



Job or Customer:

Engineer:

Contractor:

Submitted by:

Date

Approved by:

Date

Order No:

Date

Specification:

< APPLICATIONS >

- Plant Air
- Ventilation
- Valve Actuation-Control Systems
- Robotic installations

< STANDARDS >



Duraplus[™] ABS Air-Line is used for compressed air applications, a major source of industrial energy, is being used increasingly in both the manufacturing and processing industries. There, its distinct advantages of cleanliness, flexibility, safety and economy of use (compared with other energy sources) are fully exploited. Modern process equipment, pneumatic controls and instrumentation demand a supply of clean, uncontaminated air and this has prompted the development in recent years of more advanced designs of compressors and ancillary equipment.

Duraplus[™] Air-Line is manufactured from a specially formulated Acrylonitrile Butadiene Styrene (ABS) blend that has a high performance co-extruded liner which greatly enhances its mechanical and chemical properties.

Pipe, fittings and valves shall be manufactured using an alloy blend of ABS and the liner material, ensuring high performance of the whole system — in accordance with ASTM D2282.

pipe and fitting availability

DURAPLUS[™] PIPE

Sizes: 20mm (1/2"), 25mm (3/4"), 32mm (1"), 50mm (1-1/2"), 63mm (2"), 90mm (3"), and 110mm (4")

Configurations: 16.4ft lengths

FITTINGS

Sizes: 20mm (1/2"), 25mm (3/4"), 32mm (1"), 50mm (1-1/2"), 63mm (2"), 90mm (3"), and 110mm (4")

Configurations: Couplers, 45° Elbows, 90° Elbows, Caps, Tees, Reducer Tees, Reducer Bushings, Socket Unions, Reducer Couplings, Female Thread Adapters, Plugs, Blind Flanges, Composite Unions

VALVES

Sizes: 20mm (1/2"), 25mm (3/4"), 32mm (1"), 50mm (1-1/2"), 63mm (2"), 90mm (3"), and 110mm (4")

Configurations: Dropper Bends, Cobra Pipe Clips

CEMENTS AND PRIMERS

Sizes: 1 pint, and 1 quart

Configurations: Air-Line Solvent Cement, MEK Cleaner

COMPANION PRODUCTS



ipexna.com

Toll Free: 800 463-9572



IPEX
by aliaxis

Safety Alerts



AREAS OF USE

Duraplus[®] Air-Line must be used downstream from the receiver or aftercooler only.

Care must be taken to avoid overheating Air-Line. Metal pipe must be used between compressor and receiver and at any other part of a system where conditions exceed those permissible for Air-Line.

Air-Line should not be connected directly to vibrating machinery. Flexible couplings should be incorporated to absorb vibrations.



INSPECTION & TESTING

After installation, the Air-Line system must be inspected for external damage in the form of cuts or deep notches. Any such damaged areas must be cut out and replaced.

The normal precautions for testing a compressed air system before pressurizing must be followed for the Air-Line system.

Anaerobic thread sealants (e.g. Loctite, 542, 572) can chemically attack Air-Line and must not be used.



INSTALLATION PRECAUTIONS

Duraplus Air-Line pipe must not be threaded.

Lubricators must only be installed at the downstream extremities of the system.

Air-Line must not be bent. Standard elbows and molded bends are available throughout the size range.

Certain types of flexible hoses contain plasticizers which are harmful to Air-Line piping. Therefore the suitability of hoses which are to be installed upstream of the Air-Line system must be checked with IPEX prior to installation.

Purge new compressors and ancillary equipment, including new steel piping, prior to connecting to the Air-Line system.



WARNING

IPEX cannot accept responsibility for accidents arising from the misuse of their products because of incorrect design, installation or application.

Unless the procedures and recommendations set out in this manual have been strictly adhered to, all warranties are null and void.



U.V. LIGHT

Care should be taken to avoid prolonged exposure to sunlight, which will cause discolouration of the Duraplus Air-Line material. If stored outdoors, products must be underneath an opaque covering, e.g. a tarpaulin.

If installed in a location exposed to sunlight, the pipework should be painted.



COMPRESSOR OILS

Air-Line is ideally suited to clean air applications. Where air is not free from oil, IPEX must be consulted prior to installation concerning the suitability of the compressor oils to be used.

Note that synthetic oils are generally not compatible with Air-Line and must not be used with the system. Certain additive rich mineral oils are also incompatible with the system.

As a safeguard, IPEX has produced oil warning labels for attachment to the compressor. These are available upon request. A reduced copy of the label is shown below.

WARNING

Certain compressor and lubricating oils will damage your Duraplus Air-Line installation

Before using any oils in the system, contact IPEX to obtain a list of recommended oils or to confirm individual oil suitability.

U.S. (800) 463-9572

Handling & Installation Procedures

Solvent Welding

Joining of Air-Line pipe and fittings is achieved by solvent welding. Correctly made, the resulting joints are stronger than either pipe or fitting.

Air-Line solvent cement is designed and formulated to match the temperature and design performance of the Air-Line system. When applied, it will chemically soften the prepared surfaces of the pipe and fitting, allowing fusion between the mating surfaces when brought together.

The extent of softening by the solvent cement is dependent upon the removal of all traces of foreign matter from the mating surfaces, i.e. oil, dirt, grease, etc. The cleaner the mating surfaces, the stronger the resulting joint will be.

Joint Curing Times

The strength of the solvent cemented joint increases with curing time. The initial cure is very rapid but full joint strength is not reached for a number of hours. The actual curing time depends upon a number of factors, including the amount of solvent applied, the fit of the component and the ambient temperature. A guide to the amount of solvent to be used is shown below.

At a temperature of 73°F (23°), an approximate curing time is to allow one hour per 15psi (103kPa) of applied pressure. However, a minimum of six hours must elapse before any system is pressurized.

Joints made in environments with higher ambient temperatures will require longer curing times. For example, at 90°F (32°C), a full 24 hours should elapse before full working pressure is applied; at 100°F (38°C), 48 hours will be required prior to pressurization.

Precautions

- Always use clean, lint free cloth or industrial wipes.
- Always use genuine Durapipe Air-Line Xtra solvent cement and eco cleaner.
- Always replace lids on containers after use.
- Always keep joint surfaces dry.
- Never use cement or cleaners in confined spaces without adequate ventilation.
- Never joint near naked flames.
- Do not smoke in the working area.
- Never dilute cement with eco cleaner.
- Solvent cement and cleaners are hazardous, flammable materials and should be stored and handled with care and kept out of the reach of children.
- Material Safety Data Sheets (MSDS's) for these products are available.

Number of Joints per Quart

Under normal conditions, the following approximate number of joints can be made per quart of solvent cement. Actual usage will depend upon ambient conditions and the fit between the pipe and fitting.

Size (in)	Number of Approximate Joints
1/2 – 1	290
1-1/2 – 2	144
3	48
4	32

Joining Times

The following indicates expected times to produce solvent joints across the size range. These times may be extended slightly under adverse installation conditions.

Size (in)	Joining Time
1/2 – 1	5 mins/joint
1-1/2 – 2	7 mins/joint
3 – 4	10 mins/joint

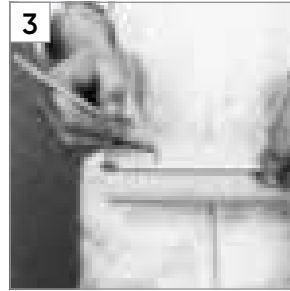
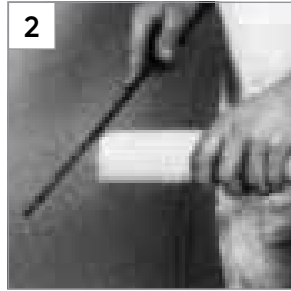
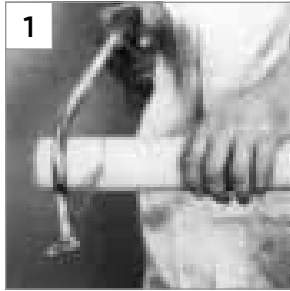
Solvent Cement Type

The integrity of the Air-Line system will be affected if the correct Duraplus Airline solvent cement is not used. IPEX disclaims responsibility for any Air-Line system constructed with any other cements or compounds or not fabricated in accordance to the instructions contained herein.



Procedure

Joining is simple and quick, but the following procedures must be adhered to if maximum joint efficiency is to be achieved.



1. Cut pipe clean and square. A hacksaw is convenient for smaller pipes but a fine-tooth carpenter's saw has proved to be more suitable on the larger sizes.

Proprietary rotary cutting tools specially designed for plastics can also be used, provided the cutting edges are maintained in a sharp condition.

2. Cut a lead chamfer on the pipe with a file or chamfering tool.

This assists entry of pipe into fitting during joining and also prevents the solvent cement layer from being sheared by the surface of the fitting when pushing the pipe fully home.

The size of chamfer will depend upon the pipe's diameter but on average it will be 1/8" x 45°.

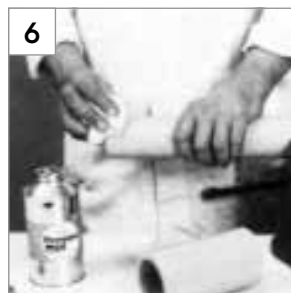
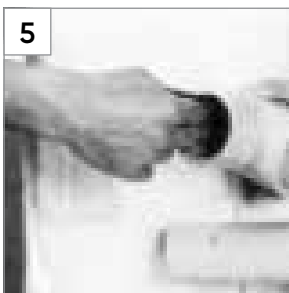
3. Remove internal and external burrs and clean out fittings.

Mark the pipe a convenient distance from the end to be joined – say 1" (25mm) plus socket depth.

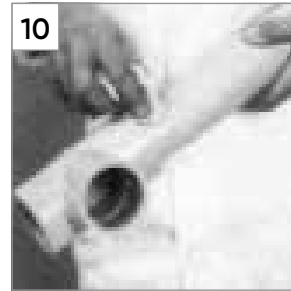
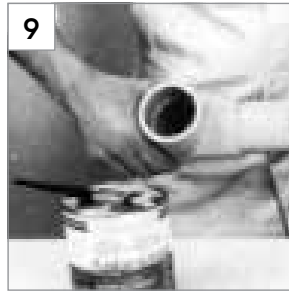
This enables checking the penetration of the pipe into the fitting after joining – the mark should be visible 1" (25mm) from the socket after joining. (This step will not be necessary as experience is gained since the fitter will be able to feel the pipe butt against the pipe stop.)

4. Lightly sand the end of the pipe over a length equal to the depth of the fitting socket, using only clean medium glass paper or emery cloth.

No attempt should be made to increase the clearance between pipes and fittings by heavy abrasion.



5. Lightly sand the socket of the fitting.
6. Thoroughly clean the sanded surfaces of pipe and fittings using a clean rag moistened with Duraplus MEK cleaner.
7. Open the can of Air-Line solvent cement and stir thoroughly. This ensures even distribution of the Air-Line resin within the solvent base and will aid the joining process.



8. Using a clean brush or a roller, apply the solvent cement to the pipe and fitting.

One coat should be sufficient for all pipe sizes.

The cement should be applied quickly to both the pipe and fitting.

Care should be taken to avoid any excess deposit of solvent cement inside the fitting which could weaken the wall, particularly in the smaller sizes.

9. Immediately after applying the cement, push pipe fully home into the fitting.

Continue to exert the pressure necessary to hold the pipe into the fitting for times varying from five seconds on 1/2" (20mm) pipe to 20 seconds on 4" (110mm) sizes. Otherwise, the slight taper of the Air-Line fittings may push the pipe out of the socket with loss of joint shear strength.

Check for full penetration of pipe to socket by measuring against the mark previously made on the pipe.

10. Wipe off excess solvent cement to avoid weakening the pipe wall due to continued solvent attack.



11. Replace lid on the solvent cement can to minimize solvent evaporation. This is particularly important in hot weather.

