Mpa (relief pressure already set)
Working oil : turbine oil VG46 or the equivalent
Hydraulic cylinder : double-acting special cylinder
stroke 150 mm
Weight : 90kg
Size : W520 x L820 x H800mm

Assembling method P.61

The followings are assembly jigs and tools for Mark 9 and 10.

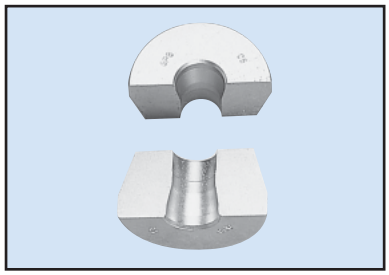
Pusher



This is a jig to fix the sleeve of the hose coupling when assembling.

List of suitable part numbers P.63

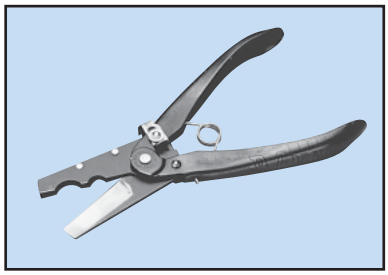
Die



This is a jig to swage the socket of the hose coupling when assembling.

List of suitable part numbers P.63

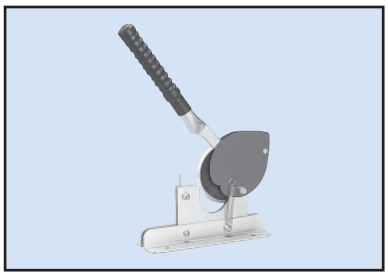
Hand hose cutter



Part number: HC03

This can cut hoses from sizes 02 to 08.

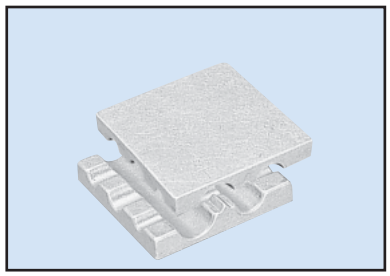
Hose cutter



Part number: HC01

This can cut all hose sizes. There are bolt holes in the base to fix the cutter.

Holding die (vice block)



Part number:
HD01 (for 03, 04, 05, 06, 08)
HD02 (for 08, 12, 16)

This is used to fix hoses.

Assembly lubricant

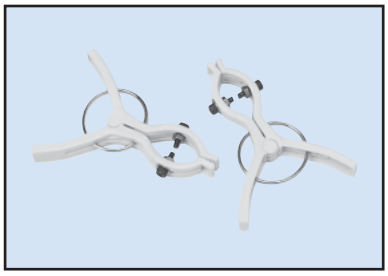
Part number:
For assembling steel connectors: PG3740 (Nihon Kohsakuyu) (lubricant color: green)
For assembling stainless connectors: CFH68 (Nisseki Mitsubishi) (lubricant color: yellow)

Content: 500 ml

This is used when you insert a hose into a hose connector or swage connectors with assembling tools.

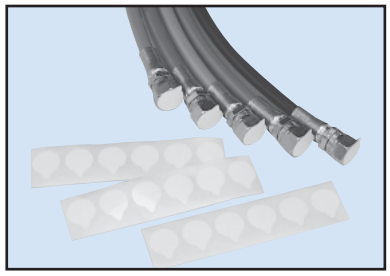
⚠ Caution
If the recommended lubricant is not applied, coating damage and/or socket buckling may occur.

Campucka coupling detachable jig



Part number: TRL

Hose coupling cap seal



☞ Contact us for details.

Hose Assembling Methods

1 Preparation

Prepare appropriate hose, coupling cutter, white pen, torque wrench, seal tape, and detachable jig.

⚠ **Caution** If the Campucka is dropped, the nipple part may detach and the hose cannot be inserted. Handle with care.

2 Attaching Campucka to equipment

Type CA
Roll seal tape onto the taper thread and connect it to the taper female thread of the equipment with proper torque.

Type CE
Attach an adaptor to the equipment and the Campucka to the adaptor with proper torque.

(proper torque) (N¥m)

Thread size	Taper thread, R thread	Parallel thread, G thread
1/8	10 to 15	15
1/4	25 to 30	25
3/8	45 to 50	34
1/2	60 to 70	59

⚠ **Caution** More torque than recomendation may damage the coupling

⚠ **Caution** When using a Campucka coupling, mark the hose to check the inserted length,fitting the hose edge to the groove mark of the socket.

⚠ **Caution** The Campucka coupling can be used only for specified hoses.

Hose No.	Hose clamp position
3130-02, F3130-02	200mm or more
1000-04, 1400-04, F3130-04	350mm or more
1000-06, 1400-06, F3130-06	400mm or more
1000-08, F3130-08	500mm or more

3 Hose cutting

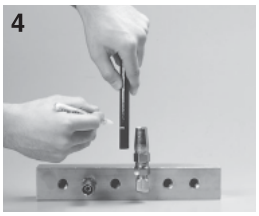
Use the specified hose cutter to cut the hose squarely

⚠ **Caution** The slanted cut section may cause pullout of the hose and leakage.

⚠ **Caution** If the blade is blunt, the hose cut section becomes elliptic, causing pullout of the nipple O-ring on insertion and leakage. Change the cutter in this case.

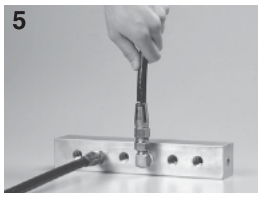
⚠ **Caution** Do not touch the blade of the cutter.

4 Marking the insertion length of the hose



As shown in the figure, mark the hose with a white pen, fitting the hose edge to the groove mark of the socket.

5 Inserting the hose to the Campucka



Insert the hose into the coupling until it meets the marked position.
Repeat the same steps 2-5 for the other end of the Campucka.

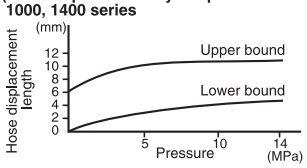
⚠ **Warning** If the insertion is insufficient, pullout of the hose or leakage may occur.

⚠ **Caution** If the hose is inserted in a tilted position, the inner part (gripper) may be deformed, interfering with the insertion.

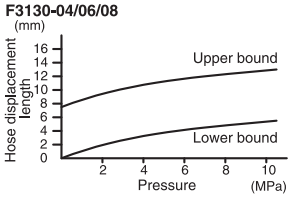
6 Completing hose assembling

Pressurization swages the hose with an appropriate force according to the pressure.

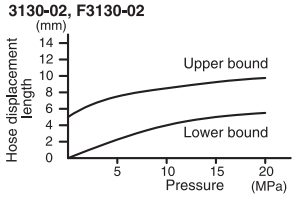
(hose displacement by the pressurization)
1000, 1400 series



F3130-04/06/08

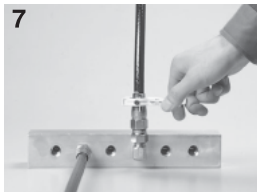


3130-02, F3130-02



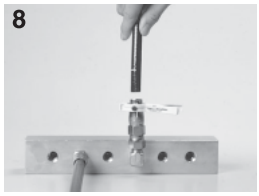
⚠ **Warning** Since displacement by the pressurization makes the hose longer, check for interference with the equipment and kinks in the hose.

7 Detaching hose (1)



Detaching method (detachable only before pressurization) Insert the (two) edge pins of the detachable jig into the side holes of the socket.

8 Detaching hose (2)

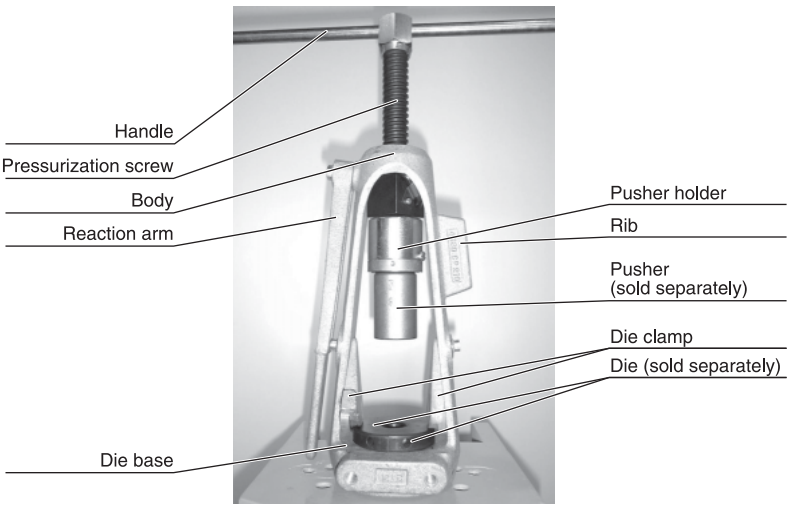


Push the hose toward the Campucka and then slowly pull it out.

⚠ **Caution** The hose cannot be pulled out after pressurization. If it is forced, the inner part of the coupling could be damaged, causing pullout of the hose or leakage.

⚠ **Caution** The hose and the Campucka are not reusable once pressurized.

Setup and specifications



There are three ways to set Mark 10 as follows:

1 Fixed on vice (recommended)

Fix the rib of Mark 10 with a vice.
(In this document, we follow this way of setting.)

2 Laid on floor

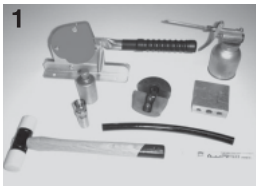
Lay Mark 10 with the support of the reaction arm.

3 Fixed on the working base

Use the optional fixing bracket and fix the bracket onto the working base with bolts.

Assembling method

1 Preparation



Prepare appropriate hose, swage coupling, pusher, die, hose cutter, holding die, lubricant*, plastic hammer, scale, and white pen.

*lubricant...Steel coupling : Nihon Kosakuyu PG3740

Stainless coupling
size 02～12 : JX Nippon Oil & Energy CFH68
size 16 : JX Nippon Oil & Energy DPX100

☞ A 50cc bottle of lubricant (for steel coupling) comes with a set.

⚠ **Caution** If the recommended lubricant is not applied, coating damage and/or socket buckling may occur

2 Hose cutting

Determine the cutting length of the hose based on the hose assembling length and cut the hose squarely using the special hose cutter.

⚠ **Caution** Do not touch the blade of the cutter.

⚠ **Caution** The slanted cut section could cause pullout of the hose and leakage.

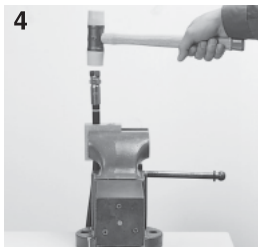
⚠ **Caution** If the blade is blunt, correct assembly is not possible. Change the hose cutter in this case.

3 Marking the insertion length of the hose

Measure the insertion length of the hose with a scale and mark the hose at the insertion length with the white pen.

☞ It is recommended to draw a marking line with a width of about 2 mm in order to check it after swaging.

4 Preparation for the hose insertion



Apply the lubricant to the inner surface of the hose and insert the coupling to the marked position. When it is difficult, use the holding die to fix the hose and hit the coupling with the plastic hammer.

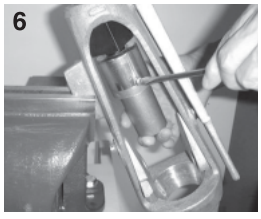
⚠ **Caution** If the insertion is incomplete, pullout of the hose, leakage, or damage may occur.

5 Fixing Mark 10

Fix the rib of Mark 10 on the vice and pull out the pressurization screw to the longest position. The die clamp should be open as shown in the figure.

⚠ **Caution** If you release your grip, the pusher holder will come down by its own weight. Take care not to trap your fingers.

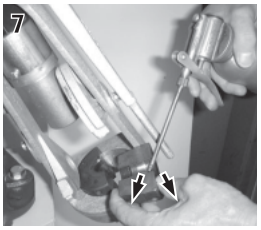
6 Attachment of pusher



Attach the pusher to the pusher holder. Fix the pusher by turning the screw of the pusher holder with the hand so that the pusher can freely rotate. Check if the pusher is really able to rotate.

⚠ **Caution** The wrong choice of pusher will cause pullout of the hose, leakage, or damage.

7 Application of lubricant



Apply lubricant to the inner surface of the die.

*lubricant ...Steel coupling : Nihon Kosakuyu PG3740 or equivalent

Stainless coupling :
size 02～12 : JX Nippon Oil & Energy CFH68 or equivalent
size 16 : JX Nippon Oil & Energy DPX100 or equivalent

⚠ **Caution** If the recommended lubricant is not applied, coating damage and/or socket buckling may occur.

8 Fixing a mate of the die

Fix a mate of the die onto the tapered base.

⚠ **Caution** The wrong choice of pusher will cause pullout of the hose, leakage, or damage.

9 Insertion to pusher

Insert the coupling, to which the hose is inserted, into the pusher.

10 Fixing the other mate of the die

Put the other mate of the die on the base. Turn the die clamp to lock the die and fix it firmly.

⚠ **Warning** Do not put your hand in the die.

11 Adjustment of positions of die and coupling

Hold the hose beneath the die base with your left hand. Pushing the coupling toward the pusher, turn the pressurization screw clockwise with your right hand to send the pusher down.
As the pusher comes down, adjust the positions of the die hole and the coupling edge so they coincide.

⚠ **Caution** Discrepancy of the positions of the die hole and the coupling edge might cause damage to the coupling, such as socket defect.

