

# RESOURCE GUIDE

**VALUABLE INFO FROM OUR  
TRUSTED MANUFACTURERS,  
COMPILED & FORMATTED BY  
EVERGREEN MIDWEST CO.**

***VALUE ADDED.***

***REGO***

***FLUORAMICS***

***SHERWOOD***

***CATALINA***

|  |           |
|--|-----------|
| <b>SHUT-OFF VALVE INSTALL &amp; MAINTENANCE</b>      | <b>3</b>  |
| <b>GLOBE VALVE INSTALL &amp; MAINTENANCE</b>         | <b>8</b>  |
| <b>PTFE EXPLAINED</b>                                | <b>18</b> |
| <b>SEALANT, LUBRICANT, RUST INHIBITOR PROPERTIES</b> | <b>20</b> |
| <b>PRD TYPES FOR CYLINDER SELECTION DEFINED</b>      | <b>22</b> |
| <b>FSTC CODES DEFINED</b>                            | <b>24</b> |

**INSTALLATION,  
MAINTENANCE, &  
INSPECTION OF  
SHORT STEM  
CRYOGENIC SHUT-  
OFF VALVES**

*Created by Carlos Arevalo  
Technical Manager of IG / Cryogenics, RegO*

**In its continuing quest for safety and quality performance, RegO® publishes a series of bulletins explaining the proper installation, inspection, and maintenance of various products. This document is not intended to conflict with federal, state, or local ordinances or regulations; these regulations should be observed at all times.**

**The purpose of this bulletin is to offer guidance for the installation, maintenance, and inspection of RegO cryogenic short stem shut off valves. The installation process of the shut off valve depends on the specific application (i.e., cryogenic liquid or vapor phase).**

**RegO recommends that the valves in liquid cryogenic service are mounted in a horizontal pipeline with the stem positioned vertically. Installing in this position will limit the exposure of the stem packing to the cryogenic liquid. If cryogenic liquid is allowed to contact the stem packing seal for prolonged periods of time, then the sealing elements can shrink beyond design limits and may result in a packing leak. An adequate packing seal can be optimized if the stem is within 45° of the vertical position.**



**For liquid cryogenic installation, it is recommended to use either brazed or back braze threaded end connections to avoid potential leakage through the threads that can occur during thermal cycling. RegO offers a diverse range of different end connections to help fit your specific installation needs.**

### **Liquid Cryogenic Installation**

- 1. Disassemble the valve, fully removing the upper assembly, prior to applying any high temperature heat processes to avoid damage to the soft materials, such as gaskets and seals.**
- 2. Ensure that connections are clean and free of any debris.**
- 3. Clean the nipple and valve threads and apply flux.**
- 4. Position the valve such that the flow arrow is in the proper direction for the intended application.**
- 5. The brazing process must be completed according to applicable codes and standards. Proper welding and brazing technique are imperative to ensure the structural integrity of the joint and the components.**
- 6. Purge and clean the body and pipeline to avoid debris or pollution that could affect the sealing of the valve.**
- 7. After the purging of the valve body and pipeline is complete, it is very important to use a new copper gasket in the valve body. As seen in Figure 3, RegO includes an extra copper gasket attached to the topworks for this purpose. Place the topworks onto the body. Verify that the valve is in the fully open position and thread the topworks finger tight into the body. With a suitable torque wrench and crowfoot wrench apply 900 to 1100 in-lbs (75 to 92 ft-lbs) for the final adjustment.**

### **WARNING:**

**USE TORCH PROPERLY; FAILURE TO DO SO MAY RESULT IN LEAKS.**

**A common mistake during the silver brazing process is the improper use of a torch. One common example is when the torch is oversized and produces overheating of the valve body. If the overheating condition is combined with a fast-cooling process, then it can create porosity in the brass body material, which can result in body leaks.**



**DO NOT REUSE GASKETS.**

**If an old gasket is reused, then the probability of leakage is high as the gasket has already been previously deformed and is unable to properly fill the void space in the new position.**

**DO NOT EXCEED THE TORQUE INDICATED; EXCESS TORQUE MAY DAMAGE GASKET AND RESULT IN LEAKAGE AT THIS JOINT.**

**Some leak channels can appear over time, as a result of thermal cycles coupled with improper torque of the topworks. Do not exceed the torque indicated. Excess torque can cause damage to the gasket and cause premature leaking at this joint.**

**Follow all local / national codes and standards for pressure testing and leak checking installation before start up of system.**

