Safety Information Necessary for Preventing Disasters Caused by High-Pressure Gases

PRECAUTIONS INFORMATION

Distributed in 2024

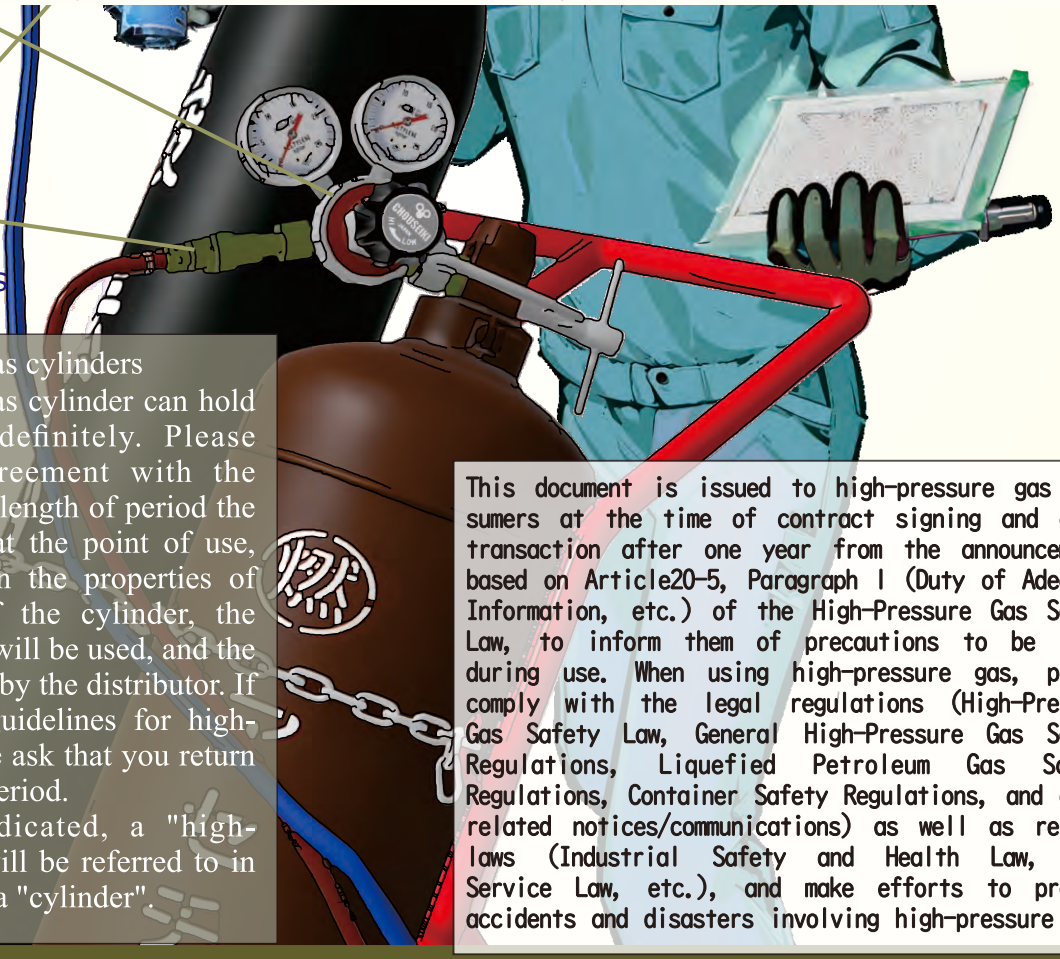
intended for users of high-pressure gases for welding and cutting (such as acetylene, liquefied petroleum gas, and oxygen for Welding or Thermal Cutting)

Accidents have occurred due to aging equipment.
We kindly request that you also schedule ※ regular overhauls, in addition to daily inspections (based on usage), annual inspections.

