Invention & Innovation
NITTA

B-HO-14E-1

Hose, Hose couplings & Adapters

Linemate™

NITTA CORPORATION

Features of Nitta thermoplastic hoses

Clean and Eco-friendly

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

Assembly on Site

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

High Durability

Nitta hose is highly durable against impact pressure and repeated bending, because of the synthetic fiber reinforcement.

High Abrasion Resistance

NItta hose has high abrasion resistance because special polyurethane resin is used as the cover material.

Light weight

Nitta hose weighs about a quarter to half that of rubber hose.

Compact Bend Radius

Small outer diameter enables installation in applications requiring compact bend 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) ISO 4414-1982	Pneumatic fluid power… Recommendations for the application of equipment to transmission and control systems.	(*3) ISO 4413-1979	Hydraulic fluid power… General rules for the application of equipment to transmission and control systems.
(*2) JIS B 8370 (1988)	Pneumatic System General Rules	(*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 manuals.

Before Selection

⚠ DANGER

①Cannot use for machines and equipment that maintain and control human life.
②Cannot use for machines and equipment that require an extremely high level of safety.

⚠ WARNING

①Designers 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.
②Those who have sufficient knowledge and experience should handle our products.
③Please do not handle and remove our products from instruments, machines, or systems until safety is confirmed.
④Please contact us when using our products in situations and conditions that are not assumed in the specifications described in the catalog.
④Please 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

①Please check if the use condition satisfies the "use conditions" in the catalog.
②Do not use our products when a caustic or flammable gas is used as a fluid or is in the environment.
③If a gas is used as a fluid, keep the maximum working pressure below 1.0 MPa.
④Do not use our products in places where excessive vibration or impact may occur.
⑤Consult the "Table of chemical resistance" if chemicals are used as a fluid or in the environment.
⑥There is a limited group of hose couplings for each type of hose product. Please select correct combinations according to the specifications.
⑦Our hose products and hose couplings are not compatible with other companies' hose products and hose connectors.
⑧Each type of hose product allows the use of a limited type of fluid. Do not use a fluid that is not allowed.
⑨If use conditions are different between hose products and hose couplings, please use the operating parameters of the lowest rated product as the guideline for all products in use.
⑩The 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".
⑪When electric insulation is necessary, for example in electrical works, please select "Nonconductive" hoses. Contact Nitta for details.
⑫When electric insulation is particularly required for use, including electrical works, please select "nonconductive" hoses. Contact Nitta for details.

⚠ CAUTION

①When water or glycol-type operating oil is used, hoses work without problem but some plated types of hose couplings cannot be used. Contact Nitta for details.
②Hose products might change their length by ±3% under pressure, so do not stretch hoses tightly.
③Gas, liquid or solid components may leak from tubes or couplings. These quantities vary depending on the material and use conditions. If there is a possibility of causing a problem in use, check the material and use conditions before use.

Disclaimer

①Nitta shall not be liable for any loss or damage caused by an accident attributable to Customer's negligence or willful misconduct, or attributable to a failure of other company's product (including software malfunction), or by a natural disaster.
②Nitta shall not be liable for any loss or damage caused by use not described or not specified in this catalog (including the instruction manuals).
③Nitta shall not be liable for a failure arising from the contents of an inquiry to Nitta unless there is a definite record showing that Nitta is responsible for the failure.
④Nitta shall not be liable for any incidental loss or damage (including a loss of business profits and business interruption) arising from the use of Nitta's product or inability to use Nitta's product.

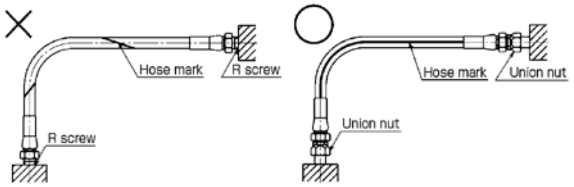
When Installing

⚠ WARNING

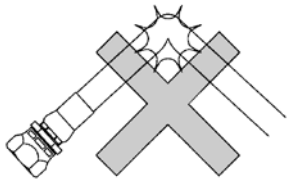
①Instructions for connecting hoses are given in a separate document. Please read it and follow the instructions for installation.
②Do not use couplings with damaged threads and seat surface.
③If you use reusable products such as reusable couplings, ensure that they are not damaged.
④We will not guarantee any products which are additionally treated, disassembled or refabricated by others.
⑤For installation of hoses, please assemble them in a place where unexpected disconnection of hose and couplings cannot cause damage to people or property.

⚠ CAUTION

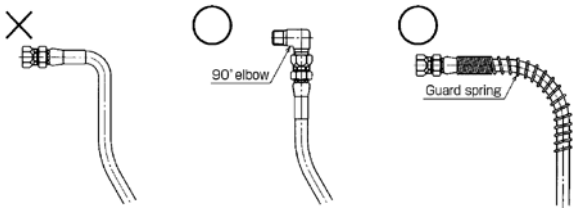
①Prevent damaging the hoses, e.g. entanglement or abrasion. It could cause flattening, destruction, and disconnection.
②Install hoses to prevent loads such as tension, torsion, rotation, and bending with a radius under the minimum bend radius.



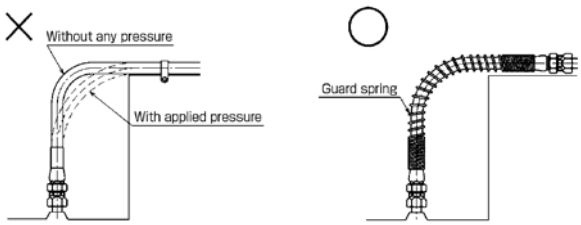
③Do not break a hose, which might cause "fatigue destruction" at the break point even under the maximum working pressure.
④When the plug-in part of the hose couplings is dirty, clean the surface.
⑤Do not use hoses if they have a dent or damage.
⑥Do not twist hose assemblies after pressure is applied. When they are twisted, it could deform the inner structure of the hoses and result in destruction.



⑦Do not throw and drop hose couplings, which might damage threads and sheets and lead to oil leakage.
⑧Tighten 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.
⑨Sharply 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 asembled part.
⑩Pressure 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.
⑪Do not over-tighten when using clamps such as INSULOK ties to assemble a hose. Concentrated stress may cause "fatigue destruction".
⑫Hose products are designed to withstand inner pressure, so do not apply outer pressure to them.
⑬You cannot reuse hoses and hose couplings except reusable couplings.
⑭Protect a hose from possible outer damage by using a wire braid or guard spring.



⑮If hoses are left bent over a certain period of time, they will retain their new shape. 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

①Do not touch hose products during pressurization. If you improperly approach or touch a hose during pressurization could be quite dangerous if an unexpected breakage of the hose or the coupling were to scatter fluid inside.
②Do not touch hose products when the fluid is hot. It could cause a burn.
③When water is used as a fluid, please keep it unfrozen.

When Storing

⚠ CAUTION

①If 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.
②Keep hose products in a dry place under 40℃ avoiding direct sunlight.
③Store a hose in a straight position or in a coil with a larger diameter than the minimum bend diameter.
④Try to use hoses and couplings within about one year after production.

When Maintaining

⚠ CAUTION

①Please conduct periodic inspection. Confirm that there is no degradation such as outer damage, corrosion, and abrasion as well as any distorted parts and replace if necessary.
②Change the hose immediately if the outer damage or abrasion reaches, or is about to reach, the synthetic fiber braid.

Hose products

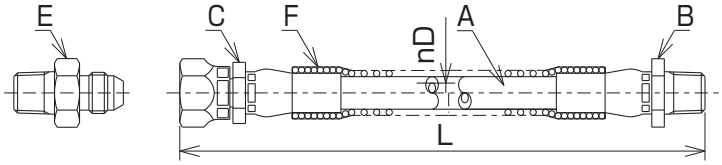
How to Order Hose Assembly

Check the following usage conditions before ordering

1. Type and volume of working fluid
2. Working pressure (maximum working pressure : MPa)
3. Working temperature range (temperature of fluid and environment : ℃)
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 adapter (E).
4. 4. Specify if guard spring and other accessories (F) are required. See P.53 for accessories.



Hose selection table

				Hydraulic Piping								
Page				9		13				19	21	
Hose series				LB70	LF70	1000	1100	1400	1500	1000 (Light gray)	F3130 (Light gray)	
Size	I.D.(in.)	I.D.(mm)	Max. working pressure (MPa)									
02	1/8	3.6		7.0	–	–	–	–	–	–	20.0	
03	3/16	4.8		–	–	–	–	–	15.0	–	–	
04	1/4	6.3		7.0	7.0	10.5	10.5	14.0	–	10.5	19.5	
05	5/16	7.9		–	–	–	–	–	–	–	–	
06	3/8	9.5		7.0	7.0	10.5	10.5	14.0	–	10.5	16.0	
08	1/2	12.7		7.0	7.0	10.5	10.5	–	–	10.5	14.0	
10	5/8	15.9		7.0	–	–	–	–	–	–	–	
12	3/4	19.0		7.0	–	–	–	–	–	–	9.0	
16	1	25.4		7.0	–	–	–	–	–	–	7.0	
Temp. range (℃)				–40 to +100 (16 sizes only –40 to +70)	–40 to +100	–40 to +100 (for Campucka –20 to +100)	–40 to +100	–40 to +100 (for Campucka –20 to +100)	–40 to +100	–40 to +100 (for Campucka –20 to +100)	–40 to +100 (for Campucka –20 to +100)	
Features				Super flexible, small bend radius	Super flexible, small bend radius	Thin, light, Campucka usable	Outer wire braid	Thin, light	Thin, light	Thin, light, Campucka usable	Flexible, Campucka usable	
Application				●Machine tools ●General operating machine, etc.	●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	

*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.

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
- **C** Types of the other couplings
- **E** Types of adapter
- **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)

Length tolerance of hose assembly

The length tolerances of hose assemblies conform to JIS B 8362.

Length of hose assembly	Length tolerance
Less than 500 L	+10L −0L
500 L to less than 1000 L	+15L −0L
1000 L to less than 2000 L	+20L −0L
2000 L to less than 5000 L	+1.0% −0L
5000 L or more	+2.0% −0L

	Hydraulic Piping							For Airless-painting		For Clean Use	
	23			24	33		37	39		41	Page
	*1 *3 N3130	3130	3000	*1 3700	N3000	HT	*2 *3 3R80	5501	3450 (Made-to-order)	34PW	Hose series / Size
	–	20.0	–	–	–	–	–	–	–	20.0	02
	21.0	20.0	34.0	21.0	–	–	35.0	–	23.0	–	03
	19.5	20.0	30.0	19.5	28.0	28.0	35.0	21.0	23.0	19.5	04
	17.5	18.0	–	–	–	–	–	–	–	–	05
	16.0	18.0	24.0	16.0	21.0	21.0	28.0	21.0	21.0	16.0	06
	14.0	16.0	20.0	14.0	21.0	21.0	25.0	–	–	14.0	08
	–	–	–	–	17.5	17.5	–	–	–	–	10
	9.0	10.0	13.0	–	–	–	16.0	–	–	10.5	12
	7.0	–	10.0	–	–	–	14.0	–	–	10.5	16
	–40 to +100	–40 to +100	–40 to +100	–55 to +100	–40 to +100	–40 to +120	–40 to +100	–10 to +60	–40 to +80	–30 to +70	Temp. range (℃)
	Flexible	Reusable coupling usable	Reusable coupling usable	Eco-friendly	Flexible	Flexible, for high temp oil	High pressure	Painting (SUS braid)	Painting, light (conductive resin)	Pure water, chemicals	Features
	●Machine tools ●Industrial vehicles ●General operating machine ●Robot ●Utility piping in factory, etc.	●General industrial machine, etc.	●General industrial machine, etc.	●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 ●Cesalination equipment, etc.	Application

Types of hose couplings for hose-assembling methods

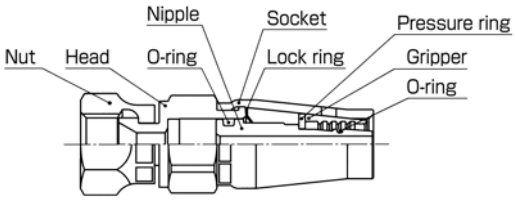
Push-one type

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

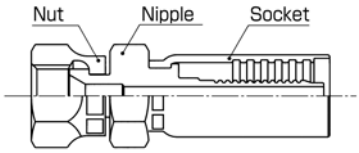
Swage

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



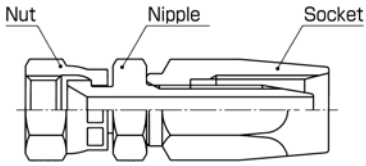
Compression type

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)

Type and shape of coupling
see below

Thread type
PT (R)
PF (G)
NPSM
UNF (Only size is shown)

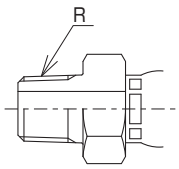
Hose size
02 = 1/8″ 08 = 1/2″
03 = 3/16″ 10 = 5/8″
04 = 1/4″ 12 = 3/4″
05 = 5/16″ 16 = 1″
06 = 3/8″

Hose part number
No indication = N3130, 3130, 3700, 3000
14 = 1000, 1100, 1400, 1500
N30 = N3000, HT
55 = 5501
PW = 34PW

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

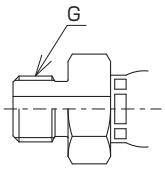
Tapered male-thread coupling

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



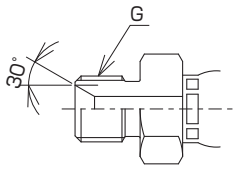
O-ring port coupling with parallel male-thread

SO (Swage)



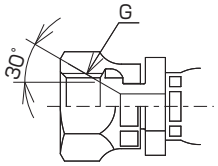
Parallel male-thread coupling (with 30° female seat)

SC (Swage)



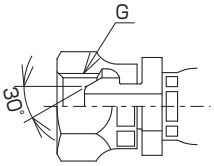
Parallel female-thread union coupling (with 30° female seat)

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



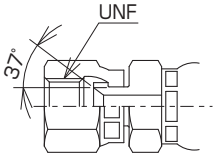
Parallel female-thread union coupling (with 30° male seat)

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



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

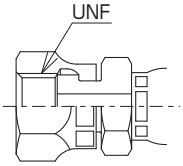
SK (Swage)



Unified female-thread ORFS union coupling

SGS (Swage)

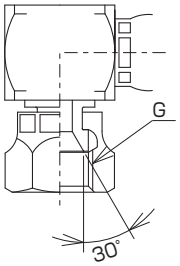
MADE TO ORDER Contact us for details



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

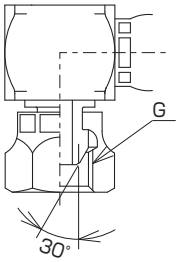
SLE (Swage)

MADE TO ORDER



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

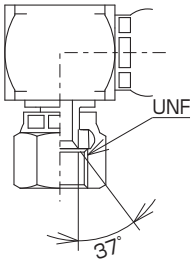
SL (Swage)



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

SLK (Swage)

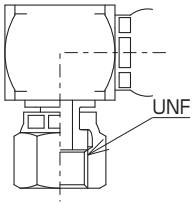
MADE TO ORDER Contact us for details



Unified female-thread ORFS union 90° elbow coupling

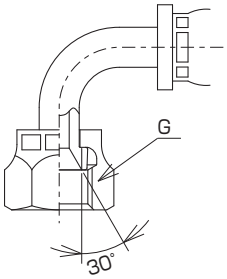
SLG (Swage)

MADE TO ORDER Contact us for details



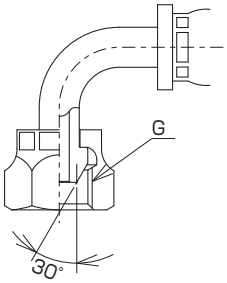
Parallel female-thread union bend coupling (with 30° female seat)

AE* (Swage)
SE (Swage)



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

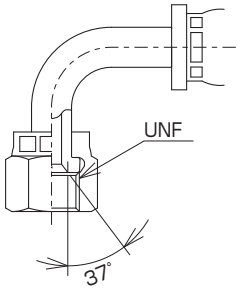
AF* (Swage)
SF (Swage)



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

AK* (Swage)

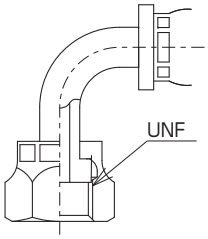
MADE TO ORDER



Unified female-thread ORFS union bend coupling

AG* (Swage)

MADE TO ORDER Contact us for details



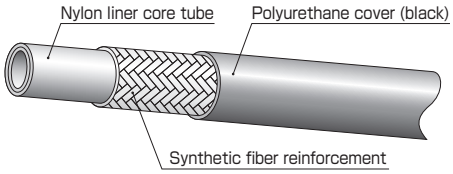
☞ The mark * at the part number of the union bend indicates the angle and select 45° or 90°.

LB70-LF70 Series

LB70

Features

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



Part No.	Size No.	Size I.D. (in.)	Size I.D. (mm)	Size O.D. (mm)	Max. working pressure (MPa)	Max. working pressure (PSi)	Min. burst pressure (MPa)	Min. burst pressure (PSi)	Min. bending radius (mm)	Weight (g/m)	Coupling
LB70-**02**	02	1/8	3.6	7.5	7.0	1,000	28.0	4,000	10	37	Swage
LB70-**04**	04	1/4	6.4	10.5	7.0	1,000	28.0	4,000	27	60	
LB70-**06**	06	3/8	9.5	13.9	7.0	1,000	28.0	4,000	45	90	
LB70-**08**	08	1/2	12.7	17.4	7.0	1,000	28.0	4,000	70	120	
★LB70-**10**	10	5/8	15.9	22.8	7.0	1,000	28.0	4,000	100	230	
LB70-**12**	12	3/4	19.2	26.6	7.0	1,000	28.0	4,000	130	270	
LB70-**16**	16	1	25.7	33.4	7.0	1,000	28.0	4,000	165	370	

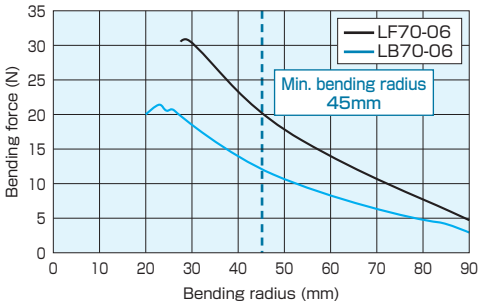
■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃ (16 sizes only−40~+70℃)
■ Length in a unit package : 100m for sizes 02, 04, 06, 08, and 50m for sizes 10, 12, 16

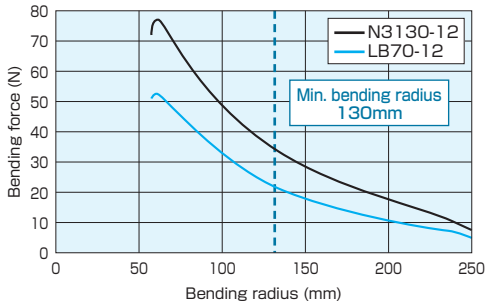
★Made-to-order

■Flexibility test

Starting from a 180° bend, bending radius of hose is gradually decreased on test equipment to compare bending radius against bending force.

<Test conditions>
Test speed : 100mm/min
Temperature : 23℃

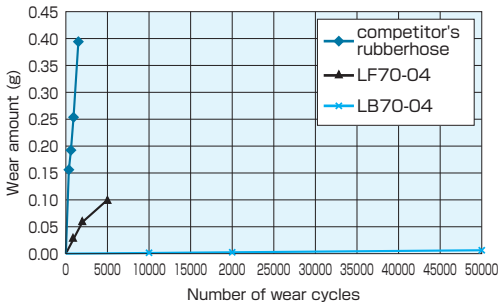




■Wear test (grindstone)

The weight of a 150mm length of hose is measured after one week in a room with constant temperature and humidity. Then, the hose is placed onto testing equipment, held by a rod at the bottom, with a grinding stone against the upper surface. The hose is subjected to a set number of wear cycles, after which it is again weighed (following a one week period in a room with constant temperature and humidity). The changes to the hose after testing are then examined to form a wear comparison.

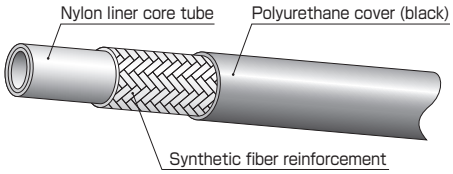
<Test conditions>
Test load : 2.5kg Temperature : Room temperature (23℃) Stroke : 100mm
Cycle : 20 times (RT)/min Grind stone : Grinding wheel for taper wear H-22 (particle size : Approx. 60)



LF70

Features

- **Short total length of coupling enables compact piping**

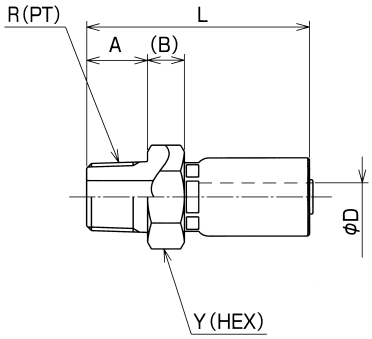


Part No.	Size No.	Size I.D. (in.)	Size I.D. (mm)	Size O.D. (mm)	Max. working pressure (MPa)	Max. working pressure (PSi)	Min. burst pressure (MPa)	Min. burst pressure (PSi)	Min. bending radius (mm)	Weight (g/m)	Coupling
LF70-**04**	04	1/4	6.4	10.3	7.0	1,000	28.0	4,000	27	60	Swage
LF70-**06**	06	3/8	9.5	13.9	7.0	1,000	28.0	4,000	45	90	
LF70-**08**	08	1/2	12.7	17.4	7.0	1,000	28.0	4,000	70	120	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m

[Swage type] (For LB70, LF70)

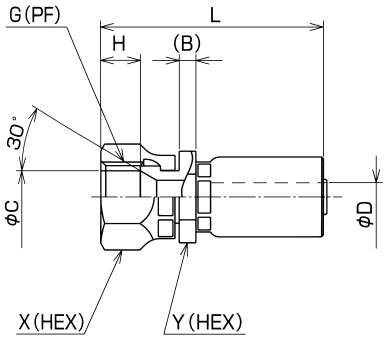
SA



Part No.	Size No.	R	A	B	Min. I.D. φD	L	Y (HEX)	Weight (g)	Pusher	Die
SSA-PT-**02**	02	1/8	10	6.5	1.8	38	14	15	PSA-02	SPLB70-02
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
SA-PT-**10**-N30	10	3/4	20	10.0	13.0	80	32	180	PSA-10	SP07-10
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	SP07-16

■ Material : steel
■ Adapter : 030, 130

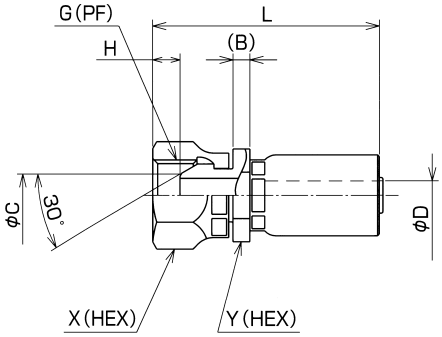
SE



Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die
SSE-PF-**02**	02	1/8	4.0	6.8	1.8	7.0	42	14	14	25	PSE-02-001	SPLB70-02
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
SE-PF-**10**-N30	10	3/4	10.5	21.0	13.1	13.0	84	32	32	220	PSE-10	SP07-10
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	SP07-16

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

SF

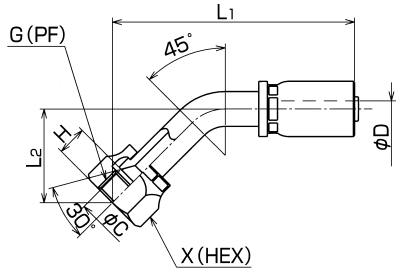


Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die
SSF-PF-**02**	02	1/8	4.0	5.0	1.8	3.0	41	14	14	25	PSE-02-001	SPLB70-02
SF-PF-**04**-14	04	1/4	4.0	7.5	3.5	5.5	49	19	17	55	PSE-14-04	SP14-04-07
SF-PF-**06**-14	06	3/8	4.0	10.0	6.8	6.5	53	22	19	75	PSE-14-06	SP14-06-07
SF-PF-**08**-14	08	1/2	4.5	13.2	9.5	9.0	61	27	24	125	PSE-14-08	SP14-08
SF-PF-**10**-N30	10	3/4	10.5	19.0	13.1	9.5	84	32	32	220	PSE-10	SP07-10
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	SP07-16

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

[Swage type] (For LB70, LF70)

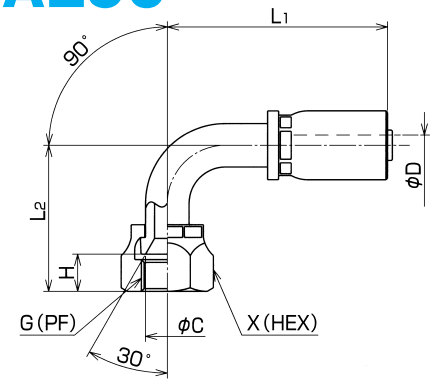
AE45



Part No.	Size No.	G	C	Min. I.D. φD	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
AE45-G-**08**-14	08	1/2	15.5	8.7	12.0	87	29	27	143	PFB-01+PA-08	SP14-08

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

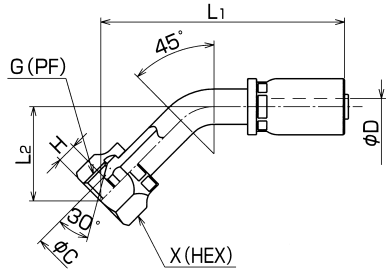
AE90



Part No.	Size No.	G	C	Min. I.D. φD	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
AE90-G-**08**-14	08	1/2	15.5	8.7	12.0	68	52	27	153	PFB-01+PA-08	SP14-08

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

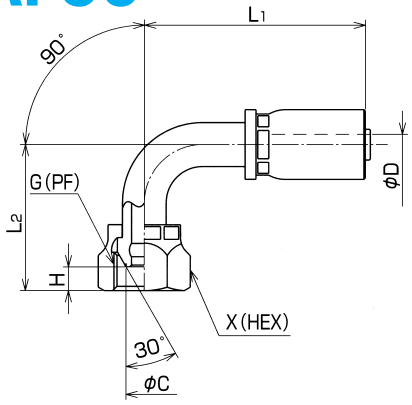
AF45



Part No.	Size No.	G	C	Min. I.D. φD	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
AF45-G-**08**-14	08	1/2	14.0	8.7	9.0	88	30	27	147	PFB-01+PA-08	SP14-08

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

AF90



Part No.	Size No.	G	C	Min. I.D. φD	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
AF90-G-**08**-14	08	1/2	14.0	8.7	9.0	68	52	27	156	PFB-01+PA-08	SP14-08

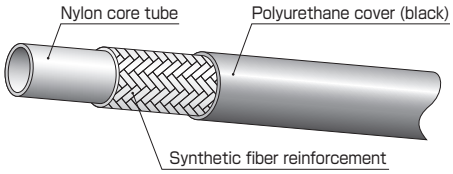
■ Material : steel
■ Adapter : 110, 145, 190, 130

1000-1100-1400-1500 Series

1000

Features

- **Small outer diameter**
- **Lightweight**
- **Campucka coupling can be used**



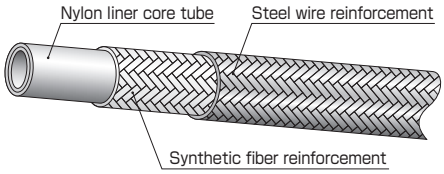
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
1000-**04**	04	1/4	6.3	10.4	10.5	1,500	42.0	6,000	30	64	Campucka Swage
1000-**06**	06	3/8	9.5	14.0	10.5	1,500	42.0	6,000	60	90	
1000-**08**	08	1/2	12.7	17.4	10.5	1,500	42.0	6,000	80	131	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m

1100

Features

- **Outer wire reinforcement prevents the cutting powder**



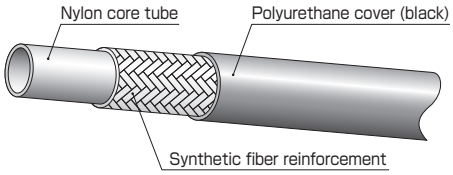
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
1100-**04**	04	1/4	6.3	11.1	10.5	1,500	42.0	6,000	40	150	Swage
1100-**06**	06	3/8	9.5	15.1	10.5	1,500	42.0	6,000	60	220	
1100-**08**	08	1/2	12.7	18.8	10.5	1,500	42.0	6,000	80	300	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m

1400

Features

- **Small outer diameter**
- **Lightweight**
- **Campucka coupling can be used**



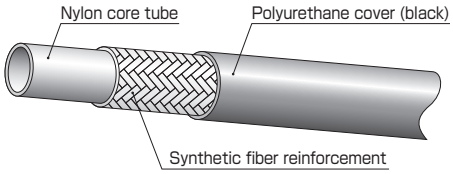
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
1400-**04**	04	1/4	6.3	10.4	14.0	2,000	56.0	8,000	30	64	Campucka Swage
1400-**06**	06	3/8	9.5	14.0	14.0	2,000	56.0	8,000	60	90	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m

1500

Features

- **Small outer diameter**
- **Lightweight**

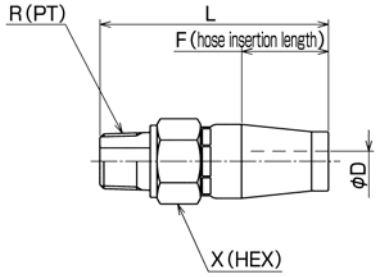


Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
1500-**03**	03	3/16	5.1	8.8	15.0	2,150	60.0	8,600	20	45	Swage

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m

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

CA

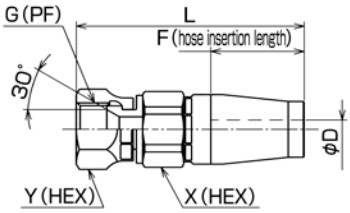


Part No.	R	Min. I.D. φD	F	L	X	Weight (g)
CA-R-**04**-14L	1/4	3.5	26.0	60	19	70
CA-R-**06**-14L	3/8	6.0	29.0	68	22	100
CA-R-**08**-14L	1/2	9.0	35.0	77	27	170

⚠ **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℃
- Adapter : 030、130

CE

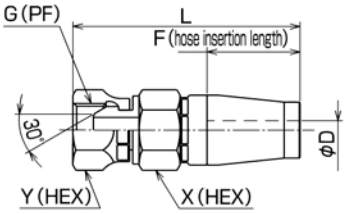


Part No.	G	Min. I.D. φD	F	L	X	Y	Weight (g)
CE-G-**04**-14L	1/4	3.5	26.0	64	19	19	85
CE-G-**06**-14L	3/8	6.0	29.0	72	22	22	115
CE-G-**08**-14L	1/2	9.0	35.0	83	27	27	205

⚠ **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℃
- Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

CF



Part No.	G	Min. I.D. φD	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℃
- Adapter : 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

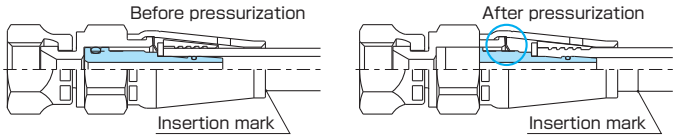
- It is possible to correct the twisted direction of a hose.

⚠ **CAUTION :** Cannot be detached after pressurization.

4 Nipple stop mechanism

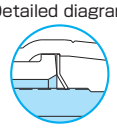
- Ratchet mechanism of our original lock ring is employed.
- Steady performance even for movable piping.
- Pressure variation is accommodated.

Campucka assembly mechanism



Swaging force proportional to inner pressure.

Detailed diagram

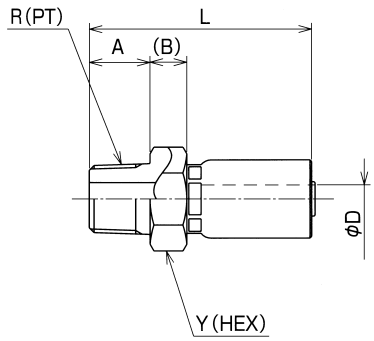


Lock ring prevents swage releasing after pressurization.

⚠ **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 type] (For 1000, 1100, 1400, 1500)

SA



Part No.	Size No.	R	A	B	Min. I.D. ϕD	L	Y (HEX)	Weight (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*

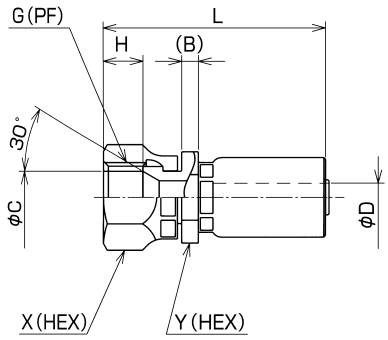
■ Material : steel
■ Adapter : 030, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

Stainless steel type

Part No.	Size No.	R	A	B	Min. I.D. ϕD	L	Y (HEX)	Weight (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
■ Adapter : 030, 130

SE



Part No.	Size No.	G	B	C	Min. I.D. ϕD	H	L	X (HEX)	Y (HEX)	Weight (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	9.3	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	16.0	9.5	12.0	61	27	24	125	PSE14-08	SP14-08* SP10-08*

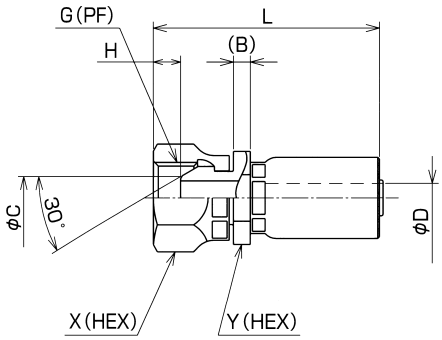
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

Stainless steel type

Part No.	Size No.	G	B	C	Min. I.D. ϕD	H	L	X (HEX)	Y (HEX)	Weight (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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

SF



Part No.	Size No.	G	B	C	Min. I.D. ϕD	H	L	X (HEX)	Y (HEX)	Weight (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
■ Adapter : 110, 145, 190, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

Stainless steel type

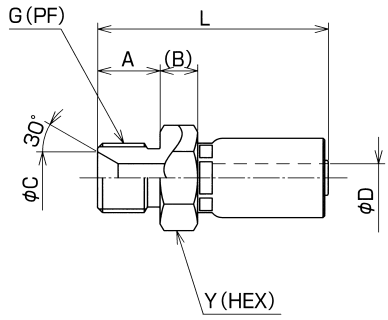
Part No.	Size No.	G	B	C	Min. I.D. ϕD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die	
												First	Second
SF-PF-**04**-14-S	04	1/4	4.0	7.5	3.5	5.5	49	19	17	56	PSE-14-04	SPH-03	SP14-04
SF-PF-**06**-14-S	06	3/8	4.0	10.0	6.8	6.5	53	22	19	75	PSE-14-06	SP3-05-1-ST	SP14-06
SF-PF-**08**-14-S	08	1/2	4.5	13.2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

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

[Swage type]

(For 1000, 1100, 1400)

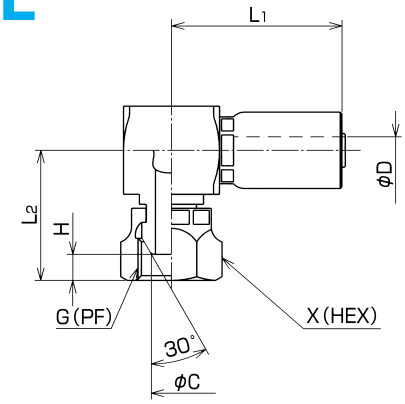
SC



Part No.	Size No.	R	A	B	C	Min. I.D. φD	L	Y (HEX)	Weight (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
■ Adapter : 060
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

SL

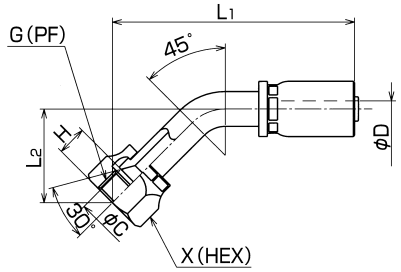


Part No.	Size No.	G	C	Min. I.D. φD	H	L_1	L_2	X (HEX)	Weight (g)	Pusher	Die
SL-PF-**04**-14	04	1/4	7.5	3.5	5.5	39	28	19	120	PSL-04	SP14-04
SL-PF-**06**-14	06	3/8	10.0	6.8	6.5	42	33	22	160	PSL-06	SP14-06
SL-PF-**08**-14	08	1/2	13.2	9.5	9.0	47	37	27	250	PSL-08	SP14-08* SP10-08*

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

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

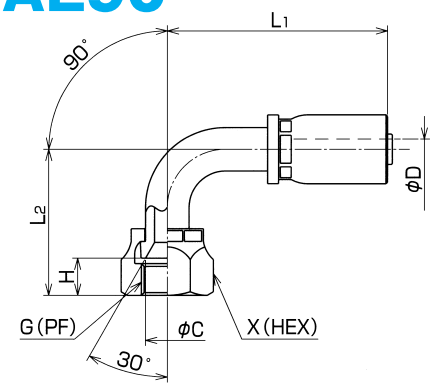
AE45



Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	Y (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
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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

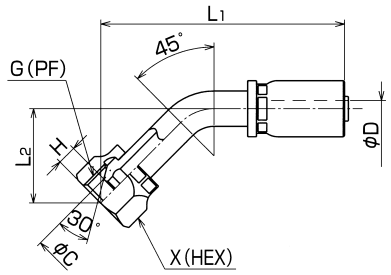
AE90



Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	Y (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
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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

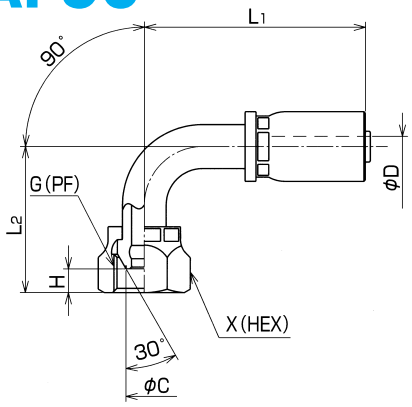
AF45



Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	Y (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
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
■ Adapter : 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. φD	H	L1	L2	Y (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
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*

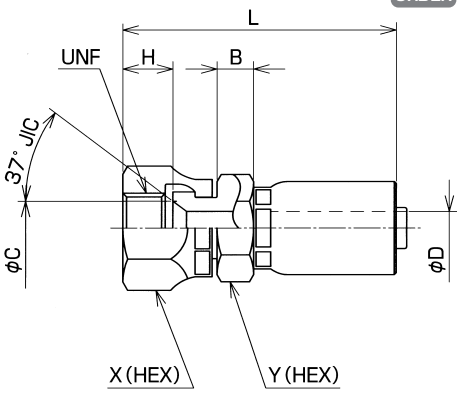
■ Material : steel
■ Adapter : 110, 145, 190, 130
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.

[Swage type]

(For 1000, 1100, 1400)

SK

MADE TO ORDER

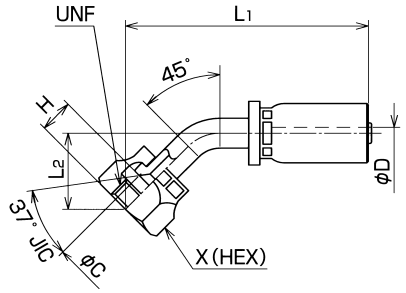


Part No.	Size No.	UNF	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die
★ SK-7/16-**04**-14	04	7/16-20	6.5	7.5	3.5	9.0	51	19	17	58	PSK-04H	SP14-04
★ SK-9/16-**06**-14	06	9/16-18	7.5	11.0	6.8	10.0	57	22	19	82	PSK-06H	SP14-06
★ SK-3/4-**08**-14	08	3/4-16	4.5	14.5	9.5	11.5	57	27	22	105	PSE-14-08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

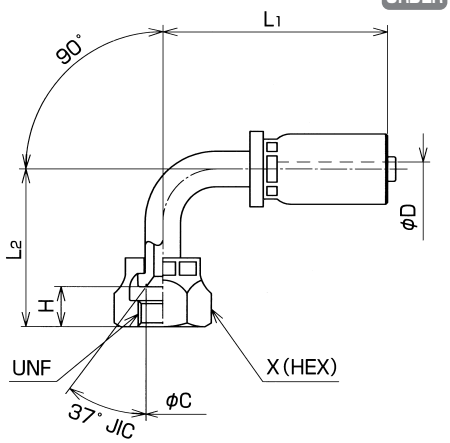


Part No.	Size No.	UNF	C	Min. I.D. φD	H	L_1	L_2	X (HEX)	Weight (g)	Pusher	Die
★ AK45-7/16-**04**-14-C	04	7/16-20	7.5	3.2	9.0	70	27	19	57	PFB-01+PA-04	SP14-04
★ AK45-9/16-**06**-14-C	06	9/16-18	11.0	5.6	10.0	91	39	22	90	PFB-01+PA-06	SP14-06
★ AK45-3/4-**08**-14-C	08	3/4-16	14.5	8.7	12.0	98	40	27	143	PFB-01+PA-08	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. φD	H	L_1	L_2	X (HEX)	Weight (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*

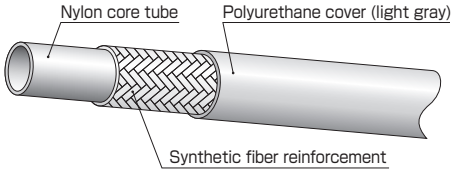
■ Material : steel
* Use SP-14-08 for 1000-08 and SP-10-08 for 1100-08.
★Made-to-order

1000 (light gray) Series

1000 (light gray)

Features

- **Slim and lightweight**
- **Campucka coupling can be used**



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
1000-**04**-LGY	04	1/4	6.3	10.4	10.5	1,500	42.0	6,000	30	64	Campucka Swage
1000-**06**-LGY	06	3/8	9.5	14.0	10.5	1,500	42.0	6,000	60	90	
1000-**08**-LGY	08	1/2	12.7	17.4	10.5	1,500	42.0	6,000	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℃

☞ If you use Campucka, the working temperature range for Campucka must be applied.

