

SUS316 Equivalent Ball Valve for

chemical and mixed gases



Feature

Option for 10 series - compact body

☑ Fitting attached type ... SUS316 Push-in fitting designed for 10 series

☑ Handle Option ... Butterfly handle for **Space saving**



Feature

30 series

3 piece structure/Full bore

3 piece structure ⇨ Easy maintenance by retightening nuts !

Max service pressure **1000psi (6.9MPa)** ⇨ **Wide range of use**



Ball Valve feature

SUS316 equivalent is used for liquid contacting part

※) SUS316 or CF8M



The stem does not come off

Structure preventing stem from detachment

Model Designation (Example)

NSBVF ① - **30** ② - **04** ③

③. Female thread size

Code	02	03	04
Size	Rc1/4	Rc3/8	Rc1/2

*Rc stands for BSP female thread

②. Construction

Code	10	30
Construction	1 piece, reduced bore	3 pieces, full bore

①. Stainless Steel Ball Valve SUS316 equivalent

Option for 10 series Ball Valve

■ SUS316 equivalent Ball Valve comes with SUS316 Push-in Fitting models

NSBV ① - **10** ② - **44** ③

③. Tubing O.D. size


Code	44	66	88	1010	1212	1616
Tubing O.D. (mm)	ø4 (5/32")	ø6	ø8 (5/16")	ø10	ø12	ø16 (5/8")

※) Fittings and a valve are packaged separately in a box. Fittings should be installed by yourself.

②. Construction

Code	10
Construction	1 piece, reduced bore

①. SUS316 equivalent Ball Valve comes with SUS316 Push-in Fitting models



■ SUS316 Push-in Fitting for SUS316 equivalent Ball Valve

SSPC ① - **8** ② - **03** ③ - **M** ④

④. Specialized for 10 series of SUS316 equivalent Ball Valve Sealing by O-ring style

③. Thread size

Code	02	03	04
Size	R1/4	R3/8	R1/2

②. Tubing O.D.

Code	4	6	8	10	12	16
Tubing O.D. (mm)	ø4 (5/32")	ø6	ø8 (5/16")	ø10	ø12	ø16 (5/8")

①. SUS316 Push-in Fitting Straight type

■ Butterfly Handle option

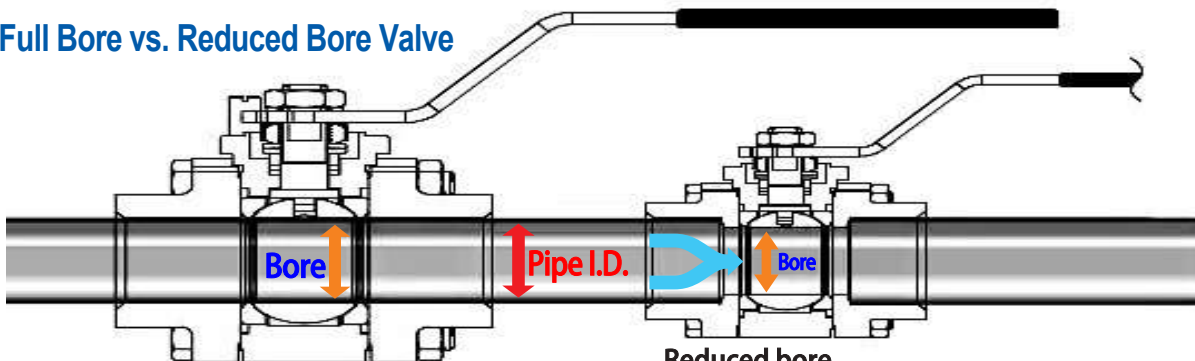
NSBL10 ① - **02** ②

③. Valve body size

Code	02	03	04
Female thread	Rc1/4	Rc3/8	Rc1/2

①. Butterfly Handle for 10 series of SUS316 equivalent Ball Valve

Full Bore vs. Reduced Bore Valve



Full bore

The I.D. of the valve is equal to the I.D. of the pipe. There is no flow restriction.

Reduced bore

The I.D. of the valve is smaller than the I.D. of the pipe. The flow is restricted by the bore of the valve. The body is compact and less expensive than the full bore valve.

Specification

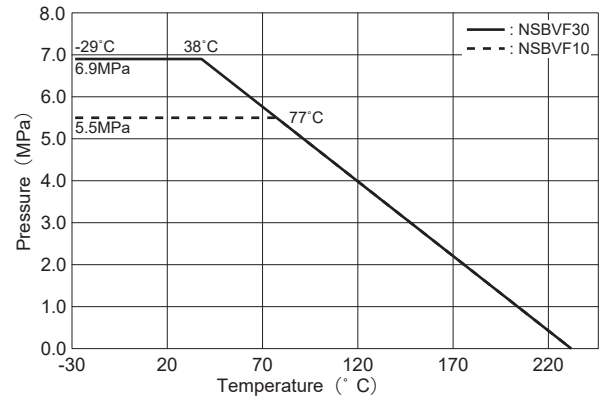
Fluid medium	Air, Inert gas such as Nitrogen/ Helium (no toxic), Water/ Liquid (*1) , Other (*1)
Max. operating pressure (*2)	NSBVF10 model : 800psi (5.5MPa) at temp. range -20~170°F (-29~77°C) NSBVF30 model : 1000psi (6.9MPa) at temp. range -20~100°F (-29~38°C)
Max. Vacuum	-29.8 in.Hg (-101kPa)
Operating temp. range (*2)	-20~450 °F (-29 ~ +232°C) (No Freezing of liquid)

△ Warnings

*1. Conditions when fluid medium is liquid or chemical.

1. Surge pressure must be controlled lower than maximum operating pressure when using with water and other liquids.
2. The specification above may not be applied, depending on chemicals or mixed gases used as fluid medium. Make sure to use PISCO products after verifying their suitability on the user side.
3. Liquid and chemicals are limited to those with no effect to valve material.

*2. Valve maximum operable pressure varies upon operating temperature. Please refer to the "Relation of Operating Temp. & Max. Operating Pressure" graph when use and operate in the condition.



Relation of Operating Temp. & Max. Operating Pressure

■ SUS316 Tube Fitting Specification

Fluid medium	Air / Water(※) / Others (chemicals) (※)
Max. operating pressure	145psi (1.0MPa)
Max. vacuum	-29.5 inHg (-100kPa)
Operating temp. range	23 ~ 300°F (-5 ~ 150°C) (No freezing)

△ Warning

※ . Make sure to follow the instructions below when the fluid medium is water or liquid.

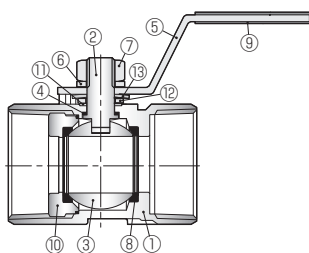
Surge pressure must be controlled lower than max. operating pressure when using water or liquid as a fluid medium.

Σ Be sure to place Insert Ring into the tube edge when using water or liquid as a fluid medium.

% The specification above may not be applied, depending on the kind of chemicals or mixed gases used as fluid medium. Make sure to use PISCO products after verifying their suitability on the user side.

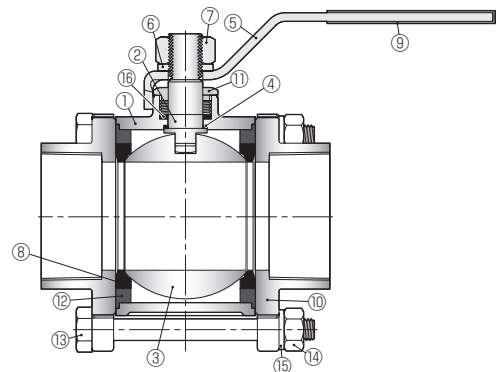
Construction

■ NSBVF10



No.	Parts	Material
①	Body	SUS316 equivalent
②	Stem	SUS316 equivalent
③	Ball	SUS316 equivalent
④	Thrust washer	PTFE
⑤	Handle	SUS304 equivalent
⑥	Handle washer	Stainless steel
⑦	Handle nut	Stainless steel
⑧	Ball seat	PTFE
⑨	Handle cover	PVC
⑩	Seat retainer	SUS316 equivalent
⑪	Gasket	PTFE
⑫	Washer	SUS304 equivalent
⑬	Disc spring washer	SUS304 equivalent