12 Rotating handle

Attach the handle to the pressurization screw and rotate the handle clockwise to send the pusher down. Continue until the pusher touches the die.

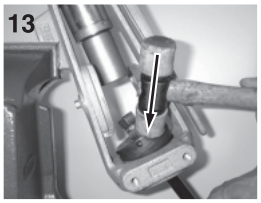
⚠ **Caution** If you stop before the pusher touches the die, the swaging is insufficient and pullout of the hose or leakage may occur.

⚠ **Caution** If you do not stop rotating the handle even after the pusher reaches the die, the tool may crash.

⚠ **Caution** Do not take your hands off the handle abruptly. The handle will return in a dangerous fashion.

⚠ **Caution** For safe operation, do not get your hands trapped.

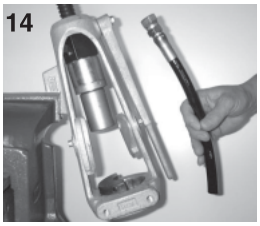
13 Detaching hose assembly



Un-install the die clamp, rotate the pressurization screw anti-clockwise to send the pusher up, and remove the hose assembly from the die. If it is difficult to remove the assembly, gently tap the die with the plastic hammer.

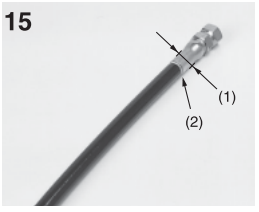
⚠ **Warning** Pay strict attention to prevent the die from falling.

14 Completion of hose assembling



⚠ **Caution** Before putting the die in storage, remove dust from the inner surface and thinly grease it to prevent rust.

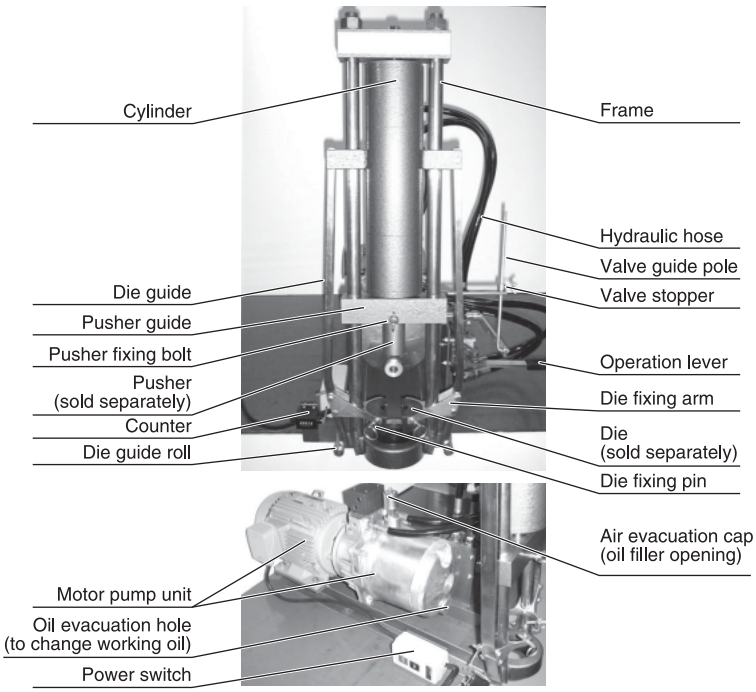
15 Check of hose assembly



(1) Check the swage diameter (see p.81).
(2) Check the mark position of the hose insertion length.
(3) Check the appearance of the coupling. (Check for any damage or misalignment of the track of the die.)
(4) Check the appearance of the hose. (Check for any kink or cut.)
Should problems occur, do not use the hose assembly.

☞ For details such as maintenance, please read the instruction manual that comes with the product.

Setup and specifications



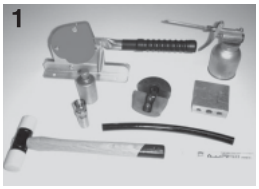
Specifications

Weight	: 90kg
Size	: 520x820x800mm
Electric motor	: three phase 200V 2.2kw
Hydraulic pump	: Max. pressure 14.3 MPa
	: Working pressure 11.2 MPa
	(Relief pressure already set)
Hydraulic cylinder	: Double-acting special cylinder
	stroke 150 mm
Working oil	: turbine oil VG46 or equivalent

☞ For details such as setting-up and electric wiring, please read the instruction manual that comes with the product.

Assembling method

1 Preparation



Prepare appropriate hose, swage connector, pusher, die, hose cutter, holding die, lubricant*, plastic hammer, scale, and white pen.

*lubricant...Steel coupling
: Nihon Kosakuyu PG3740 or equivalent
Stainless coupling :
size 02～12 : JX Nippon Oil & Energy or equivalent
size 16 : JX Nippon Oil & Energy or equivalent

☞ A 50cc bottle of lubricant (for steel coupling) comes with a set.

⚠ **Caution** If the recommended lubricant is not applied, coating damage and/or socket buckling may occur.

2 Hose cutting

Determine the cutting length of the hose based on the hose assembling length and cut the hose squarely using the specific hose cutter

⚠ **Caution** Do not touch the blade of the cutter.

⚠ **Caution** The slanted cut section could cause pullout of the hose and leakage.

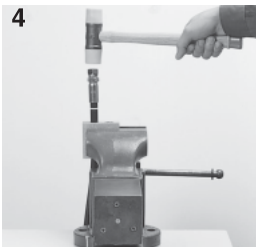
⚠ **Caution** If the blade is blunt, correct assembly is not possible. Change the hose cutter in this case.

3 Marking the insertion length of the hose

Measure the insertion length of the hose with the scale and mark the position on the hose with the white pen.

☞ It is recommended to draw a marking line of a width of about 2 mm in order to check it after the swaging.

4 Preparation for the hose insertion



Apply the lubricant to the inner surface of the hose and insert the coupling to the marked position. When it is difficult, use the holding die to fix the hose and hit the coupling with the plastic hammer.

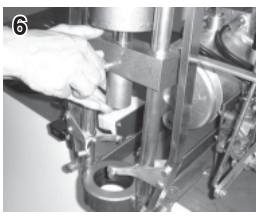
⚠ **Caution** If the insertion is insufficient, pullout of the hose, leakage, or damage may occur.

5 Lifting pusher holder

Push the operation lever to the back to lift up the pusher holder.

⚠ **Warning** Do not let the pusher holder down before the die pusher is attached.

6 Attachment of pusher

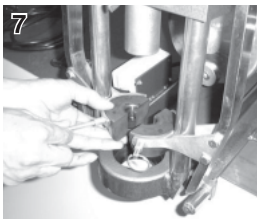


Attach the pusher to the pusher holder. Fix the pusher by turning the screw of the pusher holder so that the pusher can freely rotate.

⚠ **Warning** Only operate with the power off.

⚠ **Caution** The wrong choice of pusher will cause pullout of the hose, leakage, or damage.

7 Fixing die

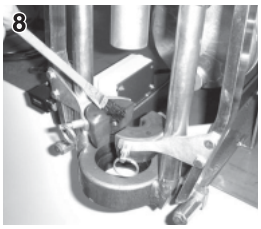


Attach the die onto the die fixing arm using the fixing pin.

⚠ Warning Only operate with the power off.

⚠ Caution The wrong choice of pusher will cause pullout of the hose, leakage, or damage.

8 Application of lubricant



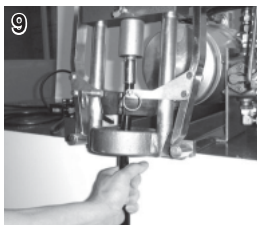
Apply lubricant to the inner surface of the die.

*lubricant ...Steel coupling : Nihon Kosakuyu PG3740 or equivalent

stainless coupling :
size 02～12 : JX Nippon Oil & Energy CFH68 or equivalent
size 16 : JX Nippon Oil & Energy DPX100 or equivalent

⚠ Caution If the recommended lubricant is not applied, coating damage and/or socket buckling may occur.

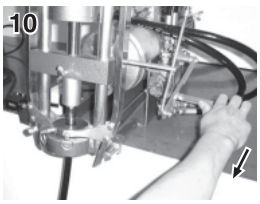
9 Insertion to pusher



Insert the coupling, to which the hose is inserted, into the pusher.

⚠ Warning Use a hose of sufficient length to hold the hose.

10 Hose assembling (1)



Hold the hose beneath the die base with your left hand. Pushing the connector toward the pusher, pull the operation lever with your right hand to send the pusher down.
As the pusher comes down, adjust the positions of the die hole and the connector edge so they coincide.

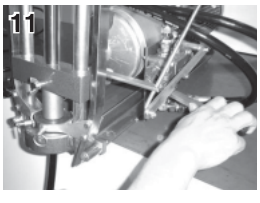
⚠ Danger It is dangerous to hold the hose near the die base. The die could trap your hand.

⚠ Danger Never touch the moving parts when operating the tool.

⚠ Caution Discrepancy of the positions of the die hole and the connector edge might cause damage to the coupling, such as socket defect.

⚠ Caution When the die closes, check that the hose is not stuck in the die.

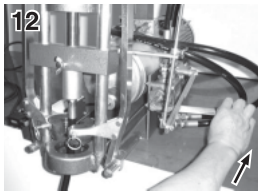
11 Hose assembling (2)



Pull the operation lever until the pusher touches the die.

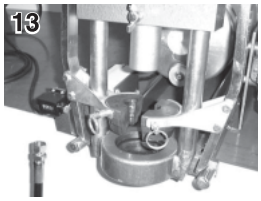
⚠ Caution If you stop before the pusher touches the die, the swaging is insufficient and pullout of the hose or leakage may occur.

12 Hose assembling (3)



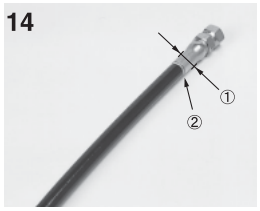
Push the operation lever to the back with your right hand to send the pusher up. When the pusher goes up, the die opens by itself and the hose assembly can be removed.
(The valve stopper adjusts the upper position of the cylinder.)

13 Completion of hose assembling



⚠ Caution Before putting the die in storage, remove dust from the inner surface and thinly grease it to prevent rust.

14 Check of hose assembly



(1) Check the swage diameter (see p.81).
(2) Check the mark position of the hose insertion length.
(3) Check the appearance of the coupling. (Check for any damage or misalignment of the track of the die.)
(4) Check the appearance of the hose. (Check for any kink or cut.)
Should problems occur, do not use the hose assembly.

☞ For details such as notes on operation, fine adjustment of each part, repair and maintenance, please read the instruction manual that comes with the product.

[Swage coupling] * For any couplings which are not intrroduced in the catalogue, please contact us.

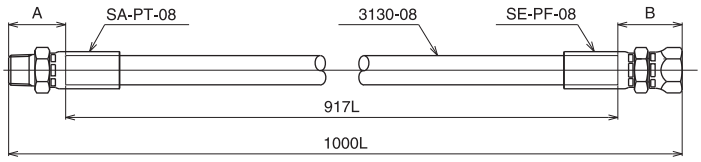
A Coupling deduction length

The cutting length of a hose is obtained by the hose-coupling assembly length minus the coupling deduction length*.

* Coupling deduction length: A (SA coupling) and B (SE, SF coupling) in the figure.

Ex. 3130-08 x 1000L SA-PT-08 x SE-PF-08
If you wish to make a hose assembly using the above, cut the hose at the length of 1000 - (39 + 44) = 917.

SE-PF-08
SA-PT-08

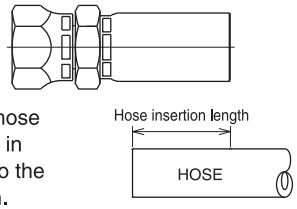


B Selection of pusher die

Part numbers are punched on pushers and dies.
The wrong pusher or die will cause oil leakage or pullout of the hose, or disable hose assembling, so always check the number.

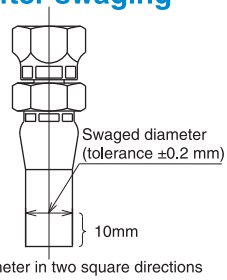
C Hose insertion length

Hose insertion lengths are presented in the list below. A shortage of hose insertion length will cause oil leakage or pullout of the hose. So mark the hose at the hose insertion length given in the list and insert the coupling into the hose to meet the marked position.



D Socket outer diameter after swaging

The socket outer diameter after swaging is measured at the point of about 10 mm from the socket end. Please regularly check the finished size. If the size is not appropriate, consult us to avoid possible oil leakage or pullout of the hose.