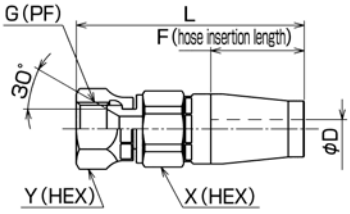
■ Length in a unit package : 100m

☞ Suitable hose coupling is the same as that for the 1000 series.

☞ Color code "LGY" stands for light gray.

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

CE



Part No.	G	Min. I.D. φD	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℃
- Adapter : 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

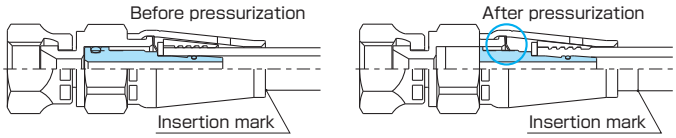
- It is possible to correct the twisted direction of a hose.

⚠ **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



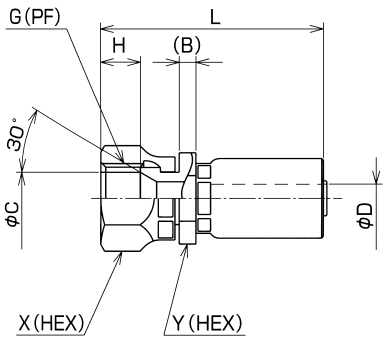
Swaging force proportional to inner pressure.

Detailed diagram

Lock ring prevents swage releasing after pressurization.

[Swage type]

SE



Part No.	Size No.	G	B	C	Min. I.D. φD	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	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	16.0	9.5	12.0	61	27	24	125	PSE14-08	SP14-08

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

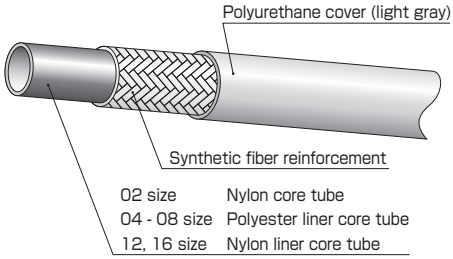
☞ Applicable hose couplings are the same as those for 1000 series.

F3130 (light gray) Series

F3130

Features

- **Flexible and tough**
- **Campucka coupling (for F3130 series only) can be used**



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D.		O.D.							
		(in.)	(mm)	(mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
F3130-**02**-LGY	02	1/8	3.6	8.3	20.0	2,900	72.0	10,500	15	45	Campucka Swage
F3130-**04**-LGY	04	1/4	6.3	12.5	19.5	2,850	77.0	11,200	40	105	
F3130-**06**-LGY	06	3/8	9.5	16.4	16.0	2,300	63.0	9,100	50	150	
F3130-**08**-LGY	08	1/2	12.7	20.3	14.0	2,000	56.0	8,000	75	210	
F3130-**12**-LGY	12	3/4	19.0	26.6	9.0	1,300	35.0	5,100	130	290	Swage
F3130-**16**-LGY	16	1	25.4	33.4	7.0	1,000	28.0	4,000	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℃

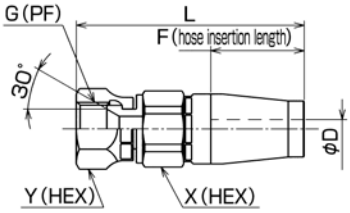
☞ If you use Campucka, the working temperature range for Campucka must be applied.

■ Length in a unit package : 100m for sizes 02, 04, 06, 08, and 50m for sizes 12, 16

☞ Suitable 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 type] Hydraulic push-one coupling (For F3130 (light gray))

CE (For F3130 series only)



Part No.	Size No.	G	Min. I.D. φD	F	L	X	Y	Weight (g)
CE-G-**02**L	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℃
- Adapter : 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

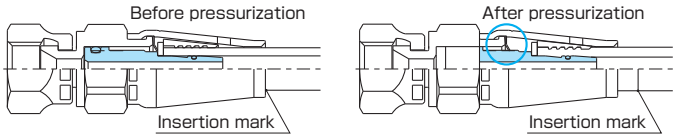
- It is possible to correct the twisted direction of a hose.

⚠ **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



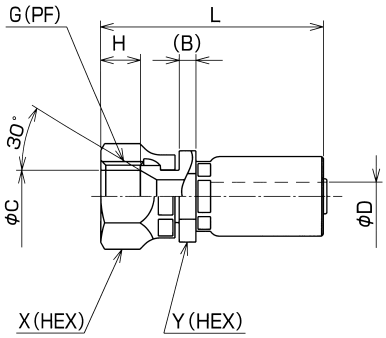
Swaging force proportional to inner pressure.

Detailed diagram

Lock ring prevents swage releasing after pressurization.

[Swage type]

SE



品　番	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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

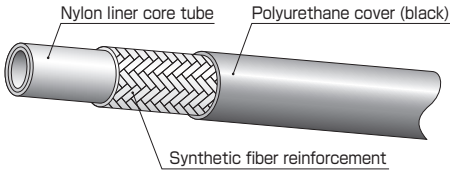
- Material : steel
- Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

N3130-3130-3000 Series

N3130

Features

- **Flexible and tough**
- **JIS K 6375 A certificated, SAE100R7 certificated**



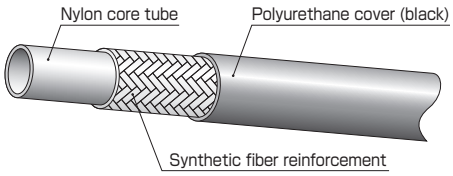
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
N3130-**03**	03	3/16	4.8	10.4	21.0	3,000	84.0	12,000	20	65	Swage
N3130-**04**	04	1/4	6.4	12.7	19.5	2,850	77.0	11,200	40	105	
N3130-**05**	05	5/16	8.1	14.7	17.5	2,550	70.0	10,200	45	130	
N3130-**06**	06	3/8	9.8	16.4	16.0	2,300	63.0	9,100	50	150	
N3130-**08**	08	1/2	12.8	20.3	14.0	2,000	56.0	8,000	75	210	
N3130-**12**	12	3/4	19.2	26.6	9.0	1,300	35.0	5,100	130	290	
N3130-**16**	16	1	25.7	33.4	7.0	1,000	28.0	4,000	165	400	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m for sizes 03, 04, 05, 06, 08, and 50m for sizes 12, 16

3130

Features

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



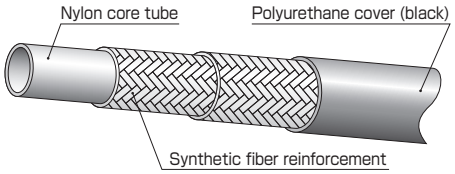
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
3130-**02**	02	1/8	3.6	8.3	20.0	2,900	72.0	10,500	15	45	Swage Reusable (Campucka can be used only for size 02.)
3130-**03**	03	3/16	4.8	10.4	20.0	2,900	72.0	10,500	30	65	
3130-**04**	04	1/4	6.3	12.4	20.0	2,900	72.0	10,500	40	105	
3130-**05**	05	5/16	7.9	13.8	18.0	2,600	65.0	9,400	50	115	
3130-**06**	06	3/8	9.5	16.1	18.0	2,600	65.0	9,400	60	150	
3130-**08**	08	1/2	12.7	19.9	16.0	2,300	58.0	8,400	80	210	
3130-**12**	12	3/4	19.0	26.2	10.0	1,450	36.0	5,200	160	290	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m for sizes 02, 03, 04, 05, 06, 08, and 50m for size 12

3000

Features

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



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
3000-**03**	03	3/16	4.8	10.4	34.0	4,900	100.0	14,500	70	76	Swage Reusable
3000-**04**	04	1/4	6.3	12.5	30.0	4,350	90.0	13,000	75	98	
3000-**06**	06	3/8	9.5	16.0	24.0	3,500	70.0	10,000	120	140	
3000-**08**	08	1/2	12.7	19.8	20.0	2,900	60.0	8,700	160	199	
3000-**12**	12	3/4	19.0	26.2	13.0	1,900	38.0	5,500	250	276	
3000-**16**	16	1	25.4	33.0	10.0	1,450	30.0	4,350	300	366	

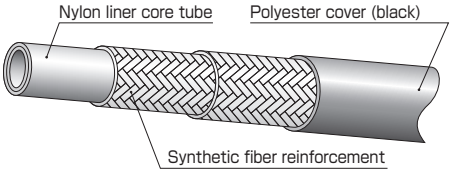
■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m for sizes 03, 04, 06, 08, and 50m for sizes 12, 16

3700 Series (for low temperature environment)

3700

Features

- High flexibility and steady performance under low temperature environment (−55℃)
- JIS K 6375 A certificated, SAE100R7 certificated



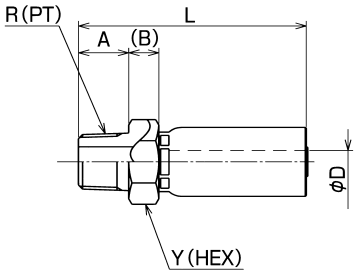
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D.		O.D.							
		(in.)	(mm)	(mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
3700-**03**	03	3/16	4.8	10.5	21.0	3,000	84.0	12,000	19	76	Swage
3700-**04**	04	1/4	6.3	12.8	19.5	2,850	77.0	11,200	32	101	
3700-**06**	06	3/8	9.5	16.3	16.0	2,300	63.0	9,100	51	141	
3700-**08**	08	1/2	12.7	20.2	14.0	2,000	56.0	8,000	76	196	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −55 to +100℃
■ Length in a unit package : 100m

[Swage type]

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

SA



Part No.	Size No.	R	A	B	Min. I.D. φD	L	Y (HEX)	Weight (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	13	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
■ Adapter : 030, 130

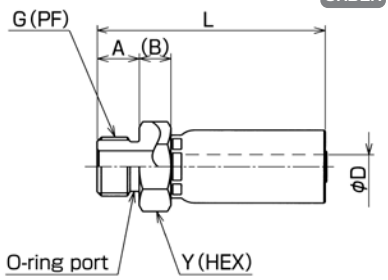
Stainless steel type

Part No.	Size No.	R	A	B	Min. I.D. φD	L	Y (HEX)	Weight (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
■ Adapter : 030, 130
* Use KM-04 for N3130 and 3700, and SP3-04 for 3130 and 3000.

SO

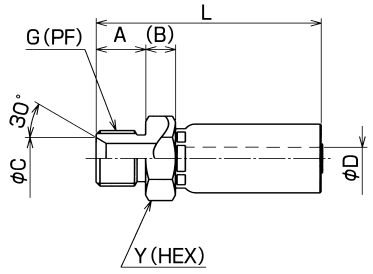
MADE TO ORDER



Part No.	Size No.	G	A	B	Min. I.D. φD	L	Y (HEX)	Weight (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



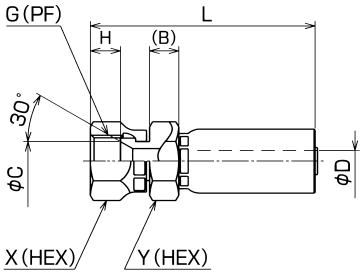
Part No.	Size No.	G	A	B	C	Min. I.D. φD	L	Y (HEX)	Weight (g)	Pusher	Die
SC-PF-**03**	03	1/4	13	8.5	9.5	2.8	57	19	50	PSA-04	SP3-03
SC-PF-**04**	04	1/4	13	8.5	9.5	3.9	61	19	60	PSA-04	SP3-04
SC-PF-**06**	06	3/8	15	9.0	12.5	6.8	67	22	90	PSA-06	SP3-06
SC-PF-**08**	08	1/2	18	10.0	16.5	10.0	76	27	140	PSA-08	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
■ Adapter : 060

[Swage type]

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

SE



Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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

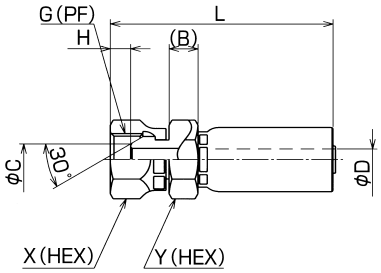
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless steel type

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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	SP3-2-001	–
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
■ Adapter : 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. φD	H	L	X (HEX)	Y (HEX)	Weight (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
■ Adapter : 110, 145, 190, 130

Stainless steel type

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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	SP3-2-001	–
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

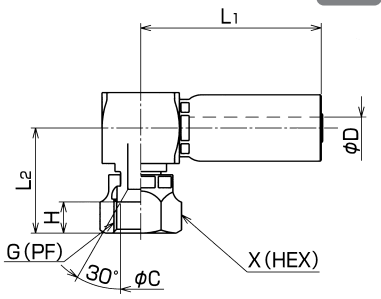
■ Material : stainless steel SUS304
■ Adapter : 110, 145, 190, 130
* Use KM-04 for N3130 and 3700, and SP3-04 for 3130 and 3000.

[Swage type]

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

SLE

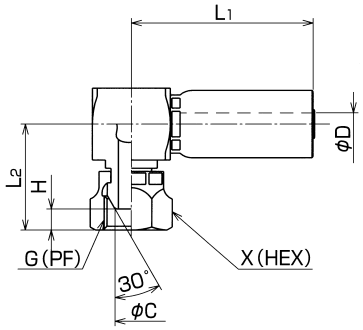
MADE TO ORDER



Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (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
■ Adapter : 010、045、090、150、020、025、064、069、030
★Made-to-order

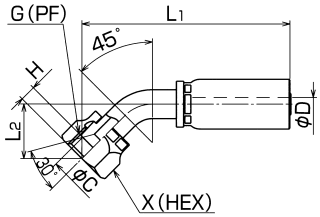
SL



Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (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

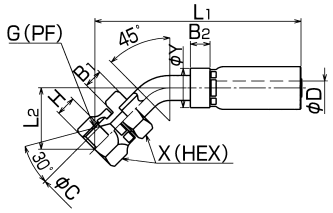
■ Material : steel
■ Adapter : 110, 145, 190, 130
★Made-to-order

AE45, SE45



Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030



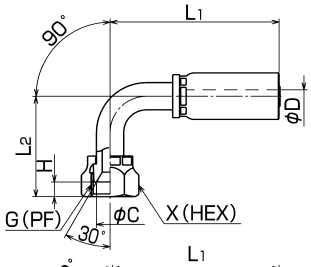
Part No.	Size No.	G	B1	B2	C	Min. I.D. φD	H	L1	L2	X (HEX)	φY	Weight (g)	Pusher	Die
★ SE45-PF-**12**	12	3/4	10.5	12.5	21.0	16.0	13.5	129	40	36	30	380	PFB-02+PHB-12	SP3-12
★ SE45-PF-**16**	16	1	12.5	12.5	28.0	20.9	16.5	154	47	41	36	590	PFB-02+PHB-16	SP3-16

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

[Swage type]

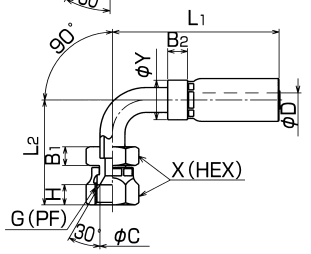
(For N3130, 3130, 3000) (For 3700)

AE90, SE90



Part No.	Size No.	G	C	Min. I.D. ϕD	H	L1	L2	X (HEX)	Weight (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	54	27	180	PFB-01+PA-08	SP3-08

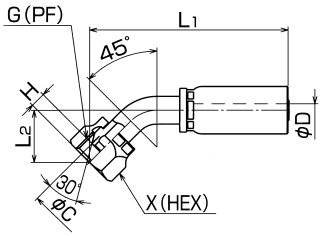
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030



Part No.	Size No.	G	B1	B2	C	Min. I.D. ϕD	H	L1	L2	X (HEX)	ϕY	Weight (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

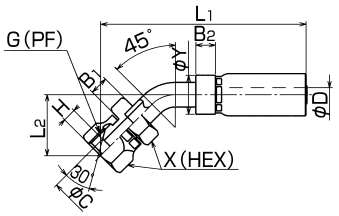
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

AF45, SF45



Part No.	Size No.	G	C	Min. I.D. ϕD	H	L1	L2	X (HEX)	Weight (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

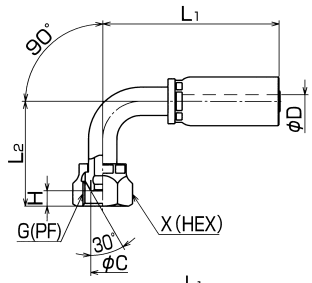
■ Material : steel
■ Adapter : 110, 145, 190, 130



Part No.	Size No.	G	B1	B2	C	Min. I.D. ϕD	H	L1	L2	X (HEX)	ϕY	Weight (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

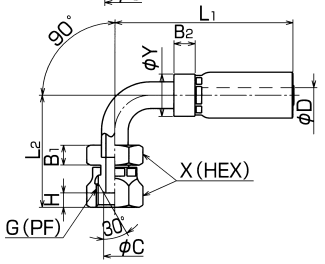
■ Material : steel
■ Adapter : 110, 145, 190, 130
★Made-to-order

AF90, SF90



Part No.	Size No.	G	C	Min. I.D. ϕD	H	L1	L2	X (HEX)	Weight (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
■ Adapter : 110, 145, 190, 130



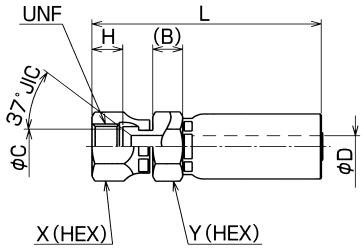
Part No.	Size No.	G	B1	B2	C	Min. I.D. ϕD	H	L1	L2	X (HEX)	ϕY	Weight (g)	Pusher	Die
★ SF90-PF-**12**	12	3/4	10.5	12.5	19.0	16.0	9.5	108	77	36	30	405	PFB-02+PHB-12	SP3-12
★ SF90-PF-**16**	16	1	11.0	12.5	25.4	20.9	10.0	127	86	41	36	645	PFB-02+PHB-16	SP3-16

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

[Swage type]

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

SK

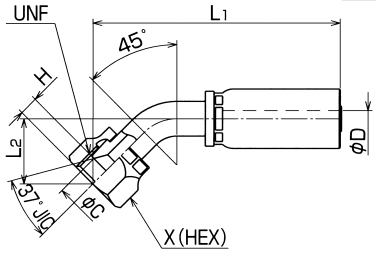


Part No.	Size No.	UNF	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (g)	Pusher	Die
SK-7/16-**03**	03	7/16	6.5	7.5	2.8	10.0	58	15.9	14.3	50	PSK-7/16-04	SP3-03
SK-7/16-**04**	04	7/16	6.5	7.5	3.9	10.0	61	15.9	15.9	60	PSK-7/16-04	SP3-04
★ SK-1/2-**04**	04	1/2	9.5	9.0	3.9	9.5	65	19.0	15.9	60	PSK-9/16-04★★	SP3-04
★ 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
★★又は、PSK-1/2-04

AK45

MADE TO ORDER

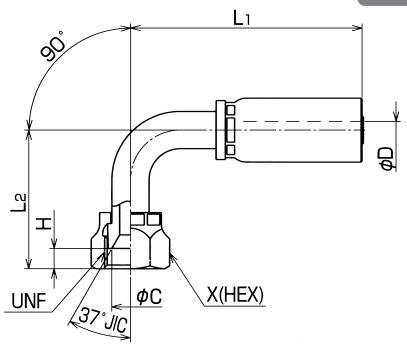


Part No.	Size No.	UNF	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
★ AK45-7/16-**03**	03	7/16	7.5	2.6	9.0	69	18	19	57	PFB-01+PA-04	SP3-03
★ AK45-7/16-**04**-C	04	7/16	7.5	3.2	9.0	72	18	19	64	PFB-01+PA-04	SP3-04
★ AK45-9/16-**06**-C	06	9/16	11.0	5.6	10.0	89	24	22	110	PFB-01+PA-06	SP3-06
★ AK45-3/4-**08**-C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

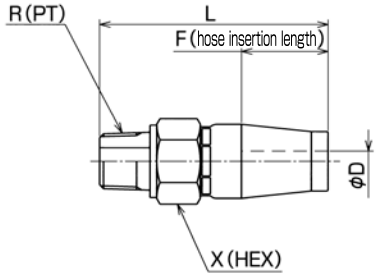


Part No.	Size No.	UNF	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
★ AK90-7/16-**03**	03	7/16	7.5	2.6	9.0	58	32	19	62	PFB-01+PA-04	SP3-03
★ AK90-7/16-**04**-C	04	7/16	7.5	3.2	9.0	61	32	19	69	PFB-01+PA-04	SP3-04
★ AK90-9/16-**06**-C	06	9/16	11.0	5.6	10.0	74	43	22	117	PFB-01+PA-06	SP3-06
★ AK90-3/4-**08**-C	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 type] Hydraulic push-one coupling (For 3130-02 only)

CA

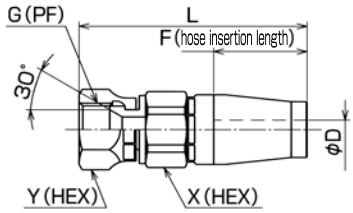


Part No.	Size No.	R	Min. I.D. φD	F	L	X	Weight (g)
CA-R-**02**L	02	1/8	1.5	22.5	56	14	36

⚠ **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℃
- Adapter : 030, 130

CE

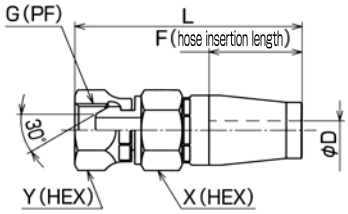


Part No.	Size No.	G	Min. I.D. φD	F	L	X	Y	Weight (g)
CE-G-**02**L	02	1/8	1.5	22.5	62	14	14	44

⚠ **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℃
- Adapter : 010, 045, 090, 150, 030

CF



Part No.	Size No.	G	Min. I.D. φD	F	L	X	Y	Weight (g)
CF-G-**02**L	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℃
- Adapter : 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

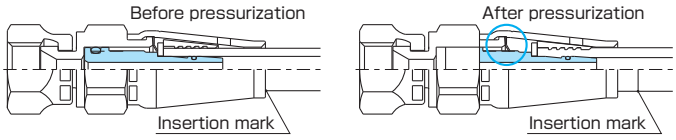
- It is possible to correct the twisted direction of a hose.

