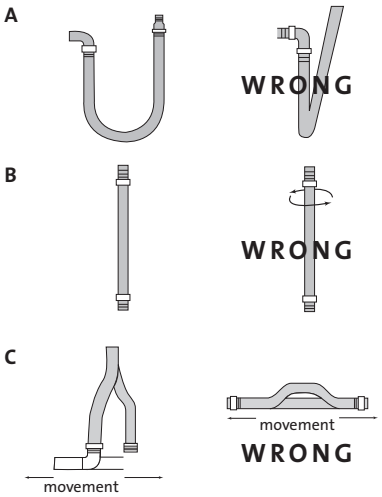
General Hose Installation Precautions

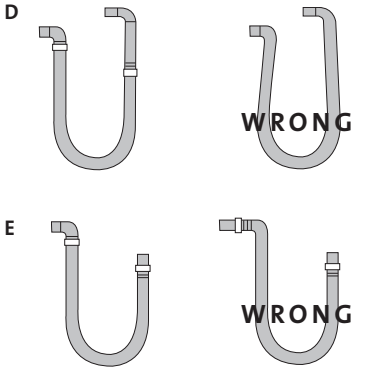
Prior to Installation

1. Examine the hose for any obvious damage. **IF THE HOSE IS DAMAGED, DO NOT USE.** Examples of damage may include slices to the cover, kinks, broken braid, and crushing of the hose (can reduce life and pressure rating).
2. Review application to ensure proper selection of hose has been made by examining materials, pressures, chemical compatibility, temperature and environment.
3. Hose movement should be restricted to a **SINGLE PLANE (Drawing A)** to minimize the resultant twisting (torque). Note: The flexing plane should also be the plane in which the bending occurs. Excessive bending will induce stress fatigue **(Drawing B).**
4. Axial movement should be eliminated. The hose should not be stretched or compressed along its longitudinal axis when installed in-line **(Drawing C)**.



Installation

- **Never use hose below minimum bend radius (Drawing D)**. Bend radii (measured to inside radius of fluoropolymer-lined hose and centerline for stainless steel metal hose) are given for individual products and sizes (consult factory for specific data). These values represent the minimum bend radius with which the hose can be properly installed. If these values are not maintained, the hose can fail prematurely. Note: In some cases, vacuum and pressure ratings are based on not exceeding 2% minimum bend radius (consult factory for specific hose ratings).
- **Do not allow severe bends (Drawing E).** Severe bends can cause kinking in a hose or overstress the assembly/material, resulting in damage and ultimate failure. If severe bends cannot be avoided, use elbows designed to accommodate the direction change.
- **Do not twist (torque) assembly along centerline during installation.** The likelihood of leakage/failure increases for hoses that are twisted (torqued) during assembly. The proper use of floating flanges and swivel-type fittings (i.e., JIC) can eliminate improper twisting.

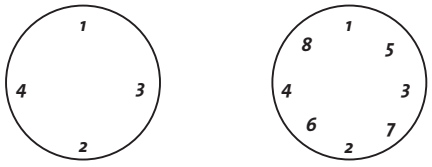


Nominal Hose Size

1/2"	1"	1-1/2"	2"	3"	4"	5"	6"
10	10	15	25	40	30	60	75

Torque (ft.-lbs.)

Bolt Torque Sequence



- **For accurate tightening a torque wrench is HIGHLY recommended.** If a flange leak occurs on one side of a properly torqued flange, the bolts should not be over-torqued. Instead loosen the bolts on the non-leaking side the same amount you tighten the bolts on the leaking side.

General Hose Installation Precautions *continued*

Service Life Factors

The actual service life of the hose assembly is strongly affected by its environment. Some of the factors that may influence service life include:

Corrosion
- General corrosion attack
- Stress corrosion cracking
- Intergranular corrosion
- Pitting corrosion

Fatigue (including)
- High cyclic
- Flexure
- Pulsation
- Torsion

Vibration

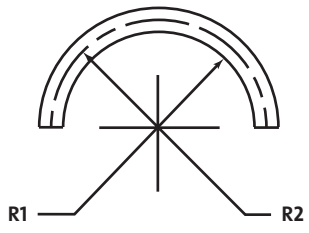
Wear

Movement of attached equipment
Proper hose configuration and live length should be used when hose may be exposed to movements from attached piping, tanks or equipment (i.e., thermal growth of mechanically imposed) and/or offset.

Glossary

Quite often, customers have questions when the subject of hose flexibility is brought up. Many different terms are used to describe this attribute of the Saint-Gobain Performance Plastics Sanitary Couplers line. Below are some of the formal definitions currently used in the hose industry.

Bend Radius (fluoropolymer hose and all rubber hose) – The radius of a bent section of hose measured to the inner-most surface of the curved portion (R1).
Bend Radius (metal hose) – The radius of a bent section of hose measured to the hose centerline (R2).
Minimum Bend Radius – The smallest radius at which a hose can be used.



Bend Radius (all, except metal hose) =
R1 measured to inside radius
Bend Radius for metal hose =
R2 measured to centerline radius

For Metal Hose

Dynamic Bend Radius – The radius at which constant or continuous flexing occurs.
Static Bend Radius – The smallest fixed radius to which a hose can be subjected.
Force to Bend – The amount of stress required to induce bending around a specified radius. Hence, a measure of stiffness.

Pressure Definitions

Maximum Rated Working Pressure – The maximum pressure that the hose can be subjected to on a continuous basis.
Maximum Rated Test Pressure – The maximum rated pressure is multiplied by 150% to determine the maximum rated test pressure.
Nominal Rated Burst Pressure – The average pressure at which the core or braid will rupture at ambient temperature.
Pulsating or Shock Pressure – The performance of metal hose can be greatly reduced under this type of working pressure. Pressures are normally reduced by 50% in pulsating or shock pressure applications.
Pressure/Temperature Correction – Metal hose pressure capabilities decrease as the temperature increases. Consult the *Temperature/Pressure Reference Guide* (p. 42) to determine pressure ratings at elevated temperatures.
Pressure Drop – Pressure drop occurs in long hose runs. The amount of pressure loss in a metal hose is approximately three times that of steel pipe.