

LIFEGUARDTM SAFETY SYSTEM

HYDROGEN HOSES | CRYOGENIC LIQUID CYLINDER HOSES | METAL PIGTAILS | LIFEGUARD COMPRESSED GAS HOSES | CARBON DIOXIDE BULK LIQUID TRANSFER HOSES

LifeGuardTM Hydrogen HosesTM The Next Generation in Hose Safety!!!



Open Flow (Valves Kept Open by Internal Cable)



Coupling Failure (Valves are closed by separation and/or back pressure)

WHAT is LifeGuardTM? A Flexible “Safety System” for use in the transfer of high pressure gases and liquids. Protect against the hazardous effects of hose rupture, pull-apart and failure.

The LifeGuardTM design utilizes the unique, patent pending design that eliminates the potential for disaster through the use of an internal compression spring device connected to specially designed, normally unseated valves located on



each end of the spring. In the event of hose separation, stretching to the point of an unsafe condition or coupling-to-hose separation, the valves are released and instantly seat stopping the flow in both directions.

Designed specifically for the ultra hazardous applications of high pressure hydrogen gas transfer in tube trailers, facilities and cylinders. Whether you prefer metallic or Tefzel[®], the LifeGuard hydrogen hose is the Safe-Choice.TM The inner hose, braid, armor casing cuffs, weld ring, and ends are all stainless steel. Each finished assembly is pneumatically tested to ensure it will withstand the application requirements.



• LifeGuard Tefzel[®] ETFE Lined Stainless Steel Braided Hoses

LifeGuard's Tefzel[®] ETFE inner core has a permeation rate that is approximately 77% lower than PTFE inner core pigtails. This makes it an ideal choice for helium and hydrogen.

• LifeGuard Metallic Lined Stainless Steel Braided Hoses

LifeGuard's metallic high pressure hose assemblies are specifically designed to transfer gaseous hydrogen to and from a bulk transport truck to the customer facility.



**LIFEGUARD
TECHNOLOGIES**
The next generation in safety hoses

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LifeGuard™ Teflon vs. Metal Inner Hose

Gas and cryogenic hoses are available with either Teflon or Metal inner hoses. To ensure long life, it is very important that you select the correct material for each application.

Corrugated VS. Smooth Bore Inner Core : One of the most common causes of metal hose failure is “high velocity” gas flow. Because of the ribs on the corrugated type hose, high velocity flow (above recommended levels) can damage or crack a metal type hose. To avoid hose damage, it is important to know the velocity of gas flowing through the hose. We have provided charts that will help you determine velocity flow levels. If you find that a particular application requires a higher than recommended gas flow velocity, in this case we would suggest that you switch to a smooth bore PTFE or ETFE type hose (dependant on the gas). Smooth bore hose are designed to handle higher velocity gas flow requirements.

Effusion: Metal inner core hoses will not effuse or diffuse gas. i.e. they have zero permeation: this is why they are preferred for high purity and hazardous specialty gases, as well as hydrogen and helium when in a constant pressurized application. Pressurized gas will permeate or effuse through the wall of the PTFE hose at rates consistent with the gas molecule size and weight, and with atmospheric gases this effusion is hardly noticeable and minimal. For hydrogen and helium, the ETFE or hose has typically 1/3 the effusion rate of a PTFE hose, so ETFE (or “post sintered”) is the recommended inner core material for H2 and He cylinder filling applications.

Flexibility: Teflon hoses tend to be a bit more forgiving in terms of flexibility than all metallic hoses. If an application requires constant flexing, a PTFE or ETFE type hose will work best.

Trailer Transfill/Cylinder Filling, Cylinder Cradles - High velocity: The inside of a Teflon gas service hose is smooth bore, whereas a metal inner hose is convoluted (ribbed). In high velocity applications (tube trailer transfill, cylinder fill) a smooth surface will work best. A convoluted hose in a high pressure drop (high velocity up to critical velocity) can experience internal hose vibration and fatigue leading to cracking of the corrugated inner core.

Trailer Transfill Liquid - Low velocity : When hydrogen or helium tube trailers are being filled at the plant in a slow volume method such as with a pump or compressor, the volume flow through the hose is typically within the velocity limitations to allow the use of a metal inner core hose. Typically lower pressures and temperatures are used in the transfer of liquid cryogenics. A metal hose will perform this job much better than a Teflon hose. However, it is important to ensure that the hose is not bent in more than one plane at a time. Failure to do so will result in premature hose failure.

Static State: Static state would include applications where the gas remains in the hose over a long period of time. Polymer inner core hose will effuse gas. Whereas metal inner core hose has zero effusion. This becomes critical when the application involves smaller molecule gases, flammable, or toxic gases. Hydrogen, helium, and specialty gases are best delivered in a metal liner core hose. When delivering corrosive gases, Monel inner core hose is recommended.

Cryogenic Hose: The low temperature of cryogenic liquids requires the use of a stainless steel inner core type hose.

Metal Hose Limitations: It is important to ensure that the hose is not bent in more than one plane at a time. Such action will set up an inherent torque, which can contribute to premature hose failure when the hose is pressurized. When the hose is connected from one static point to another static point, it should make the bend easily without forcing the hose to arrive at its position to make the connection. Also as mentioned previously: Metal inner core hoses have a velocity limitation of 100 feet per second for a straight run, 50 fps for a 90degree bend, and 25 FPS for a 180 degree bend according to metal hose manufacturer’s rules of thumb. Calculations are available to project velocity data.

Metallic Hoses	
BH22-004-11-60	5' x 1/2" NPT, CONVOLUTED SS METAL LINED, 3500PSI, 14000 BP
BH22-004-11-120	10' x 1/2" NPT, CONVOLUTED SS METAL LINED, 3500PSI, 14000 BP
BH22-004-11-180	15' x 1/2" NPT, CONVOLUTED SS METAL LINED, 3500PSI, 14000 BP
BH22-004-11-240	20' x 1/2" NPT, CONVOLUTED SS METAL LINED, 3500PSI, 14000 BP

Tefzel Hoses	
TF51-004-17-6	6.0' X 1/2" NPT,TEFZEL LINED, 3500 PSI, 14000 BP
TF51-004-17-10	10.0' X 1/2" NPT,TEFZEL LINED, 3500 PSI, 14000 BP
TF51-004-17-15	15.0' X 1/2" NPT,TEFZEL LINED, 3500 PSI, 14000 BP



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The Function of the LifeGuard Safety Hose System:

