



FITTINGS & VALVES

Piping Accessories For
Hydraulic, Pneumatic &
Instrumentation Application



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ABOUT US

Flowsys Engineering (I) Pvt. Ltd. is an emerging sister concern of Sonrab Industries which is renowned name in hydraulic & engineering field having experience more than 20 years, offers wide varieties of Fittings & Valves for Instrumentation, Hydraulic & Pneumatic application used in industries like Oil & Gas, Petrochemicals, Food & Pharma, Chemicals, Automobile, Railways, Marine and other various process industries.

The expertise of founding members having more than decades of experience in manufacturing & marketing of Tube Fittings, Instrumentation Valves and other tubing accessories, we produce high quality Fittings & Valves compatible to both national & international standards for our valuable customers. Flowsys Engineering (I) Pvt. Ltd. having manufacturing unit with impeccable inspection & testing facilities.

Our working unit has spread in an area which is sufficient enough to accommodate all essential facilities of the company.

Benefiting from our existing facilities, we are able to optimize the most cost-effective resources across. Paired with flexible manufacturing systems, we deliver a wide range of the best quality products within a competitive lead time and the most professional services to our customers in an array of applications and industries.

Our mission is to provide the best quality products and the most professional services to our customers. Our work culture tuned to customer focus through good business practices & continuous improvement and our vision is to understand customer needs & satisfy them to the optimum.

FLowsys INTEGRATES THE FOLLOWING INITIATIVES TOWARDS CUSTOMER SATISFACTION





Double Ferrule Tube Fittings

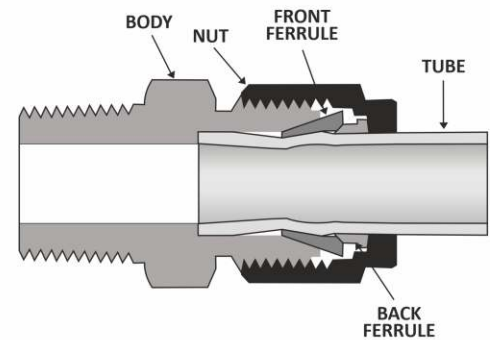


Flowsys manufactures double ferrule compression tube fittings for instrumentation & fluid transmission system to provide torque free & leak proof joints at all tubing connection & hence prevents costly and hazardous leaks in process & instrumentation tubing. Flowsys double ferrule tube fittings consist of four precision engineered components called the body, nut, front ferrule & back ferrule, all manufactured to very stringent tolerances under rigid quality control procedures. When installed affixed to tubing becomes a five-piece connection provide a solid leak proof joint by the sequential action of twin ferrule which is a combination of geometry & metallurgy.

Flowsys double ferrule tube fittings are easy to install & does not require any special tools. These fittings are used several times with no damage on tube and fittings. We summarize some of the silent feature below.

► Design

- Torque free design because of axial movement rather than rotary movement.
- Self-Aligning.
- Vibration Resistance.
- Thermal Compatibility & Corrosion Resistance.
- Resistance to temperature cycle.
- Unique combination of Geometry and Metallurgy.



► Performance

- Work on low as well as high pressure.
- Work on low as well as high temperature rated for tubes.
- Work without leakage up to burst point.
- Seals continuously under make & break condition.

► Tubing Selection

For better performance of Flowsys Fittings, the tubing should be reasonably round, free from scratches & draw lines, good surface finish & the ends should be free from burrs. The tubing should be compatible to process fluid, temperature & pressure. Fully annealed seamless tubing in accordance with ASTM A213 & ASTM A269 or equivalent with preferred hardness of 75 - 80 HRB are best suitable for use with Flowsys Tube Fittings.

► Product Range & Technical Specification

Size	Fraction	1/8" Tube OD to 1.1/2" Tube OD	
	Metric	3mm Tube OD to 38mm Tube OD	
Pressure	4000 psi to 10000 psi depends upon size (Please refer pressure chart)		
Temperature	Upto 648 Degree Celsius		
End Connection	Available with NPT, BSPT, BSPP, SAE Pipe Threads or any other type upon request		
Material	SS316/SS304	Inline	ASTM A276 / ASTM A479
		Forging	ASTM A182
	Carbon Steel	Inline	ASTM A108
		Forging	ASTM A105 / ASTM A106
Also available in Brass, Monel & Special alloy on request			