Daily checks are important for safety

※ Regulator 7 years

※ Dry-type safety devices 3 years



◇About high pressure gas cylinders

Not all high-pressure gas cylinder can hold high pressure gas indefinitely. Please develop a written agreement with the distributor regarding the length of period the cylinders will stagnate at the point of use, taking into consideration the properties of the gas, the design of the cylinder, the environment in which it will be used, and the support system provided by the distributor. If there are local safety guidelines for high-pressure gas cylinder, we ask that you return the cylinder within this period.

Unless otherwise indicated, a "high-pressure gas cylinder" will be referred to in this document simply as a "cylinder".

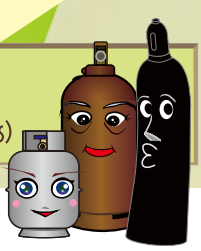
This document is issued to high-pressure gas consumers at the time of contract signing and every transaction after one year from the announcement, based on Article20-5, Paragraph 1 (Duty of Adequate Information, etc.) of the High-Pressure Gas Safety Law, to inform them of precautions to be taken during use. When using high-pressure gas, please comply with the legal regulations (High-Pressure Gas Safety Law, General High-Pressure Gas Safety Regulations, Liquefied Petroleum Gas Safety Regulations, Container Safety Regulations, and other related notices/communications) as well as related laws (Industrial Safety and Health Law, Fire Service Law, etc.), and make efforts to prevent accidents and disasters involving high-pressure gas.

一般社団法人　全国高圧ガス溶材組合連合会

高圧ガス保安協会監修／一般社団法人　日本産業・医療ガス協会推奨

1 Equipment Adaptability

(Basic information on the adaptability of the consuming equipment used to high pressure gas)



Regarding the handling of equipment and apparatus, obey the laws and regulations, thoroughly check the instruction manuals and warning signs, etc., and use the equipment and apparatus correctly.

Management and handling of high-pressure gas cylinders

Storage of cylinders for long periods of time is a very dangerous situation that can easily lead to unmanaged cylinders in a facility. Check cylinders currently in use or stored. Cylinders that are not expected to be used for some time should not be allowed to sit idle, whether or not there is residual gas.

The storage of cylinders with more than a certain amount of gas, regardless of the amount of gas remaining, is subject to either notification or licensing requirements, including the need to maintain a storage facility that meets certain requirements and to keep records in a transfer logbook.

*Calculations are based on the fully charged volume and, as a general rule, the total volume of cylinders within 22.5 meters is combined, even if they are not connected by piping.

To use high pressure gas in cylinders, please appoint a person responsible for cylinder management and ensure thorough control of the location of cylinders in terms of storage, transfer and removal from the premises, as well as the prompt return of used cylinders.

Lost or stolen cylinders are an easy source of secondary damage.In order to deter terrorism and criminal use, please prevent theft of cylinders, and in particular, thoroughly manage the receipt and delivery of cylinders to be taken out of your business, which can easily become unmanageable or lost.

Even if cylinders are not used every day, check their whereabouts before and after work begins and ends, and confirm their location and security using the cylinder storage information provided by the distributor to prevent them from becoming dangerous "unattended cylinders in the office".

Cylinders must be protected from direct sunlight to keep the temperature below 40°C (104°F) at all times, from shock from falling or tipping over, and from damage to the valves. Leaving valves in a state where they are easily corroded by chemicals, water droplets, moisture, etc. is also considered an illegal act as is rough handling.

It is dangerous to handle oxygen cylinders and valves with greasy tools or gloves.

Other gas cylinders should also not be handled with oil or grease on them as this will prevent the handler from handling the oxygen cylinder at the same time.

High-pressure gas cylinder are generally the property of the distributor or manufacturer and should be returned to the gas supplier immediately when no longer needed.

Correct use of other appliances

Before use, make sure that the equipment to be connected is compatible with the gas to be used. Carefully read and follow the instructions for equipment that uses high pressure gas, such as dry type safety devices and regulators.

Hoses are identified by the following colors:

Oxygen: BLUE	Acetylene: RED	LPG: ORANGE
shield gases (Argon, L Co_2, Nitrogen, etc.) : GREEN		

Make sure that the gas connection is correct and that the connection is secured with a hose clamp.