12. Clean brush with MEK cleaner and replace screw cap.

Seeting Times

Surrounding Temperature	Up to 63mm		75mm – 110mm	
	Up to 87 psi	Up to 185 psi	Up to 87 psi	Up to 185 psi
50 F – 120 F	2 hours	4 hours	4 hours	12 hours
40 F – 50 F	4 hours	6 hours	6 hours	24 hours

Buried Pipe

Air-Line is equally suited to above ground and buried use. Recommendations covering essential requirements for large runs below ground may be summarized as follows:

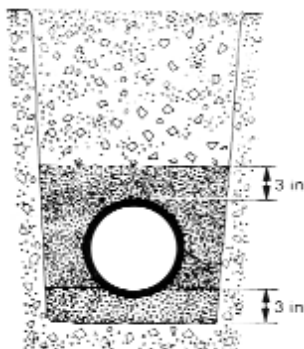
In general, trenches should not be less than 3' (.91m) deep. However, site conditions may permit pipe being laid nearer the surface – IPEX's Customer Service Department should be contacted for detailed advice.

Trenches should be straight-sided and as narrow as possible to allow proper consolidation of packing materials.

Trench bottoms should be as level as possible.

Large pieces of rock, debris and sharp objects should be removed.

Unless the excavation is in ground of natural materials of fine grains, a bed of finely graded pea gravel should be laid (3/8" (10mm), or similar) approximately 3" (76mm) deep on the floor of trench. (Sand may be used but a high water table may wash sand away and leave the pipe unsupported.)



If piping is joined above ground, it should remain undisturbed for 2 hours before being 'snaked' into the trench. Alternatively, the pipe may be joined in the trench.

Particular care should be taken to ensure piping and joining materials are thoroughly dry and that the joining procedure shown in this manual was strictly followed.

Care should be taken to ensure that sharp objects, stones, etc., are prevented from falling into the trench. Backfilling should be carried out between joints using pea gravel, or similar material, to a depth of 3" (76mm) above the pipe and extended sideways to both trench walls. Joints should be left exposed for pressure testing.

After pressure testing, joints should be covered with pea gravel and backfilling completed.

Because of the condensation which can build up in any compressed air system, drain pits should be constructed at the lowest points of the line so a drain facility can be incorporated.

Air Testing Procedure

1. Fully inspect the installed piping for evidence of mechanical abuse and dry or suspect joints.
2. Split the system into convenient test sections not exceeding 1,000ft (305m).
3. Slowly pressurize each section to 15psi (103kPa) and allow the system to equalize for 30 minutes.
4. Check joints for leaks with a Duraplus-approved foaming agent. Never use leak detection sprays such as Snoop. If leaks are detected or the system loses pressure, stop the test immediately and relieve pressure.
5. Any threaded joints found to be leaking should be re-made using Teflon® (PTFE) tape wrapped around the thread. Any defective solvent weld joint should be cut out and replaced. Further tests should be suspended until the joint has fully cured for 24 hours.
6. After successfully pressurizing the system to 15psi (103kPa) for 30 minutes, gradually increase the pressure to 50psi (345kPa) and apply for 30 minutes. If any loss in pressure occurs, immediately suspend the test, release the pressure and correct the leaks as indicated above. Re-pressurize to a maximum of 15psi (103kPa) and test each joint with a soap solution. Continue the test procedure as indicated above.
7. After successfully pressurizing to 50psi (103kPa) for 30 minutes gradually increase the pressure to full working pressure and apply for 1 hour.

If the system loses pressure, immediately suspend the test and release the pressure. Re-pressurize to a maximum 15psi (103kPa) and test each joint with soap solution. Continue the testing procedure as indicated above.

Installed Exposure to Sunlight

All Air-Line piping installed outside and subject to exposure to sunlight must be painted for protection to retain the full toughness and ductility of the material. This can be achieved as follows:

1. Lightly abrade the pipe and fittings, using medium grade glass paper, to provide a 'key' for the paint to adhere to.
2. Clean the system down with soap and water to remove any residual grease or oil. Do not use solvents or detergents.
3. Select a white, water-based latex paint, preferably one containing titanium dioxide. Do not use cellulose or solvent-based paints.
4. Apply an undercoat followed by a final gloss coat.