► Fractional Seamless Stainless Steel Tubing

OD in.	Wall Thickness (in.)																		
	0.012	0.014	0.016	0.02	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.12	0.134	0.156	0.188				
1/16	6800	8100	9400	12000															
1/8					8500	10900													
3/16					5400	7000	10200												
1/4					4000	5100	7500	10200											
5/16						4000	5800	8000											
3/8							3300	4800	6500	8600									
1/2								2400	3500	4700	6200								
5/8									2900	4000	5200	6000							
3/4										2400	3300	4200	4900	5800					
7/8											2000	2800	3600	4200	4800				
1												2400	3100	3600	4200	4700			
1.1/4													2400	2800	3300	3600	4100	4900	
1.1/2														2300	2700	3000	3400	4000	4900
2															2000	2200	2500	2900	3600

► Metric Seamless Stainless Steel Tubing

OD mm	Wall Thickness (mm)													
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.5	4.0	4.5	
3	710													
6	330	420	520	670										
8		310	380	490										
10		240	300	380										
12		200	240	310	380	430								
14		180	220	280	340	390	430							
15		170	200	260	320	360	400							
16			190	240	300	330	370							
18			170	210	260	290	320	370						
20			150	190	230	260	290	330	380					
22			130	170	210	230	260	300	340					
25					180	200	230	260	300	320				
28						180	200	230	260	280	330			
30						170	190	210	240	260	310			
32							160	170	200	230	240	290	330	
38								140	170	190	200	240	280	310
50											150	180	210	240

► Weld Stainless Steel Tubing Allowable Working Pressure

To determine the working pressure of weld tubing to the requirements of ASME B31.3 Code, De-rating factors below must be applied.

For single weld tubing multiply by 0.80 & for double weld tubing multiply by 0.85.

Example: SS316 seamless 1/2" O.D. x 0.065" WT allowable working pressure: 4700 psi.

To determine the work pressure of the single weld tubing, multiply 4700 psi by 0.80.
 $4700 \text{ psi} \times 0.80 = 3760 \text{ psi}$ at -20°F to 100°F (-28°C to 37°C)

Equal Union



Reducing Union



Bulkhead Union



Union Elbow



Union Tee



Union Cross



Male Connector



Bulkhead Male Connector



Male Elbow



Positionable Male Elbow



Male Run Tee



Male Branch Tee



Positionable Male Run Tee



Positionable Male Branch Tee



Male Tube Adapter



Female Connector



Bulkhead Female Connector



Female Elbow



Female Run Tee



Female Branch Tee



Female Tube Adapter



Tube Socket Weld Connector



Tube Butt Weld Elbow



Port Connector



Reducer



Cap



Plug



Nut



Front Ferrule



Back Ferrule





Precision Pipe Fittings



Flowsys Precision Pipe Fittings are designed & manufactured with pressure tight pipe threads for process control & instrumental connection between pipe to provide leak free connections for chemicals, petrochemical, processing plants, oil, gas and power generation industries, etc.

► **Features:** Pipe threads are available with

- NPT ANSI BI 20.13
- BSPT
- BSPP

Working pressure are calculated with respect to power piping code ANSI B31.1 & Refinery Piping Code ANSI B31.1

► **Material**

Straight fittings are machined from bar stock. Elbows, Tees & Cross are machined from closed grain forging in SS316, SS316L, C.S. to ensure leak free joint, it is recommended to use pipe thread sealant on all male taper thread.

The most effective method is PTFE tape.

► **Operating Parameters**

Working pressure upto 10000 psi (Depend upon size).
Sizes are available from 1/8" to 1.1/2" pipe thread.

► **Product Range**

Hex Nipple



Reducing Hex Nipple



Close Nipple



Long Hex Nipple



Adapter



Reducing Adapter



Reducer



Hex Coupling



Reducing Hex Coupling



Male Elbow



Female Elbow



Street Elbow



Reducing Street Elbow



Male Tee



Female Tee



Street Tee



Branch Tee



Male Cross



Female Cross



Union Ball Joint



Pipe Plug



Pipe Cap



Hollow Hex Plug



Hollow Hex Plug



Hex Head Plug



Reducing Bushing



Hose Connector



Hydraulic Tube Fittings



Flowsys fitting division offers Flareless Bite type hydraulic tube fittings widely used in hydraulic application of Automobile Industries, Earth Moving Equipments, Metallurgical Industries, Ship Building, Machine Tool Buildings, etc. These fittings are designed in accordance to DIN 2353 and ISO 8434 and carefully manufactured to provide leak free connections in fluid systems which ensure maximum reliability.

