

Handling, Storage, and Use of Compressed Gas Cylinders

压缩气体钢瓶操作、储存和使用

General

概述

As our customer, you need to share in the responsibility for safe handling, storage, and use of our products. Follow these seven general safety recommendations:

作为我们的顾客，你需要分担安全地操作、储存和使用我们的产品的责任。请遵守这七项关于安全的建议：

1. Know and understand the properties, uses, and safety precautions before using any gas or gas mixture. Consult the Air Products Material Safety Data Sheet (MSDS) and Safetygrams for safety information on the gases and equipment you will be using.

在使用任何气体或气体混合物之前，要知道和理解性质、用途和安全防范。关于你将要使用的气体和设备的安全资料，请参考Air Products的材料安全数据表（MSDS）和安全程序。

2. Determine the appropriate equipment required to use the product and know how to safely operate the equipment.

确定用来使用产品的合适的设备，同时知道怎样安全地操作设备。

3. Be aware of potential hazards and develop plans to cover possible emergencies. Use emergency drills to practice implementing these plans. Inform local hospitals, fire departments, and other emergency response organizations of the gases in use, so that they, too, will be prepared in the event of an emergency.

知道潜在的危險，制定应付可能的紧急情况的计划。利用紧急情况训练来实践这些计划的实施。将正在使用的气体告知当地的医院、消防部门和其它紧急情况反应机构，这样他们将在紧急情况下做好准备。

4. Provide personal protective equipment (PPE) and the required training for its use. Require personnel to wear the proper PPE for each task. Locate other safety equipment such as fire extinguishers, eyewash stations, and showers at appropriate locations. Thoroughly inform everyone about the hazards of the gases they are using and how to respond to an emergency.

提供个人防护装备（PPE）和它们的使用所要求的训练。要求工作员工在每次任务时穿戴合适的PPE。把其它安全装置，如灭火器、洗眼站和淋浴安排在合适的位置。把他们正在使用的气体的危險和如何应付紧急情况全面地告知每一个人。

5. Follow all state, and local regulations pertaining to the storage, use, and disposal of compressed gases and cryogenic liquids. Compressed Gas Association (CGA) Pamphlet P-1 provides guidance and is cited in OSHA regulations. The National Fire Protection Association(NFPA) also provides guidance for the storage and use of these products.

遵守国家和当地所有的关于压缩气体和低温液体的储存、使用和处理法规。

6. If you are unfamiliar with the hazards associated with a particular gas, contact your supplier for additional information.

如果你对与特定气体相联系的危险不熟悉，请与你的供应商联系，以得到补充资料。

7. Use appropriate equipment when handling portable cylinder banks. They have a high center of gravity and extreme care must be taken during their movement.

Portable banks may fall over when being moved if they are stopped suddenly by an object or crack in the floor.

当操作移动钢瓶工作台时，使用合适的设备。它们的重心很高，在运动过程中必须非常小心。如果它们正在运动时突然被地上的裂缝阻挡的话，移动工作台会摔倒。®

Handling

操作

Compressed gas cylinders should be handled only by those familiar with the hazards and who are trained in the proper handling techniques. Cylinders containing compressed gases are heavy and awkward to move. Improper handling of compressed gas cylinders can result in sprains, strains, falls, bruises, or broken bones. Other hazards such as fire, explosion, chemical burns, poisoning, and cold burns could occur if gases accidentally escape from the cylinder due to mishandling. Take the following precautions to prevent injuries caused by the improper handling of compressed gas cylinders.

只有那些对危险十分熟悉且受到过正确操作技术训练的人才可以操作压缩气体钢瓶。装有压缩气体的钢瓶很重，难于移动。不正确的操作压缩气体钢瓶会导致扭伤、损伤、摔倒、擦伤或骨折。如果由于误操作气体从钢瓶内逸出，会发生其它危险，如起火、爆炸、化学烧伤、中毒和冻伤。提高如下警惕，以防止错误操作压缩气体钢瓶造成的伤害。

NEVER

禁止

- Drag or slide cylinders, even for short distances.
拉拽或滑动钢瓶，即使是很短的距离。
- Drop cylinders or permit them to strike each other violently.
摔倒钢瓶或让它们彼此剧烈相撞。
- Subject cylinders to mechanical shocks that may cause damage to their valves.
使钢瓶受到可能损坏阀门的机械震动。
- Use cylinders as rollers for moving material or other equipment.
把钢瓶作为转子来移动材料或其它设备。
- Tamper with pressure-relief devices.
堵塞减压装置。
- Permit oil, grease, or other readily combustible substances to come in contact with cylinders, valves, or other equipment in oxidizer service.
让油、润滑脂或其它易燃物质接触钢瓶、阀门或正在使用氧化物的设备。
- Remove any product labels or Department of Transportation (DOT) shipping hazard labels.
去掉产品标签或交通部（DOT）的运输危险品标志。
- Refill compressed gas cylinders. This is to be done only by qualified producers of compressed gases.