Measure diameter in two square directions

Steel coupling

Hose series	Hose size	Swage coupling part No.	A	B		C	D
			Coupling deduction length (mm)	Pusher part No.	Die part No.	Hose insertion length (mm)	Socket outer diameter after swaging (mm) ±0.2
LF70	04	SA-PT-04-14	32.0	PSA-04	SP14-04-07	19	12.4 *1
		SE-PF-04-14 SF-PF-04-14	31.0	PSE-14-04			
	06	SA-PT-06-14	33.0	PSA-06	SP14-06-07	22	15.6 *1
		SE-PF-06-14 SF-PF-06-14	32.0	PSE-14-06			
1000/1100/1400	04	SA-PT-04-14	32.0	PSA-04	SP14-04	19	12.7
		SE-PF-04-14 SF-PF-04-14	31.0	PSE-14-04			
	06	SA-PT-06-14	33.0	PSA-06	SP14-06	22	15.9
		SE-PF-06-14 SF-PF-06-14	32.0	PSE-14-06			
1000	08	SA-PT-08-14	37.0	PSA-08	SP14-08	24	19.5
		SE-PF-08-14 SF-PF-08-14	37.0	PSE-14-08			
1100	08	SA-PT-08-14	37.0	PSA-08	SP10-08	24	19.9
		SE-PF-08-14 SF-PF-08-14	37.0	PSE-14-08			
1500	03	SA-PT-03-14	30.0	PSA-04	SP14-03	14.5	10.5
		SE-PF-03-14 SF-PF-03-14	29.0	PSE-14-04			
3130/34PW	02	SSA-PT-02	26.0	PSA-02	SP3-02-001	12	9.2
		SSE-PF-02 SSF-PF-02	30.0	PSE-02-001			
N3130/3700 3130/3000 34PW	03	SA-PT-03	32.0	PSA-04	SP3-03	26	12.4
		SE-PF-03 SF-PF-03	33.0	PSE-03			
	04	SA-PT-04	33.0	PSA-04	SP3-04	28	14.4
		SE-PF-04 SF-PF-04	36.0	PSE-04			
	05	SA-PT-05	35.0	PSA-06	SP3-05	28	16.0
		SE-PF-05 SF-PF-05	38.0	PSE-05			
	06	SA-PT-06	35.0	PSA-06	SP3-06	33	17.6
		SE-PF-06 SF-PF-06	39.0	PSE-06			
	08	SA-PT-08	39.0	PSA-08	SP3-08	37	21.5
		SE-PF-08 SF-PF-08	44.0	PSE-08			
N3130/3700 3130/3000	12	SA-PT-12	43.0	PSA-12	SP3-12	40	28.1
		SE-PF-12 SF-PF-12	47.0	PSE-12			
	16	SA-PT-16	48.0	PSA-16	SP3-16	52	34.5
		SE-PF-16 SF-PF-16	53.0	PSE-16			
N3000/HT	04	SA-PT-04	33.0	PSA-04	SPN-04	28	14.6
		SE-PF-04 SF-PF-04	36.0	PSE-04			
	06	SA-PT-06-N30	35.0	PSA-06	SPN-06	33	18.9
		SE-PF-06-N30 SF-PF-06-N30	39.0	PSE-06			
	08	SA-PT-08-N30	39.0	PSA-08	SPN-08	37	22.7
		SE-PF-08-N30 SF-PF-08-N30	44.0	PSE-08			

Hose series	Hose size	Swage coupling part No.	A	B		C	D
			Coupling deduction length (mm)	Pusher part No.	Die part No.	Hose insertion length (mm)	Socket outer diameter after swaging (mm) ±0.2
N3000/HT	10	SA-PT-10-N30	40.0	PSA-10	SPN-10	40	26.2
		SE-PF-10-N30 SF-PF-10-N30	44.0	PSE-10			
3R80	03	SA-PT-03-3R	35.0	PSA-04	SPH-03	23	13.5
		SE-PF-03-3R SF-PF-03-3R	36.0	PSE-03			
	04	SA-PT-04-3R	33.0	PSA-04	SPH-04	28	17.2
		SE-PF-04-3R SF-PF-04-3R	36.0	PSE-04			
	06	SA-PT-06-N30	35.0	PSA-06	SPH-06	33	20.1
		SE-PF-06-N30 SF-PF-06-N30	39.0	PSE-06			
	08	SA-PT-08-N30	39.0	PSA-08	SPH-08	37	23.0
		SE-PF-08-N30 SF-PF-08-N30	44.0	PSE-08			
3R80/34PW	12	SA-PT-12-3R	43.0	PSA-12	SPH-12	40	29.5
		SE-PF-12-3R SF-PF-12-3R	47.0	PSE-12			
	16	SA-PT-16-3R	48.0	PSA-16	SPH-16	52	37.8
		SE-PF-16-3R SF-PF-16-3R	53.0	PSE-16			

*1 The tolerance of the socket outer diameter after swaging for LF70 is ±0.1mm.

Stainless coupling

Hose series	Hose size	Swage coupling part No.	A	B			C	D
			Coupling deduction length (mm)	Pusher part No.	Die part No.		Hose insertion length (mm)	Socket outer diameter after swaging (mm) ±0.2
					First	Second		
1000/1100/1400	04	SA-PT-04-14-S	32.0	PSA-04	SPH-03	SP14-04	19	12.7
		SE-PF-04-14-S SF-PF-04-14-S	31.0	PSE-14-04				
	06	SA-PT-06-14-S	33.0	PSA-06	SP3-05-1-ST	SP14-06	22	15.9
		SE-PF-06-14-S SF-PF-06-14-S	32.0	PSE-14-06				
1000	08	SA-PT-08-14-S	37.0	PSA-08	SPH-06-1-ST	SP14-08	24	19.5
		SE-PF-08-14-S SF-PF-08-14-S	37.0	PSE-14-08				
1100	08	SA-PT-08-14-S	37.0	PSA-08	SPH-06-1-ST	SP10-08	24	19.9
		SE-PF-08-14-S SF-PF-08-14-S	37.0	PSE-14-08				
3130/34PW	02	SSA-PT-02-S	26.0	PSA-02	SP3-02-001	–	12	9.2
		SSE-PF-02-S SSF-PF-02-S	30.0	PSE-02-001				
N3130/3700 3130/3000	03	SA-PT-03-S	32.0	PSA-04	SP3-03-1-ST	SP3-03	24	12.4
		SE-PF-03-S	33.0	PSE-03				
N3130/3700	04	SA-PT-04-S	33.0	PSA-04	SP3-04-1-ST	KM-04	28	14.0
		SE-PF-04-S SF-PF-04-S	36.0	PSE-04				
3130/3000 34PW	04	SA-PT-04-S	33.0	PSA-04	SP3-04-1-ST	SP3-04	28	14.4
		SE-PF-04-S SF-PF-04-S	36.0	PSE-04				
N3130/3700 3130/3000 34PW	06	SA-PT-06-S	35.0	PSA-06	SP3-06-1-ST	SP3-06	33	17.6
		SE-PF-06-S SF-PF-06-S	39.0	PSE-06				
	08	SA-PT-08-S	39.0	PSA-08	SP3-08-1-ST	SP3-08	37	21.5
		SE-PF-08-S SF-PF-08-S	44.0	PSE-08				
N3130/3700 3130/3000	12	SA-PT-12-S	43.0	PSA-12	SP3-12-1-ST	SP3-12	40	28.1
		SE-PF-12-S SF-PF-12-S	47.0	PSE-12				
	16	SA-PT-16-S	48.0	PSA-16	SP3-16-1-ST	SP3-16	52	34.5
		SE-PF-16-S SF-PF-16-S	53.0	PSE-16				
N3000/HT	04	SA-PT-04-S	33.0	PSA-04	SPH-04-1-ST	SPN-04	28	14.6
		SE-PF-04-S	35.0	PSE-04				
	06	SA-PT-06-N30-S	34.0	PSA-06	SPH-06-1-ST	SPN-06	33	18.9
		SE-PF-06-N30-S	38.0	PSE-06				
	08	SA-PT-08-N30-S	39.0	PSA-08	SPH-08-1-ST	SPN-08	37	22.7
		SE-PF-08-N30-S	43.0	PSE-08				
3R80	04	SA-PT-04-3R-S	33.0	PSA-04	SPH-04-1-ST	SPH-04	28	17.2
		SE-PF-04-3R-S	35.0	PSE-04				
	06	SA-PT-06-N30-S	34.0	PSA-06	SPH-06-1-ST	SPH-06	33	20.1
		SE-PF-06-N30-S	38.0	PSE-06				
	08	SA-PT-08-N30-S	39.0	PSA-08	SPH-08-1-ST	SPH-08	37	23.0
		SE-PF-08-N30-S	43.0	PSE-08				
3R80/34N	12	SE-PF-12-3R-S	47.0	PSE-12	SPH-12-1-ST	SPH-12	40	29.5
	16	SE-PF-16-3R-S	53.0	PSE-16	SPH-16-1-ST	SPH-16	52	37.8
34PW	04	SE-G-04-PW	36.0	PSE-04	SP3-04-VC	–	28	14.4
	06	SE-G-06-PW	39.0	PSE-06	SP3-06-VC	–	33	17.6
	08	SE-G-08-PW	44.0	PSE-08	SP3-08-VC	–	37	21.5
	12	SE-G-12-PW	47.0	PSE-12	SPH-12-1-ST	SPH-12-VC	40	29.5
	16	SE-G-16-PW	53.0	PSE-16	SPH-16-1-ST	SPH-16-37VC	52	37.0
	04	SE-G-04-PWL	31.0	PSE-04-PWL	SPP-04-VC	–	11	14.7
	06	SE-G-06-PWL	32.0	PSE-06-PWL	SPP-06-VC	–	11	18.0
	08	SE-G-08-PWL	39.0	PSE-08-PWL	SPP-08-VC	–	14	21.8
	12	SE-G-12-PWL	42.0	PSE-12-PWL	SPP-12-VC	–	21	29.6
	16	SE-G-16-PWL	45.0	PSE-16-PWL	SPP-16-VC	–	29	37.2

Assembling method

1 Preparation

Prepare appropriate hose, coupling, hose cutter, holding die, lubricant*, adjustable wrench, scale, and white pen.

*lubricant...Steel coupling
: Nihon Kosakuyu PG3740 or equivalent

Stainless coupling
size 02～12 : JX Nippon Oil & Energy CFH68 or equivalent
size 16 : JX Nippon Oil & Energy DPX100 or equivalent

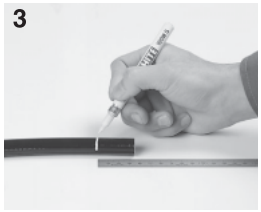
⚠ **Caution** If the recommended lubricant is not applied, coating damage and /or socket buckling may occur.

2 Hose cutting

Determine the cutting length of the hose based on the hose assembling length and cut the hose squarely using the special hose cutter.

⚠ **Caution** Do not touch the blade of the cutter.
⚠ **Caution** The slanted cut section could cause pullout of the hose and leakage.
⚠ **Caution** If the blade is blunt, correct assembly is not possible. Change the hose cutter in this case.

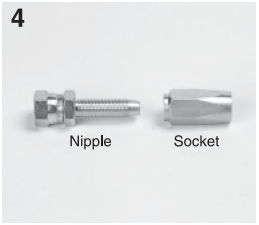
3 Marking the insertion length of the hose



Measure the insertion length of the hose with the scale and mark the position on the hose with the white pen.

☞ It is recommended to draw a marking line of a width of about 2 mm in order to check it after the swaging.

4 Disassembling of coupling



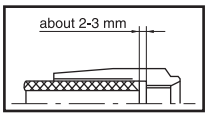
Disassemble the reusable coupling into socket and nipple.

5 Preparation to insert coupling

Nip the hose with the holding die, leaving the length of hose end to be inserted into the socket, and fix it in the vice. For easy screwing, apply lubricant to the surface of the hose end.

6 Insertion of socket

Insert the socket into the hose end and tighten it anti-clockwise with your hand. Then use the adjustable wrench to screw the socket to the position marked on the hose. Check that there is about a 2-3 mm space between the inner end of the socket and the hose end.



⚠ **Caution** Caution: Stop screwing before the inner end of the socket reaches the hose end, otherwise damage to the core tube will occur and cause leakage.

7 Insertion of the nipple (1)

Remove the assembly from the vice and the holding die. Nip the socket with the vice and apply lubricant to the nipple thread and the inner surface of the hose.

8 Insertion of the nipple (2)

Tighten the nipple clockwise with your hand and use an appropriate adjustable wrench to slowly screw the nipple until its hexagonal part touches the socket.

⚠ **Caution** Do not screw further, once the nipple touches the socket. It may cause damage to the coupling.
⚠ **Caution** Using a machine to quickly screw the nipple may cause damage to the core tube or the coupling, leading to pullout of the hose or leakage.

9 Completion of hose assembling

After finishing the tightening of the nipples, check for deformation of the core tube by inserting a checking stick into the coupling.

10 Check of hose assembly

(1) Check the mark position of the hose insertion length.
(2) Check the appearance of the coupling. (Check for any damage.)
(3) Check the appearance of the hose. (Check for any kink or cut.)
Should problems occur, do not use the hose assembly.

☞ For details such as repair and maintenance, please read the instruction manual that comes with the product.

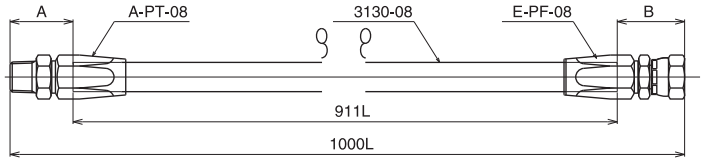
[Reusable coupling] * For any couplings which are not intrroduced in the catalogue, please contact us.

A Coupling deduction length

The cutting length of a hose is obtained by the hose-coupling assembly length minus the coupling deduction length*.

* Coupling deduction length: A (SA coupling) and B (SE, SF coupling) in the figure.