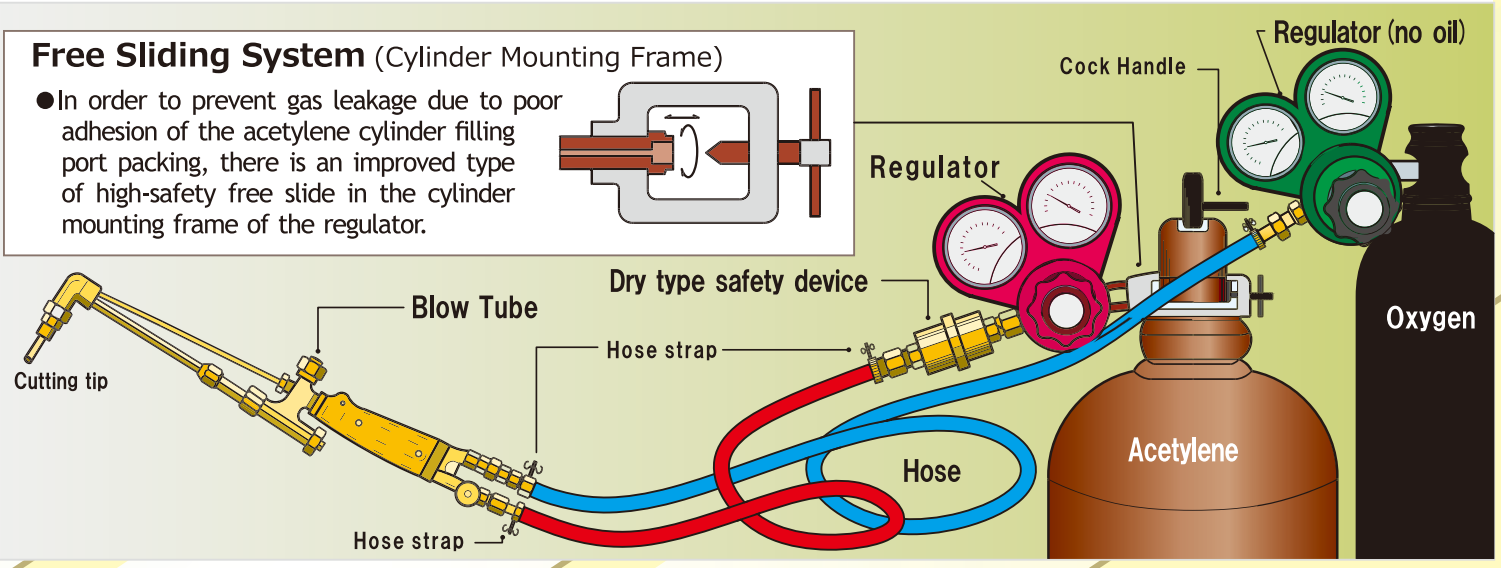
Use regulators specific to each gas and do not use regulators for other gases. Oxygen in particular is dangerous unless you use a "no-oil" regulator. For regulators and blowpipes, products with the Japan Welding Engineering Society (JWSA) approved mark that meet the new JIS standards are safer.

If the threads of the valve are deformed and the regulator is difficult to install, do not force it and consult a high-pressure gas dealer.

Gas leak detectors and fire extinguishers should be installed in the right place and with the right power.

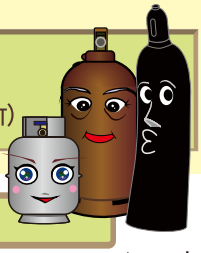
Free Sliding System (Cylinder Mounting Frame)

- In order to prevent gas leakage due to poor adhesion of the acetylene cylinder filling port packing, there is an improved type of high-safety free slide in the cylinder mounting frame of the regulator.

