

S.T.A.M.P.E.D.

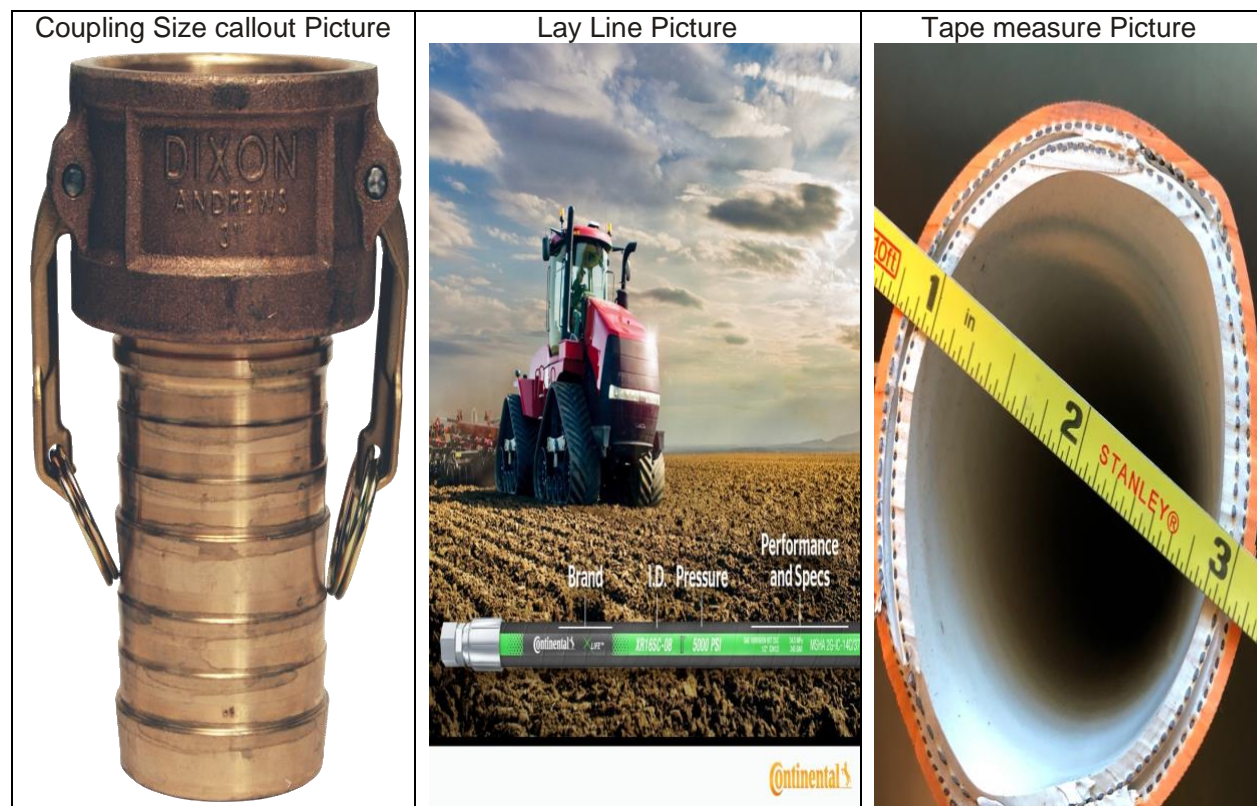
Proper hose selection is critical to the success of the assembly, can save lives, help the planet, reduce downtime, and increase service life of hose assemblies.

SIZE

Inside Diameter (I.D.) Length & Outside Diameter (O.D.)

The inside diameter of a hose, should match the size of the ports as often as possible and be adequate to keep pressure loss to a minimum, maintain adequate flow, and avoid damage to the hose due to heat generation or excessive turbulence.

Determining the internal diameter of a hose can be accomplished by locating the called-out dimensions on the attached ports or fittings, on the lay line, or by using a tape measure.



Flow Rate / Fluid Velocity- The flow rate of the system in conjunction with the inside diameter of the hose will dictate the fluid velocity through the hose.

The overall length of the assembly should be specified to include fittings; live length describes the length of hose without fittings and accessories. Common considerations for length include weight, routing, storage, and bend radius constraints, more is not always better.

Outside diameter should be considered for environments or applications that have size constraints and difficult paths to maneuver.

TEMPERATURE

Temperature exposure can be damaging to the performance and service life of any hose. Thankfully, hundreds of tube and cover construction combinations, many hose items have been designed with an industry or application in mind. To begin one should ask, what is the temperature of the material being conveyed and what is the temperature the hose is exposed to when in service and when stored?

Operating Temperatures for Industrial Hose

PVC 0°F to 140°F	STANDARD -40°F to +302°F	Engineered Rubber -70°F to +302°F
Teflon -65°F to +400°F	Silicone -65°F to +500°F	Stainless Steel below -238°F to +1500°F

Maximizing hose performance is accomplished by identifying the potentially damaging sources temperature exposure.

- Heat sources in the environment in which the hose will be used
- Minimum and maximum temperatures for both the environment and material conveyed
- Note if flame resistance or flammability will be an issue
- Sub-zero exposure
- Care must be taken when routing near hot manifolds and in extreme cases a heat shield may be advisable

Identifying all the potential sources of harmful temperature exposure will help to prolong the service and performance of any hose assembly.