VKD Series Ball Valves



IPEX VKD Series Ball Valves offer a variety of advanced features such as the patented seat stop carrier, a high quality stem and ball support system, and a multifunctional locking handle. The new DUAL BLOCK® system locks the union nuts preventing back-off due to vibration or thermal cycling. Deep grooves, thick o-rings, and cushioned Teflon® seats contribute to strong seals at pressures up to 232 PSI while an integral mounting flange and support bracketing combine for simple adaptation for actuation and anchoring. VKD Series Ball Valves are part of our complete systems of pipe, valves, and fittings, engineered and manufactured to our strict quality, performance, and dimensional standards.

VALVE AVAILABILITY

BODY MATERIAL	PVC, CPVC, PP
SIZE RANGE	1/2" through 2"
PRESSURE	up to 232 PSI, 150 PSI (PP)
SEATS	Teflon® (PTFE)
SEALS	EPDM or FKM
END CONNECTIONS	Socket (IPS), Threaded (FNPT) Socket (Metric)

Note: PVDF valves available on request



ASTM D1784	ASTM D4101
ASTM D2464	ASTM F437
ASTM D2466	ASTM F439
ASTM D2467	ASTM F1498



ANSI B1.20.1

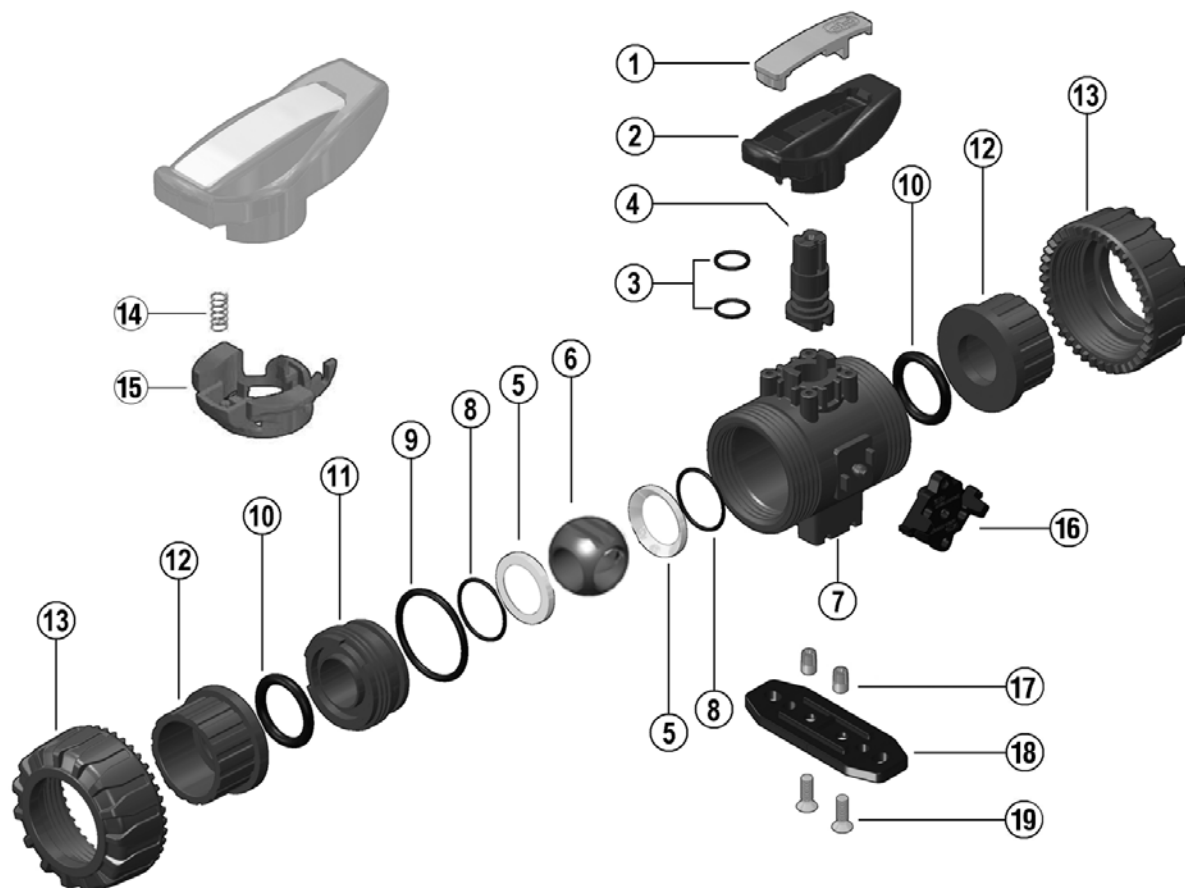


ISO 11922-1



Certified to
NSF/ANSI 61 & 372

Components: Sizes 1/2" to 2"



#	Component	Material	Qty
1	insert	PVC / CPVC / PP	1
2	handle	PVC / CPVC / PP	1
3	stem o-ring	EPDM / FKM	2
4	stem	PVC / CPVC / PP	1
5	ball seat	PTFE	2
6	ball	PVC / CPVC / PP	1
7	body	PVC / CPVC / PP	1
8	ball seat o-ring	EPDM / FKM	2
9	body o-ring	EPDM / FKM	1
10	socket o-ring	EPDM / FKM	2

#	Component	Material	Qty
11	carrier with stop ring	PVC / CPVC / PP	1
