



Creating a Hose Maintenance Plan That Could Save Your Plant Thousands

Knowing the right time to replace hoses in a plant is a common concern among many of Swagelok's customers and with good reason. Waiting too long to replace a hose that needs attention can greatly increase your risk of a failure, possibly leading to a safety issue and unplanned downtime. Replacing a hose too early – while not a safety risk – can be costly in terms of time and money. A preventive hose maintenance plan would be a valuable addition to nearly any plant's standard operating procedures.

A preventive maintenance plan can help by providing information on each individual hose in your plant. This means tracking the life and performance of every hose, inspecting them frequently, replacing them proactively, and identifying key replacements to have at your facility. While developing such a plan may seem onerous, the cost-saving benefits can make it well worth the upfront time investment.

Each hose in your facility is different due to the application parameters it experiences, and therefore needs a unique replacement interval based on its environment. Everything from pressure and temperature to movement demands and nearby equipment should be taken into account.

Consider a process application that uses 50 identical hoses. Half of these hoses are steam cleaned and wear out after one year. The other half are not cleaned and will likely last much longer, say, four years longer. Placing all the hoses on a five-year maintenance cycle is dangerous and can shut down expensive processes due to unexpected hose failure. However, putting all the hoses on a one-year replacement interval would mean replacing hoses with years of life left in them. How much could the plant save if it increased the replacement interval for the second set of hoses to five years? At a cost of about US\$200 per hose, the savings would be about US\$20,000 in product costs alone, plus the savings from reduced maintenance and downtime.

Steps to Creating a Preventive Hose Maintenance Plan

While your supplier can provide general inspection and replacement guidelines, your actual replacement intervals will vary based on each hose's operating environment, materials of construction, and other factors. These replacement intervals cannot be predicted. They can be determined only through observation and careful recordkeeping.

Here are steps to establish your plan:

1. Identify All Your Hoses

First, perform a full plant audit that includes identifying and tagging every hose. Be thorough and specific, including noting the hose type, part number, process fluid, pressure or temperature ratings, and vendor name and contact information.

In a spreadsheet, log additional details, including each hose's length, hose size, core material and construction, reinforcement layers, end connections, mounting, cover type, operating conditions, cleaning procedures, and the date the hose was installed and scheduled for replacement.

2. Track the Life Cycle of Each Hose

Follow a schedule of regular hose inspections, examining each hose at an interval recommended by your supplier. These inspections are visual and rarely require system downtime. Mainly, you are looking for signs of wear, such as scrapes, cuts, corrosion, kinks, and general deterioration. These signs indicate the hose is ready to be replaced. Note all observations in your spreadsheet.

If the system is in operation at the time of your inspection, you can also look for hoses that rub against equipment, experience pulses, are exposed to external heat sources, or are set up in arrangements that may cause undue strain (see Figure 1). These are situations that should be corrected.



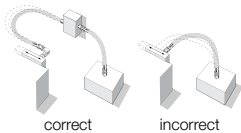
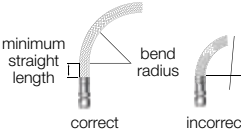
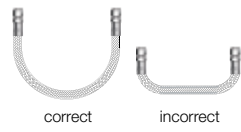
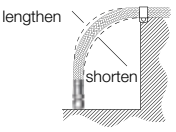
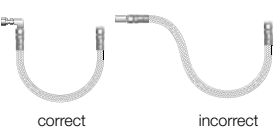
Undue Hose Strain	
 correct incorrect	Twisting a hose or bending it on more than one plane
 minimum straight length bend radius correct incorrect	Bending the hose beyond its recommended radius
 correct incorrect	Bending too close to the hose/fitting connection
 lengthen shorten	Allowing insufficient hose length so the hose is strained during impulses
 correct incorrect	Failing to use elbows and adapters to relieve hose strain on horizontal end connections

Figure 1. Eliminate these situations that will put strain on your hoses, shortening their service life or causing failure.

Once a hose has reached the end of its life, it's critical to note its service interval. This information provides a known replacement interval for that hose.

If and when a hose fails during operation, document everything, including the location of the failure on the hose, the severity of the break, and how the hose was mounted. These details will help you troubleshoot the failure with your hose supplier and determine how to prevent a reoccurrence.

3. Follow Inspection and Replacement Protocols

As you learn the replacement interval for each hose, your hose maintenance plan will take shape. However, even after determining the replacement interval, you should continue with periodic inspections to ensure that a change in system parameters does not place a strain on a hose.

4. Analyze Your Data

Periodically analyze your historical data against your established hose inspection and replacement frequencies to determine if

any intervals should be shortened or lengthened for safety or budgetary reasons. Performing a destructive test on a replaced hose can show whether the hose was replaced too soon (that is, if it has significant life left, you can extend its replacement interval) or too late (that is, if it were nearing failure, you should reduce the replacement interval).

In addition, if a specific hose is replaced frequently (for example, weekly or after only one cleaning cycle), consider using an alternative design that will offer a longer life. In doing so, verify that the cost-benefit analysis works in your favor.

5. Be Prepared with Spares

If you know the replacement interval of your hoses, you can order replacements in advance. In addition, for certain hose categories, it's a good practice to keep some spares in inventory at your plant:

- Hoses for Critical Safety or Process Applications:** You'll need a readily available spare to rapidly correct any hose applications that present critical safety hazards or severe downtime potential.
- Hoses That Are Likely to Fail:** When a hose's operating environment presents a high likelihood of premature failure, you'll want extra hoses available to accommodate your frequent replacements. For example, hoses kinking, moving in two planes or experiencing vibration will likely fail sooner than others. A better practice may be to find a more suitable hose for the application or adjust the system to remove the strain on the hose.
- Hoses for Special Applications:** Keep spares of any hoses that are difficult to source due to special materials, lengths, end connections, and other variables. For example, if you know a special order hose has a three-week lead time, you may even want to inventory two spares for good measure.

Realize Longer Hose Lives

Regular inspections and meticulous recordkeeping will require an investment of time. A hose maintenance plan could mean significant cost savings and improve your plant's safety. With a plan in place, you should be able to replace hoses less often, replace them only when needed, and always have fast access to a replacement when necessary. These outcomes mean increased profitability, enhanced safety, fewer delays, and readily available replacement hoses while a manufacturing process is down. If you keep track, the numbers will tell the story.

For help with hose training, assessing inventory or conducting inspections, contact your local [Swagelok sales and service center](#).