**Vapor Phase Installation**

- 1. Ensure that connections are clean and free of any debris.**
- 2. Clean the nipple and valve threads and apply sealant that is appropriate for the intended service to male thread of the connection.**
- 3. Position the valve such that the flow arrow is in the proper direction for the intended application.**
- 4. Restrain the valve with a vise or suitable wrench, and using an appropriate wrench for the connection, apply the proper torque to the connection according to applicable codes and standards.**
- 5. Follow all local codes or national codes and standards for pressure testing and leak checking the installation before startup of the system.**

## Inspection

The inspection period and process of the valves depends on the application, service conditions, environment, and regulatory requirements. Many visual inspections can be accomplished without disassembling the valve. The primary inspection points are:

- **Packing system**
- **Bonnet gasket**
- **Body and bonnet**

During this inspection, verify that the valves do not have the below conditions:

1. Any signs of corrosion due to water, salt, industrial pollutants, chemicals, and roadway contaminants.
2. Any physical damage that would prevent proper sealing or that may cause product failure under pressure.
3. Leaks in the valve bonnet area or between the body and end connections of the valve.

## Maintenance

The maintenance period and process of the valves depend on the application, service conditions, environment, and regulatory requirements. It is recommended that genuine RegO parts are used. The repair kit part number that applies for the T9450 Series & T9460 and similar Series is T9564-80, depending on the handwheel color the part number is indicated below.

| <b>Repair Kit</b> | <b>Handwheel Color</b> |
|-------------------|------------------------|
| <b>T9464-80</b>   | <b>Silver</b>          |
| <b>T9464-80B</b>  | <b>Blue</b>            |
| <b>T9464-80G</b>  | <b>Green</b>           |
| <b>T9464-80R</b>  | <b>Red</b>             |

**Always replace the gasket whenever the bonnet is removed.**

**INSTALLATION,  
MAINTENANCE, &  
INSPECTION OF  
GLOBE VALVES  
(WELDED &  
SILVER BRAZED)**

*Created by Carlos Arevalo*

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**The purpose of this bulletin is to offer guidance for the installation, maintenance, and inspection of RegO globe valves.**

**The installation process depends on the end connection and use of the valve. The more common end connections used in the industry are butt weld, socket weld, silver brazed tube (brass valves), threaded, and flanged. This bulletin specifically covers installation, maintenance, and inspection of valves with welded and silver brazed end connections.**

### **Welding and Silver Brazed Installation**

**To install these valves, first disassemble the valve, removing the upper assembly prior to any high heat processes to avoid damage to the soft materials such as gaskets and seals. Once the upper assembly or top work has been disassembled, the welding or brazing process must be completed according to applicable codes and standards. Proper welding and brazing techniques are imperative to ensure the structural integrity of the joint and the components.**

**A common mistake during the silver brazed process is the use of improper torch, the worst condition is when the torch is oversized and produces overheating of the valve body. If the overheating condition is combined with a fast-cooling process, then it could affect the body's brass material. The result can be porosity in the body due to the abrupt contraction produced by fast cooling.**



**Brazing BK9412T  
(Brass Globe Valve)**



**TIG Welding SKL9412SW  
(SS Globe Valve)**

The flow direction should be noted on the valve body. Depending on the application, the flow arrow direction of the valves, should be oriented to ensure easy and safe maintenance of the packing system. Purge and clean the body and pipeline to avoid debris or pollution that could affect the sealing of the valve. After the purge of the valve body and pipeline, it is very important to use a new gasket in the valve body flange. Place the seat assembly, upper assembly, and bonnet onto the body. Verify that the valve is in the fully open position and thread the bolts finger tight into the body.

If an old gasket is installed, then the probability of leakages is high. This is due to this gasket having been deformed previously, and leaks channels can appear.



**SKM9408T Globe Valve**



**SKM9408T Globe Valve**

Using an appropriate wrench for the bolts, tighten in a crisscross pattern into the body with the torque values in sequence from the instruction sheet supplied with the valve. After the final bolt is tightened using the crisscross pattern, return to each bolt in a CIRCULAR pattern and continue tightening until the final torque value is achieved.

Do not exceed the torque indicated. Excess torque can cause damage to the gasket and cause premature leaking at this joint. Follow all local or national codes and standards for pressure testing and leak checking of the installation before introducing pressure to the system.