⚠ **CAUTION :** Cannot be detached after pressurization.

4 Nipple stop mechanism

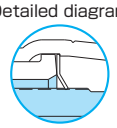
- Ratchet mechanism of our original lock ring is employed.
- Steady performance even for movable piping.
- Pressure variation is accommodated.

Campucka assembly mechanism



Swaging force proportional to inner pressure.

Detailed diagram

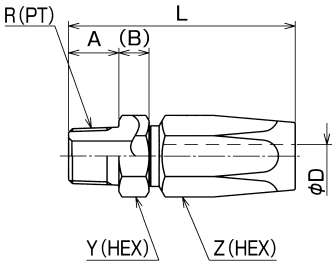


Lock ring prevents swage releasing after pressurization.

⚠ **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 type] (For 3130, 3000)

A



Part No.	Size No.	R	A	B	Min. I.D. φD	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

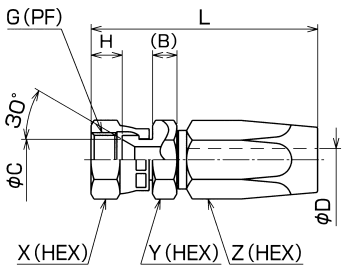
■ Material : steel
■ Adapter : 030, 130
★Made-to-order

Stainless steel type

Part No.	Size No.	R	A	B	Min. I.D. φD	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
■ Adapter : 030, 130
★Made-to-order

E



Part No.	Size No.	G	B	C	Min. I.D. φD	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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless steel type

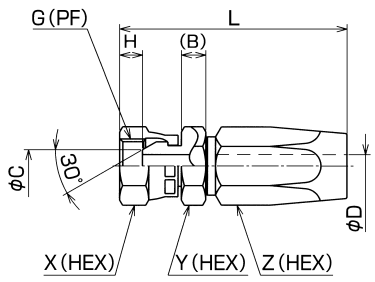
Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Z (HEX)	Weight (g)
E-PF-**02**-S	02	1/8	6.5	7.0	2.8	7.0	48	14	12	12	35
E-PF-**04**-S	04	1/4	6.5	9.5	5.0	8.5	59	17	17	17	70
E-PF-**06**-S	06	3/8	7.5	12.5	7.0	9.5	70	21	21	21	130
★ E-PF-**08**-S	08	1/2	7.5	16.0	9.6	12.5	82	26	26	26	220
★ E-PF-**12**-S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

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

[Reusable type]

(For 3130, 3000)

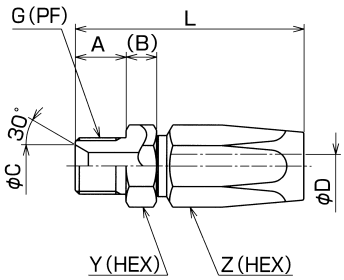
F



Part No.	Size No.	G	B	C	Min. I.D. φD	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
■ Adapter : 110, 145, 190, 130
★Made-to-order

C



Part No.	Size No.	G	A	B	C	Min. I.D. φD	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

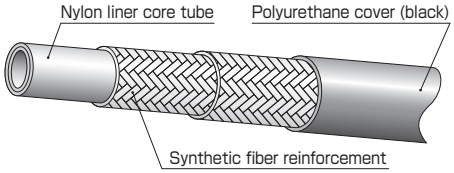
■ Material : steel
■ Adapter : 060
★Made-to-order

N3000 Series

N3000

Features

- **Flexible and tough**
- **100R18 Certified (04, 06 and 08 size only)**



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
N3000-**04**	04	1/4	6.3	13.3	28.0	4,050	112.0	16,200	50	120	Swage
N3000-**06**	06	3/8	9.5	17.5	21.0	3,000	84.0	12,000	65	190	
N3000-**08**	08	1/2	12.7	21.3	21.0	3,000	84.0	12,000	80	280	
N3000-**10**	10	5/8	15.9	25.5	17.5	2,550	70.0	10,200	120	355	

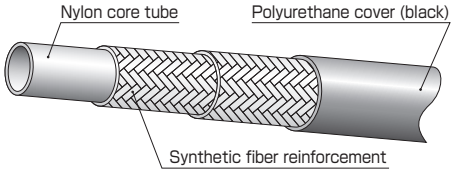
■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m for sizes 04, 06, 08, and 50m for sizes 10

HT (High Temperature) Series

HT (High Temperature)

Features

- **High temperature (120℃) oil can be used.**



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
HT-**04**	04	1/4	6.3	13.3	28.0	4,050	112.0	16,200	40	125	Swage
HT-**06**	06	3/8	9.5	17.5	21.0	3,000	84.0	12,000	60	180	
HT-**08**	08	1/2	12.7	21.3	21.0	3,000	84.0	12,000	80	255	
HT-**10**	10	5/8	15.9	25.5	17.5	2,550	70.0	10,200	120	355	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +120℃
■ Length in a unit package : 100m for sizes 04, 06, 08, and 50m for sizes 10

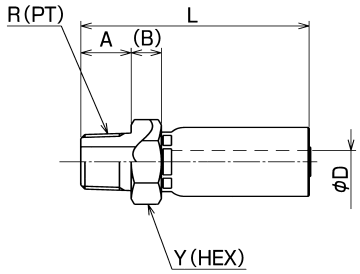
☞Stainless fittings are not available for HT series.

[Swage type]

⚠ **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. φD	L	Y (HEX)	Weight (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

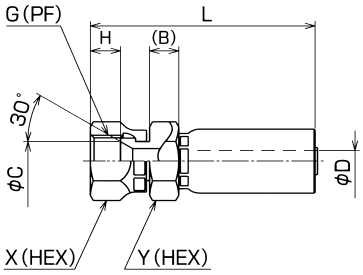
■ Material : steel
■ Adapter : 030, 130

Stainless steel type

Part No.	Size No.	R	A	B	Min. I.D. φD	L	Y (HEX)	Weight (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
■ Adapter : 030, 130

SE



Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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

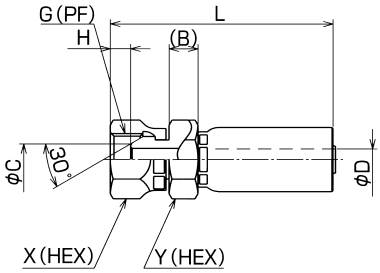
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless steel type

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

SF



Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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

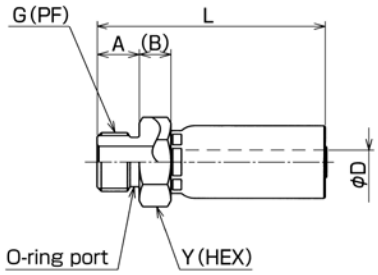
■ Material : steel
■ Adapter : 110, 145, 190, 130

[Swage type]

⚠ **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)

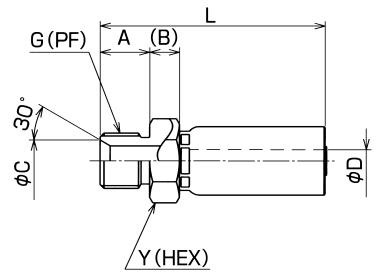
SO



Part No.	Size No.	G	A	B	Min. I.D. φD	L	Y (HEX)	Weight (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.

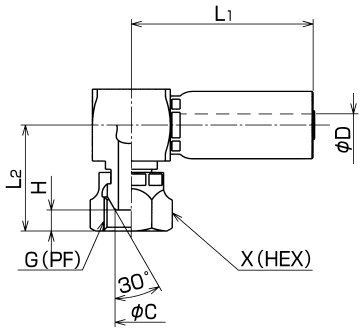
SC



Part No.	Size No.	G	A	B	C	Min. I.D. φD	L	Y (HEX)	Weight (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	3/4	20	10.0	22.0	13.0	80	32	180	PSA-10	SPN-10

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

SL



Part No.	Size No.	G	C	Min. I.D. φD	H	L_1	L_2	X (HEX)	Weight (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

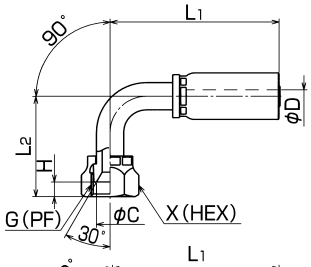
■ Material : steel
■ Adapter : 110, 145, 190, 130, C70, C74, C79

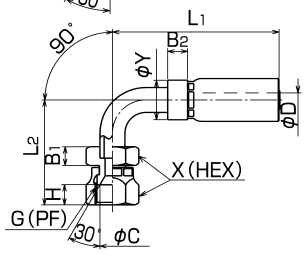
[Swage type]

⚠ **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





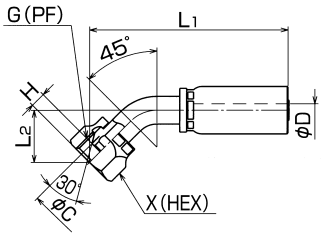
Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
AE90-G-**04**	04	1/4	9.0	3.2	8.0	59	33	19	75	PFB-01+PA-04	SPN-04
AE90-G-**06**-N30	06	3/8	12.0	5.6	9.5	73	45	22	122	PFB-01+PA-06	SPN-06
AE90-G-**08**-N30	08	1/2	15.5	8.7	12.5	83	52	27	189	PFB-01+PA-08	SPN-08

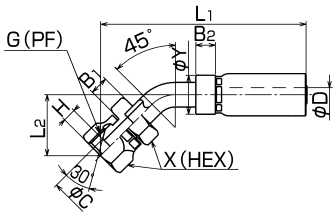
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030
★Made-to-order

AF45, SF45





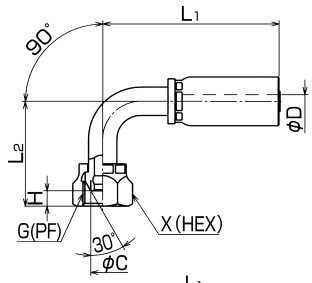
Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (g)	Pusher	Die
AF45-G-**04**	04	1/4	7.0	3.2	5.5	73	19	19	70	PFB-01+PA-04	SPN-04
AF45-G-**06**-N30	06	3/8	10.0	5.6	6.5	85	23	22	115	PFB-01+PA-06	SPN-06
AF45-G-**08**-N30	08	1/2	14.0	8.7	9.0	103	29	27	185	PFB-01+PA-08	SPN-08

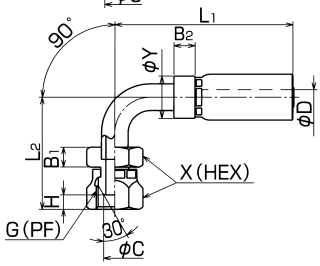
■ Material : steel
■ Adapter : 110, 145, 190, 130

Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (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
■ Adapter : 110, 145, 190, 130
★Made-to-order

AF90, SF90





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

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

Part No.	Size No.	G	C	Min. I.D. φD	H	L1	L2	X (HEX)	Weight (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

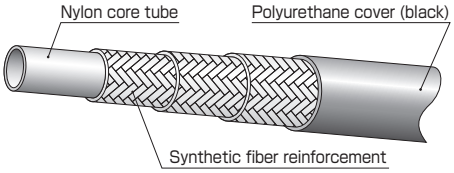
■ Material : steel
■ Adapter : 110, 145, 190, 130
★Made-to-order

3R80 Series

3R80

Features

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



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D.		O.D.							
		(in.)	(mm)	(mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
3R80-**03**	03	3/16	4.8	12.7	35.0	5,050	140.0	20,200	38	115	Swage
3R80-**04**	04	1/4	6.3	15.5	35.0	5,050	140.0	20,200	51	175	
3R80-**06**	06	3/8	9.5	19.1	28.0	4,050	112.0	16,200	64	221	
3R80-**08**	08	1/2	12.7	22.2	25.0	3,600	98.0	14,200	102	283	
3R80-**12**	12	3/4	19.0	28.6	16.0	2,300	63.0	9,100	165	380	
3R80-**16**	16	1	25.4	36.9	14.0	2,000	56.0	8,000	254	572	

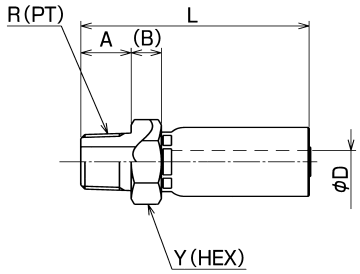
■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m for sizes 03, 04, 05, 08, and 50m for sizes 12, 16

[Swage type]

⚠ **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. φD	L	Y (HEX)	Weight (g)	Pusher	Die
SA-PT-**03**-3R	03	1/4	13	8.5	2.8	53	19	50	PSA-04	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

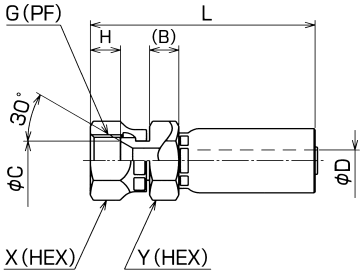
■ Material : steel
■ Adapter : 030, 130

Stainless steel type

Part No.	Size No.	R	A	B	Min. I.D. φD	L	Y (HEX)	Weight (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
■ Adapter : 030, 130

SE



Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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

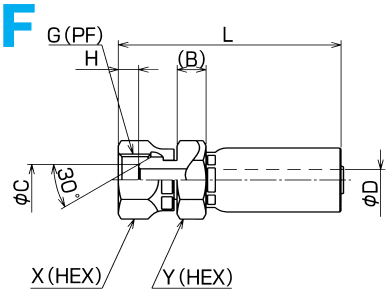
■ Material : steel
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

Stainless steel type

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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
■ Adapter : 010, 045, 090, 150, 020, 025, 064, 069, 030

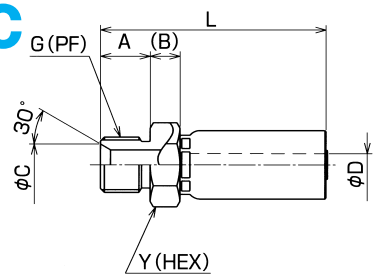
SF



Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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
■ Adapter : 110, 145, 190, 130

SC



Part No.	Size No.	G	A	B	C	Min. I.D. φD	L	Y (HEX)	Weight (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

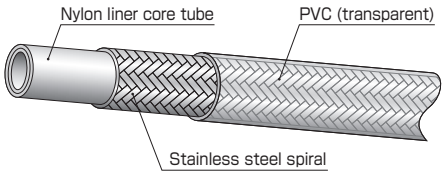
■ Material : steel
■ Adapter : 060
★Made-to-order

5501 Series of electrostatic-free type

5501

Features

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



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
5501-**04**-CL	04	1/4	6.0	10.6	21.0	3,000	70.0	10,200	50	110	Swage
5501-**06**-CL	06	3/8	9.0	14.8	21.0	3,000	70.0	10,200	80	220	

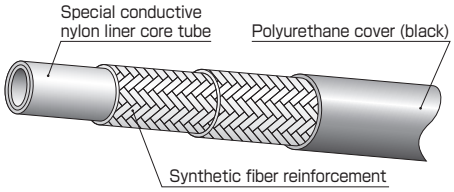
■ Appropriate fluid : paint, thinner
■ Working temperature range : −10 to +60℃
■ Assembly of couplings with hose is to be done at our factory.
☞"-CL" stands for clear.

3450 Series of conductive polymer structure type

3450

Features

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



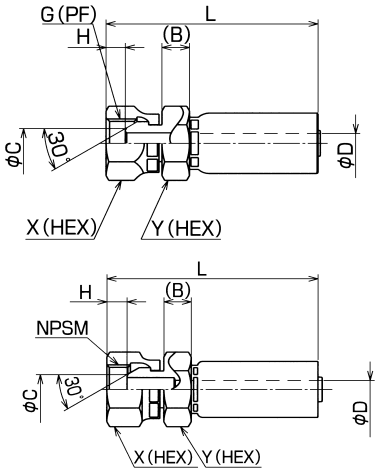
Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius (mm)	Weight (g/m)	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)			
★ 3450-**03**	03	3/16	4.8	10.8	23.0	3,350	92.0	13,400	25	71	Swage
★ 3450-**04**	04	1/4	6.3	13.2	23.0	3,350	92.0	13,400	25	95	
★ 3450-**06**	06	3/8	9.5	18.5	21.0	3,000	84.0	12,000	60	195	

■ Appropriate fluid : paint, thinner
■ Working temperature range : −40 to +80℃
■ Assembly of couplings with hose is to be done at our factory.
★Made-to-order

[Swage type]

(For 5501)

SF (for 5501)

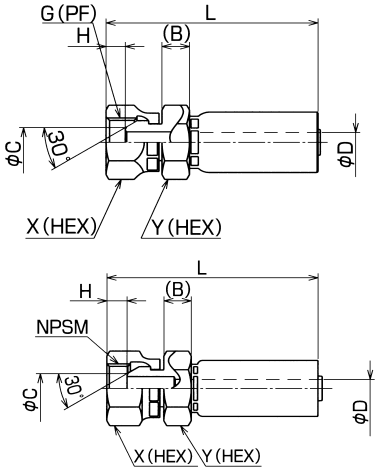


Part No.	Size No.	G or NPSM	B	C	Min. I.D. ϕD	H	L	X (HEX)	Y (HEX)	Weight (g)
SF-PF-**04**-55	04	G1/4	8.5	7.5	3.3	5.5	60	19	17	80
SF-NPSM-**04**-55	04	NPSM1/4	8.5	7.5	3.3	5.5	60	19	17	80
SF-PF-**06**-5501	06	G3/8	9.5	10.0	6.2	6.5	71	22	22	110
SF-NPSM-**06**-5501	06	NPSM3/8	9.5	10.0	6.2	6.5	71	22	22	110

■ Material : steel
■ Adapter : 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. ϕD	H	L	X (HEX)	Y (HEX)	Weight (g)
SF-PF-**03**	03	G1/4	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
■ Adapter : 110, 145, 190, 130
■ Assembly of couplings with hose is to be done at our factory.
★Made-to-order

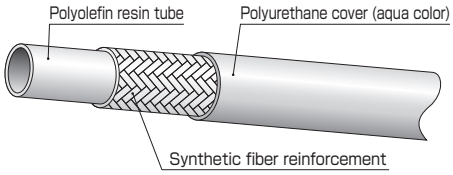
34PW Series

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

34PW

Features

- High water-barrier performance
- Excellent chemical durability
- Anti-taint property
- The core tubing material complies with NSF and No.370 of the Ministry of Health and Welfare, Japan.

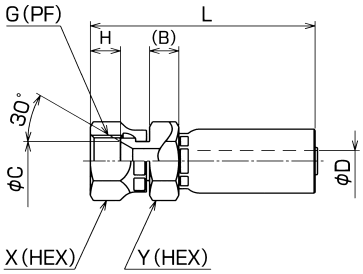


Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D.		O.D.							
		(in.)	(mm)	(mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
34PW-**02**-LBU	02	1/8	3.6	8.3	20.0	2,900	80.0	11,600	25	45	Swage
34PW-**04**-LBU	04	1/4	6.3	12.5	19.5	2,850	78.0	11,400	30	95	
34PW-**06**-LBU	06	3/8	9.5	16.4	16.0	2,300	64.0	9,200	50	134	
34PW-**08**-LBU	08	1/2	12.7	20.3	14.0	2,000	56.0	8,000	75	201	
34PW-**12**-LBU	12	3/4	19.0	28.7	10.5	1,500	42.0	6,000	125	368	
34PW-**16**-LBU	16	1	25.4	36.5	10.5	1,500	42.0	6,000	200	554	

■ Appropriate fluid : pure water, chemicals (isocyanate), etc.
■ Working temperature range : −30 to +70℃
■ Assembly of couplings with hose is to 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 type] (For 34PW)

SE (PW coupling)

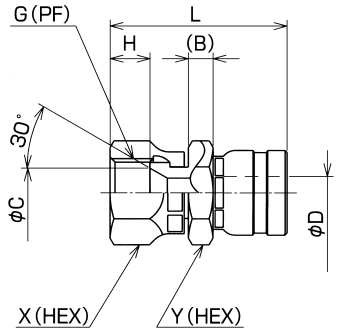


Stainless steel type (SUS316)

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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-12-1-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-16-1-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

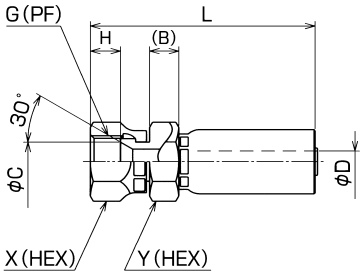


Stainless steel type (SUS316)

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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	PSE12-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

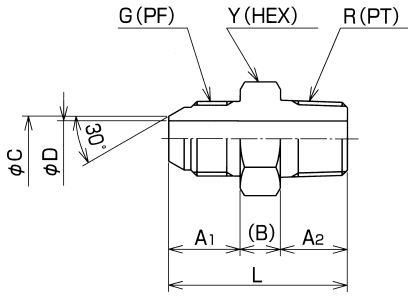


Stainless steel type (SUS304)

Part No.	Size No.	G	B	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (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.