重新灌装压缩气体钢瓶。这只能由有资格的压缩气体制造商来做。

- Lift a cylinder by its cap using a sling or a magnet.
用吊索或磁铁通过钢瓶帽升起钢瓶。
- Attempt to catch a falling cylinder.
试图抓住正在倒下的钢瓶。

ALWAYS

总是

- Move cylinders using a suitable hand truck or cart.
用合适的手推车或移动钢瓶。
- Leave the valve protection cap in place until the cylinder has been secured in place and is ready to be used.
让阀门保护帽一直留在原位，直到钢瓶已经固定好，并准备使用。
- Secure cylinders when in storage, transit, or use.
储存、搬运或使用固定钢瓶。
- When returning cylinders to the supplier, properly close the cylinder valve, replace and secure any valve outlet seals, and properly install the cylinder cap.
钢瓶返还给供应商时，正确关闭钢瓶阀门，替换并固定阀门排气口密封，正确安装钢瓶帽。
- Use a cylinder cage or cradle to lift a cylinder.
使用钢瓶升降机升起钢瓶。
- Use the proper PPE for cylinder handling. Wear safety glasses with side shields, leather gloves, safety shoes, and other appropriate equipment.
使用用于钢瓶操作的正确的个人防护装备。穿戴带护罩的安全眼镜、皮手套、安全鞋和其它合适的装备。
- Use extreme care and restrict the movement of portable banks to localize movement on clean, smooth, level stationary surfaces.
非常小心地限制移动工作台的运动，使其在干净、平滑、水平固定的表面上运动。
- Use two people for localized manual movement of a portable bank. Stay out of the bank's travel path. Also, be aware of escape routes should the bank get out of control or start falling. If a smooth, level surface is not available over which to move the portable bank, use a fork lift, crane, or other appropriate moving equipment.
用手移动可动工作台时要用两个人，呆在工作台运动轨道之外。还要知道如果工作台失控或开始跌倒时的逃跑路线。如果没有平滑的水平表面来移动工作台，使用叉式升降机、起重机或其它合适的设备。

Storage

储存

Take the following precautions to prevent injuries caused by asphyxiation, fire, explosion, high pressure, and improper handling of compressed gas cylinders.
注意以下事项，以防止窒息、起火、爆炸、高压和错误操作压缩气体钢瓶造成的伤害。

NEVER

禁止

- Allow storage temperature to exceed 125°F (52°C).

允许储存温度超过125°F (52°C)。

- Permit smoking or open flames in oxidizer or flammable gas storage areas.
允许在氧化物或易燃气体储存区域吸烟或有明火。
- Expose cylinders to corrosive materials such as ice melting compounds.
把钢瓶暴露于腐蚀性材料，如冰熔化的化合物。

ALWAYS

总是

- Store cylinders in accordance with CGA Pamphlet P-1.
按CGA手册的第一页储存钢瓶。
- Store cylinders upright with valve outlet seals and valve protection caps in place.
垂直储存钢瓶，保持阀门排气口密封阀门保护帽在位。
- Secure cylinders when in storage, transit, or use.
储存、搬运或使用固定钢瓶。
- Store cylinders in areas designated for that purpose.
在专用区域储存钢瓶。
- Segregate full and empty cylinders.
隔开满瓶和空瓶。
- Store cylinders in a dry, cool, well-ventilated, secure area protected from the weather and away from combustible materials.
把钢瓶储存在干燥、凉爽、不受天气影响，而且远离可燃材料的地方。
- Separate flammables or combustibles from oxidizers by at least 20 feet or a half-hour firewall.
把易燃或可燃物和氧化物隔开至少20英尺或半小时的防火墙。
- Monitor the atmosphere in areas where gases may vent and collect.
监测气体可能排出和积累区域的空气。
- Use a first-in, first-out (FIFO) inventory system to prevent full containers from being stored for long periods of time.
使用先进先出库存系统，防止满瓶储存过长时间。
- Store only the amount of compressed gas required for the specific application.
只储存专门应用所要求的压缩气体数量。
- Store cylinders away from heavily traveled areas and emergency exits.
钢瓶储存在远离人们经常出入的地方和紧急出口。
- Provide adequate access for cylinder handling.
为钢瓶操作提供足够的通路。
- Visually inspect stored cylinders on a routine basis, or at least weekly, for any indication of leakage or problems.
定期或至少每周用眼睛检查储存的钢瓶是否有任何泄露迹象或问题。
- Restrict access to cylinder storage areas.
对进入钢瓶储存区域加以限制。
- Protect cylinders from wet or damp ground.
防止钢瓶接触湿或潮的地面。

Proper Use of Compressed Gases

正确使用压缩气体

Take the following precautions to prevent injuries caused by the improper use of compressed gases.