Ex. 3130-08 x 1000L SA-PT-08 x E-PF-08
If you wish to make a hose assembly using the above, cut the hose at the length of
1000 - (43 + 46) = 911.
E-PF-08
A-PT-08



B Hose insertion length

Hose insertion lengths are presented in the list below.
A shortage of hose insertion length will cause oil leakage or pullout of the hose. So mark the hose at the hose insertion length given in the list and insert the coupling into the hose to meet the marked position.

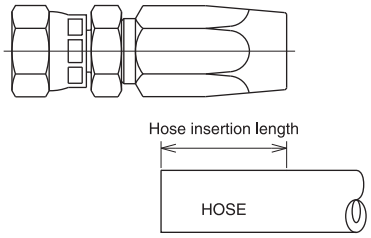


Table of hose screwing length

Hose series	Hose size	Reusable coupling part No.	A Coupling deduction length (mm)	B Hose insertion length (mm)
3130	02	A-PT-02	25.5	16
		E-PF-02 F-PF-02	31.5	
3130・3000	03	A-PT-03	30.0	21
		E-PF-03 F-PF-03	32.5	
	04	A-PT-04	31.5	25
		E-PF-04 F-PF-04	34.0	
3130	05	A-PT-05	35.5	29
		E-PF-05 F-PF-05	37.0	
3130・3000	06	A-PT-06	37.5	30
		E-PF-06 F-PF-06	40.0	
	08	A-PT-08	43.0	36
		E-PF-08 F-PF-08	46.0	
	12	A-PT-12	46.5	38
		E-PF-12 F-PF-12	47.5	
3000	16	A-PT-16	49.5	42
		E-PF-16 F-PF-16	50.0	

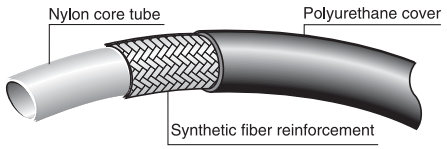
How to read the catalog

N3130

Features

- Flexible and tough
- JIS K 6375 type 1 certificated, SAE100R7 certificated
- Nonconductive hose with high electrical insulation is also available.

(5)



	Part No.	(1) Size No.	(1) Inner diameter (in.)	(1) Inner diameter (mm)	(1) Outer diameter (mm)	(2) Maximum working pressure (MPa)	(2) Maximum impact pressure (MPa)	(2) Minimum destruction pressure (MPa)	(3) Minimum bending radius (mm)	Weight (g/m)	(4) Coupling
*	N3130-03	03	3/16	4.8	10.4	21.0	26.3	84.0	20	65	
*	N3130-04	04	1/4	6.4	12.7	19.5	24.4	77.0	40	105	
	N3130-05	05	5/16	8.1	14.7	17.5	21.9	70.0	45	130	
*	N3130-06	06	3/8	9.8	16.4	16.0	20.0	63.0	50	150	Swage
*	N3130-08	08	1/2	12.8	20.3	14.0	17.5	56.0	75	210	
*	N3130-12	12	3/4	19.2	26.6	9.0	11.3	35.0	130	290	
*	N3130-16	16	1	25.7	33.4	7.0	8.8	28.0	165	400	

- Appropriate fluid: mineral hydraulic oil
- Working temperature range: -40 to -100¡C
- Unit length in a package: 100 m for sizes 03, 04, 05, 06, 08 , and 50 m for sizes 12,16

(6) (7)

(1) Size (inner diameter)

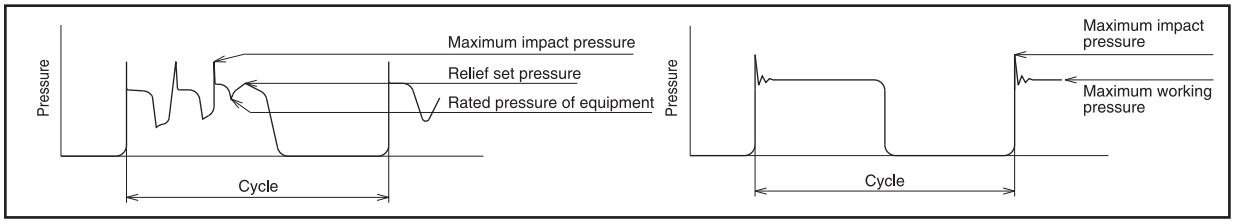
It is necessary to select the correct hose size (inner diameter) to obtain the necessary flow volume.
In general, the flow speed range shown below is the standard.
Too small an inner diameter of hose and coupling leads to an increase of flow speed, which causes problems such as pressure loss and increase of oil temperature. Pressure loss may vary with fluid viscosity, flow volume, and circuit length.
To see how flow speed, inner diameter, and flow volume, relate to each other, refer to [nomograph] on P.87

Pump intake and return line	0.5 to 1.5m/sec
Pressurization line	2.0 to 8.0m/sec

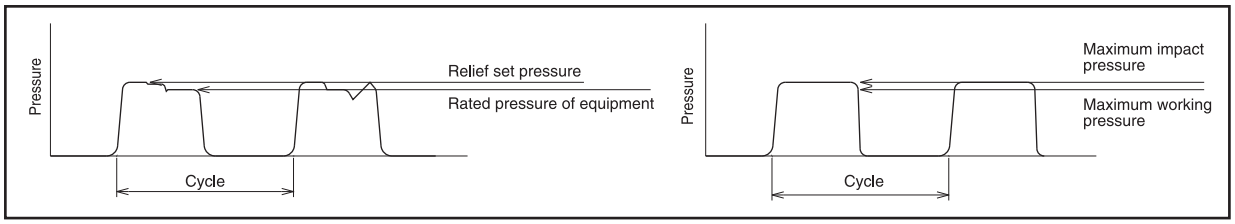
(2) Pressure

Fluid pressure in hydraulic circuits varies, e.g. negative pressure, static fluid, or impact pressure. The maximum working pressure (regular pressure) of the hose represents the maximum pressure for continuous use, and is generally set according to the relief set pressure.
However, since the impact pressure due to the opening and closing of circuits has serious influence on hose life, it is important to select suitable hoses so that the maximum impact pressure will not exceed the standard.
Although plastic is usually more rigid than rubber against negative pressure and can withstand small negative pressure, contact us if large negative pressure is expected.
The maximum impact pressure is about 1.5 times the maximum working pressure of case [A]. Refer to the catalog for case [B].

A



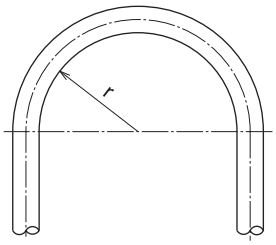
B



* The test examples are the pressure waveforms used for the hydraulic impact test machine. In particular [B] is provided for JIS, pursuant to SAE and ISO.

(3) Bending radius

The hose can be bent, but there is always a limit. If the hose is bent at a radius smaller than the minimum bending radius, deformation or kink of the hose may occur and cause problems.
Please bend the hose at a radius larger than the minimum bending radius.



r: Bending radius

(4) Coupling

The coupling consists of a connection to equipment, a hexagonal part, and a connection to the hose. There are various types of couplings ,including adaptors. Sometimes connections to the imported equipment do not work well because their thread and sheet shape differs from the JIS standard. Therefore, check the thread type, sealing method and sheet surface shape and angle of equipment to be connected before selecting couplings.

(5) Electrical insulation (nonconductive hose)

Plastic hoses in general have high electrical insulation. When electrical insulation is particularly necessary, e.g. for the hydraulic hose of electrical work equipment, leakage current is sometimes determined. Contact us in this case. When electrical insulation is required, a nonconductive hose without pin pricking (no pin hole for gas venting) is also available to prevent the reduction of electrical insulation due to external water invasion.

(6) Fluid type

Since the hose core tube is made of high oil resistant plastic , it will not be damaged by mineral or aqueous hydraulic oil. However, some types of synthetic hydraulic oil and nonflammable special oil could affect the hose.
Typical couplings and adaptors are made of zinc galvanized steel. Contact us if using a special fluid that may damage the material or the surface processing.

☞ Stainless couplings or black colored couplings (made-to-order) are also available if using water or glycol hydraulic oil.

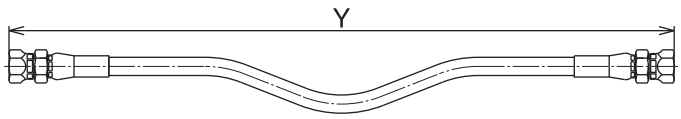
(7) Working temperature (fluid temperature, atmospheric temperature)

Using a hose at a temperature higher than the specification may cause thermal degradation and could shorten the hose life. Also using at a temperature lower than the specification could make the hose harder and frangible. When effects of atmospheric temperature, e.g. radiational heat, are expected, use a heat insulator to protect the hose.

Fixed piping

Since the length of the hose may change by ±3% when pressurized, give some extra length to the hose to prevent shrinkage stress. Also since the minimum bending radius is determined for the specification of each hose, follow the standard and keep the hose straight (for about the same length as the outer diameter of the hose) near the coupling edge to prevent sharp bending.

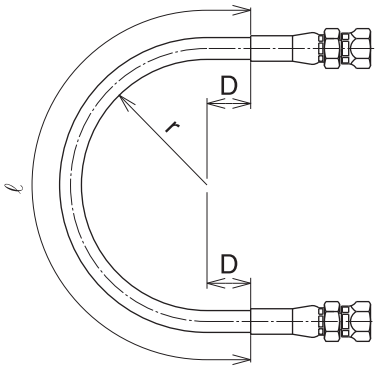
Formula when using the hose in a straight line



$L = Y \times 1.03$

L: Length of hose assembly
Y: Working straight length

Formula when using the hose in a U-line

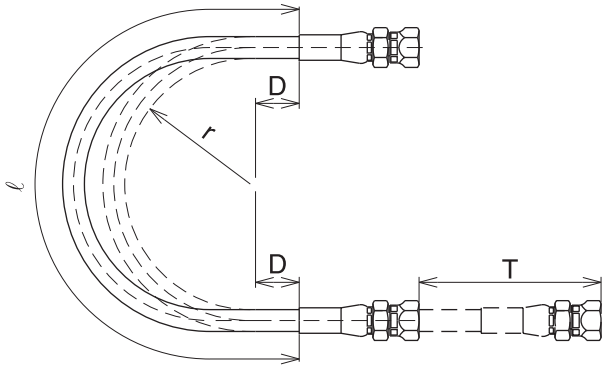


$\ell = \pi(r + D/2) + 2D$

ℓ: Free length of hose
π : Ludolphian number
r : Minimum bending radius of hose
D : Maximum outer diameter of hose

Movable piping

For movable hose, determine the hose length with attention paid to the hose movement to prevent sharp bending or kink near the coupling edge.



$\ell = \pi(r + D/2) + 2D + T$

ℓ: Free length of hose
π : Ludolphian number
r : Minimum bending radius of hose
D : Maximum outer diameter of hose
T : Stroke

Explanation of nomograph

The figure below is to help in the selection of the most suitable choice of hose for equipment. Keep the flow velocity in the column. If the flow velocity exceeds the recommended value, problems such as increased pressure loss and overheating could occur. Generally, when fluid flows in a hose, the “flow volume”, “flow velocity”, and “hose cross section” are linked as shown in the formula below.

$$\text{Hose cross section (cm}^2\text{)} = \frac{\text{Flow volume (}\ell\text{/min)}}{\text{Flow velocity (m/sec) x 60}} \text{ x 10}$$

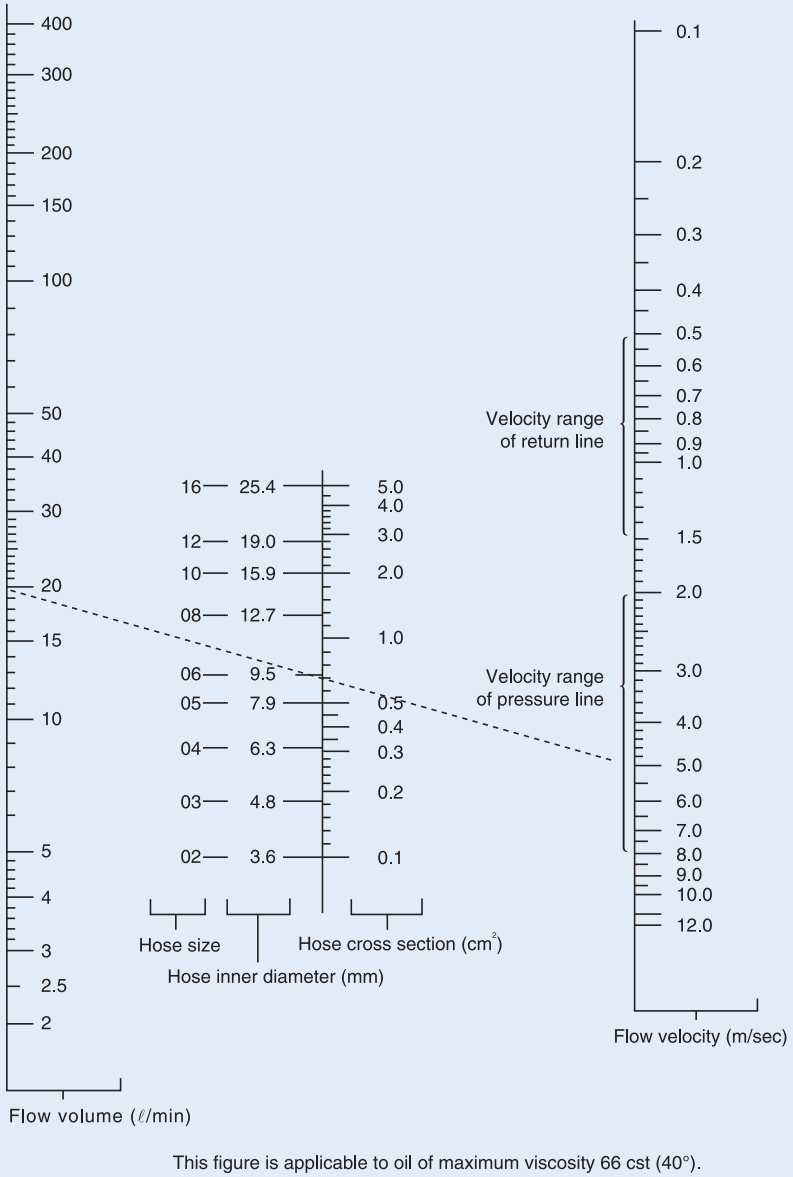
Therefore, if any two of the three are given, the rest is determined by this formula.

How to use the graph

(1) Select the discharge flow volume of the pressure line in the leftmost line graph.
(2) Select the flow velocity in the recommended range of the rightmost line graph.
(3) Draw a line connecting both points obtained above and find the correct hose inner diameter at the point where the line crosses the central graph.

[Nomograph]

(Ex.) When the flow velocity of the pressure line is 5 m/sec and the necessary flow volume is 20 ℓ/min, the recommended hose size is 06.



This figure is applicable to oil of maximum viscosity 66 cst (40°).

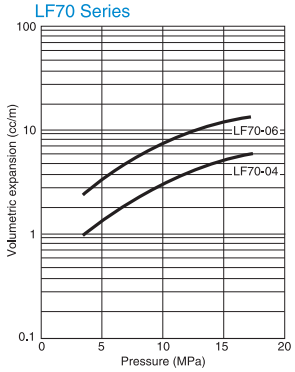
Graphs for cubical expansion of hoses

How to use the graph

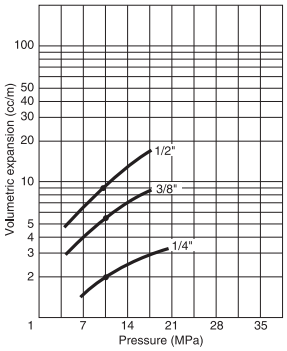
1. ● represents the maximum working pressure
2. The hose size indicates inner diameter

☞ Please contact us for the details of 35NG series.

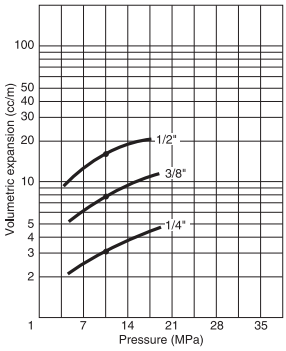
LF70 Series



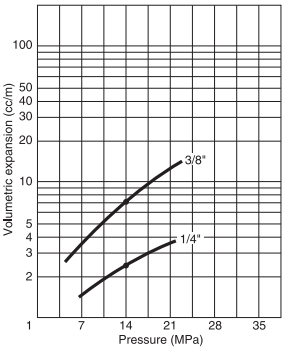
1000 Series



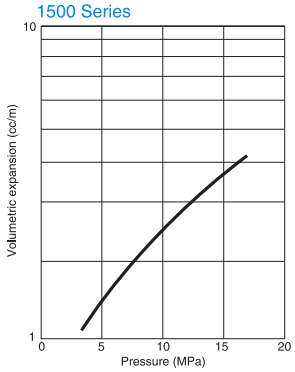
1100 Series



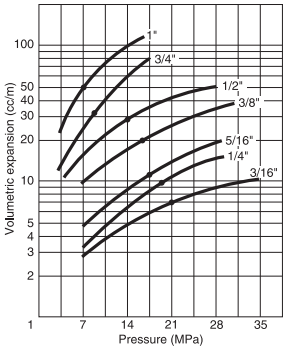
1400 Series



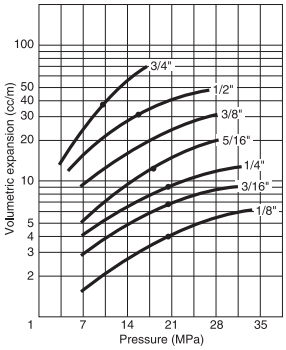
1500 Series



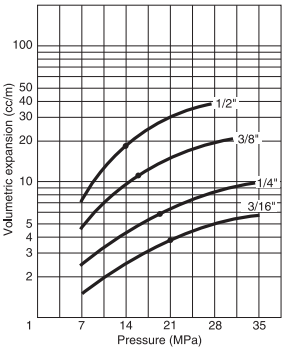
N3130 Series, F3130 Series



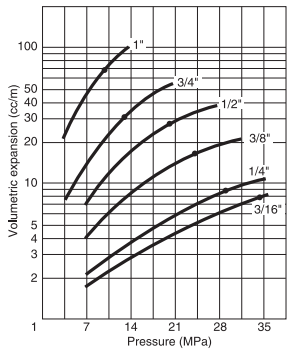
3130 Series, F3130-02 Series



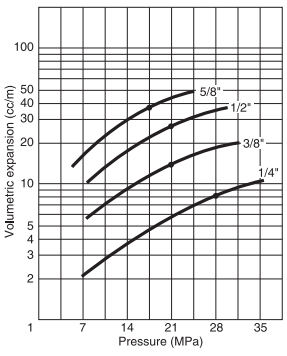
3700 Series



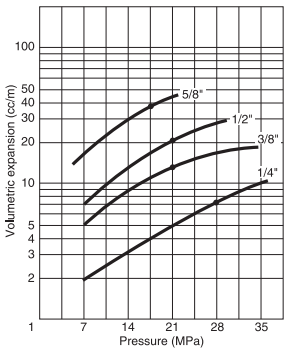
3000 Series



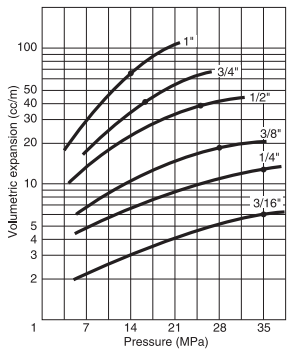
N3000 Series



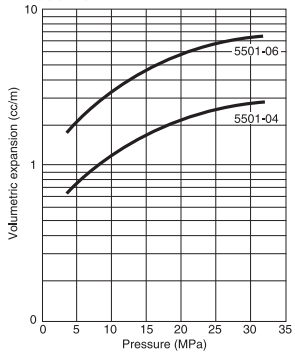
HT Series



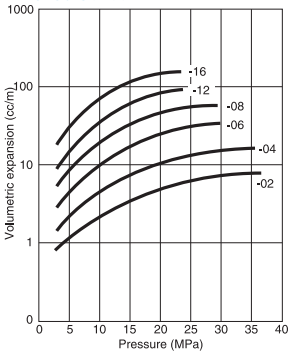
3R80 Series



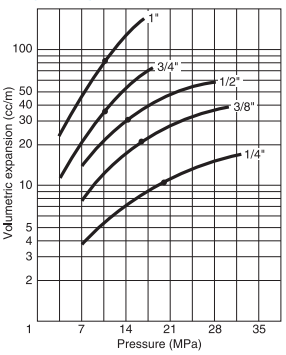
5501 Series



3450 Series



34PW Series



Parallel pipe thread

Thread size	1/8	1/4	3/8	1/2	3/4	1
G (PF) Thread	15N•m	25N•m	34N•m	64N•m	132N•m	196N•m

Taper pipe thread

Thread size	1/8	1/4	3/8	1/2	3/4	1
R (PT) Thread	10 to15N•m	25 to 30N•m	45 to 50N•m	60 to 70N•m	120 to 140N•m	140 to 160N•m

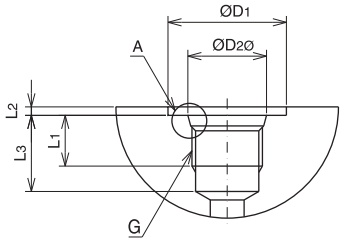
Unified fine thread

Thread size	7/16-20	1/2-20	9/16-18	3/4-16	7/8-14
UNF Thread	25N•m	30N•m	40N•m	50N•m	60N•m

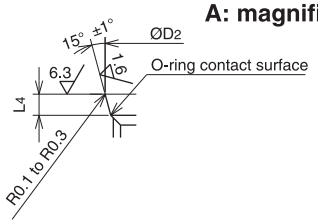
American Standard straight pipe threads for free−fitting mechanical joints for fixtures

Thread size	1/4	3/8
NPSM Thread	25N•m	34N•m

Shape and size of JIS-standard O-ring port (JISB2351)



A: magnified



Thread name G	D_1±0.3	D_2 +0.1 0	L_1 (Min)	L_2 (Max)	L_3 (Min)	L_4 +0.40 0	Suitable O-ring number
1/8	18	11.6	10	1.0	15	2.0	P8
1/4	24	15.6	12	1.5	18	2.5	P11
3/8	28	18.6	12	2.0	18	2.5	P14
1/2	34	22.6	16	2.5	24	2.5	P18
3/4	45	29.8	17	2.5	25	3.5	P24
1	51	35.8	21	2.5	30	3.5	P29

- There must be no axial scratch or spiral tool mark on the O-shaped O-ring contact surface.
- D1 scraped surface must be squarely or flat to the thread axis.

Connection method of hose coupling (with sheet) and adaptor

1. Coupling

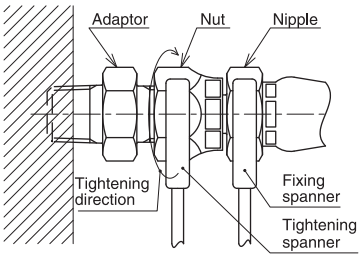
Tighten with your hand until the two sheets perfectly contact each other.

⚠ **Caution:** Adjust the axes of the coupling and adaptor to prevent non-uniform contact of sheets. After tightening with your hand, please check for any unwanted space between the coupling and adaptor.

2. Fixing

Fix the adaptor and nipple with a spanner so that the sheets cannot rotate together, and tighten the nut with a torque wrench (see the figure). When the rotation speed of the torque wrench is high, the surface pressure at the sheet surface is low, which might cause leakage. In this case, slowly tighten again until you feel a click.

⚠ **Caution:** The tightening torque should follow the figures in the “parallel pipe thread” table on the previous page. If the sheets are rotated while contacting each other, it will damage the sheet surface and cause leakage.



Types

Thread symbol	Thread type	Related standard
G (PF)	Parallel pipe thread	JIS B0202
R (PT)	Taper pipe thread	JIS B0203
UNC	Unified coarse thread	JIS B0206
UNF	Unified fine thread	JIS B0208
M	Metric coarse thread	JIS B0205
M	Metric fine thread	JIS B0207
NPT	American Standard taper pipe threads for general use	ANSI B1/20/1
NPS	American Standard straight threads	ANSI B1/20/1
NPTF	Dryseal American Standard taper pipe threads	ANSI B1/20/3
NPSM	American Standard straight pipe threads for free-fitting mechanical joints for fixtures	ANSI B1/20/1

Class

Thread type	Parallel male pipe thread		Unified thread						Metric thread	
									Female thread	Male thread
Class	Class A	Class B	Class 3A	Class 3B	Class 2A	Class 2B	Class 1A	Class 1B	4H to 6H	6 to 8g
Notation	A	B	3A	3B	2A	2B	1A	1B	4H to 6H	6 to 8g

Expressional example

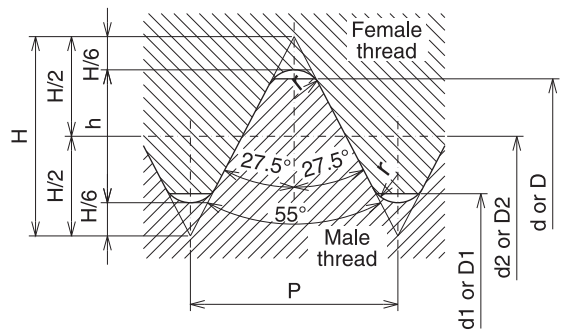
G (Thread symbol) 3/4 (Size) — B (Class)

9/16 (Thread size) — 18 (Number of screw threads) UNF (Thread symbol) — 2B (Class)

M (Thread symbol) 18 (Thread size) x 1.5 (Pitch) — 2 (Class)

Parallel pipe thread [JIS BO202]

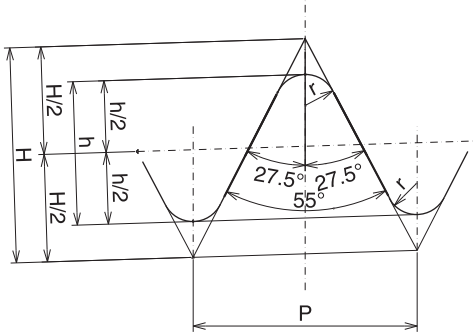
Standard shape and size of parallel pipe thread



Thread name (PF)	Number of screw threads (per 25.4 mm) n	Pitch P (reference)	Height of thread h	Curvature of top r	Male thread		
					Outer diameter d	Pitch diameter d_2	Root diameter d_1
					Female thread		
					Root diameter D	Pitch diameter D_2	Inner diameter D_1
G1/8	28	0.9071	0.581	0.12	9.728	9.147	8.566
G1/4	19	1.3368	0.856	0.18	13.157	12.301	11.445
G3/8	19	1.3368	0.856	0.18	16.662	15.806	14.950
G1/2	14	1.8143	1.162	0.25	20.955	19.793	18.631
G3/4	14	1.8143	1.162	0.25	26.441	25.279	24.117
G1	11	2.3091	1.479	0.32	33.249	31.770	30.291