Flowsys Hydraulic tube fittings, a unique three piece design consists of a body, a special case hardened ferrule, and a nut. When the nut is screwed onto the body, the ferrule grips the pipe in position & perceptibly bites onto the tube surface to provide the positive seal. When fully tightened the case hardened ferrules bowed slightly from the middle & acts like a spring. This spring action of ferrules maintains a continuous tension between the body & nut prevents the nut from loosening under vibration and strain.

The fittings can be dismantled & reassembled as often as necessary for maintenance purpose without reducing the effectiveness of seal. This results in unmatched degree of safety & reliability in hydraulic system of various applications.

We also offer 37 degree flared JIC tube fittings suited for low & medium wall tubing with good vibration resistance & is used in every application that uses fluid power for motion control & automation. These fittings are in accordance to SAE J514 standard. The design of these fittings are such engineered that the 37 degree flared tube end is sandwiched between the fitting body nose (seat) & the sleeve with nut, which provide a very effective leak proof joint, full flow connection in process tubing

Size & Pressure Rating	Series	Tube OD	Pressure	Application
	Light Series (L)	6mm - 18mm 22mm - 42mm	250 Bar 160 Bar	Light Duty can be used for compressed air, Hydraulic Return Lines, Fuel Heating, Automating Industries Etc...
	Heavy Series (H)	6mm - 14mm 16mm - 25mm 38mm	630 Bar 400 Bar 315 Bar	Heavy Duty can be used for heavy duty Machineries, Ship building, Mining Etc...
Temp Rating :		Upto 430° C		
End Connection :		Available with NPT/BSPT/BSPP/SAE/Metric threads		
Material :		Body & Nut - Carbon Steel with Zinc Plating, SS304 & SS316 Ferrules - SS316 & Carbon Steel with special case hardening Any other material is available on request		



Female Elbow



Positionable Elbow



Union Tee



Male Run Tee



Female Run Tee



Male Branch Tee



JIC Female Run Tee



Union Cross



Female Cross



Ferrule



JIC Male Connector



JIC Male Elbow



Weld Nipple



Nut



Cap





Needle Valves



Flowsys Needle Valves are specially designed & manufactured to provide flexibility in piping system used for Instrumentation, Hydraulic & Pneumatic application to meet the requirement of Oil & Gas Industry, Petrochemicals, Food & Pharma, Chemicals, Automobile, Railways, Marine & other various process industries.

► Features

Available in SS316 / SS316L / SS304 materials.

Available in Integral Bonnet & Screwed Bonnet Designs.

Available in Bar stock body, Forged body, Straight & Angle Pattern & Panel Mountable designs.

Thread rolled & Burnished stems for low operating torques.

Available in variety of orifice size as per application.

Available in variety of end connection like Tube OD, NPT, BSPT, BSP.

Available in sizes 1/4" to 1".

Working pressure upto 6000 psi.

Temperature Ratings: -50 to 200 degree celsius with standard PTFE packaging & upto 400 degree celsius with Graphoil packaging.

All valves are 100% factory tested.

► Application

Hydraulics & Pneumatics.

Plant Service.

Instrument Isolation.

Pressure Measuring Devices.

▶ ▶ **Ball Valves** ◀ ◀



Flowsys Ball Valves are designed for shutoff flow by turning handle upto 1/2 turn. These valves use a hollow floating ball to control flow through it.

▶ **Features**

- Available in SS316 / SS316L / SS304 materials.
- Designed for Low Pressure & Medium Pressure application.
- Available in Round Body, Square Body & Hex Body designs.
- Available in 2 Piece and 3 Piece designs.
- Superfinished Ball surface for effective sealing and low torques.
- Available in end connection - Tube OD & Pipe Thread.
- Size ranges from 1/4" to 1.1/2".
- Working Pressure upto 10000 psi.
- Temperature Ratings: -50 to 200 degree celsius with standard PTFE packaging.
- All valves are 100% factory tested.

▶ **Application**

- Low Pressure & High Pressure Instrument.
- Line Process Plant Service.
- Hydraulic Lines.