■ NSBVF30



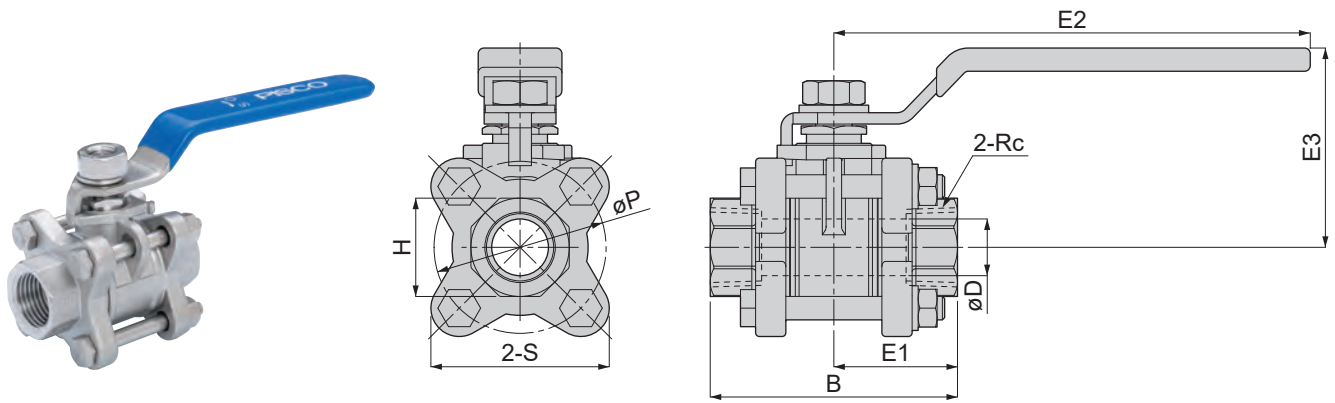
No.	Parts	Material
①	Body	SUS316 equivalent
②	Stem	SUS316 equivalent
③	Ball	SUS316 equivalent
④	Thrust washer	PTFE
⑤	Handle	SUS304 equivalent
⑥	Handle washer	Stainless steel
⑦	Handle nut	Stainless steel
⑧	Ball seat	PTFE
⑨	Handle cover	PVC
⑩	Cover/Body	SUS316 equivalent
⑪	Gland nut	Stainless steel
⑫	Retainer seal	PTFE
⑬	Bolt	Stainless steel
⑭	Nut	Stainless steel
⑮	Spring washer	Stainless steel
⑯	Gland washer	PTFE

※) Other class of stainless steel is to be used for no liquid contact portions

SUS316 equivalent - Ball Valve

Dimensions

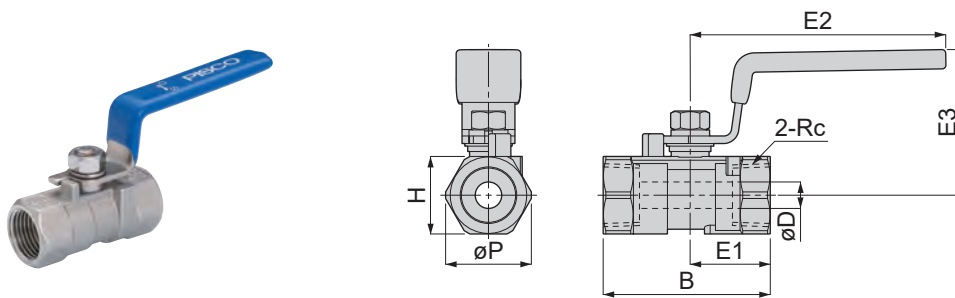
NSBVF30 3-piece construction, Full bore (30 series)



Unit : mm

Model	ϕD	Rc	B	ϕP	E1	E2	E3	Hex. H	S	Wight (g)	Price (\$)
NSBVF30-02	9.5	Rc1/4	60.0	40.0	30.0	107±1.5	48.0±1.5	22.0	41.3	377	52.73
NSBVF30-03	9.5	Rc3/8	60.0	40.0	30.0	107±1.5	48.0±1.5	22.0	41.3	363	52.73
NSBVF30-04	15.0	Rc1/2	65.4	45.5	32.7	126±1.5	52.7±1.5	26.0	47.2	516	52.82