12	end connector	PVC / CPVC / PP	2
13	union nut	PVC / CPVC / PP	2
14*	spring	SS	1
15*	handle lock	GRPP	1
16	DUAL BLOCK®	POM	1
17*	bracket bushing	SS / brass	2
18*	mounting plate	GRPP	1
19*	screw	SS	2

* Optional Accessories

FK Series Butterfly Valves



IPEX FK Series Butterfly Valves offer superior strength and chemical resistance in highly corrosive environments and process flow conditions. The special trapezoid shape of the liner and a serrated body cavity guarantee a bubble tight seal while keeping break-away torque at an absolute minimum. This versatile industrial valve features double self-lubricating seals, direct actuator mount capability, and the option of either a lever handle or mounted gear box. The FK lever handle includes the EasyFit labeling system for valve identification. A special integral stainless steel lug version provides for full bi-directional operation allowing disassembly of the downstream flange connection without weakening the integrity of the upstream connection to the pressurized line. FK Series Butterfly Valves are part of our complete systems of pipe, valves, and fittings, engineered and manufactured to our strict quality, performance, and dimensional standards.

VALVE AVAILABILITY

Body Material	Glass reinforced PP (GRPP)
Disc Material	CPVC, also offered in PP, PVC, ABS, and PVDF
Size Range	2" through 4"
Pressure	See Sample Specifications
Seals	EPDM or FKM
Body Style	Wafer or Lugged
Control Style	Lever Handle or Mounted Gear Box
End Connections	Flanged (ANSI 150)