**New Body Gasket**



**Used**



**Over-Torqued**



**Reassembly of BK9412T applying proper torque with torque wrench**

The inspection period and process of the valves depends on the application, service conditions, environment, and regulatory requirements. Many visual inspections can be accomplished without disassembling the valve. The primary inspection points are:

- **Packing system**
- **Bonnet gasket**
- **Body and bonnet**

During this inspection, verify that the valves do not have the below conditions:

1. Any signs of corrosion due to water, salt, industrial pollutants, chemicals and roadway contaminants.
2. Any physical damage that would prevent proper sealing or that may cause product failure under pressure.
3. Leaks in the valve bonnet area or between the body and end connections of the valve.

**WARNING: The presence of any of these conditions could impair proper function of the valve and result in serious injury, property damage or both.**

The maintenance period and process of the valves depends on the application, service conditions, environment and regulatory requirements. In the absence of a preventative maintenance plan, the recommendation is to disassemble the valve a **MINIMUM** of every 10 years to inspect the internal condition of the components and replace as necessary. It is recommended that genuine RegO parts are used.

**Always replace the gasket whenever the bonnet is removed.**



**INSTALLATION,  
MAINTENANCE, &  
INSPECTION OF  
GLOBE VALVES  
(THREADED END  
CONNECTION)**

*Created by Carlos Arevalo*

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**The purpose of this bulletin is to offer guidance for the installation, maintenance, and inspection of RegO globe valves, specifically valves with threaded end connections.**

**The installation process depends on the end connection and use of the valve. Common end connections used in the industry are butt weld, socket weld, silver brazed tube (brass valves), threaded, and flanged.**

### **Vapor Phase Application**

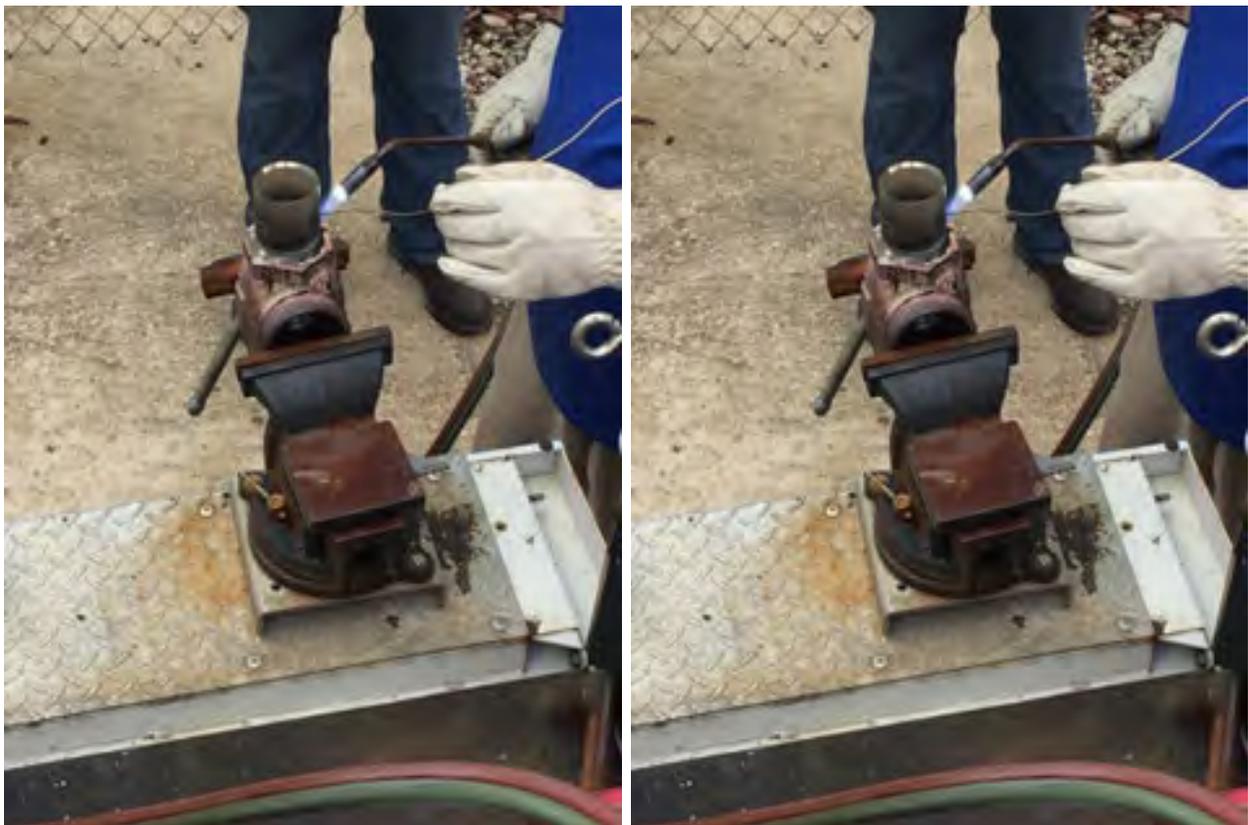
- 1. Ensure that connections are clean and free of any debris.**
- 2. Clean the nipple and valve threads and apply sealant that is appropriate for the intended service to male thread of the connection.**
- 3. Position the valve such that the flow arrow is in the proper direction for the intended application. The flow arrow direction of the valve should be oriented to ensure easy and safe maintenance of the packing system. When the valve is closed, the packing should be isolated from the media.**
- 4. Restrain the valve with a vise or suitable wrench, and using an appropriate wrench for the connection, apply the proper torque to the connection according to applicable codes and standards.**
- 5. 5. Follow all local or national codes and standards for pressure testing and leak checking the installation before startup of the system.**