Taper pipe threads [JIS BO203]

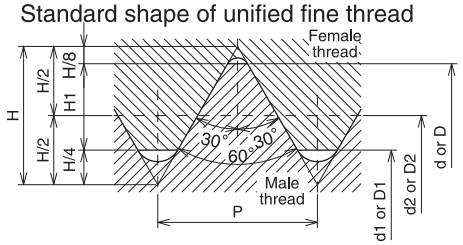
Standard shape applied to tapered male and female threads



Thread name (PT)	Thread				Standard diameter			Position of standard diameter			Tolerance of D_1, D_2 and D_1 of parallel female thread	Length of useful thread				Size of carbon-steel pipe (reference)	
	Number of screw threads (per 25.4 mm) n	Pitch P (reference)	Height of thread h	Curvature radius r or r_2	Male thread			Male thread		Female thread		Male thread	Female thread				
					Outer diameter d	Pitch diameter d_2	Root diameter d_1	From pipe edge		At pipe edge		From position of standard diameter to larger diameter part	With incomplete thread part		Without incomplete thread part		
					Female thread			Standard length	Tolerance along axis	Tolerance along axis			Taper female thread	Parallel male thread	Taper female thread, parallel female thread	Outer diameter	Thickness
					Root diameter D	Pitch diameter D_2	Inner diameter D_1						From position of standard diameter to smaller diameter part	From pipe or pipe coupling edge (reference)	From standard diameter, pipe, pipe coupling edge		
R1/8	28	0.9071	0.581	0.12	9.728	9.147	8.566	3.97	0.91	1.13	0.071	2.5	6.2	7.4	4.4	10.5	2.0
R1/4	19	1.3368	0.856	0.18	13.157	12.301	11.445	6.01	1.34	1.67	0.104	3.7	9.4	11.0	6.7	13.8	2.3
R3/8	19	1.3368	0.856	0.18	16.662	15.806	14.950	6.35	1.34	1.67	0.104	3.7	9.7	11.4	7.0	17.3	2.3
R1/2	14	1.8143	1.162	0.25	20.955	19.793	18.631	8.16	1.81	2.27	0.142	5.0	12.7	15.0	9.1	21.7	2.8
R3/4	14	1.8143	1.162	0.25	26.441	25.279	24.117	9.53	1.81	2.27	0.142	5.0	14.1	16.3	10.2	27.2	2.8
R1	11	2.3091	1.479	0.32	33.249	31.770	30.291	10.39	2.31	2.89	0.181	6.4	16.2	19.1	11.6	34.0	3.2

Unified fine thread [JIS BO208]

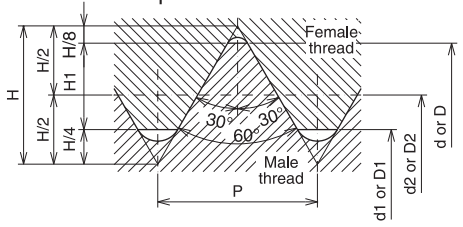
Standard shape of unified fine thread



Thread name	Number of screw threads (per 25.4 mm) n	Pitch P (reference)	Height of engagement H_1	Female thread		
				Root diameter D	Pitch diameter D_2	Inner diameter D_1
				Male thread		
				Outer diameter d	Pitch diameter d_2	Root diameter d_1
1/4 - 28 UNF	28	0.9071	0.491	6.350	5.761	5.367
5/16-24 UNF	24	1.0583	0.573	7.938	7.249	6.792
3/8 - 24 UNF	24	1.0583	0.573	9.525	8.837	8.379
7/16-20 UNF	20	1.2700	0.687	11.112	10.287	9.738
1/2 - 20 UNF	20	1.2700	0.687	12.700	11.874	11.326
9/16-18 UNF	18	1.4111	0.764	14.288	13.371	12.761
5/8 - 18 UNF	18	1.4111	0.764	15.875	14.958	14.348
3/4 - 16 UNF	16	1.5875	0.859	19.050	18.019	17.330
7/8 - 14 UNF	14	1.8143	0.982	22.225	21.046	20.262

Metric fine thread [JIS BO207]

Standard shape of metric fine thread



Thread name	Pitch P (reference)	Height of engagement H_1	Female thread		
			Root diameter D	Pitch diameter D_2	Inner diameter D_1
			Male thread		
			Outer diameter d	Pitch diameter d_2	Root diameter d_1
M12 x 1.5	1.5	0.812	12.000	11.026	10.376
M14 x 1.5	1.5	0.812	14.000	13.026	12.376
M16 x 1.5	1.5	0.812	16.000	15.026	14.376
M18 x 1.5	1.5	0.812	18.000	17.026	16.376
M20 x 1.5	1.5	0.812	20.000	19.026	18.376
M22 x 1.5	1.5	0.812	22.000	21.026	20.376
M24 x 1.5	1.5	0.812	24.000	23.026	22.376
M30 x 1.5	1.5	0.812	30.000	29.026	28.376

Technical standard for plastic hoses

Item \ Standard			Japan		ISO		USA	
			JIS K 6375 (Hose) JIS B 8362 (Hose assembly)		ISO 3949		SAE J 517	
Type			Type 1	Type 2	Type 1	Type 2	100R7	100R8
Main performa	Maximum working pressure		Minimum burst pressure x 1/4	←	←	←	←	←
	Test pressure		Maximum working pressure x 2	←	←	←	←	←
	Minimum burst pressure		Maximum working pressure x 4	←	←	←	←	←
	Working temperature range		-40°C to +100°C	←	←	←	-40°C to +93°C	←
	Fatigue resistance	Pressure	Maximum working pressure x 125%	Maximum working pressure x 133%	Maximum working pressure x 125%	Maximum working pressure x 133%	Maximum working pressure x 125%	Maximum working pressure x 133%
		Waveform	Square	←	←	←	←	←
		Frequency	150,000	200,000	150,000	200,000	150,000	200,000
		Oil temperature	93°C	←	←	←	←	←
		Cycle	30 to 75 cycle/min	←	←	←	←	←
		Oil type	Two types of JIS K2213 (turbine oil), ISOVG46 or equivalent	←	ISOVG46 of ISO3448	←	No specification	←
	Change rate of length (at max. working pressure)		+3 to -3%	←	←	←	←	←
Other performance	Low-temperature resistance		Bend hose at minimum bending radius, 8 to 12 sec after leaving it for 24 hr at -40°C. Then perform the pressure durability test.	←	←	←	←	←
	Ozone resistance of outer surface		Perform visual check at two-fold magnification after leaving it for 72 hr at 40°C under the ozone concentration 0.5 ppm.	←	←	←	Perform visual check at seven-fold magnification after leaving it for 70 hr at 40°C under the ozone concentration 0.5 ppm.	←
	Hydraulic resistance of inner and outer surface		+35 to -15% of volume change rate after dipping for 72 hr at 100°C in No. 3 oil.	←	←	←	+35 to -15% of volume change rate after dipping for 70 hr at 100°C in ASTM No. 3.	←

Length

m	in	foot	yard	mile
1	3.937 x 10	3.2808	1.0936	6.2×10^{-4}
2.54×10^{-2}	1	8.3333×10^{-2}	2.778×10^{-2}	1.6×10^{-5}
3.048×10^{-1}	1.2 x 10	1	3.3333×10^{-1}	1.9×10^{-4}
9.114×10^{-1}	3.6 x 10	3	1	5.7×10^{-4}
1.6093×10^{3}	6.3360×10^{4}	5.280×10^{3}	1.760×10^{3}	1

Weight

kg	ton (UK)	ton (USA)	lb	Ounce
1	9.842×10^{-4}	1.1023×10^{-3}	2.2046	3.5274 x 10
1.016×10^{3}	1	1.12	2.240×10^{3}	3.5838×10^{4}
9.072×10^{2}	8.9286×10^{-1}	1	2×10^{3}	3.2×10^{4}
4.536×10^{-1}	4.464×10^{-4}	5×10^{-4}	1	1.6 x 10
2.835×10^{-2}	2.79×10^{-5}	3.13×10^{-5}	6.25×10^{-2}	1

Pressure

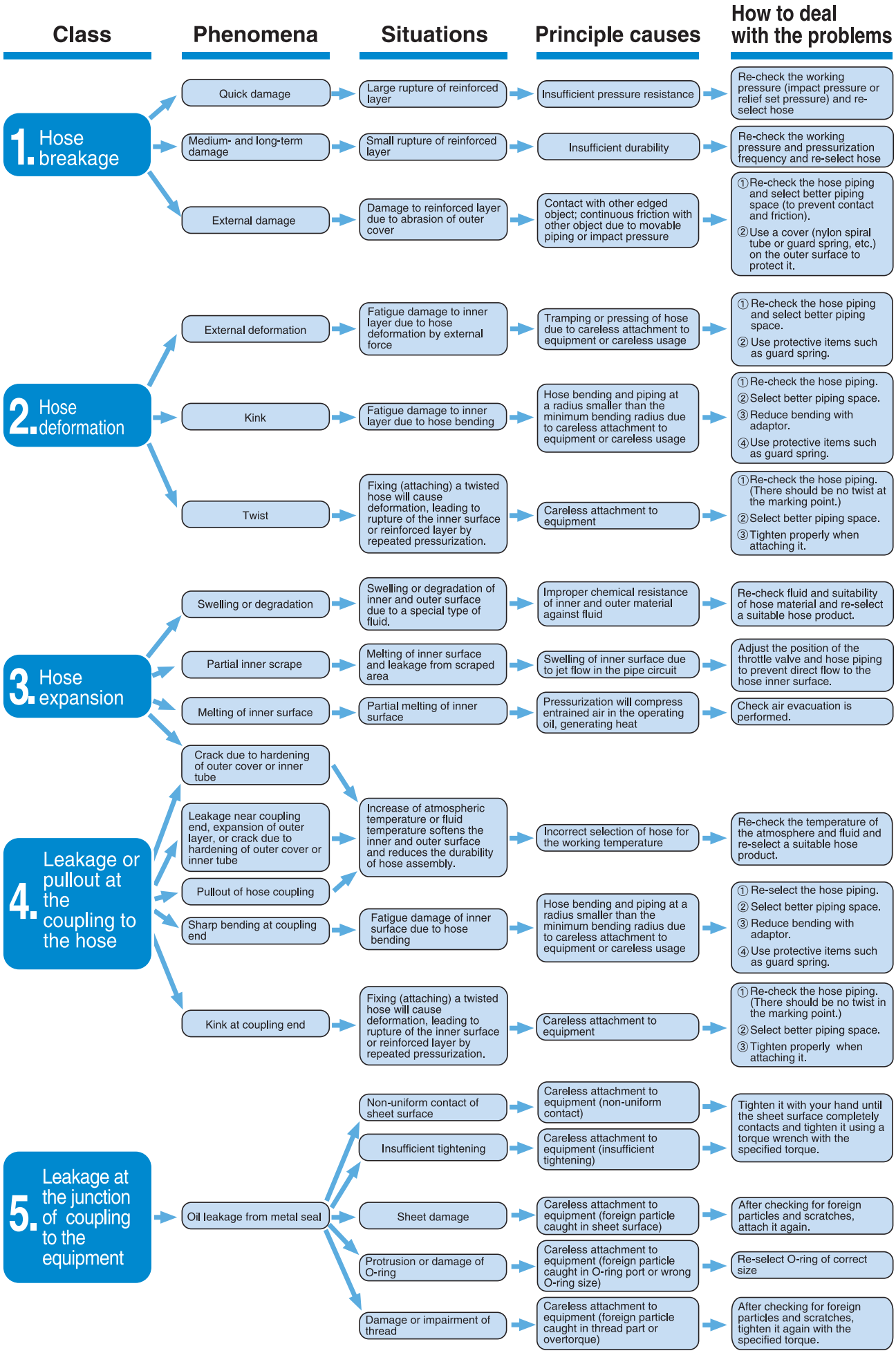
Pa	MPa	bar	kgf/cm^2	psi	mmHg
1	1×10^{-6}	1×10^{-5}	1.0197×10^{-5}	1.4504×10^{-4}	7.5006×10^{-3}
1×10^{5}	1×10^{-1}	1	1.0197	1.4504 x 10	7.5006×10^{2}
9.8067×10^{4}	9.8067×10^{-2}	9.8067×10^{-1}	1	1.4223 x 10	7.3556×10^{2}
6.8948×10^{3}	6.8948×10^{-3}	6.4898×10^{-2}	7.0307×10^{-2}	1	5.1715 x 10
1.3332×10^{2}	1.3332×10^{-4}	1.332×10^{-3}	1.3595×10^{-3}	$1.934^{1} \times 10^{-2}$	1

Force

N	dyn	kgf
1	1×10^{5}	1.0197×10^{-1}
1×10^{-5}	1	1.0197×10^{-6}
9.8066	9.8066×10^{5}	1

* ☐ is the SI unit.

Examples of problems when hose assembly is not used appropriately



Chemical resistance list

Please refer to the attached chemical resistance list for the safe use of the products. Special attention should also be paid to the explanation written below.