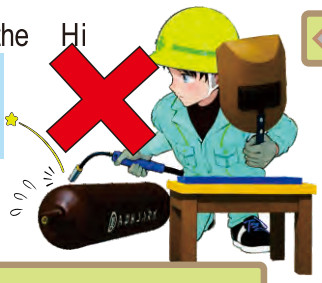


2 Management, Operation and Inspection

(Basic points to be observed with regard to the operation, management and inspection of consuming equipment)



Observe the consumption standards of the gh Pressure Gas Safety Act and do not use the cylinder for any purpose other than its original purpose of holding high pressure gas, such as arc starting.
Of course, rough handling of the cylinder while in use is also prohibited.



Gas Consumption Precautions

Valves on filled cylinders shall be opened and closed quietly, and signs and other measures shall be provided to ensure that the valves and cocks can be operated properly. The main valve must be fully opened and fully closed after use.

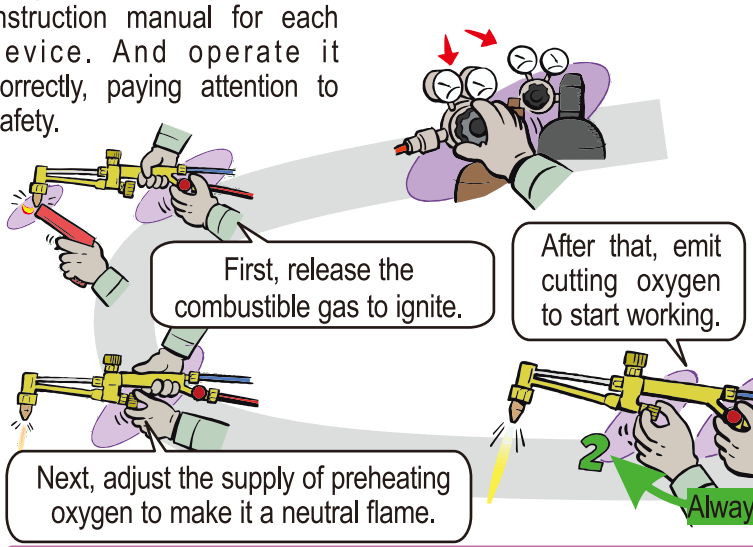
However, the main valve for acetylene gas should be opened only about one turn. And, except in the case of a manifold system, the gas consumption rate should be less than 1 kg per hour and the operating pressure should be less than 0.13 MPa. Except in an emergency, it is dangerous to operate the regulator or open/close the cylinder valve while the blowpipe, burner, etc. are ignited.

Also, when consuming propane gas, appropriate alarms and static electricity elimination equipment must be provided at all necessary locations.In addition, ignition and extinguishing of a blowpipe is regulated by the High Pressure Gas Safety Law consumption standards as follows

Ignition of a blowpipe: With the oxygen supply valve closed, only combustible gas is released first, and after ignition, oxygen is supplied.

Extinguishing a blowpipe: First shut off the oxygen, then the flammable gas.

To ignite and extinguish other combustion devices, follow the instruction manual for each device. And operate it correctly, paying attention to safety.



Daily inspection

Since the function of the high pressure gas system is guaranteed by the daily efforts of the operator, it is important to inspect hoses, regulators, valves and other equipment on a daily basis. At the beginning and end of use, the consuming equipment must be inspected for any abnormalities, and at least once a day the operation of the equipment (cylinder/regulator/hose/blowpipe) must be checked.

Before use, leakage of regulator connections and hose connections should be checked with a special detection fluid. The use of fire for inspection is unacceptable.

Control Inspection

Regular checks, overhauls, and replacement updates

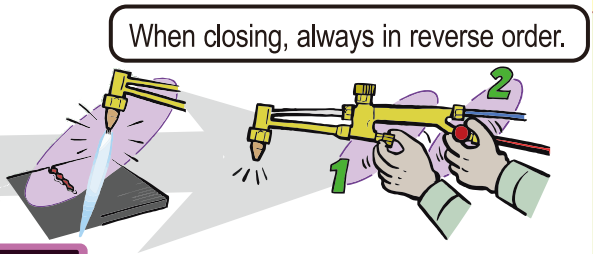
Equipment, including cylinders, should be inspected at least annually in accordance with the periodic voluntary inspections required by the High Pressure Gas Safety Act, and if a problem is discovered, it should be addressed immediately.