### **CAUTION:**

**Do not over tighten pipes, as this may damage the valve and result in a leak.**

## Liquid Phase Application

1. **Disassemble the valve, fully removing the upper assembly, prior to applying any high temperature heat processes to avoid damage to the soft materials, such as gaskets and seals.**
2. **Ensure that connections are clean and free of any debris.**
3. **Clean the nipple and valve threads and apply flux.**
4. **Position the valve such that the flow arrow is in the proper direction for the intended application. The flow arrow direction of the valve should be oriented to ensure easy and safe maintenance of the packing system. When the valve is closed, the packing should be isolated from the media.**
5. **The brazing process must be completed according to applicable codes and standards. Proper welding and brazing technique are imperative to ensure the structural integrity of the joint and the components.**
6. **Purge and clean the body and pipeline to avoid debris or pollution that could affect the sealing of the valve.**
7. **After the purging of the valve body and pipeline is complete, it is very important to use a new Teflon gasket in the valve body. RegO® includes two extra Teflon gasket attached to the topworks for this purpose. Place the topworks onto the body.**



**Brazing of BK9412T (Brass Globe Valve)**

- 8. Using an appropriate wrench for the bolts, tighten in a crisscross pattern into the body with the torque values in sequence from the instruction sheet supplied with the valve. After the final bolt is tightened using the crisscross pattern, return to each bolt in a CIRCULAR pattern and continue tightening until the final torque value is achieved.**
- 9. Follow all local codes or national codes and standards for pressure testing and leak checking the installation before start up of the system.**

**USE TORCH PROPERLY; FAILURE TO DO SO MAY RESULT IN LEAKS.**

**A common mistake during the silver brazing process is the improper use of a torch. One common example is when the torch is oversized and produces overheating of the valve body. If the overheating condition is combined with a fast-cooling process, then it can create porosity in the brass body material, which can result in body leaks.**

**DO NOT REUSE GASKETS.**

**If an old gasket is reused, then the probability of leakage is high as the gasket has already been previously deformed and is unable to properly fill the void space in the new position.**



**Figure 3: New**



**Figure 4: Used**



**Figure 5: Over-Torqued**

**DO NOT EXCEED THE TORQUE INDICATED; EXCESS TORQUE MAY DAMAGE GASKET AND RESULT IN LEAKAGE AT THIS JOINT.**

**Some leak channels can appear over time, as a result of thermal cycles coupled with improper torque of the topworks. Do not exceed the torque indicated. Excess torque can cause damage to the gasket and cause premature leaking at this joint.**



**The inspection period and process of the valves depends on the application, service conditions, environment, and regulatory requirements. Many visual inspections can be accomplished without disassembling the valve. The primary inspection points are:**

- **Packing system**
- **Bonnet gasket**
- **Body and bonnet**

**During this inspection, verify that the valves do not have the below conditions:**

- 1. Any signs of corrosion due to water, salt, industrial pollutants, chemicals and roadway contaminants.**
- 2. Any physical damage that would prevent proper sealing or that may cause product failure under pressure.**
- 3. Leaks in the valve bonnet area or between the body and end connections of the valve.**

**The presence of any of these conditions could impair proper function of the valve and result in serious injury, property damage or both.**

