

## SAFE HANDLING OF GAS CYLINDERS

Cylinders must not be subjected to violent impact. If, after an accidental collision, a cylinder exhibits any sort of deformation (dent), even shallow, it should be considered as hazardous and must be removed from the use. Cylinders must not be dragged, rolled or slid along the ground even for short distances. When handled on a flat surface, they may be pivoted into a slightly inclined position, or transported by means of a hand truck. Never drop cylinders or permit them to strike each other violently. The valve protection cap should be left on each cylinder until it has been secured against a wall or bench, or placed in a cylinder stand or proper storage area, and is ready to be used.

No part of a cylinder should be subjected to a temperature higher than 55°C. A flame should never be permitted to come in contact with any part of a compressed gas cylinder.

For the safe use of cylinders users must know the gas nature (i.e. toxicity, corrosiveness, flammability, reactivity and asphyxiant) of the content and follow its safety instructions (refer to MSDS). Use gas cylinders in a vertical position, unless specifically designed to be used in any other position. The pressure regulating devices should be those suited to the physical and chemical properties of the gas contents. It is necessary to understand all safety parameters and appropriate use of devices to help insure safe handling and usage of different gas products. To reduce risks, follow the safety information given below.

### **Training**

Any one who refurbishes, fills or uses a gas cylinder should be suitably trained and have the necessary skills to carry out their job safely. They should understand the risks associated with gas cylinders and contents.

### **Handling and Use**

It is important to use the correct pressure/flow control equipment. The choice of equipment is dependent upon the gas supply pressure, the chemical and physical properties of the gas purity and other users' requirements.

Special considerations include:

- Installations handling oxygen or oxidants must be free of flammable materials (e.g. oil, grease) and must be oxidant compatible.
- In the case of fluorine, the system must also be 'passivated' prior to use.
- Installations handling flammable gases should be grounded to minimize the risk of sparks due to static discharge.
- Installations handling flammable, very high purity gases must be specially cleaned and incorporate a high purity purge facility.

### **Lifting**

Use suitable cradles, slings, clamps or other effective means when lifting cylinders with a hoist or crane.

### **Transport**

Fit suitable protective valve caps and covers to cylinders, when necessary, before transporting. Ensure gas cylinders are clearly marked to show their contents and the hazards associated with their contents.

### **Storage**

Store gas cylinders in a ventilated and well-lit area, away from combustible materials. Protect cylinders from external heat sources. Cylinder temperature should not be permitted to exceed 125°F (52°C). Contents and associated hazards should be well marked.

### Cylinder color-coding

Except in the few cases where the color codes are imposed by law, all cylinders should be compulsorily be color-coded. The product group numbering system described in the safety section is considered to provide a safer and more effective means of hazard identification and storage requirement classification.

### Cylinder labeling

In addition to the safety information being marked with the product group numbers, all cylinders should be labeled as per the local Government standards.

### Safety precautions in handling cylinders

To reduce the risks of accidents, follow the safety information given below.

- No smoking or naked flame should be allowed in the vicinity of gas cylinders.
- When handling cylinders wear stout gloves or rubber gloves and steel toe safety boots.
- Wear suitable eye and face protection. The choice between safety glasses, chemical goggles, or full-face shield will depend on the pressure and nature of gas being handled.
- Proper cylinder leakage control equipment as well as eye baths and safety showers should be available nearby.
- Operators must be assured of the ready availability of the gas masks with filter cartridges appropriate to the gas to be handled. Leaks should not go unchecked. The use of a suitable leak detector is advised.
- A suitable sign should be posted at every workstation employing pressurized gas, and the personnel must be familiar with its contents.
- Fire extinguishers, preferably of the dry chemical type, should be kept in the vicinity of gas storage or use area and should be checked periodically.
- Users and handlers of compressed gas cylinders should be familiar with the first aid methods required for the type of gas handled.

### Filling

Anyone carrying out the filling of gas cylinders must do a cylinder inspection each time for its appearance, hydrostatic due date, valves and its safe operating limits. The filling personnel should be familiar with vacuuming, purging and the working pressure of gas cylinders, and should wear the appropriate personal protective equipment. After filling a gas cylinder, it is necessary to perform a leakage test using a soap water solution.



**Note: This literature is compiled from various reference documents and internet. ALTAIR is not responsible for the authenticity of the information provided in this literature. It is advised to verify the information.**

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