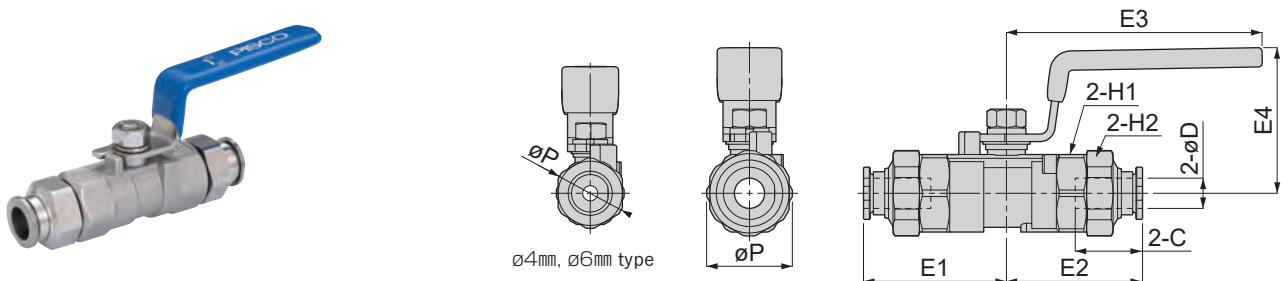
NSBVF10 1-piece construction, Reduced bore (10 series)



Unit : mm

Model	ϕD	Rc	B	ϕP	E1	E2	E3	Hex. H	Weight (g)	Price (\$)
NSBVF10-02	5.0	Rc1/4	39.4	17.9	19.3	63.4±1.5	33.5±1.5	16.5	62	18.00
NSBVF10-03	7.0	Rc3/8	44.2	22.7	21.2	67.6±1.5	38.5±1.5	20.5	94	19.82
NSBVF10-04	9.2	Rc1/2	56.6	27.3	27.5	91.5±1.5	44.5±1.5	24.5	171	23.73

NSBV10 SUS316 equivalent 10 series models with SUS316 push-in fittings

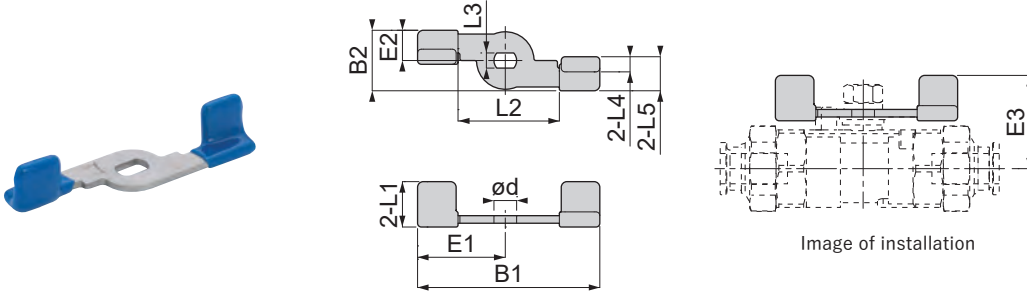


Unit : mm

Model	Tubing O.D. ϕD	ϕP	Tube End C	E1	E2	E3	E4	Hex. H1	Hex. H2	Weight (g)	Orifice dia. (ϕ mm)	Price (\$)
NSBV10-44	4	18.6	14.9	30.95	30.05	63.4±1.5	33.5±1.5	16.5	17	94	3	47.27
NSBV10-66	6	18.6	16.8	34.1	33.2	63.4±1.5	33.5±1.5	16.5	17	100	5	49.09
NSBV10-88	8	22.7	17.8	37.8	36	67.6±1.5	38.5±1.5	20.5	21	151	6	54.55
NSBV10-1010	10	22.7	19.7	39.5	37.7	67.6±1.5	38.5±1.5	20.5	21	153	7	67.73
NSBV10-1212	12	27.3	23.3	48.1	46.5	91.5±1.5	44.5±1.5	24.5	24	267	9.2	82.73
NSBV10-1616	16	27.3	24	54.65	53.05	91.5±1.5	44.5±1.5	24.5	24	279	9.2	92.73

※) The dimensions of E1 and E2 of with fittings being installed.