#### **Maintenance:**

**The maintenance period and process of the valves depends on the application, service conditions, environment and regulatory requirements. In the absence of a preventative maintenance plan, the recommendation is to disassemble the valve a MINIMUM of every 10 years to inspect the internal condition of the components and replace as necessary. It is recommended that genuine RegO parts are used. Always replace the gasket whenever the bonnet is removed.**

**WHAT PTFE IS**

**&**

**WHY IT IS**

**IMPORTANT**

**Polytetrafluoroethylene (PTFE)** is an **incredibly versatile fluorocarbon solid that underpins every product manufactured by Fluoramics, Inc. PTFE is hydrophobic (repels water) and non-reactive (unaffected by harsh chemicals), and it has one of the lowest coefficients of friction of any solid.**

**Throughout decades of research, Fluoramics engineers have developed unique ways to suspend and incorporate PTFE into a broad range of products to make sealants more robust, lubricants more slippery, and rust inhibitors more protective and longer lasting.**

**FLUORAMICS'**

**SEALANT,**

**LUBRICANT,**

**& RUST INHIBITOR**

**PROPERTIES**

|  |   |
|--|---|
| <b>Chem-8</b>                          | <b>Synthetic PTFE silicone blend. Sealant of choice for water applications. Waterproof, chemically inert, great for high pressure gases except fluorine and oxygen.</b>   |
| <b>Fluoramics PTFE Tape</b>            | <b>Premium Full-Density PTFE Tapes for all applications. MIL-T-27730A, A-A-58092.</b>   |
| <b>Formula-8</b>                       | <b>Aqueous PTFE dispersion. NSF approved. Ideal sealant for oil-based systems, fuels, hydraulic oils. Seals threads in gas, liquid and vacuum service. NSN 8030-01-527-7193.</b>  |
| <b>LOX-8 Grease</b>                    | <b>Synthetic PTFE blend. NSF approved. Withstands extreme temperatures and pressures. Applicator gun for 1-handed application available. MIL-PRF-27617G.</b>  |
| <b>LOX-8 LD</b>                        | <b>Large Diameter LOX-8 Paste for use on larger diameter joints.</b>  |
| <b>LOX-8 Paste</b>                     | <b>Synthetic PTFE blend. NSF approved. For use with harsh chemicals, acids. Withstands extreme temperatures and pressures. Applicator gun for 1-handed application available. NSN 8030-00-829-3982. MIL-PRF-27617G.</b>                       |
| <b>Air Tool Oil</b>                    | <b>Lubricant utilizing Tufoil Technology for use with all air compressor-driven tools. Fights internal component rust. Solvent free.</b>  |
| <b>High Temperature Spindle Grease</b> | <b>Stable in excessive heat and will not melt or run, even in direct flame.</b>   |
| <b>Industrial Tufoil</b>               | <b>Compatible with mineral and synthetic oils.*<br/>Reduces operating temperatures and time between overhauls.</b>  |
| <b>Lightning Grease</b>                | <b>Eliminates stick slip and provides smoother action. Lowers operating temperatures and extends machinery and bearing life. Engineered with Tufoil Technology.</b>   |
| <b>Tufoil Engine Treatment</b>         | <b>Keeps cars, trucks, motorcycles, boats and all other 4-cycle engines running efficiently, smoothly and quietly. Extends engine life and improves horsepower and acceleration. Utilizes proven suspension of sub-micron PTFE particles.</b> |
| <b>Tufoil Gun-Coat</b>                 | <b>Formulated with Tufoil Technology and incorporates unique surface chemistries, rust inhibitors, and lubricant engineering for enhanced firearm operation and protection.</b>   |
| <b>Tufoil Lubit-8</b>                  | <b>All-purpose lubricant engineered with Tufoil Technology for superb lubrication and rust inhibition. Convenient handy oiler and pen oiler.</b>  |
| <b>HinderRUST HV100</b>                | <b>Extreme Exposure.<br/>Thickens over time after application to form extra shielding against extreme conditions. Solvent-free, low odor, low VOC.</b>  |
| <b>HinderRUST R2.0</b>                 | <b>Removable. Solvent-free, removable with detergents, high-pressure washing. Great temporary protection against flash rust or for use during storage and/or transportation. Solvent free, low odor, low VOC.</b>                             |
| <b>HinderRUST S4.0</b>                 | <b>Standard. Engineered to provide extreme surface adhesion and wetting across and into surfaces. Provides self-repairing rust protection and lubrication. Solvent-free, low odor, low VOC.</b>   |
| <b>HinderRUST-ASC R2.0,S4.0, HV100</b> | <b>Same great properties as HinderRUST but packaged in aerosol cans for ease of application. Cannot be shipped via air.</b>   |