Instrumentation Manifold Valves



Manifold Valves are designed & manufactured for various application like Isolation, Vent, Pressure Equipment Testing, Calibration & maintenance purpose. Manifold Valves are designed to combine the variety of isolation valves for compact design. These valves comes in the configuration of 2 Valve, 3 Valve & 5 Valve.

► Features

- Available in variety of materials like SS316 / SS316L / SS304 / CS / NACE Compliance materials.
- Available in size upto 1/2" NPT / BSPT / BSP.
- Working Pressure upto 6000 psi.
- Temperature Ratings: -50 to 200 degree celsius with standard PTFE packaging & upto 400 degree celsius with Graphoil packaging.
- Low operating Torques.
- Color coded dust cap for identification of Valve type.
- Easy to install & maintain.
- All valves are 100% factory tested.

► Application

- Isolation, Equalising and Venting of Process Line for General Plant application.
- Pressure & Differential Pressure Instrumentation.
- System Impulse Line.
- Flow Plotter & Switches.

▶ ▶ **Gauge Cock** ◀ ◀



Pressure Gauge Cock are used for controlling flow for basic on & off, isolation applications. It acts as a Shut-off device for pressure measuring instruments, for measurement of liquids gases and vapours.

▶ **Features**

- Available in 2 way, 3 way type.
- Forged Body Construction & Bar Stock Construction.
- Material SS316 or SS304 or Brass, Exotic Materials like Monel, Inconel, Super Duplex available on request.
- NPT, BSP (G), BSPT (R) Metric Threads available.
- Connection Type: MxF, FxF, MxM in all the above mentioned threads.
- Suitable for pressure upto 30 kg/cm² / 30 Bar / 750 psi.
- Suitable for gases, vapours and fluids from -10°C to +50°C.
- Highly corrosion and chemical resistant in stainless steel design.
- Size Option of 1/4", 3/8", 1/2".

▶ ▶ **Snubber** ◀ ◀



Snubbers also known as Dampeners are used with pressure gauges, where there are sudden shocks & impulses in process lines. Snubbers are used to considerably reduce the impulses & hence makes the gauge reading easier. Snubbers also helps in increasing the life of gauge.

The damping is achieved by the adjustment of a needle tip that restricts the flow & therefore protects the pressure gauge against pulsations. A unique feature of this design is that the adjustment to the damping can be made after installation in the system.

► Features

- Available in S316, SS304, Brass.
- Available in 1/4", 3/8" & 1/2" Connections.
- Variety of end connections include NPT, ISO/BSP Threads.
- Compact Design.
- Teflon or Viton O-ring.
- Working Pressure Upto 6000 psi.
- Operating temperature up to 100 deg. Centigrade.
- 100 % Factory Tested.



Pipe Clamps



Clamping of pipes is required to damp vibration, providing support to system & prevent loosening of joints. The traditional method of clamping (U-Bolts) cannot damp vibrations & results to loosening of joints. To overcome this, Flowsys introduces their unique designed pipe clamps which prevents the transmission of vibration from pipe to system & vice versa.

Flowsys pipe clamps consist of pair of clamps made up of poly propylene which damps the vibration, top plate and bottom plate of weld plate made up Carbon Steel screwed together by Nut & Bolt. These plates are electro plated to prevent corrosion & clamp material differs to send cold condition as well as high temp. The choice of clamp material provides the loosening of joints & consequently prevent leakage in the system. These clamps are available at various sizes depend upon tube or pipe.



Syphon



Flowsys syphon tube allows liquid to travel upward, above the surface of the origin reservoir, then downwards to a lower level without using a pump.

Maximum working temperature: 850° F (454° C).

Working pressure up to: 6000 psi (414 bar).

Standard materials are SS316 & SS304, other materials are available upon request



Flowsys manufactures Stainless Steel Flanges of different shapes & sizes & with different specifications as per the customer's requirement in various material A182 Gr 316, A182 Gr 304, etc....

Our flanges division encompasses an integrated manufacturing facilities which manufactures all types of flanges in various specifications like ASTM/ASME/ANSI, EN, DIN, etc in various class of pressure rating.

We produce flanges in the size range from 1/2" to 24". Flowsys has an established & stringent quality system in accordance with various specific requirements & applications.