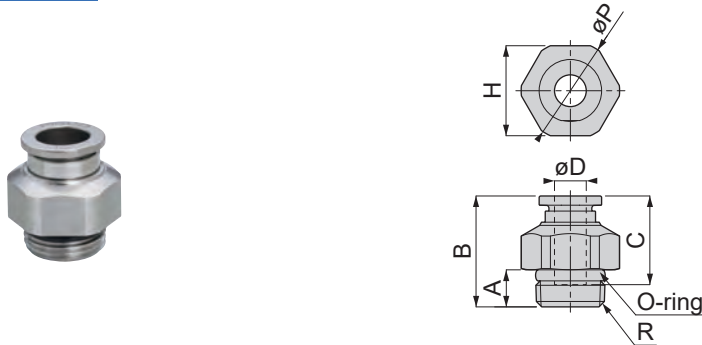
NSBL Butterfly lever for SUS316 equivalent Ball Valve 10 series models



Unit : mm

Model	B1	B2	L1	L2	L3	L4	L5	E1	E2	E3	ød	Weight (g)	Price (\$)
NSBL10-02	43.4	14	12	23.6	3.1	4	8	21.7	7	22	5	6.6	3.64
NSBL10-03	48.2	16	12	26.8	4	4	9	23.2	8	24.7	6	8.4	3.82
NSBL10-04	63	18	14	28	5	4	10	31.5	9	28.9	8	12.2	4.09

SSPC SUS316 fitting for SUS316 equivalent 10 series models



Unit : mm

Model	Tubing O.D. øD	R	A	B	øP	Tube End C	Hex. H	Weight (g)	Orifice dia. (ømm)	Price (\$)
SSPC4-02M	4	R1/4	7	17.8	18.6	14.9	17	16	3	17.27
SSPC6-02M	6	R1/4	7	21	18.6	16.8	17	19	5	18.18
SSPC8-03M	8	R3/8	7	21.8	22.6	17.8	21	29	6	20.91
SSPC10-03M	10	R3/8	7	23.5	22.6	19.7	21	30	8.5	28.64
SSPC12-04M	12	R1/2	9	28	26.4	23.3	24	48	11	35.00
SSPC16-04M	16	R1/2	9	34.6	26.4	24	24	55	13	36.36

⚠ Warnings

1. When the fluid medium is chemicals, solvents or mixed gases, check the chemical resistance before using the products. Damage or leakage may occur to the valve upon the usage.
2. Do not use the valve in applications that cause shaking or shocking. Damage or leakage may occur to the valve upon usage.
3. Do not use the products in environments that have vibration or shocking. Damage or leakage may occur to the valve upon usage.
4. Use soapy water or any other method to check for leakage before use.
5. After installation, carry out maintenance and leakage inspections periodically, considering the environment on frequency, temperature, fluid flow rate, pressure, fluid medium, etc. Danger to human life can occur from oxygen deficiency etc.
6. Do not retighten the product while pressurized. Valve deformation or breakage may occur and lead to fluid spouting. Make sure to set pressure to "0" and lower the temperature to normal before retightening.
7. Do not use the valve outside of its stated specification. Otherwise accidents like a fluid leakage or piping coming-off may occur.
8. Fluid and pressure may remain inside the valve when turning it to on/off while pressure is supplied. The residual fluid pressure may increase due to rise in temperature. If the pressure exceeds maximum operating pressure, valve breakage or fluid leakage may occur.
9. The ball seat may deform or wear out, and cause leakage in cases where fluid medium has high temperature and high flow rate or is a two-phase fluid mixed with small particles.
10. When opening or closing the valve, turn the handle to the fully open or closed position. Leaving the handle in the mid-way position may cause scratching on the ball seat, fluid leakage and decrease lifespan for the valve.
11. Used alone, the maximum operating pressure of the valve is its own stated maximum operating pressure. However, when using the valve with a push-in fitting, the maximum operating pressure should be that of the push-in fitting.