Adapter for 34PW



Stainless steel type (SUS316)

Part No.	Size No.	G	R	A_1	A_2	B	C	Min. I.D. φD	L	Y (HEX)	Weight (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.

Adapter

Adapter

Assembling method ▶▶▶p.74

Specification

Material : Steel, SUS304, SUS316

Usage conditions

Appropriate fluid : Mineral hydraulic oil

Maximum working pressure : It changes with the size of G- and A-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℃ to +120℃

Example of part number

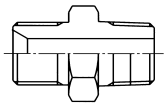
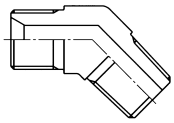
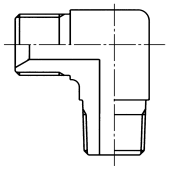
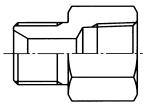
010-04-04-(S)

- Material: No indication = Steel; S = SUS304
- Size of R(PT) or G(PF): 02 = 1/8″, 04 = 1/4″, 06 = 3/8″, 08 = 1/2″, 12 = 3/4″, 16 = 1″
- Size of G(PF) thread: 02 = 1/8″, 04 = 1/4″, 06 = 3/8″, 08 = 1/2″, 12 = 3/4″, 16 = 1″
- Adapter shape: see the next page

Adapter shapes chart

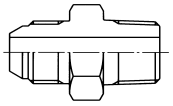
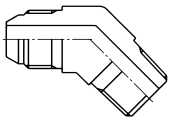
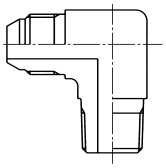
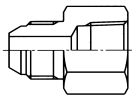
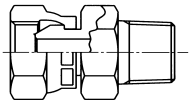
Taper thread type to equipment side (with 30° female seat)

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

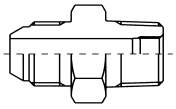
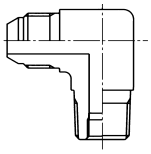
Taper thread type to equipment side (with 30° male seat)

Straight type	45° elbow type	90° elbow type	Femalel-thread straight type	Parallel male-thread type
010	045	090	030	060

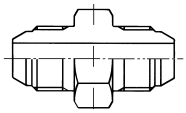
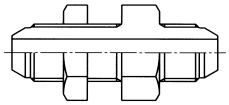
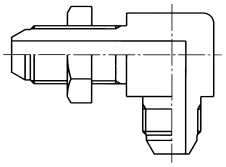
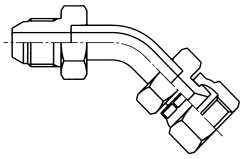
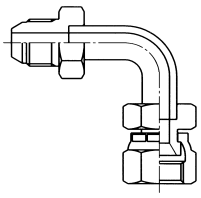
Taper thread screw type to equipment side (with 30° malel seat)

Straight type	45° elbow type	Thread screw bolt
010-001	090-001	007

Interconnection type (with 30° male seat)

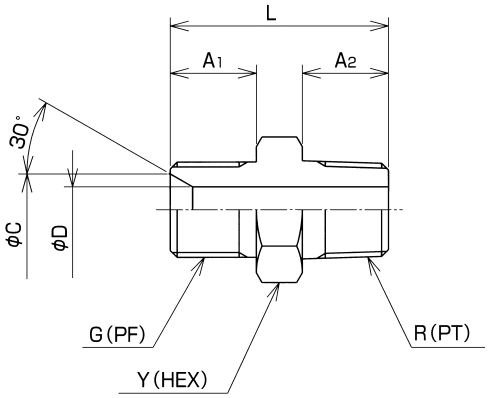
Straight type	Panel touch straight type	Panel touch 90° straight type	45° bend type	90° bend type
150	020	025	064	069

☞Contact us for other shapes.

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

110



Part No.	G	R	A1	A2	C	D	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	19	30
110-**04-02**	1/4	1/8	13	10	9.5	5.0	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	9.5	5.0	36	22	50
110-**06-04**	3/8	1/4	15	13	12.5	8.0	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	16.0	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	16.0	11.0	50	36	165
110-**12-08**	3/4	1/2	20	18	21.5	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	21.5	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

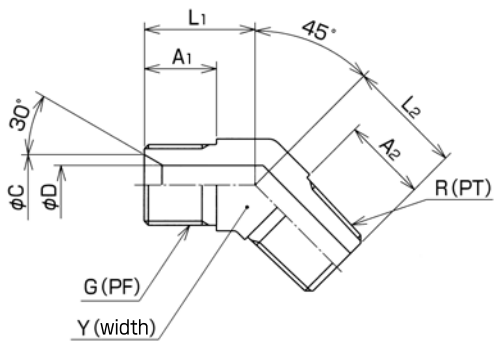
Stainless steel type

Part No.	G	R	A1	A2	C	D	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



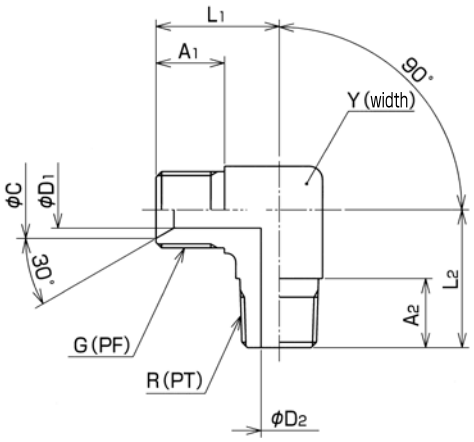
Part No.	G	R	A1	A2	C	D	L1	L2	Y (width)	Weight (g)
145-**02-02**	1/8	1/8	14	14	7.0	3.0	18	18	14	20
★ 145-**02-04**	1/8	1/4	10	13	7.0	3.0	18	20	17	35
★ 145-**04-02**	1/4	1/8	13	14	9.0	5.5	19	20	17	36
145-**04-04**	1/4	1/4	13	14	9.0	5.5	19	20	17	40
★ 145-**04-06**	1/4	3/8	13	18	9.0	5.5	18	24	19	55
★ 145-**06-04**	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	8.0	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	27.5	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	A_1	A_2	C	D_1	D_2	L_1	L_2	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	9.5	5.0	8.0	25	30	19	80
190-**06-04**	3/8	1/4	15	16	12.5	8.0	5.0	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	16.0	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	16.0	11.0	16.0	34	43	30	250
190-**12-08**	3/4	1/2	20	22	21.5	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	40	46	36	400
190-**16-12**	1	3/4	22	20	27.5	22.0	16.0	42	44	36	400
190-**16-16**	1	1	22	22	27.5	22.0	22.0	42	46	36	460

■ Material : steel

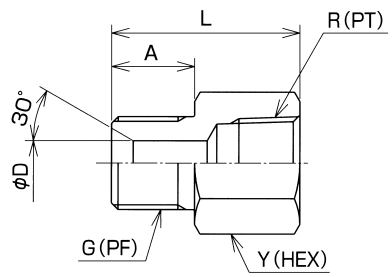
Stainless steel type

Part No.	G	R	A_1	A_2	C	D_1	D_2	L_1	L_2	Y (HEX)	Weight (g)
190-**02-02**-S	1/8	1/8	10	10	7.0	3.0	3.0	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



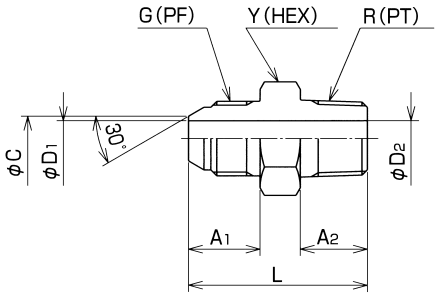
Part No.	G	R	A	C	D	L	Y (HEX)	Weight (g)
130-**02-02**	1/8	1/8	10	7.0	3.0	25	14	18
130-**04-04**	1/4	1/4	13	9.5	5.5	30	19	36
130-**06-06**	3/8	3/8	15	12.5	8.0	34	22	52
130-**08-08**	1/2	1/2	18	16.0	11.0	40	27	88
130-**12-12**	3/4	3/4	20	21.5	16.0	45	36	175
130-**16-16**	1	1	22	27.5	22.0	50	41	221

■ Material : steel

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

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

010



Part No.	G	R	A_1	A_2	C	D_1	D_2	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

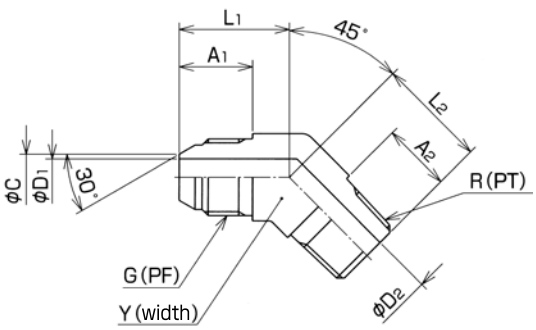
Stainless steel type

Part No.	G	R	A_1	A_2	C	D_1	D_2	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	A_1	A_2	C	D_1	D_2	L_1	L_2	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	14	14	7.5	5.0	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	14	18	7.0	5.0	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	16	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	19	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	20	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 steel type

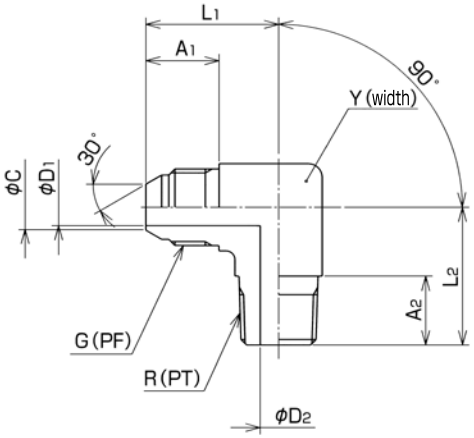
Part No.	G	R	A_1	A_2	C	D_1	D_2	L_1	L_2	Y (width)	Weight (g)
★ 045-**04-04**-S	1/4	1/4	14	13	7.5	5.0	5	22	20	17	40
★ 045-**06-06**-S	3/8	3/8	16	15	10.0	8.0	8	24	24	19	65
★ 045-**08-08**-S	1/2	1/2	19	18	13.0	11.0	11	27	27	24	100
★ 045-**12-12**-S	3/4	3/4	21	20	19.0	16.0	16	32	32	30	190
★ 045-**16-16**-S	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	A_1	A_2	C	D_1	D_2	L_1	L_2	Y (width)	Weight (g)
090-**02-02**	1/8	1/8	12	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	14	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	18	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	19	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

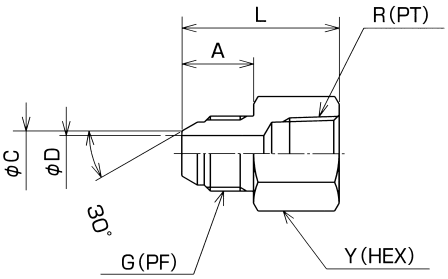
Stainless steel type

Part No.	G	R	A_1	A_2	C	D_1	D_2	L_1	L_2	Y (width)	Weight (g)
090-**02-02**-S	1/8	1/8	12	10	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	19	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	D	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

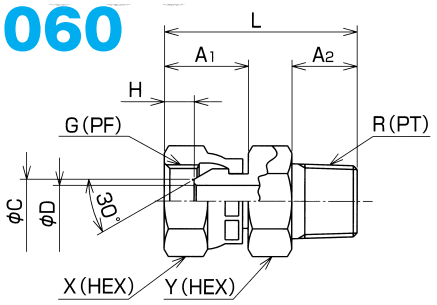
Stainless steel type

Part No.	G	R	A	C	D	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

060



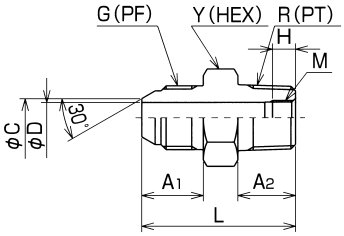
Part No.	G	R	A_1	A_2	C	Min. I.D. φD	H	L	X (HEX)	Y (HEX)	Weight (g)
060-**02-02**	1/8	1/8	16.0	11	5.0	2.8	3.0	35	14	14	25
060-**04-04**	1/4	1/4	17.0	13	7.0	5.0	5.5	38	19	19	50
060-**06-06**	3/8	3/8	19.0	15	10.0	7.2	6.5	44	22	22	80
060-**08-08**	1/2	1/2	23.5	18	13.2	11.0	9.5	52	27	27	115
060-**12-12**	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 screw type to equipment side] (with 30° male seat)

010 screw

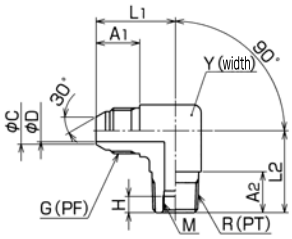


	Part No.	G	R	A_1	A_2	C	D	H	L	M	Y (HEX)	Weight (g)
★	010-**04-04**-001	1/4	1/4	14	13	7.5	5.5	6.0	35	M7×0.75	19	35
★	010-**06-06**-001	3/8	3/8	16	15	10.0	8.0	6.0	40	M9×0.75	22	55
★	010-**08-08**-001	1/2	1/2	19	18	13.0	11.0	7.5	47	M12×1	27	90
★	010-**12-12**-001	3/4	3/4	21	20	19.0	16.0	8.5	53	M17×1	36	170

■ Material : steel
★Made-to-order

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

090 screw

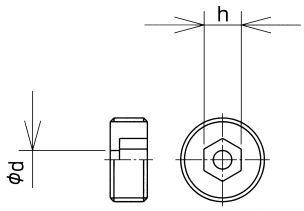


	Part No.	G	A_1	A_2	C	D	H	L_1	L_2	Y (width)	M	Weight (g)
★	090-**04-04**-001	1/4	14	13	7.5	5	6.0	24	27	17	M7×0.75	50
★	090-**06-06**-001	3/8	16	15	10.0	8	6.0	29	30	19	M9×0.75	90
★	090-**08-08**-001	1/2	20	22	13.0	11	7.5	33	38	24	M12×1	145
★	090-**12-12**-001	3/4	21	20	19.0	16	8.5	36	43	30	M17×1	260

■ Material : steel
★Made-to-order

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

Bolt for fixed screw adapter

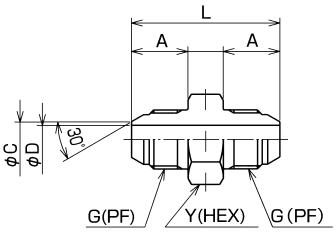


	Part No.	Adapter 1	Adapter 2	h	ϕd	Weight (g)
★	007-**04-0.5**	010-04-04-001	090-04-04-001	3	0.5	1.0
★	007-**04-0.7**	010-04-04-001	090-04-04-001	3	0.7	1.0
★	007-**04-1.0**	010-04-04-001	090-04-04-001	3	1.0	1.0
★	007-**04-1.5**	010-04-04-001	090-04-04-001	3	1.5	1.0
★	007-**04-2.0**	010-04-04-001	090-04-04-001	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

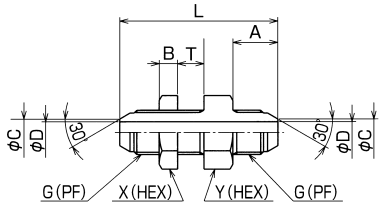


Part No.	G	A	C	D	L	Y (HEX)	Weight (g)
150-**02-02**	1/8	12	4.5	3.0	31	14	15
150-**04-04**	1/4	14	7.5	5.5	36	19	50
150-**06-06**	3/8	16	10.0	8.0	42	22	75
150-**08-08**	1/2	19	13.0	11.0	48	27	85
150-**12-12**	3/4	21	19.0	16.0	54	36	160
150-**16-16**	1	23	25.0	22.0	59	41	230

■ Material : steel

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

020 panel touch

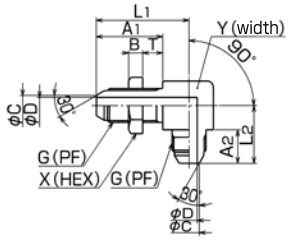


Part No.	G	A	B	C	D	L	T (max. panel thickness)	X (HEX)	Y (HEX)	Mounting nut	Weight (g)
★ 020-**04-04**-001	1/4	14	7.0	7.5	5	54	10	22	22	NP04	75
★ 020-**06-06**-001	3/8	17	7.0	10.0	8	60	10	24	24	NP06	105
★ 020-**08-08**-001	1/2	19	10.0	13.0	11	71	10	30	30	NP08	190
★ 020-**12-12**-001	3/4	21	10.0	19.0	16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

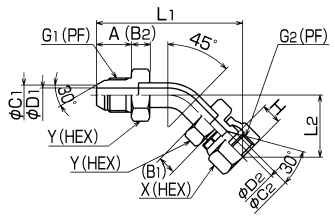


Part No.	G	A2	A2	B	C	D	L1	L2	T (max. panel thickness)	X (HEX)	Y (width)	Mounting nut	Weight (g)
★ 025-**04-04**	1/4	32	15	7.0	7.0	5.5	45	26	10	22	22	NP04	125
★ 025-**06-06**	3/8	33	16	7.0	10.0	8.0	46	29	10	24	24	NP06	160
★ 025-**08-08**	1/2	40	19	10.0	13.0	11.0	59	35	10	30	30	NP08	320

■ Material : steel
★Made-to-order

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

064

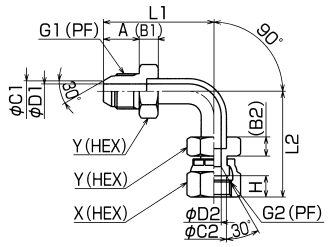


Part No.	G_1	G_2	A	B_1	B_2	C_1	C_2	D_1	D_2	H	L_1	L_2	X (HEX)	Y (HEX)	Pipe size	Weight (g)
★ 064-**04**	1/4	1/4	15	8.5	8.5	9.0	9.0	5.0	5.0	8.0	63	26	19	19	φ10×t2	85
★ 064-**06**	3/8	3/8	17	9.0	9.0	12.0	12.0	7.0	7.0	9.5	72	30	22	22	φ12×t2	120
★ 064-**08**	1/2	1/2	20	9.5	9.5	15.5	15.5	10.0	10.0	12.5	82	32	27	27	φ15×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	φ20×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	φ28×t3.5	515

■ Material : steel
★Made-to-order

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

069



Part No.	G_1	G_2	A	B_1	B_2	C_1	C_2	D_1	D_2	H	L_1	L_2	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	φ10×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	φ12×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	φ15×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	φ20×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	φ28×t3.5	565

■ Material : steel
★Made-to-order

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

Hose protection parts /

Specially-treated hoses

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.

special processed parts

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

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 5.

Guard spring

Features

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

Specification

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.