**\*Compatibility check with synthetic gear oil recommended.**

**PRD TYPES FOR**

**CYLINDER**

**SELECTION**

**DEFINED**

|                   |  |
|-------------------|--|
| <b>CG-1</b>       | <b>Rupture Disc</b>  |
| <b>CG-2</b>       | <b>165 F (73.9 Celsius) fusible plug for cylinder product not exceeding 500 PSI (3450 KPa)</b>                     |
| <b>CG-3</b>       | <b>212 F (100 Celsius) fusible plug for cylinder product not exceeding 500 PSI (3450 KPa)</b>                      |
| <b>CG-4</b>       | <b>Rupture disc with 165 Farenheit (73.9 Celsius) fusible alloy backing</b>  |
| <b>CG-5</b>       | <b>Rupture disc with 212 Farenheit (100 Celsius) fusible alloy backing</b>   |
| <b>CG-7</b>       | <b>Pressure relief valve</b>   |
| <b>CG-8</b>       | <b>Rupture disc followed by pressure relief valve</b>  |
| <b>CG-9</b>       | <b>217 F (102.7 Celsius) fusible plug for cylinder marked working pressure not exceeding 6000 PSI (41,400 Kpa)</b> |
| <b>Prohibited</b> | <b>Prohibited from using pressure relief device for this gas 49CFR100-199</b>                                      |
| <b>N.R.</b>       | <b>None required</b>   |
| <b>N.R. CG-</b>   | <b>None required, but CG- style is to be selected for pressure relief device</b>                                   |

**FSTC CODES**

**DEFINED**

**(FIRE SERVICE)**

| <b>First Digit</b> | <b>Fire Potential</b>  |
|--------------------|--|
| 0                  | Inert  |
| 1                  | Support Combustion (Oxidizing)   |
| 2                  | Flammable: In Air at 68 Farenheit (20 Celsius) and 1 Atmosphere (14.5 PSI) |
| 3                  | Pyrophoric   |
| 4                  | Highly Oxidizing   |
| 5                  | May Decompose or Polymerize and Is Flammable                               |

| <b>Second Digit</b> | <b>Toxicity</b>  |
|---------------------|--|
| 0                   | Life Supporting (Oxygen > 19.5 Farenheit in simple asphyxiant) |
| 1                   | LC50 > 5000 ppm  |
| 2                   | LC50 > 200 ppm and < 5000 ppm                                  |
| 3                   | LC50 > 200 ppm   |

| <b>Third Digit</b> | <b>State of Gas (In Cylinder @ 68 Farenheit [20 Celsius])*</b>                    |
|--------------------|---|
| 0                  | Non-Cryogenic Liquefied Gas (less than 500 PSI) (3450 Kpa) ** (gas withdrawal)    |
| 1                  | Non-Cryogenic Liquefied Gas (less than 500 PSI) (3450 Kpa) (gas withdrawal)       |
| 2                  | Liquefied Gas (liquid withdrawal) ***   |
| 3                  | Dissolved Gas   |
| 4                  | Non-Liquefied Gas or Cryogenic Gas Withdrawal (less than 500 PSI) (3450 KPa)      |
| 5                  | Europe Only   |
| 6                  | Non-Liquefied Gas or Cryogenic Gas between 500 and 3000 PSI (3450 and 20,680 KPa) |
| 7                  | Non-Liquefied Gas above 3000 PSI and below 10,000 PSI (20,680 and 68,900 KPa)     |
| 8                  | Cryogenic Gas (liquid withdrawal) above -400 Farenheit (-240 Celsius)             |
| 9                  | Cryogenic Gas (liquid withdrawal) above -400 Farenheit (-240 Celsius)             |

| <b>Fourth Digit</b> | <b>Corrosiveness</b>     |   |
|---------------------|--------------------------|---|
| 0                   | Non-Corrosive            | *The temperature of the refrigerated (cryogenic) liquids is always below 130 Farenheit (54.4 Celsius) |
| 1                   | Non-Halogen Forming Acid |   |
| 2                   | Base Forming             | **If pressure at 130 Farenheit (54.4 Celsius) is over 600 PSI (4140 Kpa), use digit 1.                |
| 3                   | Halogen Acid Forming     |   |

\*\*\*When a separate outlet for liquid withdrawal is specified.