⚠ Cautions

1. Do not disassemble or modify valve except for replacing handles. Doing so will damage the valve function.
2. Do not touch valve while using in a high temperature environment.
3. Make sure to understand the valve's components' material properties, considering the fluid medium and usage environment before use. Most parts are made of SUS316 equivalent, but some parts where the fluid medium does not come into contact are made from SUS304 equivalent.
4. Consider the load-bearing of the piping when installing the valve as it may cause deformation and leakage.
5. Do not tighten the thread too firmly. Excessive tightening can deform the valve body and ball seat. Follow the tightening torque guide for tube fittings.
6. Make sure to position the wrench properly when tightening the valve. Otherwise, improper positioning may cause parts to loosen.
7. The valve is not completely oil-free as oil may remain from the assembly process.
8. The level of corrosion and dust emission from the valve varies by operating conditions. In case there is a possibility of negative effects on machines or facilities due to these operating conditions, evaluate the suitability of the products in advance.
9. Depending on the service fluid and/or frequency of opening and closing the valve, the PTFE seal portion may wear out and generate dust. If your application does not allow any dust emission, please take countermeasures like installing filters located downstream of the valve.
10. When used in vacuum systems, install a filter located in the upstream of the valve to prevent from clogging.
11. Specialized SUS316 fittings have been made specially to be used with the NSBVF10 ball valves. Using them for other uses may cause leakage.

■ SUS316 fitting safety instruction

⚠ Warnings

1. The fluid medium is... before using the products...
The fluid medium... such as...
• The fluid medium...
• Such as...
• Using with fluid whose temperature changes drastically or under conditions where the temperature changes drastically.
• Using in high temperature environments.
2. Do not use the product in applications where water and liquid do not meet the product specification. Otherwise, it may cause damage to the fittings, such as the tubing coming off and fluid leakage.
3. Be sure to use an Insert Ring when the fluid being used is liquid. There is a possibility of the tubing coming off and fluid leakage in the following situation.

⚠ Cautions

1. The level of corrosion and dust emission from the fittings varies by operating conditions. In case there is a possibility of negative effects on machines or facilities due to these conditions, evaluate the suitability of the products in advance.

Transportation • Storage

- Turn the valve handle to the fully open position when transport or store otherwise it may lead to ball seat deformation.
- Store the valve indoor, avoiding dust and foreign matter.
- To prevent from dust and foreign mater, do not unwrap packaging before installation.

Installation

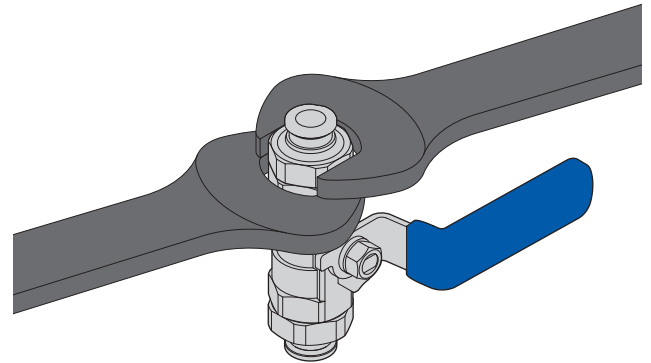
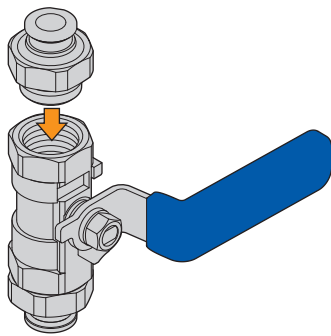
- Before installation, use air blow or water to clean valve internal.
- IN/OUT flow can be connected to both side of valve. Choose side which is easy to install and operate.
- Consider the load from the piping when installing valve.
- Follow the tightening torque for tube fitting.
- Consider operating temperature and fluid medium before selecting pipe seal material (sealing tape or sealant).
- When tighten pipe to the valve, make sure to hold the valve body with wrench etc.
- After installation, open the valve and flush to remove dust and foreign matter.

SUS316 Push-in Fitting Installation

- The tightening torque on the fitting/ball valve is indicated in Chart 1. Please use the right tools. When installing the fitting, there may be a gap between the valve and the fitting but it does not affect the valve performance.

Chart 1. SUS316 Fitting - Tightening torque

Model	Torque (N · m)
NSBV10-44, 66	7 ~ 9
NSBV10-88, 1010	12.5 ~ 14.5
NSBV10-1212, 1616	20 ~ 22

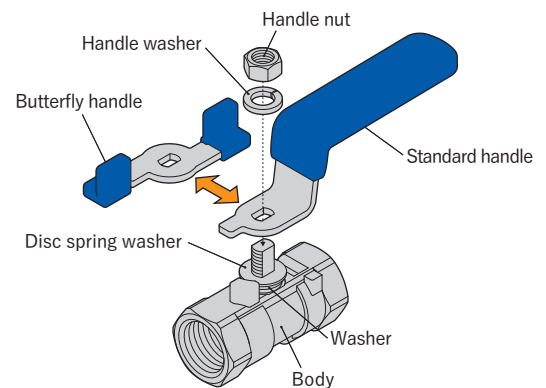


How to replace with Butterfly Handle

1. Untighten the handle nut by a wrench and remove together with the handle washer and handle. Do not remove the disc spring washer.
2. Replace the standard handle with a butterfly handle. Place the handle washer and tighten the handle nut by a wrench in Chart 2, watching a fluid leakage.

Chart 2. Tightening torque for butterfly handle

Model	Torque (N · m)
NSBL10-02	1.5 ~ 2.0
NSBL10-03	2.5 ~ 4.5
NSBL10-04	4.0 ~ 6.0

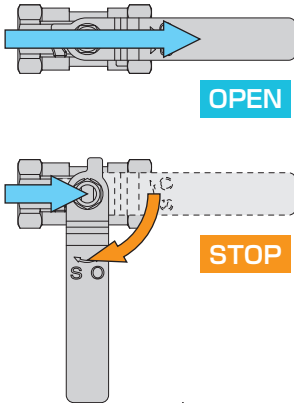


SUS316 equivalent - Ball Valve

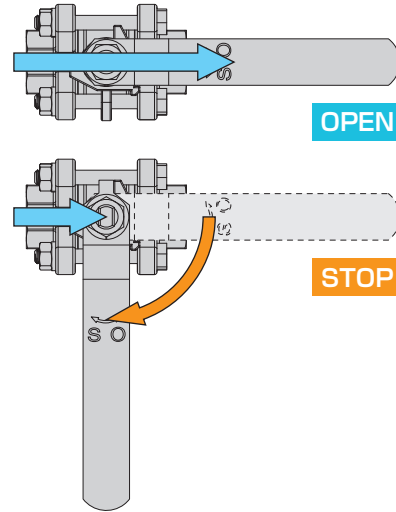
Open and Close

- Turn the handle 90° counterclockwise (Open) to open the valve and turn 90° clockwise (Shut) to close the valve.

■ NSBVF10



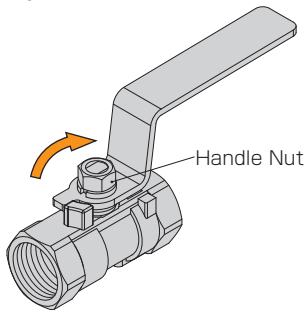
■ NSBVF30



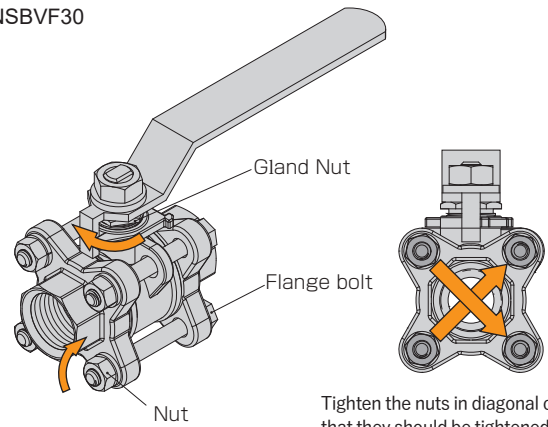
Maintenance

1. After the installation, carry out regular inspection and maintenance periodically, considering environment including use frequency, temperature, fluid flow rate, pressure, fluid medium, etc
2. Periodically use soapy water or leakage checker to ensure there is no leakage.
3. If leakage occurred or packing worn out, retighten handle nut (for NSBVF10), gland nut and flange bolt/nut (for NSBVF30).
4. Retighten the nut by 1/4 turns watching leaking condition. Retighten 4 flange bolts evenly.

■ NSBVF10



■ NSBVF30



Tighten the nuts in diagonal order so that they should be tightened evenly.

Related products



Push-in Fitting SUS316

NEW



SUS316 Push-in Fitting has been remodeled. Now the body is smaller than the previous version.

PFA tubing

NEW



Outstanding chemical/heat/weather resistance. 5 colors are provided. New PFA has been added newly.