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)
YM07-**04**-MCH-1700L	04	15.3	1.6
YM07-**06**-MCH-1700L	06	19.1	2.0

For 1000, 1400, 1500 series

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

For 1100 series

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YM11-**04**-MCH-1700L	04	15.8	1.6
YM11-**06**-MCH-1700L	06	19.6	2.0
YM11-**08**-MCH-1700L	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**-MCH-1700L	02	11.6	1.4
YMS-**03**-MCH-1700L	03	15.4	1.6
YMS-**04**-MCH-1700L	04	18.2	2.0
YMS-**05**-MCH-1700L	05	19.6	2.0
YMS-**06**-MCH-1700L	06	21.2	2.0
YMS-**08**-MCH-1700L	08	25.1	2.0
YMS-**12**-MCH-1700L	12	34.9	2.6
YMS-**16**-MCH-1700L	16	39.1	2.6

For N3000, HT series

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YMS-**04**-MCH-1700L	04	18.2	2.0
YMSN-**06**-MCH-1700L	06	22.4	2.0
YMSN-**08**-MCH-1700L	08	26.2	2.0
YMSN-**10**-MCH-1700L	10	31.7	2.6

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

Part No.	Hose size	Spring O.D. (mm)	Spring wire diameter (mm)
YMSH-**03**-MCH-1700L	03	17.3	2.0
YMSH-**04**-MCH-1700L	04	20.5	2.0
YMSH-**06**-MCH-1700L	06	23.7	2.0
YMSH-**08**-MCH-1700L	08	28.1	2.6
YMSH-**12**-MCH-1700L	12	35.6	2.9
YMSH-**16**-MCH-1700L	16	43.2	2.9

Nylon spiral tube

Features

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

Specification

Material : nylon
Color : black

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

Working temperature range

Nylon : −40℃ to +105℃
Polyethylene : −40℃ to +85℃

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 × inner diameters (mm)	Thickness (mm)	Pitch (mm)	Recommended hose size
SPN-**06**-0-100M	5.5×4	0.75	10	02~04
SPN-**11**-0-50M	10.6×9	0.8	12	03~08
SPN-**18**-0-50M	16.6×15	0.8	18	08~16

Heat contraction tube

Features

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

Specification

Material : EPR
Color : black

Working temperature range

−50℃ to +80℃

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

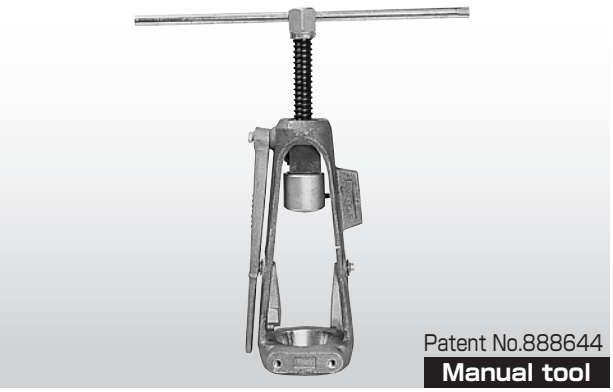
Part No.	Inner diameter before heat contraction (mm)	Inner diameter after heat contraction (mm)	Thickness after heat contraction (mm)
H990-NT**200**-5M	20	10.0	1
H990-NT**250**-5M	25	12.5	1
H990-NT**300**-5M	30	15.0	1
H990-NT**400**-5M	40	20.0	1

Hose assembly machine and tool,

Hose assembly tools

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



Features

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

Specification

Weight : 4kg
Size : W118 × L 118 × 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

Features

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

Specification

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 × L820 × H800mm

Assembling method ▶▶▶p.61

special jigs and tools

Hose assembly jigs and tools

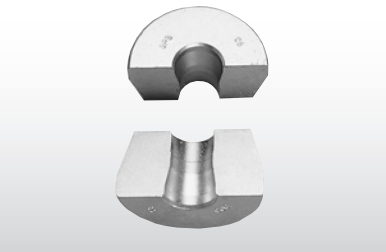
The followings are assembly jigs and tools for Mark 9 and 10.

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

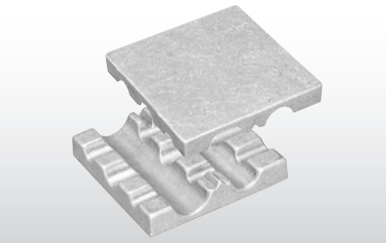
This can cut hoses from sizes 02 to 08.

Hose cutter

Part number : HC01

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

Holding die (vice block)



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

This is used to fix hoses in place.

☞ Use Size 02 at the position of 3/16 of HD01.

Assembly lubricant

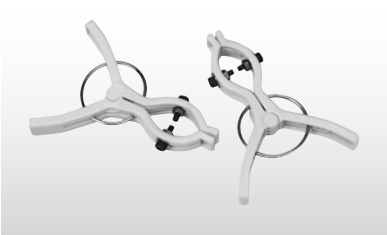
Part number :
For assembling steel connectors : PG3740 (Nihon Kohsakuyu) (lubricant color : green)
For assembling stainless connectors : CFH68 (Nisseki Mitsubishi) (lubricant color : yellow)
Content: 500 ml

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

⚠ CAUTION

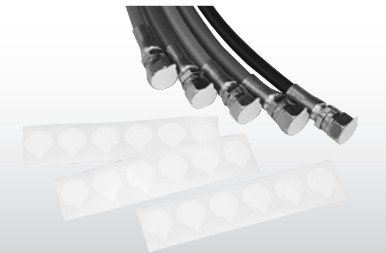
If the recommended lubricant is not applied, coating damage and/or socket buckling may occur.

Campucka coupling detachable jig



Part number : TRL

Hose coupling cap seal



☞ Contact us for details.

HC01 Handling Instructions

1. Fix the HC01 to a stable work surface.
2. Remove the blade fixing spring to open the cutter.
3. Set the hose into the U-shaped support.

⚠ CAUTION Do not use with any resin hoses other than the ones manufactured by Nitta.
⚠ WARNING Do not touch the cutting edge of the cutter. Also, do not place your hand near the cutting edge of the cutter. Doing so is dangerous because it may cause injury.

⚠ CAUTION Cut the hose so that the cut surface is at right angles. If the hose is cut diagonally, there is a risk of causing malfunction due to insufficient hose insertion.
⚠ CAUTION Avoid cutting a wire braid hose such as an 1100 series hose. It may cause nicks in the blade.

Use a commercially available wire cutter to cut a wire braid hose.

4. Push down the cutter handle to press-cut the hose.

⚠ CAUTION Do not use with any resin hoses other than the ones manufactured by Nitta.
⚠ WARNING Do not touch the cutting edge of the cutter. Also, do not place your hand near the cutting edge of the cutter. Doing so is dangerous because it may cause injury.

5. When not using the cutter or when temporarily stopping work, fix the blade in closed position with the blade fixing spring so that the blade is not exposed.

⚠ WARNING Leaving the cutter with the blade exposed or not closed with the fixing spring is very dangerous.

Hose assembly method

Campucka couplings

Hose Assembl ng 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 adapter to the equipment and the Campucka to the adapter with proper torque.

●proper torque (N-m)

Thread size	Taper thread, R thread	Parallel thread, G thread	Thread size	Taper thread, R thread	Parallel thread, G thread
1/8	10~15	15	3/8	45~50	34
1/4	25~30	25	1/2	60~70	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以上
1000-04、1400-04、F3130-04	350mm以上
1000-06、1400-06、F3130-06	400mm以上
1000-08、F3130-08	500mm以上

3 Hose cutting

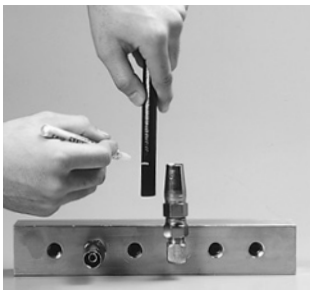
Use the specified hose cutter to cut the hose squarely.

⚠ WARNING
Do not touch the blade of the cutter.

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

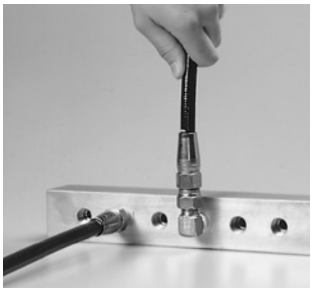
⚠ CAUTION
If the blade is blunt, the hose cut section becomes elliptic, causing pullout of the nipple O-ring on insertion and leakage. Change the cutter in this case.

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.

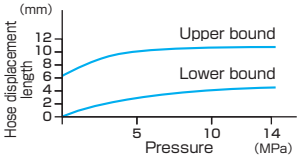
⚠ CAUTION If the hose is inserted in a tilted position, the inner part (gripper) may be deformed, interfering with the insertion.

6 Completing hose assembling

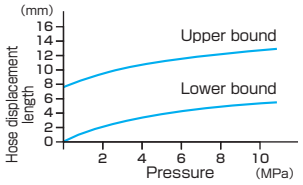
Pressurization swages the hose with an appropriate force according to the pressure.

●hose displacement by the pressurization

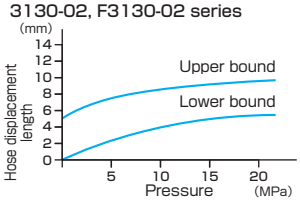
1000, 1400 series



3130-04/06/08 series

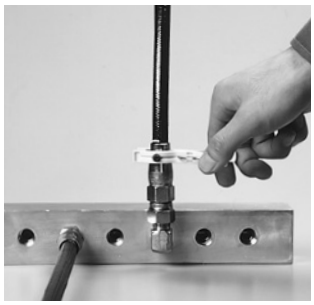


3130-02, F3130-02 series



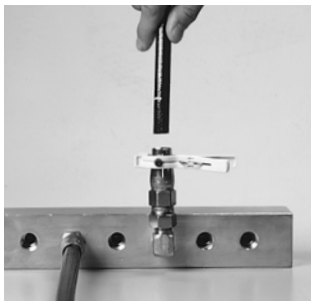
⚠ CAUTION Since displacement by the pressurization makes the hose longer, check for interference with the equipment and kinks in the hose.

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.

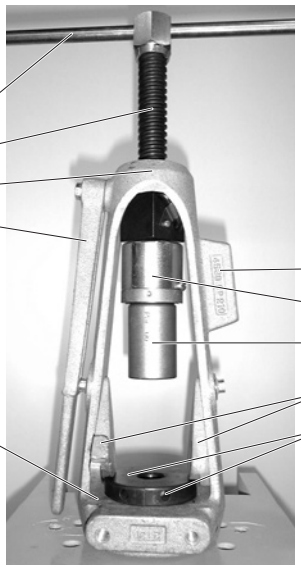
⚠ **CAUTION** The hose cannot be pulled out after pressurization. If it is forced, the inner part of the coupling could be damaged, causing pullout of the hose or leakage.

⚠ **CAUTION** The hose and the Campucka are not reusable once pressunzed.

* Do not pull the hose before pressurization.

Swage coupling (with Mark 10)

Setup and specifications



Specification

Weight : 4kg
Size : W118 × L 118 × H330mm
Material : aluminum die casting

There are two 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.

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.

* When cutting a wire braided hose such as 1100 series hose, secure the portion to be cut with plastic tape, etc. in advance in order to prevent the wire from breaking into pieces after cutting, and then cut the secured portion with a commercially available wire cutter, etc. Note that you need to remove the plastic tape before inserting the hose into a fitting.

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

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

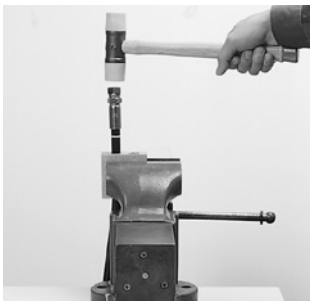
⚠ **CAUTION** If the blade is blunt, correct assembly is not possible. Change the hose cutter in this case.

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.

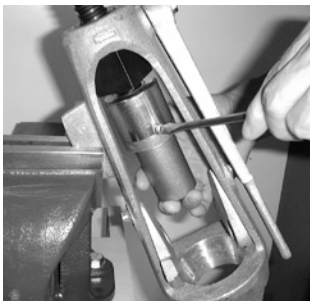
⚠ **CAUTION**
If the insertion is incomplete, pullout of the hose, leakage, or damage may occur.

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.

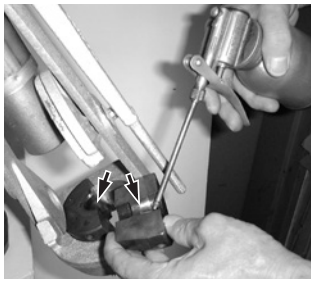
6 Attachment of pusher



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

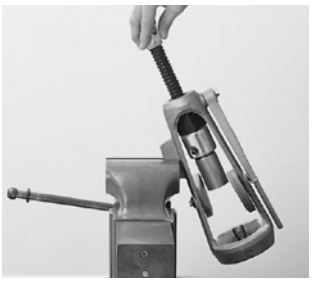


Apply lubricant to the inner surface of the die.

* lubricant...
  Steel coupling : Nihon Kosakuyu PG3740
  Stainless coupling :
  size 02-12 : JX Nippon Oil & Energy CFH68
  size 16 : JX Nippon Oil & Energy DPX100

⚠ 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

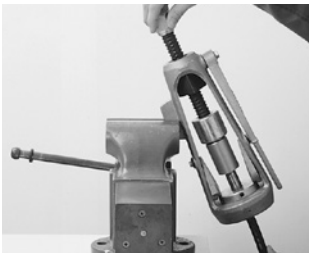
Insert the coupling, to which the hose is inserted, into the pusher.

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.

⚠ CAUTION
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

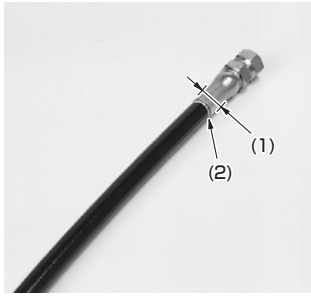
Un-install the die clamp, rotate the pressurization screw anti-clockwise to send the pusher up, and remove the hose assembly from the die. If it is difficult to remove the assembly, gently tap the die with the plastic hammer.

⚠ CAUTION
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



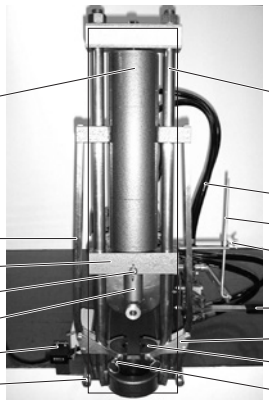
(1) Check the swage diameter (see p.81).
(2) Check the mark position of the hose insertion length.
(3) Check the appearance of the coupling. (Check for any damage or misalignment of the track of the die.)
(4) Check the appearance of the hose. (Check for any kink or cut.)

Should problems occur, do not use the hose assembly.

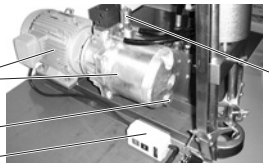
☞ For details such as maintenance, please read the instruction manual that comes with the product.

Swage coupling (with Mark 9)

Setup and specifications



Cylinder
Frame
Hydraulic hose
Valve guide pole
Valve stopper
Die guide
Pusher guide
Pusher fixing bolt
Pusher (sold separately)
Counter
Die guide roll
Operation lever
Die fixing arm
Die (sold separately)
Die fixing pin



Motor pump unit
Oil evacuation hole
(to change working oil)
Power switch
Air evacuation cap
(oil filler opening)

Specifications

Weight : 90kg
Size : 520×820×800mm
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 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.

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

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

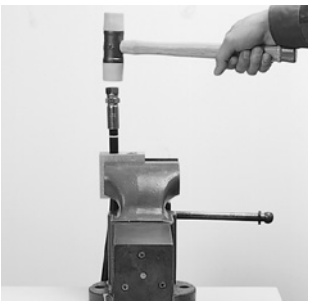
⚠ **CAUTION** If the blade is blunt, correct assembly is not possible. Change the hose cutter in this case.

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.

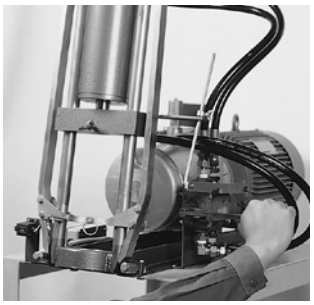
4 Preparation for the hose insertion



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 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.

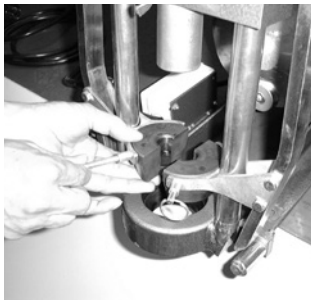
6 Attachment of pusher

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

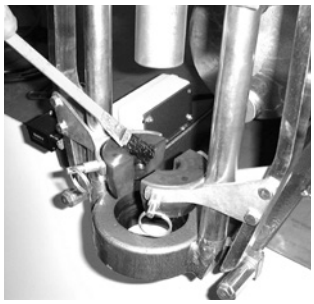


Attach the die onto the die fixing arm using the fixing pin.

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

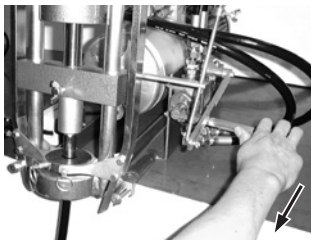
⚠ CAUTION
If the recommended lubricant is not applied, coating damage and/or socket buckling may occur.

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.

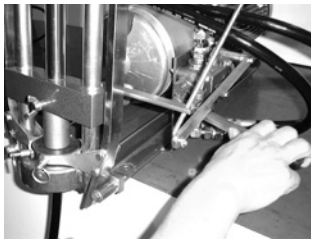
⚠ DANGER It is dangerous to hold the hose near the die base. The die could trap your hand.

⚠ 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.

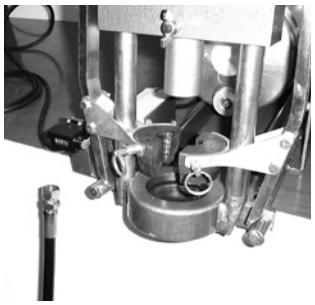
⚠ CAUTION
If you stop before the pusher touches the die, the swaging is insufficient and pullout of the hose or leakage may occur.

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.)

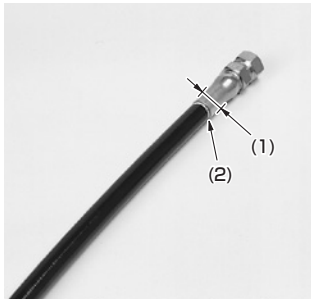
⚠ CAUTION
Pay strict attention to prevent the die from falling.

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 maintenance, please read the instruction manual that comes with the product.

Swage coupling (applicable to both Mark 10 and Mark 9)

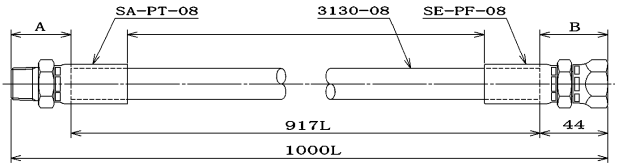
[Swage coupling] * For any couplings which are not introduced in the catalogue, please contact us.

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 × 1000L SA-PT-08 × 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

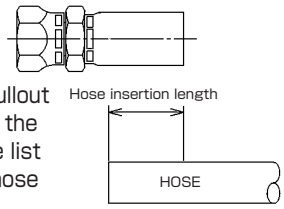


B Selection of pusher die

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.

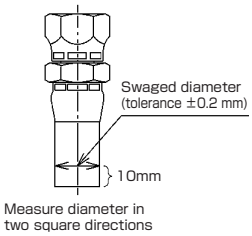
C Hose insertion length

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.



[Steel coupling]

Hose series	Hose size	Swage coupling part No.	A Coupling deduction length (mm)	B Pusher part No.	B Die part No.	C Hose insertion length (mm)	D Socket outer diameter after swaging (mm)
LB70	02	SSA-PT-02	26.0	PSA-02	SPLB70-02	12	8.5±0.1
		SSE-PF-02 SSF-PF-02	30.0	PSE-02-001			
LB70・LF70	04	SA-PT-04-14	32.0	PSA-04	SP14-04-07	19	12.4±0.1
		SE-PF-04-14 SF-PF-04-14	31.0	PSE-14-04			
LB70・LF70	06	SA-PT-06-14	33.0	PSA-06	SP14-06-07	22	15.6±0.1
		SE-PF-06-14 SF-PF-06-14	32.0	PSE-14-06			
LB70・LF70	08	SA-PT-08-14	37.0	PSA-08	SP14-08	24	19.5±0.2
		SE-PF-08-14 SF-PF-08-14	37.0	PSE-14-08			
LB70	10	SA-PT-10-N30	40.0	PSA-10	SP07-10	40	24.4±0.2
		SE-PF-10-N30 SF-PF-10-N30	44.0	PSE-10			
LB70	12	SA-PT-12	43.0	PSA-12	SP3-12	40	28.1±0.2
		SE-PF-12 SF-PF-12	47.0	PSE-12			
LB70	16	SA-PT-16	48.0	PSA-16	SP07-16	52	34.2±0.2
		SE-PF-16 SF-PF-16	53.0	PSE-16			
1000・1100・1400	04	SA-PT-04-14	32.0	PSA-04	SP14-04	19	12.7±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.1
		SE-PF-03-14 SF-PF-03-14	29.0	PSE-14-04			

Hose series	Hose size	Swage coupling part No.	A Coupling deduction length (mm)	B Pusher part No.	B Die part No.	C Hose insertion length (mm)	D Socket outer diameter after swaging (mm)
3130・34PW	02	SSA-PT-02	26.0	PSA-02	SP3-02-001	12	9.2±0.2
		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±0.2
		SE-PF-03 SF-PF-03	33.0	PSE-03			
	04	SA-PT-04	33.0	PSA-04	SP3-04	28	14.4±0.2
		SE-PF-04 SF-PF-04	36.0	PSE-04			
	05	SA-PT-05	35.0	PSA-06	SP3-05	28	16.0±0.2
		SE-PF-05 SF-PF-05	38.0	PSE-05			
	06	SA-PT-06	35.0	PSA-06	SP3-06	33	17.6±0.2
		SE-PF-06 SF-PF-06	39.0	PSE-06			
	08	SA-PT-08	39.0	PSA-08	SP3-08	37	21.5±0.2
		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±0.2
		SE-PF-12 SF-PF-12	47.0	PSE-12			
	16	SA-PT-16	48.0	PSA-16	SP3-16	52	34.5±0.2
		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±0.2
		SE-PF-04 SF-PF-04	36.0	PSE-04			
	06	SA-PT-06-N30	35.0	PSA-06	SPN-06	33	18.9±0.2
		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±0.2
		SE-PF-08-N30 SF-PF-08-N30	44.0	PSE-08			
	10	SA-PT-10-N30	40.0	PSA-10	SPN-10	40	26.2±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		SE-PF-16-3R SF-PF-16-3R	53.0	PSE-16			

Swage coupling (applicable to both Mark 10 and Mark 9)

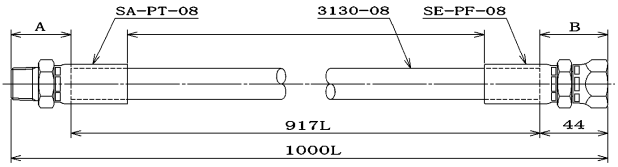
[Swage coupling] * For any couplings which are not introduced in the catalogue, please contact us.

