Stamp It Before You Spec It

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It's important to "STAMP" hydraulic hoses and fittings before you order them. STAMP is an industry acronym that stands for Size, Temperature, Application, Media, and Pressure. Knowing each will help you select the right part for your application. Selecting the wrong part can cost your company time and money. To keep machine downtime to a minimum, STAMP it before you SPEC it.

Size

Dash Number (or dash size) is a common size designation used by the fluid power industry to identify the size of a hydraulic hose or fitting. The Dash Number is the measure of a hose's inside diameter (I.D.) in sixteenths of an inch or in millimeters (the exception to this is SAE 100R5 hose). You'll find it on the layline of a hose or stamped on a fitting.

If the hose has no layline (if the original printing has worn off), measure the I.D. Be sure to record the overall assembly length and fitting orientation before you cut the hose. To determine the size of an unidentified fitting, use a caliper to measure the outside diameter of male couplings or the I.D. of female couplings.

Correct I.D. is important for maintaining proper flow velocity – too slow and the system performs sluggishly, too high and excessive pressure drops, leaks, and system damage can occur. Parker provides a Flow Capacity Nomogram to help determine proper hose size based on the flow rate your system requires. To use the nomogram, connect a straight edge from the required flow rate to the recommended velocity range. The required hose I.D. will appear at the intersection of the straight edge and the center column. If the edge passes through the scale between sizes, use the next larger I.D. hose.

Temperature

When specifying hose, there are two temperatures you must identify – ambient and system. Ambient temperature is that which exists outside the hose (the environment the hose is being used in). System is the temperature of the media (typically hydraulic fluid) being conveyed through the hose/system.

Unusually high or low ambient temperatures can have adverse effects on hoses not designed for such conditions. The integrity of the hose cover and reinforcement materials can be compromised, reducing the service life of the hose. Extreme conditions require special hoses. Parker's 772LT spiral hose, for instance, is rated to -70 degrees F and intended for hydraulic applications in and around the Arctic Circle.

System or media temperatures can also have a significant impact. Rubber, for example, loses flexibility if subjected to high temperatures for extended periods of time. Hoses carry different temperature ratings for different fluids. For example, a hose could be rated from -40 to 257 degrees F for petroleum-based hydraulic fluids. When conveying water, water/glycol or water/oil emulsion fluids, however, the maximum rating for the same hose drops to 185 degrees F. Air is rated even lower at up to 158 degrees F.

Always consult the manufacturer's temperature chart to determine the maximum and minimum ratings for a specific hose/media combination.

Application

Before selecting your hose it's important to consider how it will be used. Certain applications require specific hoses. For example, if the hose will be used on a machine where it will encounter extensive movement or contact with rough surfaces, an abrasion-resistant cover may be necessary. Other considerations include:

Environmental factors (i.e. proximity to salt water may necessitate the use of stainless steel fittings).

Use of permanent or field-attachable fittings.

Bundled hoses (zip ties or plastic sleeves can be eliminated by using twin-line hose).

Bend radius is another key consideration where space is tight. For maximum service life and safety, a hose assembly should be routed so that the hose is not stretched, compressed, or kinked. When considering the bend radius, allow for a minimum straight length of twice the hose's outside diameter between the end of the fitting and the point at which the bend starts.

You must also select a hose that meets the functional and legal requirements of your application. Industry standards maintain specific requirements concerning construction type, size, tolerances, working pressure, and impulse cycles of hoses. Also be aware that government agencies control application standards for certain industries – two examples are the United States Coast Guard and American Bureau of Shipping. Know the standards that apply to your industry.

Media

What will the hose convey? Special oils or chemicals are required in some applications. These can quickly destroy a hose that is not compatible with the media. Not only must the inner tube be compatible, so must be the cover, fittings, and O-rings. Reference the manufacturer's literature to compare the chemical resistance rating of the hose or fitting you will select to a variety of media. Parker provides a Chemical Resistance Chart that accounts for more than 400 substances a

hose can convey.

Pressure

It's critical to know both the system working pressure and the pressure of any surges or spikes in the system. The published maximum working pressure of the hose must exceed the peak transient pressure the system can attain. Simply put, it must be greater than the pressure the system can surge to.

Pressure spikes can occur in an instant during machine operation – so quickly, in fact, that standard glycerin-filled gauges never detect them. A pressure diagnostic system can help detect how often these surges occur and how drastic they are. Your system may not be performing as you think it should be.

The maximum pressure rating of a hose can be found on the layline and/or in the manufacturer's literature. Care must be taken when looking at the "weakest link" of the hose assembly. Assemblies are rated at the lesser working pressure of the hose and end connections used. For example, if the fittings are rated at 5,000 psi and the hose is rated at 5,800 psi, the pressure rating of the complete assembly is 5,000 psi.

A hydraulic system is only as good as the quality, compatibility, and capability of its components. Improper hoses and fittings can create hazards for engineers, machine operators and maintenance professionals, as well as cost companies money when machines are left inoperable as the result of a failed assembly.

When you STAMP a component before you SPEC it, you are more likely to identify the right part for the job and keep your business productive and profitable.

For a complete guide to STAMP, consult the Parker Hose Products Division catalog (Catalog 4400), call 800-C-Parker, or visit *www.parkerhose.com* [2] to download your copy today.

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