[Criteria of availability for each chemical]
○ : No influence
△ : Further confirmation required
× : Not applicable
– : No data available

When consulting with us in case of △, following data are necessary for us to judge.
①Pressure in operation, ②Max. temperature in operation, ③Concentration of chemicals, ④Installation condition, ⑤Applicatio.

1. The data shown here are based upon laboratory. Variations in temperature, pressure, fluids duration of exposure or other special conditions influence the results in the list and therefore no guarantee is expressed or implied.
2. Please be sure to evaluate the products in the condition at a real workplace before use.
3. In case of aqueous solution in the list , the chemicals are all in a saturated condition at a room temperature , unless otherwise stated.
4. The list only shows chemical resistance at the liquid condition of chemicals but not referring at all to the gas permeation quality . Do not use the products for the chemicals which is dangerous if the gas permeates through/from the products.
5. Please consult with us about the chemical resistance for the galvanized materials.

☞ Campucka couplings are for the general operating oil and can not be used for any other kinds of liquids.

☞ When using the aqueous glycol operating oil, the materials for the couplings should be stainless or black oxidizing ones specially arranged upon request.

Chemical resistance list (Guideline)

	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
	2-Aminophenyl Disulfide	○	○	△	—	—	—	—	—
A	Acetaldehyde	△	×	×	×	○	○	○	○
	Acetic Acid (10%, 20°C)	△	○	×	○	△	×	△	○
	Acetic Acid (100%, 20°C)	×	×	×	—	—	×	△	△
	Acetic Acid (50%, 20°C)	×	△	×	—	—	×	△	△
	Acetic Acid (50%, 70°C)	×	×	×	—	—	×	△	△
	Acetic Anhydride	×	△	×	×	×	×	△	△
	Acetoamide	—	×	—	—	—	—	—	—
	Acetone	△	△	×	×	△	○	△	△
	Acetyl Bromide	×	×	×	—	—	—	—	—
	Acetyl Chloride	×	×	×	×	×	○	—	△
	Acetylene	○	○	○	—	○	○	○	○
	Acrylonitrile	—	△	—	—	—	—	△	△
	Alum	×	○	—	○	—	—	—	—
	Aluminium Acetate	○	○	—	—	—	—	—	—
	Aluminium Bromide	△	○	—	—	—	—	—	
	Aluminium Chloride	△	○	—	○	—	×	×	×
	Aluminium Fluoride	△	○	—	—	—	△	×	×
	Aluminium Nitrate	△	○	△	—	—	—	—	△
	Aluminium Sulfate	○	○	—	○	—	×	○	○
	Ammonia Anhydrous	○	○	—	—	—	—	○	○
	Ammonia Gas Cold	×	×	×	—	△	○	○	○
	Ammonia Gas Hot	×	×	×	—	△	○	△	△
	Ammonia Liquid	○	○	—	—	—	—	○	○
	Ammonia Water	△	○	△	—	△	△	△	△
	Ammonium Carbonate	○	○	—	—	—	—	△	△
	Ammonium Chloride	○	○	○	○	○	×	△	△
	Ammonium Hydroxide	△	○	△	×	×	△	△	△
	Ammonium Nitrate	○	○	○	○	△	○	△	△
	Ammonium Persulphate	○	○	—	—	—	—	—	—
	Ammonium Phosphate	○	○	○	○	△	×	△	△
	Ammonium Sulfate	○	○	○	○	△	×	△	△
	Amyl Acetate	○	×	×	×	△	×	—	○
	Amyl Alcohol	△	△	△	○	○	△	—	—

The table shows relative merits under condition that cardinal number of aqueous liquor is based on saturated status with ordinary temperature unless otherwise specified.

	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
A	Amyl Borate	—	△	—	—	—	—	—	—
	Amyl Naphthalene	—	△	—	—	—	—	—	—
	Anethole	○	—	—	—	—	—	—	—
	Aniline	×	×	×	△	×	×	△	△
	Aniline Dyes	×	○	—	—	—	—	—	—
	Animal oil (Lard oil)	○	○	○	○	○	×	—	△
	Aqua Regia	×	×	×	—	—	—	—	—
	Arsenic Acid	△	○	—	—	—	—	△	△
	Asphalt	○	○	○	○	○	○	○	○
	ASTM lubricant No.1	○	×	○	—	○	○	○	○
	ASTM lubricant No2	○	×	×	—	○	○	○	○
	ASTM lubricantNo.3	○	×	×	—	○	○	○	○
	ASTM Standard fuel oil A	○	×	○	—	○	○	○	○
	ASTM Standard fuel oil B	○	×	○	—	○	○	○	○
	ASTM Standard fuel oil C	○	×	○	—	○	○	○	○
B	Balium Hydroide	○	○	—	—	—	×	—	○
	Barium Chloride	○	○	○	○	○	×	—	△
	Barium Sulfate	○	○	—	—	—	△	△	△
	Barium Sulfide	○	○	—	—	—	—	—	△
	Beet sugar oil	○	○	—	—	—	—	—	○
	Benzene	△	×	×	×	△	△	△	△
	Benzin	△	×	△	—	—	—	—	—
	Benzoaldehyde	△	×	△	×	○	×	△	△
	Benzoic Acid	○	○	×	○	×	×	△	△
	Benzyl Alcohol	△	△	△	△	△	○	△	△
	Benzyl Benzoate	—	—	—	—	—	—	—	—
	Benzyl Chloride	×	—	—	—	—	—	—	×
	Borax	○	○	○	△	○	△	—	△
	Boric acid	○	○	○	○	○	×	△	△
	Bromine	×	×	×	△	×	×	—	×
	Bunker fuel	○	—	—	—	—	—	—	○
	Buthane	○	△	—	—	—	○	○	○
	Butyl Acetate	○	×	×	×	△	○	—	△
	Butyl Acrylate	○	×	—	—	—	—	—	—
	Butyl Alcohol	△	△	△	○	○	○	○	○
	Butyl Cellosolve	△	—	—	—	—	—	—	△
	Butyl Stearate	○	—	—	—	—	—	—	—
C	Calcium Acetate	○	○	○	—	—	△	—	△
	Calcium Arsenate	○	○	○	○	○	—	—	—
	Calcium Bisulfite	○	○	○	△	○	×	—	△
	Calcium Chloride	○	○	○	○	○	△	△	△
	Calcium Hydroxide	○	○	△	○	△	△	△	△
	Calcium Hypochlorite (20%, 20°C)	×	○	×	○	△	×	—	△
	Calcium Nitrate	○	○	—	—	—	—	—	—
	Calcium Sulfide	○	○	—	—	—	—	—	—
	Cane sugar liquor	○	○	—	—	—	○	—	○
	Carbitol	—	△	—	—	—	—	—	△
	Carbon Dioxide	○	○	○	—	—	○	○	○
	Carbon Oxide	○	○	○	—	—	○	○	○
	Carbon Tetrachloride	×	×	×	△	×	△	△	△
	Carbone Disulfide	×	×	×	×	△	○	○	○
	Carbonic Acid	○	△	△	—	—	×	△	△
	Castor Oil	○	○	△	○	△	○	△	△
	Cellosolve	○	○	—	—	—	—	—	△
	Cellosolve Acetate	△	—	×	—	—	—	—	—
	Chloride gas (dry)	×	×	×	△	×	○	×	×
	Chloride gas (wet)	×	×	×	—	—	—	×	×
	Chloro acetone	—	×	—	—	—	—	—	—
	Chlororform	△	×	×	△	△	×	△	△
	Chlorosulfonic acid	×	×	—	—	—	—	×	×

The table shows relative merits under condition that cardinal number of aqueous liquor is based on saturated status with ordinary temperature unless otherwise specified.

	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
C	Chlorotoluene	×	×	—	—	—	—	—	—
	Chromic Acid (10%, 70°C)	×	×	×	—	×	×	×	△
	Chromic Acid (2%, 50°C)	×	×	×	—	×	×	×	△
	Chromic acid (2%, 70°C)	×	×	×	△	×	×	×	△
	Chromic acid (25%, 70°C)	×	×	×	—	×	×	×	△
	Citric acid	○	○	△	○	△	×	△	△
	Coal-Tar	○	△	○	○	○	○	○	○
	Copper Chloride	△	○	○	○	○	×	×	×
	Copper Cyanide	○	○	—	—	—	—	—	○
	Copper Sulfate	○	○	○	○	○	×	△	○
	Corn oil	○	△	○	○	○	△	—	○
	Cotton seed oil	○	△	○	○	○	○	△	△
	Creosote	×	△	×	△	×	○	△	△
	Cresol	×	×	×	△	×	△	△	○
	Cyclohexane	○	×	×	—	○	△	—	—
	Cyclohexanol	○	△	—	—	—	△	△	△
	Cyclohexanone	○	×	×	—	○	△	—	—
D	Decalin	○	△	—	—	—	—	—	—
	Developer (Hypo)	△	○	△	—	—	—	—	—
	Diacetone Alcohol	○	○	△	×	△	△	○	○
	Dibenzine Ether	△	×	×	—	—	—	—	○
	Dibutyl Ether	△	×	△	—	—	—	—	—
	Dibutyl Phthalate	○	△	△	—	△	—	—	—
	Dichlorobenzene	△	×	×	—	—	○	—	—
	Diethanol Amine	○	—	△	—	△	△	—	○
	Diethyl Ether	△	△	△	△	△	○	—	△
	Diethyl Sebacate	△	×	—	—	—	—	—	—
	Diisopropyl Ketone	△	△	×	—	—	—	—	—
	Dimethyl Formamide	×	△	×	—	—	—	—	—
	Dinitrogen oxide (Nitrous Oxide)	○	×	×	○	○	×	△	○
	Dioctyl Phthalate (DOP)	○	×	△	×	△	—	—	—
	Dioctyl Sebacate (DOS)	○	×	△	—	—	—	—	—
	Dipentene (Limonene)	△	×	×	—	—	—	—	—
	Diphenyl	△	×	×	—	—	—	—	—
	Diphenyl Oxide	—	—	—	—	—	—	—	—
	Dowtherm (100°C)	—	—	—	—	—	—	—	—
	Dowtherm (200°C)	—	—	—	—	—	—	—	—
E	Epichlorohydrin	×	—	—	—	—	—	—	—
	Ester Silicate	○	—	—	—	—	—	—	—
	Ethanol Amine	×	×	—	—	—	—	—	—
	Ethyl Acetate	○	△	×	×	△	○	△	△
	Ethyl Acetoacetate	—	—	—	—	—	—	—	—
	Ethyl Acrylate	—	—	×	—	—	—	—	—
	Ethyl Alcohol	△	△	×	△	△	○	△	○
	Ethyl Benzene	—	×	—	—	—	—	○	○
	Ethyl Cellulose	—	○	—	—	—	—	—	△
	Ethyl Chloride	○	×	×	×	×	○	○	○
	Ethyl Oxalate	○	×	×	—	—	—	—	—
	Ethyl Silicate	△	—	—	—	—	—	—	—
	Ethylene Chlorohydrin	×	×	×	×	×	—	—	—
	Ethylene Diamine	×	×	—	—	—	—	—	—
	Ethylene Dioxide	×	△	×	×	×	△	△	△
	Ethylene Glycol	○	○	○	○	○	△	△	△
	Ethylene Oxide	○	×	×	—	△	△	—	△
F	Fatty Acids	○	×	△	○	○	×	△	○
	Ferric Chloride	△	○	—	○	—	×	×	×
	Ferric Nitrate (II)	○	○	—	—	—	—	—	—
	Fluorine	—	×	×	△	×	×	—	△
	Fluoroboric acid	—	○	×	△	×	△	—	○
	Formaldehyde (40%, 20°C)	×	△	×	○	△	○	△	△

The table shows relative merits under condition that cardinal number of aqueous liquor is based on saturated status with ordinary temperature unless otherwise specified.