Application

Application refers to the intended use of the hose assembly and the service conditions it will be exposed to and expected to perform under. It is easy

enough to understand, and one can usually find a hose designed with an application in mind i.e. petroleum dispensing hose or water & air hose.

Many products have been engineered and designed to function under normal conditions and will perform optimally if proper care is taken. For new assemblies or custom operations users will want to maximize service, performance, and safety by addressing the following application factors.

- Configuration/routing (add a sketch or drawing if applicable)
- Is the hose hanging, laying horizontal, supported, unsupported?
- Orientation and aspect of the hose
- What else is attached to the hose, any external load on the hose?
- Bend radius requirements, flexibility
- Elongation considerations with working pressure
- Quantify anticipated movements and geometry of use requirements
- Intermittent or continuous service
- Indoor and outdoor use
- Unusual mechanical loads
- Excessive abrasion
- Electrical conductivity requirements
- Equipment type
- External conditions – abrasion, oil (specify type), solvents (specify types), acid (specify type and concentration), ozone, saltwater
- Type of hose
- Service life being obtained and description of failure or source of customer dissatisfaction
- Strength and frequency of impulsing or pressure spikes
- Non-flexing applications (static), flexing applications (dynamic)
- Vacuum requirements

Media / Material

Media and material refer to what is being transferred, the type and concentration through the hose tube. A chemical compatibility chart provides an extensive list of common and uncommon industrial chemicals and the recommended materials for contacting those chemicals. One should be aware of the material contacting the outer cover of the hose as well as this will impact the performance of the hose. For a more comprehensive understanding of what media and material aspects should be addressed consider the following.

- Are there any specific requirements for this hose tube?
- Any special specifications (or agency requirements) that need to be considered (e.g., FDA, API)
- Will the material be continuously flowing, or sit in the hose for long periods of time (specify)?
- Media velocity, flow rate
- Chemical name/concentration (MSDS)
- Solids, description and size
- Fluid Compatibility- Some applications require specialized oils or chemicals to be conveyed through the system. Hose selection must assure compatibility of the hose tube. In addition to the hose materials, all other components, which make up the hose assembly (hose ends, o-rings, etc.), must also be compatible with the fluid being used. Depending on the fluid, your hose supplier may lower the maximum temperature or pressure rating of the assembly.

Pressure

Pressure includes maximum working pressure, pressure spikes and the presence of impulse pressure when a hose is in service. An assembly that operates under or near its recommended working pressure with little variation will last much longer than a hose experiencing pressure spikes and impulses exceeding the maximum operating pressure. Hose assembly working pressure must be equal to or greater than the system pressure, including all fittings, clamps, and accessories. The lowest pressure rating of any element of the hose assembly determines the maximum operating pressure. Hose manufacturers have various attachment methods that when properly installed will result in hose ends that exceed the maximum working pressure of the hose itself. Assemblies designed for service with pressure conditions should consider

- Temperature implications- All catalog pressure ratings are assumed to be at 70°F
- Vacuum considerations
- **Maximum Operating Pressure-** This is the maximum pressure that the system should be exposed to in normal operating conditions. Both the hose and hose end should not be rated to a pressure less than the maximum operating pressure of the system.

- **Pressure Spikes-** When a hose assembly is subjected to a large load in a short period of time, the system pressure cannot exceed the maximum operating pressure. Frequent pressure spikes can reduce the life of hose assemblies. In general, spiral hose constructions are better suited to high impulse applications, which involve flexing and large pressure spikes. However, there are specialized braided hoses available from various manufacturers.

High pressure service accidents can be lethal and cause permanent damage to life and property. Consult with an expert to guarantee a safe hose assembly.

Ends

Having determined the appropriate hose tube and cover construction for the application it is time to select the proper ends to complete the design. Hose ends should match the ports style: flange, quick disconnect, SAE thread, metric thread, etc., and size as often as possible to reduce instances of flow rate variability, and connection issues. Hose design must consider chemical capabilities for the ends as well, materials include aluminum, brass, polypropylene, plated carbon steel, 304 stainless steel, 316 stainless steel all have different strengths and weakness when it comes to conveying material types and temperatures. For new hose design and replacement hose one should know the following:

- Style, type, orientation, attachment methods, etc.
- Uncoupled or coupled hose; hose with built- in fittings
- Materials and dimensions
- Conductivity requirements

Bay Rubber Company stocks a variety of Couplings, Fittings, Clamps and Accessories

Adapters	Cam and Groove	Chemical Clamps	General Purpose	Menders
Petroleum	Quick Coupling	Sanitary	Sand Blast	Steam
Strainers	Tank Car	Valves	Victaulic and Groove	Worm Gear

Details

Hose selection is about complete but a few more details should be considered to ensure maximum service life and performance for the assembly. Common items that will increase hose life are abrasion protection, bend restrictors, fire sleeve or thermal protection devices. It is important to mention any phase change occurrences and any electrical conductivity requirements. Please mention any other details including

packaging, cleaning, tagging & labeling, and testing & certification before delivery is scheduled.

Call Bay Rubber Company for selection and order assistance. 510-635-9151