

# Maintaining Your Hose

As a major manufacturer of hoses used in the Industrial, Medical and Specialty Gas industry, we highly recommend that you implement an ongoing inspection program for all compressed gas and cryogenic hoses.

**Remember, it is better to be  
"Proactive vs. Reactive."**

**The goal is to replace the hose  
before it fails."**

We care about this market, however, in the past two years we have witnessed "first hand" the negative effects of misused and abused hoses. In the interest of time, we will limit this discussion to PTFE, ETFE, and "all metal" hoses only. We have purposefully left out oxy-fuel hoses.

The following recommendations utilize some common safety practices. First of all, please understand that not all hoses are constructed in the same manner. Added to that, compressed gas and cryogenic hoses are used in many different ways. It is important that you identify and address your critical applications first. Critical applications will vary in each facility, however, a common guide would be as follows: high pressure fill manifolds, tube trailer transfill systems, and cryogenic transfer. There are a few basic "maintenance" steps that you can implement rather easily. In fact, a continual hose maintenance program will go a long ways towards increasing the life of this important tool, while preventing the chance of serious injury or damage.

## How do you begin your maintenance program?

### 1 Conduct a Visual Inspection

Probably the most important thing that an operator can do (as part of a maintenance program) is a visual inspection. This should be conducted on a regular basis (daily, weekly, or monthly) depending on the application, and the usage/cycle rate. A continual visual inspection is the best way to identify and prevent a potential problem.

## What should you look for?

### • Discolorations

Freckles, spotting, or other markings are an indication of a foreign matter coming in contact with the hose. Often, freckles can occur from the use of a "leak check" solution. Typically, this is not a problem. However, it is crucial that leak check solutions be mixed to the manufacturer's recommended proportions. If the proportions are not correct, braid damage can occur.

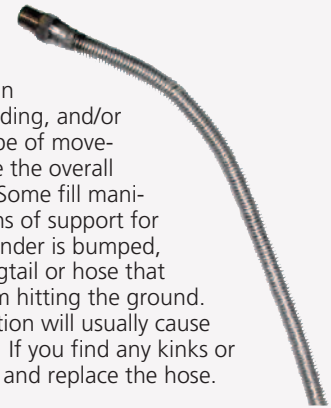
With ethylene glycol (a common substance used in oxygen free leak check), the wrong proportions can negatively affect the stainless steel braid.



*The braid on this hose was chemically attacked by an improper mixture of leak check solution.*

### • Kinking

A kink in the hose is an indication of over bending, and/or over stressing. This type of movement can compromise the overall integrity of the hose. Some fill manifolds provide no means of support for the cylinder. If the cylinder is bumped, quite often it is the pigtail or hose that stops the cylinder from hitting the ground. Unfortunately, this action will usually cause damage to the pigtail. If you find any kinks or severe bends, remove and replace the hose.

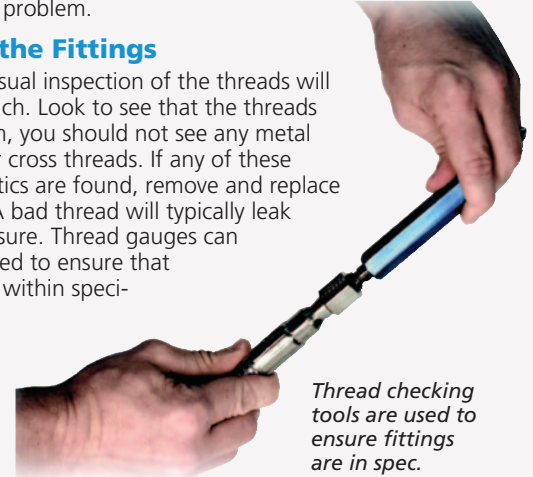


### • Braid Integrity

The stainless braid gives the inner core of the hose the ability to withstand pressure. There should not be breaks **anywhere** on the stainless steel braid. A single broken braid is the sign of a potential problem.