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 × 1000L SA-PT-08 × 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

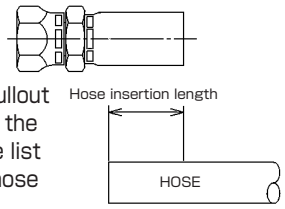


B Selection of pusher die

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.

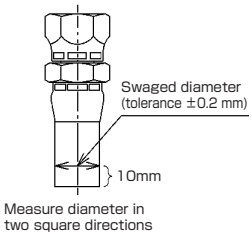
C Hose insertion length

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.



[Stainless steel coupling]

Hose series	Hose size	Swage coupling part No.	A Coupling deduction length (mm)	B Pusher part No.	B Die part No. First	B Die part No. Second	C Hose insertion length (mm)	D Socket outer diameter after swaging (mm)
1000・1100・1400	04	SA-PT-04-14-S	32.0	PSA-04	SPH-03	SP14-04	19	12.7±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		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±0.2
		SE-PF-16-S SF-PF-16-S	53.0	PSE-16				

Hose series	Hose size	Swage coupling part No.	A	B			C	D
			Coupling deduction length (mm)	Pusher part No.	Die part No. First	Die part No. Second	Hose insertion length (mm)	Socket outer diameter after swaging (mm)
N3000・HT	04	SA-PT-04-S	33	PSA-04	SP3-04-1-ST	SPN-04	28	14.6±0.2
		SE-PF-04-S	35	PSE-04				
	06	SA-PT-06-N30-S	34	PSA-06	SPH-06-1-ST	SPN-06	33	18.9±0.2
		SE-PF-06-N30-S	38	PSE-06				
	08	SA-PT-08-N30-S	39	PSA-08	SPH-08-1-ST	SPN-08	37	22.7±0.2
		SE-PF-08-N30-S	43	PSE-08				
3R80	04	SA-PT-04-3R-S	33	PSA-04	SPH-04-1-ST	SPH-04	28	17.2±0.2
		SE-PF-04-3R-S	35	PSE-04				
	06	SA-PT-06-N30-S	34	PSA-06	SPH-06-1-ST	SPH-06	33	20.1±0.2
		SE-PF-06-N30-S	38	PSE-06				
	08	SA-PT-08-N30-S	39	PSA-08	SPH-08-1-ST	SPH-08	37	23.0±0.2
		SE-PF-08-N30-S	43	PSE-08				
3R80・34PW	12	SE-PF-12-3R-S	47	PSE-12	SPH-12-1-ST	SPH-12	40	29.5±0.2
	16	SE-PF-16-3R-S	53	PSE-16	SPH-16-1-ST	SPH-16	52	37.8±0.2
34PW	04	SE-G-04-PW	36	PSE-04	SP3-04-VC	—	28	14.4±0.2
	06	SE-G-06-PW	39	PSE-06	SP3-06-VC	—	33	17.6±0.2
	08	SE-G-08-PW	44	PSE-08	SP3-08-VC	—	37	21.5±0.2
	12	SE-G-12-PW	47	PSE-12	SPH-12-1-ST	SPH-12-VC	40	29.5±0.2
	16	SE-G-16-PW	53	PSE-16	SPH-16-1-ST	SPH-16-37VC	52	37.0±0.2
	04	SE-G-04-PWL	31	PSE-04-PWL	SPP-04-VC	—	11	14.7±0.2
	06	SE-G-06-PWL	32	PSE-06-PWL	SPP-06-VC	—	11	18.0±0.2
	08	SE-G-08-PWL	39	PSE-08-PWL	SPP-08-VC	—	14	21.8±0.2
	12	SE-G-12-PWL	42	PSE-12-PWL	SPP-12-VC	—	21	29.6±0.2
	16	SE-G-16-PWL	45	PSE-16-PWL	SPP-16-VC	—	29	37.2±0.2

Reusable coupling

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

⚠ 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.

⚠ WARNING Do not touch the blade of the cutter.

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

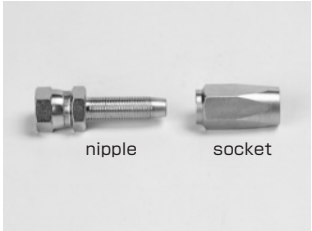
⚠ CAUTION If the blade is blunt, correct assembly is not possible. Change the hose cutter in this case.

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 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 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 maintenance, please read the instruction manual that comes with the product.

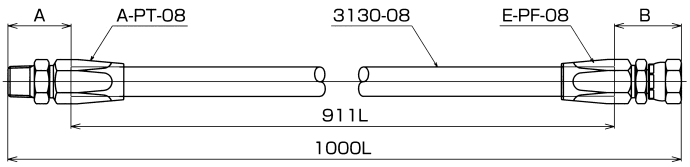
[Reusable coupling] * For any couplings which are not introduced in the catalogue, please contact us.

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 × 1000L SA-PT-08 × 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.

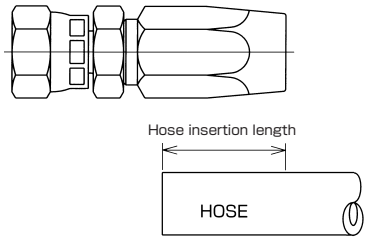


Table of hose screwing length

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	

Technical data

How to select a hose

How to read the catalog

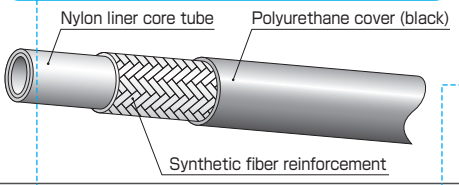
❶ ❷ ❸ ❹

N3130

Features

- **Flexible and tough**
- **JIS K 6375 A certificated, SAE100R7 certificated**

Nonconductive hose with high electrical insulation is also available.



Part No.	Size				Max. working pressure		Min. burst pressure		Min. bending radius	Weight	Coupling
	Size No.	I.D. (in.)	I.D. (mm)	O.D. (mm)	(MPa)	(PSi)	(MPa)	(PSi)	(mm)	(g/m)	
N3130-**03**	03	3/16	4.8	10.4	21.0	3,000	84.0	12,000	20	65	Swage
N3130-**04**	04	1/4	6.4	12.7	19.5	2,850	77.0	11,200	40	105	
N3130-**05**	05	5/16	8.1	14.7	17.5	2,550	70.0	10,200	45	130	
N3130-**06**	06	3/8	9.8	16.4	16.0	2,300	63.0	9,100	50	150	
N3130-**08**	08	1/2	12.8	20.3	14.0	2,000	56.0	8,000	75	210	
N3130-**12**	12	3/4	19.2	26.6	9.0	1,300	35.0	5,100	130	290	
N3130-**16**	16	1	25.7	33.4	7.0	1,000	28.0	4,000	165	400	

■ Appropriate fluid : mineral general operating oil
■ Working temperature range : −40 to +100℃
■ Length in a unit package : 100m for sizes 03, 04, 05, 06, 08, and 50m for sizes 12, 16

❺ ❻ ❼

❶ 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.72

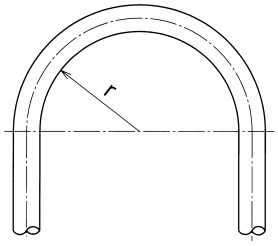
Pump intake and return line	0.5~1.5m/sec
Pressurization line	2.0~8.0m/sec

❷ 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.
Furthermore, an impact pressure may occur in the oil-hydraulic circuit in concurrence with the opening or closing of the circuit.
In general, the waveform of impact pressure can be a peak wave type (maximum working pressure × 150%) or trapezoidal waveform (maximum working pressure × 125% or × 133%).
Please consult us if the negative pressure is large, although a resin has a higher rigidity than rubber in general regarding negative pressure and there should be no problem as long as the negative pressure is small.

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 adapters. 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 adapters 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)

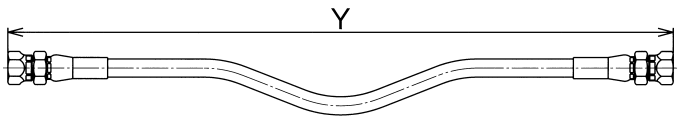
Using a hose at a temperature higher than the specification may cause thermal degradation and could shorten the hose life. Also using at a temperature lower than the specification could make the hose harder and frangible. When effects of atmospheric temperature, e.g. radiational heat, are expected, use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

How to determine the hose length

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.

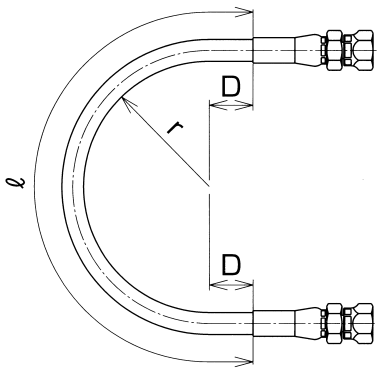
■Formula when using the hose in a straight line



$L = Y \times 1.03$

L : Length of hose assembly
Y : Working straight length

■Formula when using the hose in aU-line

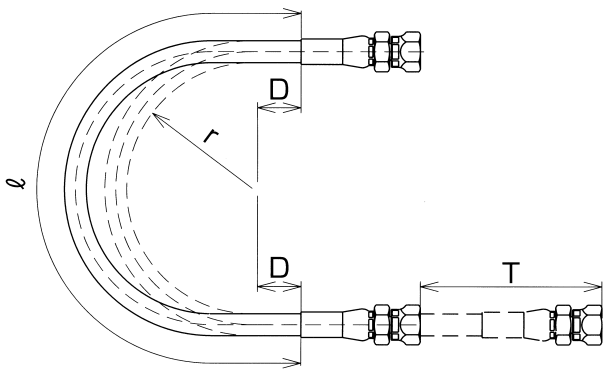


$\ell = \pi(r + D/2) + 2D$

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

How to select the hose size for given flow volume and velocity

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.

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

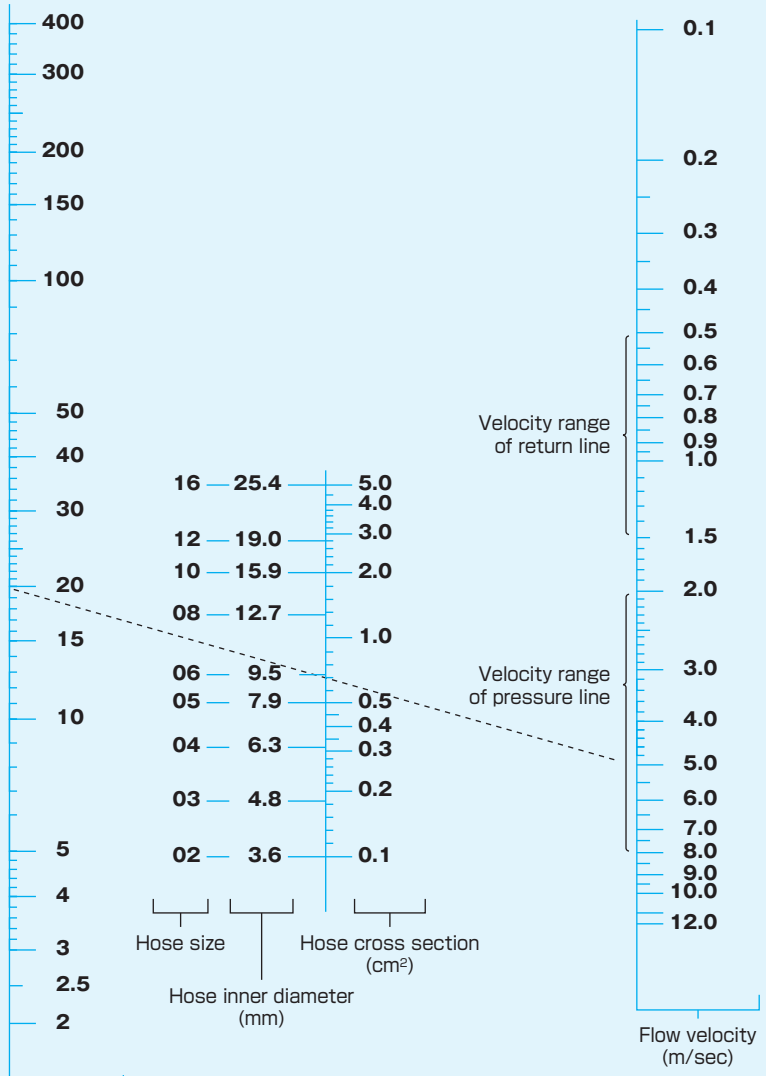
Therefore, if any two of the three are given, the rest is determined by this formula.

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 est (40℃).

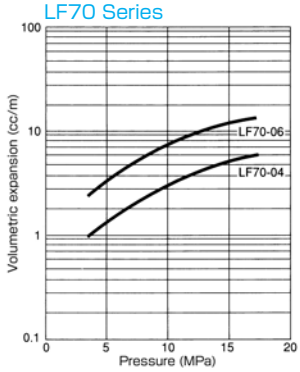
Graphs for cubical expansion of hoses

How to use the graph

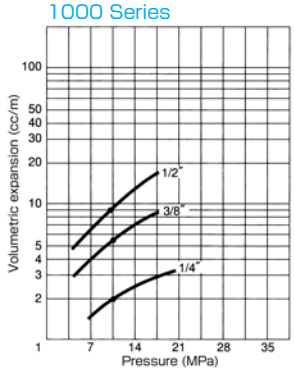
1. • represents the maximum working pressure
2. The hose size indicates inner diamete

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

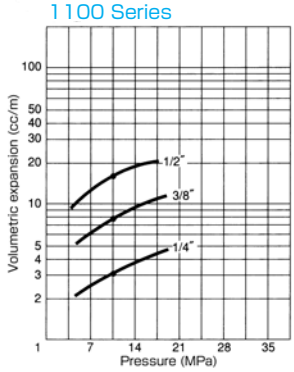
LF70 Series



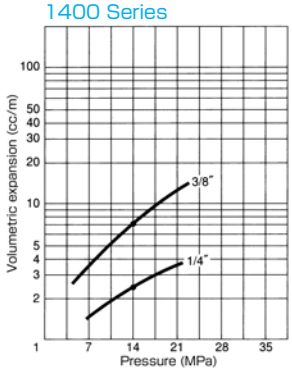
1000 Series



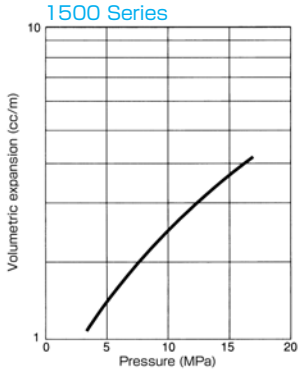
1100 Series



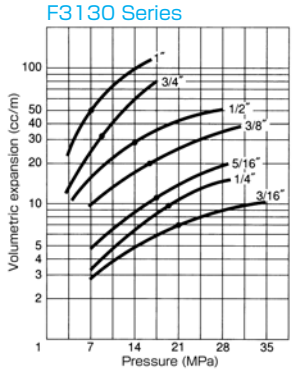
1400 Series



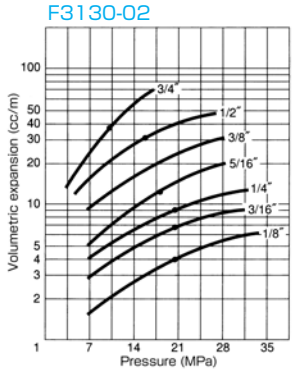
1500 Series



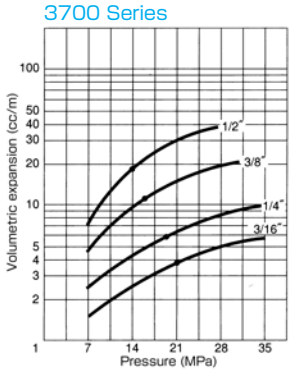
N3130 Series, F3130 Series



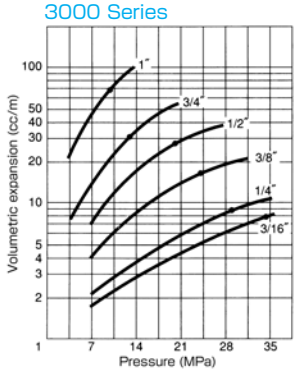
3130 Series, F3130-02



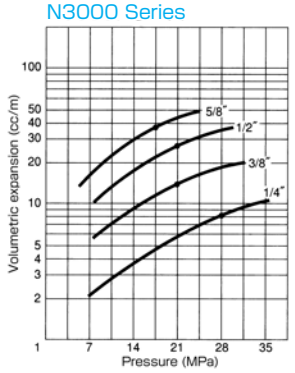
3700 Series



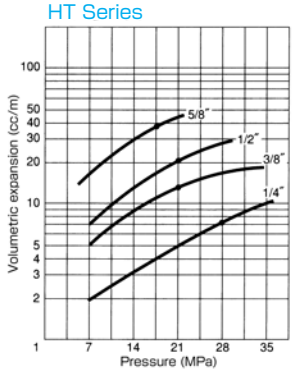
3000 Series



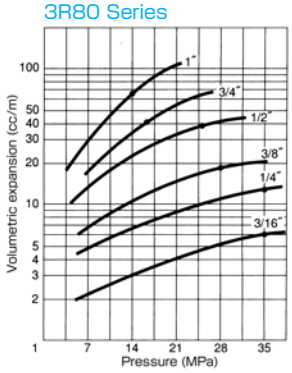
N3000 Series



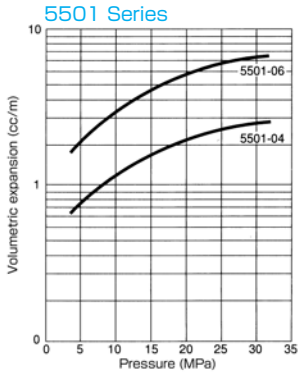
HT Series



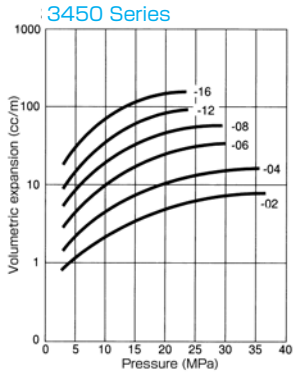
3R80 Series



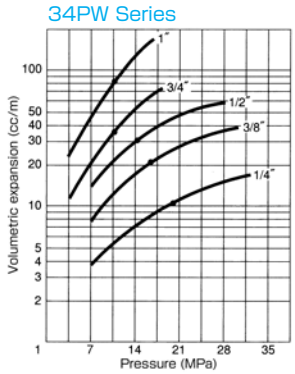
5501 Series



3450 Series



34PW Series



Tightening torque of hose couplings and adapters

[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 to 15N・m	25 to 30N・m	45 to 50N・m	60 to 70N・m	120 to 140N・m	140 to 160N・m

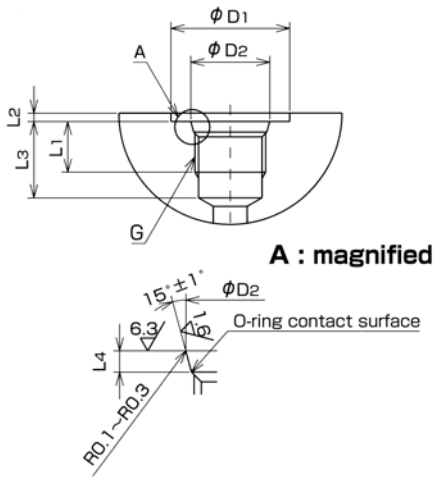
[Unified fine thread]

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)]



Thread name G	$D_1 \pm 0.3$	$D_1{}^{+0.1}_{0}$	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 adapter

1 Coupling

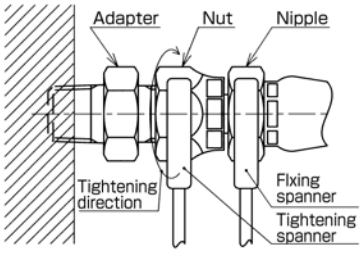
Tighten with your hand until the two sheets perfectly contact each other.

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

2 Fixing

Fix the adapter 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.