► Applications of Stainless Steel Flanges

- Pipeline engineering.
- Oil & gas industry.
- Process Plant Engineering.
- Marine Industry.
- Waste Water Management.
- Chemical Industry.
- Petrochemical Industry.
- Power Industry.
- Aerospace.
- Food & Pharma Industries.

Types of Flanges - Our manufacturing facilities is well equipped to manufacture various types of flanges namely:

► **Blind Flange**

Blind flange is round plate which has all the relevant boltholes but no centre hole & because of this feature this flange is used to close off the ends of a piping systems & pressure vessel.

► **Weld Neck Flange**

Weld Neck Flanges have a long tapered hub & are often used for high pressure applications. These flanges are designed to be joined to a Piping system by Butt Welding. The Neck, or Hub transmits stresses to the Pipe, reducing stress concentrations at the base of Flange.

The gradual transition of thickness from the base of Hub to the wall thickness at Butt Weld, provides important reinforcement of the Flange. The bore of Flange matches the bore of Pipe, reducing turbulence & erosion. These flanges are ideal for extreme fluctuations of temperature & in environments where there may be high temperature.

► **Slip - On - Flange**

Slip On Flanges are easily fitted & welded into different pipes. Slip on pipe Flange is slipped over the Pipe & then welded both inside & outside to provide sufficient strength & prevent leakage. These flanges are ideal for lower pressure applications. This Flange is used in preference to Weld Necks by many users because of its lower cost & the fact that less accuracy is required when cutting pipe to length

► **Threaded Flange**

Threaded flanges are similar to slip-on pipe flanges except the bore of threaded pipe flange has tapered threads. These flanges are ideal for relatively low pressure piping systems. Threaded flanges are used with pipes that have external threads.

The benefit of these pipe flanges is that it can be attached without welding.

► **Lap Joint Flange**

Lap Joint Flanges slide over the pipe & are most commonly used with Stub End Fittings. A pipe is typically welded to the Stub End & the Lap Joint pipe flange is free to rotate around the stub end. Lap Joint pipe flanges are often used for applications that require frequent dismantling. Threaded pipe flanges are often used for small diameter, high pressure requirements.

► **Orifice Flange**

Orifice Flanges are used instead of standard pipe flanges when an orifice plate or flow nozzle must be installed. Pairs of pressure tapings are machined into the orifice flange, making separate orifice carriers or tapings in the pipe wall necessary.

Note: We can also manufacture according to other standards like, API-605, UNL, AWWA & Custom Drawings of customers

▶▶ **Condensate Pot** ◀◀



▶ **Condensate Pot**

The main purpose of condensate pot is to hold the condensate & arrest foreign ingredients. The function of the condensate pots is to condensate steam into a liquid to protect the instruments like transmitters from heat & to keep the liquid levels unchanged. The piping from the restricting device to the condensate pots are full of steam & from the condensate pot to the measuring instrument is full of condensate. The condensate is drained from the bottom ports with valve connection. The condensate water transmits the pressure to the transmitter, so that the transmitter itself is not in contact with steam. Condensate chambers are used as a barrier between the main line & the secondary instruments in the measurement of steam or other vapours which condense to a liquid state insuring compatibility with the secondary instruments. Installation can be done either in vertical or in horizontal lines between the primary component & the secondary instrument. It acts as a barrier to the line fluid allowing direct sensing of the flow conditions. Condensate pots should be mounted at the same level minimizing possible error that could arise due to unequal head of fluid in the connecting pressure lines. Usually the level in the chambers should be equal the total volume of condensate in the transmitter & the sensing lines.

▶ **Features**

- Sizes available up to 6".
- Fabricated from Seamless pipes.
- Available in Carbon Steel, SS304, SS316, SS316L, Monel 400, Inconel, Super Duplex based on the process requirements & applications.
- Wide range of operating pressure rating. Operating temperature up to 400 deg. Centigrade.
- Available with customized socket weld coupling (ANSI B 16.11) configurations.
- Variety of end connections include NPT, ISO/BSP Threads, welded adaptors.
- Multiple coupling selections to suit technical requirements.
- TIG welded as per ASME SEC IX by qualified welding personnel.
- Cleaned from inside to measure correct liquid volume.
- Offered with Shot blasted, painted or mirror like surface finish.
- Available with NACE MR-01-75 compliance.
- Offered with complete relevant testing requirements.

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