Hoses should be inspected regularly for hardening, wear or cracks and replaced immediately if any abnormality is found to prevent gas leak accidents.

It is recommended that pressure regulators be inspected or replaced by the manufacturer after 7 years from the date of manufacture and blowguns after 5 years*. In addition, a voluntary inspection should be performed once a year to ensure safety. Dry-type safety devices should be subjected to periodic voluntary inspections once a year after they are put into service and should also be re-inspected by the manufacturer every three years*. Of course, they should not be used without backfire protection between inspections.

During inspection of equipment by the manufacturer, to prevent any problems occurs even, please consider either preparing spare parts for substitution or replacing them with new ones or equivalent items at the time of the inspection deadline.

The "Technical Guideline for Work Safety in Gas Cutting and Gas Welding" issued by the National Institute for Occupational Safety and Health (NISO) clearly states this.



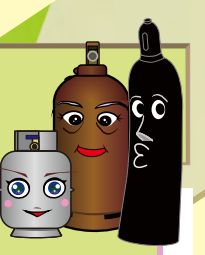
Measures to be Taken for Cylinders That Have Been remained for a Long Time

Within the consuming facility, accidents have not been eliminated in which high-pressure gas cylinders have been remained for a long period of time, resulting in spontaneous rupture due to corrosion of the outer surface. Not only have ruptures occurred in unattended storage areas, but there have also been accidents resulting in personal injury and fire damage.
If a filled cylinder is remaining for a long period of time and corrosion has progressed, whether the corrosion is total or partial, it is considered a "dangerous condition" with the possibility of rupture, and the owner and user are legally obligated to release the gas (Article 36 of the Law).

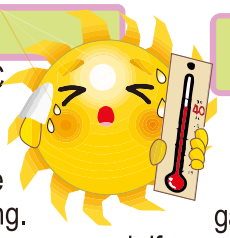
However, this does not mean that any gas can be released without permission, and cylinders with advanced corrosion must be handled with the utmost care depending on the degree of corrosion, and there have been cases where the evacuation of nearby residents has been requested. Please be sure to contact your high pressure gas supplier and ask them to dispose of cylinders that have been sitting for an extended period of time.
In the event of a violation of Article 36, there is a stipulated fine of 300,000 yen each for both the manager and the company, and in the event of an accident, it will be deemed to have been caused by a violation of the law.

3 Environment of Use

(Basic information about the environment where the consumable is used)



High pressure gas environment



Cylinders must always be kept below 40°C (104°F), out of direct sunlight, and used in such a way as to prevent corrosion from moisture droplets, etc. Valves must be protected and prevented from overturning.

Avoid using gas in a confined, enclosed space, and if unavoidable, provide adequate ventilation to prevent carbon monoxide poisoning and oxygen deficiency accidents.

It is dangerous to perform gas welding and fusion work with a loaded cylinder in a vehicle. **Be sure to unload the cylinder from the vehicle immediately after moving it.**

When using flammable gases such as acetylene gas, it is mandatory to install a backfire prevention device (dry type safety device or water sealed safety device). Acetylene cylinders must be stored in an upright position and static electricity must be avoided. Do not use the equipment with excess hose still wrapped around the cylinder. Doing so may cause a backfire, resulting in the burning hose scorching the cylinder and causing an accident.

Use a special handle to open and close the cylinder valve. And to be able to close the gas immediately in case of an emergency, the handle is attached during the operation, or it is placed in a close and easy to understand way so that it can be used immediately. When you stop working, close the valve even during breaks, and loosen the regulator handle.

Visually check for ignition and extinction, stable flame of the burner after ignition, etc. To maintain normal combustion, always keep the air ratio at the proper level, visually check the combustion condition, etc. as appropriate during work, and take appropriate measures in case of abnormality.