	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
F	Formic acid (25%, 20°C)	×	○	×	○	×	×	△	○
	Formic acid (50%, 20°C)	×	○	×	—	—	×	△	○
	Formic acid (90%, 20°C)	×	△	×	—	—	×	△	○
	Freon 114	△	—	—	△	△	○	○	○
	Freon 12	△	—	—	△	△	○	○	○
	Freon 21	△	—	—	△	△	○	○	○
	Freon 22	△	—	—	△	△	○	○	○
	Freon11	△	—	—	△	△	○	○	○
	Freon113	△	—	—	△	△	○	○	○
	Furan	×	—	—	—	—	—	—	—
	Furfural	×	×	×	—	—	△	△	△
	Furfuryl Alcohol	○	○	○	○	○	—	—	—
G	Gasoline	○	△	×	△	○	○	○	○
	Gelatine	○	○	○	○	○	△	○	○
	Glucose	○	○	○	○	○	○	○	○
	Glue	○	○	—	○	○	○	—	△
	Glycerine	○	○	△	○	○	○	○	○
	Grease	○	△	△	○	○	○	○	○
H	Heavy water	○	○	○	—	—	—	—	—
	Heptane	○	×	○	△	○	○	○	○
	Hexane	○	×	△	△	○	○	△	△
	Hexyl Alcohol	△	△	—	—	—	—	—	—
	Hydrazine	△	△	—	—	—	—	—	—
	Hydrobromic Acid (20%, 20°C)	△	○	—	—	—	—	×	×
	Hydrobromic Acid (20%, 70°C)	×	△	—	—	—	—	×	×
	hydrobromic Acid (37%, 20°C)	△	○	—	—	—	—	×	×
	Hydrochloric Acid (10%, 20°C)	△	○	×	○	×	×	×	×
	Hydrochloric Acid (20%, 20°C)	×	△	×	—	×	×	×	×
	Hydrochloric Acid (20%, 80°C)	×	×	×	—	×	×	×	×
	Hydrochloric Acid (38%, 20°C)	×	×	×	—	×	×	×	×
	Hydrocyanic Acid	×	○	—	○	—	×	—	○
	Hydrofluoric Acid (10%, 20°C)	×	△	×	△	×	×	×	×
	Hydrofluoric Acid (20%, 20°C)	×	△	×	—	×	×	×	×
	Hydrofluoric Acid (40%, 20°C)	×	△	×	—	×	×	×	×
	Hydrofluoric Acid (Anhydrous)	×	×	×	—	—	×	—	×
	Hydrogen	○	○	○	○	○	○	○	○
	Hydrogen Peroxide (30%, 20°C)	×	△	×	△	×	×	△	△
	Hydrogen Peroxide (5%, 20°C)	○	○	△	○	○	×	△	△
	Hydrogen Peroxide (5%, 50°C)	△	△	×	—	—	×	△	△
	Hydrogen Sulfide	△	○	—	○	△	△	△	△
	Hydroquinone	○	○	—	—	—	—	—	—
	Hypochlorous acid	△	○	×	—	—	—	—	—
I	Isobutyl Alcohol	△	○	—	—	—	—	—	—
	Isocyanates	○	○	○	—	—	—	—	—
	Isooctane	○	×	×	—	○	○	△	△
	Isopropyl Acetate	○	×	△	×	△	○	—	△
	Isopropyl Alcohol	△	○	—	—	—	○	△	△
	Isopropyl Ether	△	△	—	—	—	○	△	△
J	JP fuel oil	△	×	△	—	○	○	○	○
K	Kerosene	○	△	○	—	—	—	○	○
	Ketones	○	○	△	×	△	○	△	△
L	Lacquer	△	△	△	×	△	△	—	—
	Lactic Acid	△	△	—	○	○	△	△	△
	Lard oil	○	○	○	○	○	○	—	△
	Lead Acetate	○	○	—	—	—	×	△	—
	Lead Arsenate	○	○	○	○	○	—	—	—
	Lead Nitrate	○	○	—	—	—	—	—	—
	Lead Sulfamate	○	○	—	—	—	—	—	—
	Lead Sulfate	○	○	○	○	○	×	—	△
	Linoleic acid Dipentene	△	△	—	—	—	—	—	—

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	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
L	Linseed oil	○	×	○	—	—	—	—	—
	Liquid Chloride	×	×	×	—	—	—	—	—
	Liquidified Petroleum Gas	○	△	—	—	—	—	○	○
	Lubricant (Ether type)	△	×	×	—	△	○	○	○
	Lubricant (mineral oil type)	○	×	○	○	○	○	○	○
	Lye solutions	○	○	—	—	—	—	—	—
M	Magnesium Chloride	○	○	○	○	○	△	×	×
	Magnesium Hydroxide ,	○	○	△	△	○	○	—	△
	Magnesium Sulfate	○	○	○	○	○	△	○	○
	Maleic acid	○	○	△	○	△	○	△	△
	Malic Acid	○	○	—	—	—	△	△	△
	Mercaptane	—	×	—	—	—	—	—	—
	Mercuric Chloride	○	○	○	△	○	×	×	×
	Methane	○	○	○	×	○	△	—	△
	Methyl Acetate	○	△	×	×	△	△	—	○
	Methyl Alcohol	△	△	×	×	△	△	△	△
	Methyl Bromide	△	×	×	×	×	—	—	○
	Methyl Chloride	×	×	×	×	×	△	○	○
	Methyl Iso Butyl Ketone	△	△	×	×	△	△	—	△
	MethylEethyl Ketone	△	△	×	×	△	○	△	△
	Methylene Dichloride	×	△	×	—	—	—	—	—
	Metyl Metacrylate	○	×	—	—	—	—	—	—
	Metyl Sulfate	△	×	×	—	○	—	—	—
	Mineral oil	○	△	○	○	○	○	○	○
	Monochloro Acetic Acid	×	×	×	×	×	—	—	—
	Monochloro Benzene	×	×	×	—	—	—	—	—
	Monoethanol Amine	○	△	—	—	—	—	—	—
N	Naphtha	○	×	△	×	△	○	△	△
	Naphthalene	○	△	△	×	△	○	—	△
	Naphthenic acid	—	○	—	—	—	—	—	—
	Natural gas	○	○	—	—	—	—	○	○
	n-Hexa Aldehyde	—	×	—	—	—	—	—	—
	Nickel Acetate	○	○	—	—	—	—	—	△
	Nickel Chloride	×	○	—	×	×	×	—	×
	Nickel Sulfate	○	○	—	—	—	×	△	△
	Nitric acid (10%, 20°C)	×	○	×	○	△	×	△	○
	Nitric Acid (10%, 70°C)	×	△	×	—	—	×	△	○
	Nitric Acid (30%, 20°C)	×	△	×	○	×	×	△	○
	Nitric Acid (30%, 70°C)	×	×	×	—	×	×	△	○
	Nitric Acid (61%, 20°C)	×	×	×	—	×	×	△	○
	Nitric Acid (fuming 20°C)	×	×	×	—	×	×	△	○
	Nitrobenzene	×	×	×	×	×	○	△	△
	Nitroethane	—	×	—	—	—	—	—	—
	Nitrogen	○	○	○	○	○	○	○	○
	Nitromethane	—	×	—	—	—	—	—	—
	Nitropropane	—	×	—	—	—	—	—	—
O	Octyl Alcohol	×	△	—	—	—	—	—	△
	Oleic Acid	○	△	△	△	○	△	△	△
	Olive Oil	○	○	○	—	—	—	○	○
	Oxalic Acid	○	○	△	○	△	△	×	×
	Oxygene	△	△	△	—	—	—	○	○
	Ozone	△	△	△	△	○	△	△	○
P	Palm oil	○	△	—	—	—	△	—	△
	Palmitin Acid	○	○	○	○	○	△	△	△
	Pentane	○	×	○	△	○	○	—	△
	Perchloroethylene	×	×	×	△	×	○	—	△
	Petroleum	○	×	○	○	○	○	—	—
	Phenol	×	△	×	△	×	×	△	△
	Phenyl Hydrazine	—	—	—	—	—	—	—	—
	Phorone	—	—	—	—	—	—	—	—

The table shows relative merits under condition that cardinal number of aqueous liquor is based on saturated status with ordinary temperature unless otherwise specified.

	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
P	Phosphoric Acid (50%, 20°C)	△	○	×	○	×	△	△	△
	Phosphoric Acid (50%, 70°C)	×	○	×	—	×	×	△	×
	Phosphoric Acid (75%, 20°C)	×	○	×	—	—	×	△	△
	Phosphorobenzene	○	○	△	—	—	—	—	△
	Pickling Acid (Nitric acid 20% / Fluoric acid 4%)	×	○	—	—	—	—	—	—
	Pickling Acid (Nitric acid 40% / Fluoric acid 15%)	×	○	—	—	—	—	—	—
	Picric Acid	×	△	×	○	×	△	△	△
	Pine oil	×	×	—	—	—	△	△	○
	Pinene	○	×	—	—	—	—	—	—
	Piperidine	△	△	—	—	—	—	—	—
	Potassium Bichromate	△	○	△	—	×	○	—	△
	Potassium Chloride	○	○	○	○	○	×	△	○
	Potassium Cyanide	○	○	—	—	—	△	△	△
	Potassium Hydroxide	△	○	△	△	×	△	△	△
	Potassium Nitrate	△	○	○	○	○	△	△	△
	Potassium Perchlorate	×	△	×	△	×	×	×	×
	Potassium Permanganate (5%, 20°C)	×	△	×	○	—	△	△	△
	Potassium Sulfate	○	○	○	○	○	△	△	△
	Propane	○	○	△	○	○	○	○	○
	Propyl Acetate	○	×	×	—	—	○	—	○
	Propyl Alchol	△	△	×	—	—	△	○	○
	Propylene	○	—	—	—	—	○	○	○
	Pyridine	×	○	△	×	△	○	—	△
	Pyrrole	—	△	—	—	—	—	—	—
S	Salicylic Acid	—	○	—	—	—	—	△	△
	Salt Water (Brine)	○	○	—	—	—	—	△	△
	Sea Water	○	○	○	○	○	△	○	○
	Silicone Grease	○	△	—	—	—	—	—	—
	Silicone oil	○	△	—	—	—	—	—	—
	Silver Nitrate	△	○	—	—	—	—	—	—
	Soap aqueous solution	○	△	○	○	○	○	○	○
	Soda Ash	○	○	○	—	—	—	△	△
	Soda (Carbonated) water	○	○	○	○	○	—	—	—
	Sodium Bicarbonate	○	○	○	○	○	△	—	△
	Sodium Bisulphate ,	○	○	○	—	—	—	—	—
	Sodium Carbonate	○	○	○	○	○	○	△	△
	Sodium Cyanide	○	○	○	○	○	○	—	△
	Sodium Hydroxide (30%, 20°C)	○	○	×	—	—	—	—	—
	Sodium Hydroxide (30%, 70°C)	×	×	×	—	—	—	—	—
	Sodium Hydroxide(10%, 20°C)	○	○	×	○	△	△	△	△
	Sodium Hypochlorite (5%, 20°C)	×	○	×	○	△	×	×	△
	Sodium Hypochlorite(5%, 70°C)	×	△	×	—	—	×	×	△
	Sodium Metaphosphate	○	○	—	—	—	—	—	△
	Sodium Nitrate	○	○	○	○	○	○	○	○
	Sodium Perborate	○	○	—	—	—	—	—	△
	Sodium Peroxide	×	○	—	—	—	○	—	△
	Sodium Phosphate	○	○	○	○	○	×	△	△
	Sodium Silicate	○	○	○	○	○	△	—	△
	Sodium Sulfate	○	○	○	○	○	○	△	△
	Sodium Sulfide	○	○	○	○	○	△	△	△
	Sodium Sulfite	×	×	—	—	—	—	○	○
	Sodium Thiosulfate	○	○	○	○	○	×	—	△
	Soy Bean oil	○	○	—	—	—	—	△	○
	Stannic Chloride	△	○	—	—	—	—	×	×
	Stannous chloride	△	○	○	○	○	×	×	×
	Stearic Acid	○	○	○	○	○	×	△	△
	Styene	△	△	△	—	△	△	—	△
	Sulfur	○	○	○	○	○	○	△	△
	Sulfur Chloride	—	×	—	—	—	—	—	△
	Sulfur Dioxide	×	×	×	△	△	△	—	△

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	Chemicals (Weight concentration %, Temperature °C)	Hose materials					Hose couplings/ Adoptors		
		Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
S	Sulfur Trioxide	△	○	×	○	×	△	△	△
	Sulfuric Acid (10%, 20°C)	△	△	×	△	×	×	×	×
	Sulfuric Acid (10%, 70°C)	×	△	×	—	—	×	×	×
	Sulfuric Acid (30%, 20°C)	×	△	×	△	×	×	×	×
	Sulfuric Acid (30%, 70°C)	×	×	×	—	—	×	×	×
	Sulfuric Acid (98%, 20°C)	×	×	×	—	—	×	×	×
	Sulfuric Acid (fuming 20°C)	×	×	×	—	—	×	×	×
	Sulfurous Acid	×	×	×	△	△	△	△	△
T	Table Salt (Common Salt)	○	○	○	○	○	△	△	△
	Tannic Acid	○	○	△	○	△	△	△	△
	Tartaric acid	△	○	○	○	○	△	△	△
	Terpineol	○	×	—	—	—	—	—	—
	Tetrachloro Ethane	△	×	—	—	—	—	—	—
	Tetraethyl Lead	△	△	—	—	—	—	—	△
	Tetrahydro Furan	△	×	—	—	—	—	—	—
	Tetraline	△	×	—	—	—	—	—	—
	Tetrametyl Lead	○	—	○	—	○	—	—	—
	Thionyl Chloride	×	×	—	—	—	—	—	—
	Toluene	△	×	×	×	△	○	○	○
	Triacetine	—	—	—	—	—	—	—	—
	Tributoxyethyl Phosphate	○	—	—	—	—	—	—	—
	Tributyl Phosphate	○	×	△	×	△	○	—	○
	Trichloroacetate	×	△	×	△	×	—	△	△
	Trichloroethylene	△	×	×	△	×	○	—	○
	Tricresyl Phosphate	○	×	△	—	—	—	—	—
	Triethanolamine	○	×	—	—	—	○	—	○
	Tung oil	○	○	—	—	—	—	—	—
	Turpentine oil	○	×	○	○	○	△	—	○
U	Uric acid	○	○	×	○	×	—	—	—
V	Vegetable oil	○	○	—	—	—	—	—	—
X	Xylene	△	×	×	×	△	○	○	○
Z	Zeolite	○	○	—	—	—	—	—	—
	Zinc Acetate	○	○	—	—	—	—	—	—
	Zinc Chloride	△	○	○	○	○	△	△	○
	Zinc Sulfide	△	○	△	○	△	×	△	△

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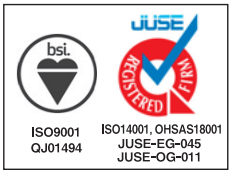

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