注意以下事项，以防止错误使用压缩气体钢瓶造成的伤害。

NEVER

禁止

- Attempt to mix gases in a cylinder.
试图混合钢瓶内的气体。
- Insert an object (e.g., wrench, screwdriver, etc.) into valve cap openings to remove a stuck cylinder cap. Doing so may damage or open the valve causing a leak to occur. Use an adjustable strap-wrench to remove over-tight or rusted caps.
禁止把物体（如扳手、螺丝起子、撬杆等）插入阀门帽的开口处来移动粘住了的钢瓶帽。这样做可能损伤或打开阀门，导致泄漏发生。使用可调套扳来移动过紧或生锈的帽子。
- Allow any part of a cylinder to be exposed to temperatures exceeding 125°F.
允许钢瓶任何部分暴露在超过125°F的温度。
- Permit cylinders to become part of an electrical circuit.
允许钢瓶成为电路的一部分。
- Use oxygen as a substitute for compressed air.
使用氧作为压缩空气的替代品。
- Strike an arc on a cylinder.
电弧打到钢瓶上。
- Return product into a cylinder.
产品回流入钢瓶
- Introduce another product into a cylinder. 将另一种产品引入钢瓶。
- Use cylinder color as a primary means to identify the contents of a cylinder.
把钢瓶颜色作为鉴定钢瓶内容物的主要手段。
- Heat a cylinder to increase its pressure or withdrawal rate unless using an approved method.
加热钢瓶以增加压力或提高逸出率，除非采用经认可的方法。

ALWAYS

总是

- Know and understand the gases and associated equipment you will be using. Refer to the supplier's MSDS to determine the proper PPE and any other special requirements for the gas being used.
知道和理解你将要使用的气体和相关设备。参考供应商的MSDS，以确定正确的PPE和对所使用气体的任何其它特殊要求。
- Secure cylinders when in storage, transit, or use.
储存、搬运或使用固定钢瓶。
- Use a pressure-reducing regulator or separate control valve to safely discharge gas from a cylinder.
使用减压调整器或单独的控制阀门来从钢瓶内安全的排出气体。
- Use regulators approved for the specific gas.
使用核准用于特殊气体的调整器。

- Leak-test lines and equipment with an inert gas before using.
使用前用惰性气体对管道和设备检漏。
- Use regulators and pressure-relief devices when connecting cylinders to piping circuits with lower pressure service ratings.
在把钢瓶连接到较低额定工作压力的管道回路时，使用调整器和减压装置。
- Use check valves to prevent reverse flow in to the cylinder.
使用止回阀，防止回流入钢瓶。
- Loosen the valve outlet seal slowly when preparing to connect a cylinder.
准备连接钢瓶时，慢慢地松开阀门排气口密封。
- Open cylinder valves slowly and carefully after the cylinder has been connected to the process.
在钢瓶已经连接到过程后，慢慢地仔细地开启钢瓶阀门。
- Stand clear of the regulator and valve outlet, while opening the valve.
开启阀门时，躲开调整器和阀门排气口。
- Prevent sparks and flames from contacting cylinders.
防止火花和火焰接触钢瓶。
- Discontinue use and contact the supplier if a cylinder valve is difficult to operate. Wrenches should not be used on valves equipped with hand wheels. If the valve is faulty, tag the cylinder identifying the problem and notify the supplier.
如果钢瓶阀门难于操作，停止使用并同供应商联系。扳手不能用于装有手轮的阀门。如果阀门有故障，在钢瓶上作标记说明问题，并通知供应商。
- Close the cylinder valve and release all pressure from the downstream equipment connected to the cylinder, anytime an extended non-use period is anticipated.
关闭气瓶阀门，从下游设备泄压。
- Use oxygen-compatible threading compounds, such as Teflon tape, on systems for use in oxygen or oxidizer service.
在用于氧或氧化物设施的系统上使用同氧相容的车有螺纹的化合物，如聚四氟乙烯带。
- Remember, the cylinder label or decal is the only positive way to identify the contents of a cylinder.
记住，钢瓶的标签或标志是鉴定钢瓶内容物的唯一正确的办法。