Operator Qualifications and Knowledge

(Occupational Safety and Health Law)

Work involving welding, fusing, or heating metal with combustible gas and oxygen may be performed only by qualified operators, such as those who have completed a gas welding course and hold a certificate of completion.

(A person who has obtained a "Gas Welding Operator's※ License" may perform such work with the same license; he or she must carry the same license).

□ Both employers, managers and workers will be punished.

When such work, such as the distribution system of 10 or more cylinders of flammable gases, a person who has obtained a "Gas Welding Operator's License" must be appointed as the work foreman.

Fire and Flammable Materials Precautions

Fire extinguishers (B-10 or higher) and sufficient water for fire prevention must be provided in areas where gas is used. Smoking and open flames are prohibited within 5meters, and "flammable substances", oils and greases must not be placed.

It's also extremely dangerous to place cylinders, hoses, flammable materials, etc. in areas where sparks from welding and fusing are likely to fly.

When working with LP gas, keep the work area tidy and well ventilated, and take measures to prevent leakage.

Welding sparks are high-temperature, high-energy sparks that can easily ignite even flame-retardant urethanes, produce toxic gases, and cause fire to spread.

If it is unavoidable, use steel plates, nonflammable cloth, spatter sheets, etc. to cover the heat from flames, spatter, and sparks to ensure with checking risk of fire spreading while working.

4 4-1 Equipment Repair and Disposal

□ (Basic Points to Consider When Replacing Consumable Equipment) □

Repairing or constructing equipment

If any abnormality is found in equipment that uses high pressure gas, you are required to repair or replace it immediately.

When constructing or repairing equipment, replace the gas in the equipment with water or nitrogen.

The same precautions should be taken if the object to be welded is a cylinder (tank or drum) of combustible materials, etc.

Repair and construction work must be carried out under the supervision of a person in charge and in accordance with a work plan and a person in charge of the repair work.

If any abnormality is found during repair, etc., measures should be taken to immediately notify the person in charge of the abnormality.

After completion of work

After using the cylinder, return it with residual pressure (with the valve completely closed before removing the regulator) to prevent foreign objects from flowing back from the outside.

Take precautions to prevent damage to the valve and to prevent the cylinder from being dropped or overturned in the event of an earthquake, etc.

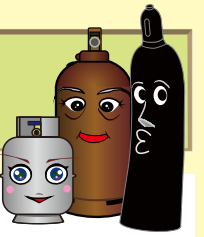
Disposal of cylinders

Disposal of cylinders with high pressure gas still inside is prohibited.Disposal of cylinders and high pressure gases (oxygen or flammable gases) must be done in accordance with the procedures established by law, otherwise it is illegal.

If you're the owner of the cylinder, it is strongly recommended that you make an arrangement at the time of purchase to ask the dealer to dispose of the cylinder under the Management Service Consignment Contract. It is very dangerous to ask anyone other than a high pressure gas specialist to dispose of it, or to dispose of it at your own discretion without thinking. (There have been cases of fatal accidents).

4 4-2 Transporting Cylinders, etc.

(Basic points to be observed when changing consumption facilities)



Transporting and Loading/Unloading Cylinders

When moving cylinders, be careful not to damage the valves or the cylinder itself, and if the cylinder does not have a protector, put on a protective cap.

(Of course, the regulator must be removed).

When moving cylinders by hand on the ground, make sure that the body of the cylinder does not come in contact with the surface of the ground.

When transporting by vehicle

Ensure that the maximum load capacity of the vehicle is not exceeded and that the vehicle is secured to prevent overturning and falling, that the valves, etc. are protected, and that warning signs (high-pressure gas stickers) are displayed in places that are clearly visible from the front and rear of the vehicle.

Cylinders filled with liquefied gas must be stacked either upright or at an angle (20° or more, with the safety valve vent facing up). And don't stack, except for cylinders weighing 10kg or less.

The YellowCard for loaded gas must include emergency contact information and be carried with a fire extinguisher (equipped with vehicle mounted fire extinguishers that are within their expiration date and meet the required "fire extinguisher rating") and fire prevention tools, etc.