ASTM D4101
ASTM D1784
ASTM D3222



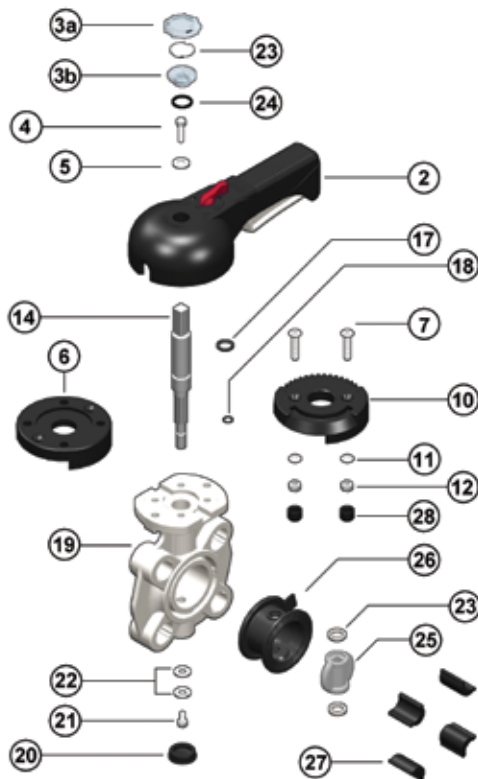
ANSI B16.5



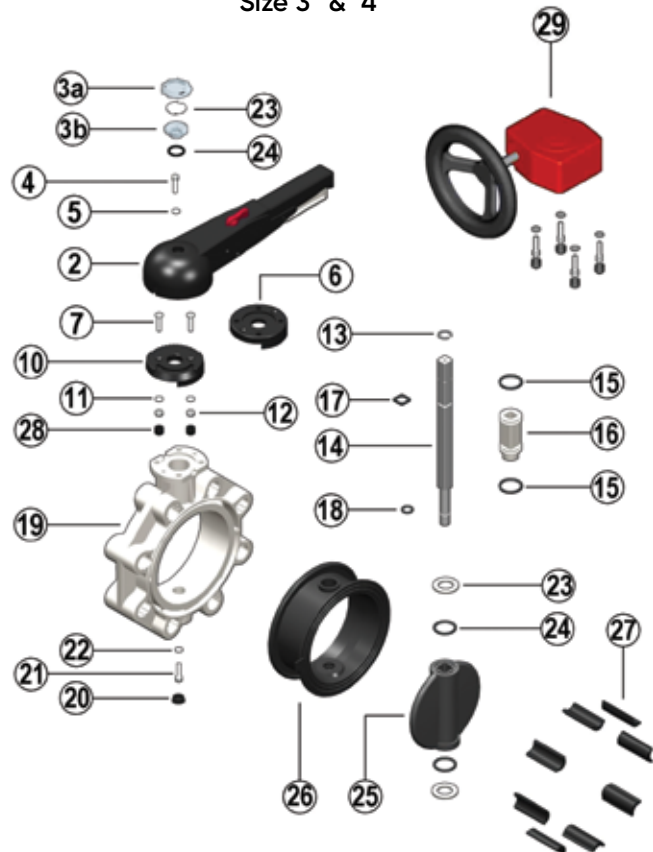
Certified to
NSF/ANSI 61-G

Components

Size 2"



Size 3" & 4"



#	Component	Material	Qty
* 1	position indicator	PA	1
* 2	handle	PVC	1
* 3 a,b	transparent service plug	PVC	1
* 4	screw	SS	1
* 5	washer	SS	1
6	spacer pad	GRPP	1
7	screw	SS	2
8	screw	SS	2
9	ratchet	SS	1
10	pad	GRPP	1
11	washer	SS	2
12	nut	SS	2
13	retaining ring	SS	1
* 14	shaft	420 SS	1

* Spare parts available.

#	Component	Material	Qty
* 15	bushing o-ring	EPDM or FKM	2
16	bushing	Nylon	1
* 17	shaft o-ring	EPDM or FKM	1
* 18	shaft o-ring	EPDM or FKM	1
19	body	GRPP	1
20	cap	PE	1
21	screw	SS	1
22	washer	SS	1
* 23	anti-friction ring	PTFE	2
* 24	disc o-ring	EPDM or FKM	2
* 25	disc	CPVC / PP / PVC / ABS / PVDF	1
* 26	primary liner	EPDM or FKM	1
27	inserts	ABS	4 or 8
28	cap	PE	2
29	gearbox	Al, Steel	1

* Spare parts available.

About IPEX by Aliaxis

As leading suppliers of thermoplastic piping systems, IPEX by Aliaxis provides our customers with some of the world's largest and most comprehensive product lines. All IPEX by Aliaxis products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have earned a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX by Aliaxis include:

- Electrical systems
- Telecommunications and utility piping systems
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems
- PVC, CPVC, PP, PVDF, PE, ABS, and PEX pipe and fittings

Products distributed in the United States by IPEX USA LLC.
Duratec® and DuraplusTM are trademarks of IPEX Inc.

This literature is published in good faith and is believed to be reliable. However, it does not represent and/or warrant in any manner the information and suggestions contained in this brochure. Data presented is the result of laboratory tests and field experience.

A policy of ongoing product improvement is maintained. This may result in modifications of features and/or specifications without notice.