### • Inspect the Fittings

A simple visual inspection of the threads will tell you much. Look to see that the threads are uniform, you should not see any metal shavings or cross threads. If any of these characteristics are found, remove and replace the hose. A bad thread will typically leak under pressure. Thread gauges can be purchased to ensure that fittings are within specification.



*Thread checking tools are used to ensure fittings are in spec.*

### 2 Pressure Test & Leak Check

#### Leak Check Hose

It is very important to leak check the hose and fittings under pressure for any signs of leakage. Leak check solutions are commonly available and work very well under pressure. It is crucial that you not only use the correct solution, but that you mix the solution to the manufacturer recommended proportions. Failure to do so can cause damage. Keep in mind, not all leak check solutions work for every gas service. Check with your supplier to make certain you are using the correct "leak check" product.

**For Leak Check Products see next page**

#### Pressure Test

It is very important to leak check hoses on a regular basis. Often, this test is conducted while the hose is attached to the fill manifold and under pressure. The best gas to use for a leak check (and most expensive) is helium. Helium works well because the helium molecule is very small. As a result, helium will find a leak better than most other gases. Keep in mind that this can get a little spendy, so other inert gases can be substituted. We do not recommend compressed air or any other gas that could contain impurities.

# Maintaining Your Hose (continued)

## 3 Replace Old Hoses

Remove and replace old hoses. All too often, hoses are overused. **Contrary to popular belief, hoses do not last forever!** Every high pressure hose has a life expectancy. This is typically based on the amount of service the hose has provided, and the manner in which it has been used. A good "rule of thumb" is a hose that see 18 cylinder changes per day, five days a week, will operate safely for approximately 18 months. At this rate, the hose will have been connected and disconnected 12,960 times. Provided that the hose has not been abused in any other way this is a good point of reference. *Please note reference guide below that will help to determine when a hose should be changed out.*

Keep in mind, hoses attached to a fill manifold can be connected and disconnected up to 20 times a day. This equates to 9600 changes per year. At an average cost of \$20.00 per pigtail, this tool is costing pennies per change-out.



Tube trailer hoses can get "banged around" and bent in a myriad of configurations. It is important to inspect all cryogenic hoses for leaks on a regular basis.

One of the most common problems associated with cryogenic hose is exceeding the recommended velocity. If you exceed the recommended velocity, damage will occur. If this is of interest, we would be happy to supply a velocity chart for our hoses.



*Circumferential cracks on the convolution are typically caused by high velocity flow rates*

All of our hoses include a band that states the date of manufacture, and MAWP.

Don't assume that just because a hose is being used for a particular application, that it is the correct hose. **Call our Service Representative at 1-800-264-7793 to make certain that you are using the right hose for a particular application.**

To sum it up, a regular "hose" maintenance program is a great idea. Simply conduct regular visual inspections of the hoses that you use. Also, perform pressure test to ensure the hose is in good condition. Any hoses that fail these two test should be removed and replaced. Track the cycle rate of your current hoses and replace as required. With these three simple steps, you can maximize the life of your high pressure and cryogenic hoses, while adding a new layer of safety for your employees and customers.

### Handy chart to check when Hose Replacement is Recommended

#### High Pressure Hose Cycle/Use Replacement Chart

Cycles per Day	4	6	8	10	16	20
Equals # of Changeouts per Month	160	240	320	480	640	800
Equals # of Changeouts per Year	1,920	2,880	3,840	5,760	7,680	9,600
Expected Life* (months)	24	22	20	18	16	12

*\*This is an approximate life expectation based on normal use. These numbers are not intended to be used with other hose types.*



**Ratermann's Oxygen Safe**  
**CGA & Valve Leak Check**  
**Find your Leaks Fast and Easily**  
**with the Extending Tube to Get**  
**in the Hard to Reach Areas.**

• **Ready to Use – No Mixing**

Part #	Description	Size
LC-8OZ	Leak Check Squeeze Bottle	8 oz.
LC-1GAL	Leak Check 4 to a case	1 Gallon



1 gal. size  
Pt # LC-1GAL



8 oz. size  
Pt # LC-8OZ