☒Materials and tools for oxygen and flammable gases, etc.

red signal light or flashlight (must work reliably)/Red flag/Leather gloves/Wheel stoppers (2 or more)/Megaphone/Leak detection fluid/Cylinder valve open/close handle/Cylinder valve gland wrench or monkey wrench/Rope (two or more ropes of 15 m or longer)

*However, there are cases where it is not necessary if only cylinders with a capacity of 25liters or less are loaded with a total volume of 50liters or less.

(Required if the cylinder is larger than 7m^3 of oxygen or 6 kg of acetylene)

Wagons and cars are not suitable for transporting high pressure gases. If they are unavoidably used, they must be well ventilated at all times to prevent stagnation even in the event of a leak. **It is prohibited to leave loaded cylinders in a parked vehicle for extended periods of time (generally 2 hours or more).**

This is a violation of storage standards and is subject to more severe penalties. In cases where large quantities of gas,(flammable gases or oxygen and so with a volume of 300 cubic meters or more) are transported, there are regulations* that include the provision of a movement monitor. *:For more details, please contact the dealer.

When parking, avoid places where 'safety-related facility' is densely packed, except for loading and unloading cylinders, and choose a safe place with little traffic, you must not leave the vehicle as much as possible.

5 Accident Response

(Emergency measures to be taken by consumers in the event of a disaster or threat of disaster caused by high pressure gas, and basic matters concerning communication with the supplier, etc.)

Please thoroughly discuss emergency response with suppliers and ensure that appropriate measures, responses and communications are in place, such as posting emergency contact information. In preparation for emergencies such as earthquakes and disasters, establish a clear "emergency response system" and determine the roles of contact persons, etc., and establish the necessary systems. Be aware of owning high-pressure gas, anticipate natural disasters and secondary disasters, and follow rules such as shutting off the main gas valve before evacuating to work diligently on disaster mitigation.In addition to posting contact information, prepare for emergencies by regularly briefing employees on emergency procedures, reviewing their roles and emergency equipment, and conducting communications drills.

Cylinder Gas Leaks and Emergency Response

If a gas leak alarm is triggered or a gas leak is detected during work, the work must be stopped immediately. At the same time, combustion equipment and cylinder valves must be closed and the leaking area repaired.

Doors and windows must be fully opened to provide ventilation, and use must not be resumed until it has been confirmed that there are no gas leaks from the repaired area.

Gas leaks around the handles or spindle can most likely be extinguished by closing the valve, but then please move the cylinder to a fire-free area and contact the distributor at the same time.

What to do in the event of a fire caused by flammable gas

First turn off the gas and extinguish the fire, then cool the cylinder by pouring a large amount of water into it.

Flames in equipment or hoses will be suppressed by closing the cylinder valve, making it easier to extinguish the fire.

Even after the fire is extinguished, if there is a gas leak, there is a possibility of re-ignition or explosion, so even after the fire has been extinguished, continue to thoroughly cool and pour water and forcibly ventilate to avoid fire.

Legal Notification of Accidents and Contacting the Distributor

Accidents involving high-pressure gas, such as fire or rupture of a safety valve, must be reported to the prefectural government (or the municipal fire department if the authority has been transferred to the municipality). Failure to do so is a violation of the law.

In the event of theft or loss, you must also contact the prefectural government or police department.

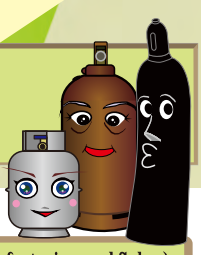
Be sure to contact the dealer as well.

In the event of an accident of any kind (including theft or loss), be sure to contact the dealer.

(Please note that it may be required by law to preserve the current condition of the accident).

6 Other

(Other matters necessary for the prevention of disasters caused by high-pressure gas)



Compliance with Laws and Regulations and Voluntary Safety

Regulations under the Safety Law are the minimum rules to be followed. In addition, accident prevention through self-safety is essential.(Article 1of The High Pressure Gas Safety)

To ensure safety at consumption sites and in the community, please attend safety training sessions held by high-pressure gas industry associations, etc., and collect safety information.