Reference

Technical standard for threads

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~6H	6~8g
Notation	A	B	3A	3B	2A	2B	1A	1B	4H~6H	6~8g

Expressional example

G 3/4-B

- Class
- Size
- Thread symbo

9/16-18 UNF-2B

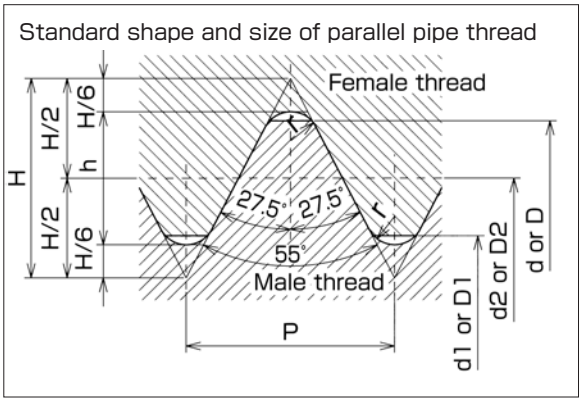
- Class
- Thread symbo
- Number of screw threads
- Thread size

M 18×1.5-2

- Class
- Pitch
- Thread size
- Thread symbo

[Parallel pipe thread] [JIS B0202]

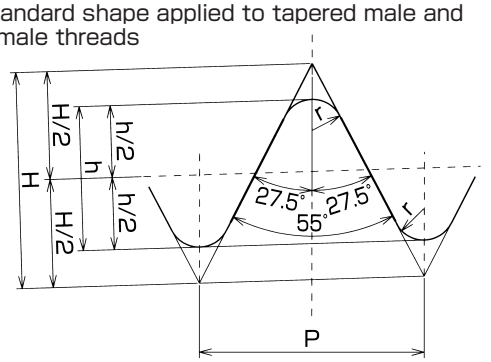
Standard shape and size of parallel pipe thread



Thread name	Number of screw threads (per 25.4 mm)	Pitch P (reference)	Height of thread h	Curvature of top	Male thread		
					Outer diameter d	Pitch diameter d_2	Root diameter d_1
					Female thread		
					Outer diameter d	Pitch diameter d_2	Root 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 B0203]

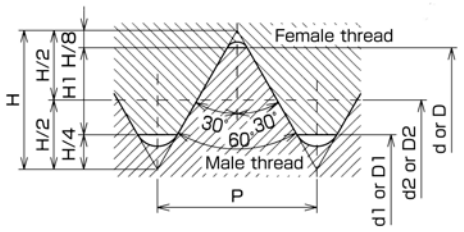
Standard shape applied to tapered male and female threads



Thread name (PT)	Thread: Number of screw threads (per 25.4 mm) n	Thread: Pitch P (reference)	Thread: Height of thread h	Thread: Curvature radius r or r2	Standard diameter: Male thread: Outer diameter d	Standard diameter: Male thread: Pitch diameter d2	Standard diameter: Male thread: Root diameter d1	Standard diameter: Female thread: Root diameter D	Standard diameter: Female thread: Pitch diameter D2	Standard diameter: Female thread: Inner diameter D1	Position of standard diameter: Male thread: From pipe edge: Standard length	Position of standard diameter: Male thread: From pipe edge: Tolerance along axis	Position of standard diameter: Male thread: At pipe edge: Tolerance along axis	Position of standard diameter: Female thread: At pipe edge: Tolerance along axis	Tolerance of D1, D2 and D1 of female thread	Length of useful thread: Male thread: From position of standard diameter to larger diameter part	Length of useful thread: Female thread: With incomplete thread part: Taper female thread: From position of standard diameter to smaller diameter part	Length of useful thread: Female thread: With incomplete thread part: Parallel male thread: From pipe or pipe coupling edge (reference)	Length of useful thread: Female thread: Without incomplete thread part: Taper female thread, parallel female thread: From standard diameter, pipe, pipe coupling edge	Size of carbon-steel pipe (reference): Outer diameter	Size of carbon-steel pipe (reference): Thickness
R1/8	28	0.9701	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 B0208]

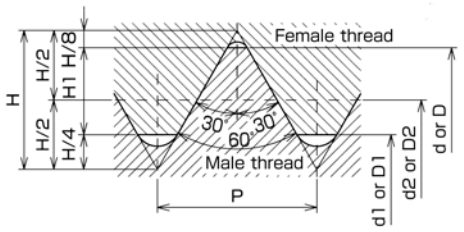
Standfud shape of unified fine thread



Thread name	Number of screw threads (per 25.4 mm) n	Pitch P (reference)	Height of engagement H1	Male thread: Outer diameter d	Male thread: Pitch diameter d2	Male thread: Root diameter d1	Female thread: Root diameter D	Female thread: Pitch diameter D2	Female thread: Inner diameter D1
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 threa] [JIS B0207]

Standard shape of metric fine thread



Thread name	Pitch P (reference)	Height of engagement H1	Male thread: Outer diameter d	Male thread: Pitch diameter d2	Male thread: Root diameter d1	Female thread: Root diameter D	Female thread: Pitch diameter D2	Female thread: Inner diameter D1
M12×1.5	1.5	0.812	12.000	11.026	10.376			
M14×1.5	1.5	0.812	14.000	13.026	12.376			
M16×1.5	1.5	0.812	16.000	15.026	14.376			
M18×1.5	1.5	0.812	18.000	17.026	16.376			
M20×1.5	1.5	0.812	20.000	19.026	18.376			
M22×1.5	1.5	0.812	22.000	21.026	20.376			
M24×1.5	1.5	0.812	24.000	23.026	22.376			
M30×1.5	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 ×1/4	←	←	←	←	←
	Test pressure		Maximum working pressure ×2	←	←	←	←	←
	Minimum burst pressure		Maximum working pressure ×4	←	←	←	←	←
	Working temperature range		−40℃ to +100℃	←	←	←	−40℃ to +93℃	←
	Fatigue resistance	Pressure	Maximum working pressure ×125%	Maximum working pressure ×133%	Maximum working pressure ×125%	Maximum working pressure ×133%	Maximum working pressure ×125%	Maximum working pressure ×133%
		Waveform	Square	←	←	←	←	←
		Frequency	150,000	200,000	150,000	200,000	150,000	200,000
		Oil temperature	93℃	←	←	←	←	←
		Cycle	30 to 75 cycle/min	←	←	←	←	←
		Oil type	Two types of JIS K2213 (turbine oil), ISOVG46 or equivalent	←	ISO 3448 of ISO VG46	←	No specification	←
	Change rate of length (at max. working pressure)		+3～−3%	←	←	←	←	←
Other performance	Low-temperature resistance		Bend hose at minimum bending radius, 8 to 12 sec after leaving it for 24 hr at −40℃. 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℃ under the ozone concentration 0.5 ppm.	←	←	←	Perform visual check at seven-fold magnification after leaving it for 70 hr at 40℃ 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℃ in No. 3 oil.	←	←	←	+35 to −15% of volume change rate after dipping for 70 hr at 100℃ in ASTM No.3.	←

Table of unit conversion

Length

m	in	foot	yard	mile
1	3.937×10	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}	1.2×10	1	3.3333×10^{-1}	1.9×10^{-4}
9.114×10^{-1}	3.6×10	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	3.5274×10
1.016×10^{3}	1	1.12	2.240×10^{3}	3.5838×10^{4}
9.072×10^{3}	8.9286×10^{-1}	1	2×10^{3}	3.2×10^{4}
4.536×10^{3}	4.464×10^{-4}	5×10^{-4}	1	1.6×10
2.835×10^{3}	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	1.4504×10	7.5006×10^{2}
9.8067×10^{4}	9.8067×10^{-2}	9.8067×10^{-1}	1	1.4223×10	7.3556×10^{2}
6.8948×10^{3}	6.8948×10^{-3}	6.4898×10^{-2}	7.0307×10^{-2}	1	5.1715×10
1.3332×10^{2}	1.3332×10^{-4}	1.332×10^{-3}	1.3595×10^{-3}	$1.934^{1}\times10^{-2}$	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

Class	Phenomena	Situations	Principle causes	How to deal with the problems
1 Hose breakage	Quick damage.	Large rupture of reinforcedlayer.	Insufficient pressure resistance.	Re-check the working pressure (impact pressure or relief set pressure) and reselect hose.
	Medium- and long-term damage.	Small rupture of reinforced layer.	Insufficient durability.	Re-check the working pressure and pressurization frequency and re-select hose.
	External damage.	Damage to reinforced layer due to abrasion of outer cover.	Contact with other edged object; continuous friction with other object due to movable piping or impact pressure.	①Re-check the hose piping and select better piping space (to prevent contact and friction). ②Use a cover (nylon spiral tube or guard spring, etc.) on the outer surface to protect it.
2 Hose deformation	External deformation.	Fatigue damage to inner layer due to hose deformation by external force.	Tramping or pressing of hose due to careless attachment to equipment or careless usage.	①Re-check the hose piping and select better piping space. ②Use protective items such as guard spring.
	Kink	Fatigue damage to inner layer due to hose bending.	Hose bending and piping at a radius smaller than the minimum bending radius due to careless attachment to equipment or careless usage.	①Re-check the hose piping. ②Select better piping space. ③Reduce bending with adapter.
	Twist	Fixing (attaching) a twisted hose will cause deformation, leading to rupture of the inner surface or reinforced layer by repeated pressurization.	Careless attachment to equipment.	①Re-check the hose piping. (There should be no twist at the marking point.) ②Select better piping space. ③Tighten properly when attaching it.
3 Hose expansion	Swelling or degradation.	Swelling or degradation of inner and outer surface due to a special type of fluid.	Improper chemical resistance of inner and outer material against fluid.	Re-check fluid and suitability of hose material and re-select a suitable hose product.
	Partial inner scrape.	Melting of inner surface and leakage from scraped area.	Swelling of inner surface due to jet flow in the pipe circuit.	Adjust the position of the throttle valve and hose piping to prevent direct flow to the hose inner surface.
	Melting of inner surface.	Partial melting of inner surface.	Pressurization will compress entrained air in the operating oil, generating heat.	Check air evacuation is performed.
4 Leakage or pullout at the coupling to the hose	Crack due to hardening of outer cover or inner tube.	Increase of atmospheric temperature or fluid temperature softens the inner and outer surface and reduces the durability of hose assembly.	Incorrect selection of hose for the working temperature.	Re-check the temperature of the atmosphere and fluid and re-select a suitable hose product.
	Leakage near coupling end, expansion of outer layer, or crack due to hardening of outer cover or inner tube.			
	Pullout of hose coupling.			
	Sharp bending at coupling end.	Fatigue damage of inner surface due to hose bending.	Hose bending and piping at a radius smaller than the minimum bending radius due to careless attachment to equipment or careless usage.	①Re-select the hose piping. ②Select better piping space. ③Reduce bending with adapter. ④Use protective items such as guard spring.
	Kink at coupling end.	Fixing (attaching) a twisted hose will cause deformation, leading to rupture of the inner surface or reinforced layer by repeated pressurization.	Careless attachment to equipment.	①Re-check the hose piping. (There should be no twist in the marking point.) ②Select better piping space. ③Tighten properly when attaching it.
5 Leakage at the junction of coupling to the equipment	Oil leakage from metal seal.	Non-uniform contact of sheet surface.	Careless attachment to equipment. (non-uniform contact)	Tighten it with your hand until the sheet surface completely contacts and tighten it using a torque wrench with the specified torque.
		Insufficient tightening.	Careless attachment to equipment. (insufficient tightening)	
		Sheet damage.	Careless attachment to equipment. (foreign particle caught in sheet surface)	After checking for foreign particles and scratches, attach it again.
		Protrusion or damage of O-ring.	Careless attachment to equipment. (foreign particle caught in O-ring port or wro O-ring size)	Re-select O-ring of correct size.
		Damage or impairment of thread.	Careless attachment to equipment. (foreign particle caught in thread part or overtorque)	After checking for foreign particles and scratches, tighten it again with the specified torque.

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 inlluence
△ = Further confirmation required
× = Not applicable
− = No data available

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

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 ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
2-Aminophenyl Disulfide	○	○	△	−	−	−	−	−
A Acetaldehyde	△	×	×	×	○	○	○	○
Acetic Acid (10%, 20℃)	△	○	×	○	△	×	△	○
Acetic Acid (50%, 20℃)	×	△	×	−	−	×	△	△
Acetic Acid (50%, 70℃)	×	×	×	−	−	×	△	△
Acetic Acid (100%, 20℃)	×	×	×	−	−	×	△	△
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	△	△	△	○	○	△	−	−

Chemical resistance list

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 ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
Amyl Borate	–	△	–	–	–	–	–	–
Amyl Naphthalene	–	△	–	–	–	–	–	–
Anethole	○	–	–	–	–	–	–	–
Aniline	×	×	×	△	×	×	△	△
Aniline Dyes	×	○	–	–	–	–	–	–
Animal oil (Lard oil)	○	○	○	○	○	×	–	△
Aqua Regia	×	×	×	–	–	–	–	–
Arsenic Acid	△	○	–	–	–	–	△	△
Asphalt	○	○	○	○	○	○	○	○
ASTM lubricant No.1	○	×	○	–	○	○	○	○
ASTM lubricant No.2	○	×	×	–	○	○	○	○
ASTM lubricant No.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℃)	×	○	×	○	△	×	–	△
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 ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
Chlorotoluene	×	×	–	–	–	–	–	–
Chromic Acid (2%, 70℃)	×	×	×	△	×	×	×	△
Chromic Acid (2%, 50℃)	×	×	×	–	×	×	×	△
Chromic Acid (10%, 70℃)	×	×	×	–	×	×	×	△
Chromic Acid (25%, 70℃)	×	×	×	–	×	×	×	△
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	△	×	×	–	–	○	–	–
Diezthanol 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℃)	–	–	–	–	–	–	–	–
Dowtherm (200℃)	–	–	–	–	–	–	–	–
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℃)	×	△	×	○	△	○	△	△

Chemical resistance list

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 ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
Formic acid (25%, 20℃)	×	○	×	○	×	×	△	○
Formic acid (50%, 20℃)	×	○	×	–	–	×	△	○
Formic acid (90%, 20℃)	×	△	×	–	–	×	△	○
Freon11	△	–	–	△	△	○	○	○
Freon12	△	–	–	△	△	○	○	○
Freon21	△	–	–	△	△	○	○	○
Freon22	△	–	–	△	△	○	○	○
Freon113	△	–	–	△	△	○	○	○
Freon114	△	–	–	△	△	○	○	○
Furan	×	–	–	–	–	–	–	–
Furfural	×	×	×	–	–	△	△	△
Furfuryl Alcohol	○	○	○	○	○	–	–	–
G Gasoline	○	△	×	△	○	○	○	○
Gelatine	○	○	○	○	○	△	○	○
Glucose	○	○	○	○	○	○	○	○
Glue	○	○	–	○	○	○	–	△
Glycerine	○	○	△	○	○	○	○	○
Grease	○	△	△	○	○	○	○	○
H Heavy water	○	○	○	–	–	–	–	–
Heptane	○	×	○	△	○	○	○	○
Hexane	○	×	△	△	○	○	△	△
Hexyl Alcohol	△	△	–	–	–	–	–	–
Hydrazine	△	△	–	–	–	–	–	–
Hydrobromic Acid (20%, 20℃)	△	○	–	–	–	–	×	×
Hydrobromic Acid (20%, 70℃)	×	△	–	–	–	–	×	×
Hydrobromic Acid (37%, 20℃)	△	○	–	–	–	–	×	×
Hydrochloric (10%, 20℃)	△	○	×	○	×	×	×	×
Hydrochloric (20%, 20℃)	×	△	×	–	×	×	×	×
Hydrochloric (20%, 80℃)	×	×	×	–	×	×	×	×
Hydrochloric (38%, 20℃)	×	×	×	–	×	×	×	×
Hydrocyanic Acid	×	○	–	○	–	×	–	○
Hydrofluoric Acid (10%, 20℃)	×	△	×	△	×	×	×	×
Hydrofluoric Acid (20%, 20℃)	×	△	×	–	×	×	×	×
Hydrofluoric Acid (40%, 20℃)	×	△	×	–	×	×	×	×
Hydrofluoric Acid (Anhydrous)	×	×	×	–	–	×	–	×
Hydrogen	○	○	○	○	○	○	○	○
Hydrogen Peroxide (5%, 20℃)	○	○	△	○	○	×	△	△
Hydrogen Peroxide (5%, 50℃)	△	△	×	–	–	×	△	△
Hydrogen Peroxide (30%, 20℃)	×	△	×	△	×	×	△	△
Hydrogen Sulfide	△	○	–	○	△	△	△	△
Hydroquinone	○	○	–	–	–	–	–	–
Hypochlorous acid	△	○	×	–	–	–	–	–
I Isobutyl Alcohol	△	○	–	–	–	–	–	–
Isocyanates	○	○	○	–	–	–	–	–
Isooctane	○	×	×	–	○	○	△	△
Isopropyl Acetate	○	×	△	×	△	○	–	△
Isopropyl Alcohol	△	○	–	–	–	○	△	△
Isopropyl Ether	△	△	–	–	–	○	△	△
J JP fuel oil (1～6)	△	×	△	–	○	○	○	○
K Kerosene	○	△	○	–	–	–	○	○
Ketones	○	○	△	×	△	○	△	△
L Lacquer	△	△	△	×	△	△	–	–
Lactic Acid	△	△	–	○	○	△	△	△
Lard oil	○	○	○	○	○	○	–	△
Lead Acetate	○	○	–	–	–	×	△	–
Lead Arsenate	○	○	○	○	○	–	–	–
Lead Nit rate	○	○	–	–	–	–	–	–
Lead Sulfamate	○	○	–	–	–	–	–	–
Lead Sulfate	○	○	○	○	○	×	–	△
Linoleic acid Dipentene	△	△	–	–	–	–	–	–

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Chemicals (Weight concentration %, Temperature ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
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 (MIBK)	△	△	×	×	△	△	–	△
MethyiEethyl Ketone (MEK)	△	△	×	×	△	○	△	△
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℃)	×	○	×	○	△	×	△	○
Nitric acid (10%, 70℃)	×	△	×	–	–	×	△	○
Nitric acid (30%, 20℃)	×	△	×	○	×	×	△	○
Nitric acid (30%, 70℃)	×	×	×	–	×	×	△	○
Nitric acid (61%, 20℃)	×	×	×	–	×	×	△	○
Nitric acid (fuming, 20℃)	×	×	×	–	×	×	△	○
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	–	–	–	–	–	–	–	–

Chemical resistance list

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Chemicals (Weight concentration %, Temperature ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
Phosphoric Acid (50%, 20℃)	△	○	×	○	×	△	△	△
Phosphoric Acid (50%, 70℃)	×	○	×	–	×	×	△	×
Phosphoric Acid (75%, 20℃)	×	○	×	–	–	×	△	△
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 Permanganate (5%, 20℃)	×	△	×	○	–	△	△	△
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 (10%, 20℃)	○	○	×	○	△	△	△	△
Sodium Hydroxide (30%, 20℃)	○	○	×	–	–	–	–	–
Sodium Hydroxide (30%, 70℃)	×	×	×	–	–	–	–	–
Sodium Hypochlorite (5%, 20℃)	×	○	×	○	△	×	×	△
Sodium Hypochlorite (5%, 70℃)	×	△	×	–	–	×	×	△
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	×	×	×	△	△	△	–	△
Sulfur Trioxide	△	○	×	○	×	△	△	△

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Chemicals (Weight concentration %, Temperature ℃)	Hose materials					Hose couplings / Adapters		
	Nylon	Polyolefi	Urethane	PVC	Polyester	Steel	SUS304	SUS316
Sulfuric Acid (10%, 20℃)	△	△	×	△	×	×	×	×
Sulfuric Acid (10%, 70℃)	×	△	×	–	–	×	×	×
Sulfuric Acid (30%, 20℃)	×	△	×	△	×	×	×	×
Sulfuric Acid (30%, 70℃)	×	×	×	–	–	×	×	×
Sulfuric Acid (98%, 20℃)	×	×	×	–	–	×	×	×
Sulfuric Acid (fuming, 20℃)	×	×	×	–	–	×	×	×
Sulfurous Acid	×	×	×	△	△	△	△	△
T Table Salt (Common Salt)	○	○	○	○	○	△	△	△
Tannic Acid	○	○	△	○	△	△	△	△
Tartaric acid	△	○	○	○	○	△	△	△
Terpineol	○	×	–	–	–	–	–	–
TetrachloroEthane	△	×	–	–	–	–	–	–
Tetraethyl Lead	△	△	–	–	–	–	–	△
Tetrahydro Furan	△	×	–	–	–	–	–	–
Tetraline	△	×	–	–	–	–	–	–
Tetrametyl Lead	○	–	○	–	○	–	–	–
Thionyl Chloride	×	×	–	–	–	–	–	–
Toluene	△	×	×	×	△	○	○	○
Triacetine	–	–	–	–	–	–	–	–
Tributoxyethyl Phosphate (TBEP)	○	–	–	–	–	–	–	–
Tributyl Phosphate (TBP)	○	×	△	×	△	○	–	○
Trich loroacetate	×	△	×	△	×	–	△	△
Trichloroethylene	△	×	×	△	×	○	–	○
Tricresyl Phosphate (TCP)	○	×	△	–	–	–	–	–
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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