Cooperate in updating the safety records of dealers as required by law, and disseminate the safety information, etc. provided to you within your business premises.If a problem is pointed out, it should be improved and reported. Wear necessary protective equipment such as helmets, safety shoes, protective gloves, and safety glasses.

Cylinder Storage - Ensure the safety of the cylinder storage area.

Cylinders should be stored upright in a cylinder storage area.Valves must be adequately protected and prevented from tipping, taking into account all foreseeable disasters.High-pressure gas cylinder must be stored out of direct sunlight and in a well ventilated area.

The temperature shall be maintained below 40°C at all times, and oxygen and combustible gas cylinders shall be kept separate, and filling cylinders and residual gas cylinders shall be segregated in the cylinder storage area.

Fire extinguishers shall be provided in the cylinder storage area and "No Fire" signs shall be posted.

No fire or flammable or combustible materials should be placed within 2 meters of the cylinder.

Storage of more than 40 kg of acetylene or 300 kg of LP gas must be notified in advance to the fire department in accordance with the Fire Code. (Other notifications may be required according to ordinances, etc., so please consult your dealer, etc.).

About Gases

Be familiar with the safety and hazardous properties of gases used for welding and cutting.

High concentrations of oxygen have the property of igniting even difficult-to-ignite materials and causing them to burn explosively if an ignition source is present.

All flammable gases except oxygen are highly flammable and will mix with air (oxygen) to form explosive gas mixtures.

Use extreme caution when handling these high pressure gases and avoid gas leaks.

If you intend to use LP gases for cooking, heating or other purposes, please obtain a supply in accordance with the LP Law.

For safe use of gas, please use the safety reference materials issued by ZenYoRen.

Prohibited Actions (Unauthorized and Unreported Manufacturing and Sales.)

Manufacturing activities that do not meet the standards for high pressure gas manufacturing are extremely dangerous and are prohibited by law.All high-pressure gas manufacturing businesses must notify the prefectural governor, etc. (or the mayor or other designated address if authority has been transferred to the municipality) or apply for a license (violations will be severely punished).

Transferring and filling a cylinder is also a manufacturing act.

Avoid operations where air is compressed with acetylene, as it is dangerous.Cylinders may not be owned without proper ownership identification (stamping and proper labeling).

In general, consumer-owned cylinders should be subject to a contract for outsourced cylinder management services.

Failure to do so may result in severe penalties, including imprisonment, so please contact the distributor for more information.When entering into a management service contract, it is safe to enter into a contract for periodic inspections by the distributor, etc. (management service recipient).

Unregistered sales are also illegal and strictly prohibited.If a general contractor allows a subcontractor to use the gas or repeatedly subleases the gas, it may be included in the scope of sale.

- Consumption means reducing the pressure of high pressure gas to a state where it is not high pressure gas for a specific purpose other than disposal, and using the resulting gas that is not high pressure gas.
- The term "high pressure gas equipment" in the Act includes cylinders unless otherwise specified.

●Gas Name (Cylinder Color) and Properties

Name	Color	Properties
Oxygen	Black	Oxygen is a highly flammable gas that will not burn in air, but will often burn in high concentrations of oxygen.When using oxygen, there is a risk of ignition if the cylinder or equipment (valves, regulators, etc.) is covered with oil, grease, or other combustible materials.
Acetylene	Brown	Extremely unstable gas which may explode if ignited, heated or struck. Contains impurities, has an odor, and can be toxic if inhaled.
Propane Butane Propylene	Gray	All are components of LP gas. It is originally colorless and odorless, but an unpleasant odor is intentionally added, except for those labeled "industrial odorless" on cylinders.It is heavier than air and tends to stay lower, and if you breathe a lot, there is a risk of suffocation and mild anesthesia.For safe use of gas, please use the safety reference materials issued by ZenYoRen.

Sales Office

VEGETABLE OIL INK