Overview of the General High Pressure Gas Safety Ordinance

Unofficial translation
(October 2016)

The High Pressure Gas Safety Institute of Japan (KHK)

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This document has been compiled based on information available as of October 1, 2016. For the latest information or if there is any doubt or ambiguity, please refer to the High Pressure Gas Safety Act, related ministerial ordinances, etc.

1. Introduction

1-1. Background of the Establishment of the General High Pressure Gas Safety Ordinance

The High Pressure Gas Safety Act was issued in 1951, as briefly described in “2. The History of the High Pressure Gas Safety Act” in the Overview of the High Pressure Gas Safety Act. At the time, the technical standards for the handling of high pressure gas were all prescribed in a single Ordinance for Enforcement (the Ordinance for Enforcement of the High Pressure Gas Control Law) without any divisions for the types and handling manners of high pressure gas. With the later development of the industry and the increase in number, diversification, etc., of plants related to high pressure gas, various issues started to emerge from regulating all aspects with a single Ordinance for Enforcement. For instance, due to differences in the nature and number of disasters and accidents associated with each type of business that handled high pressure gas, enforcing stricter ordinance on a certain type of business meant tighter ordinance also for other types of business that did not have to be regulated so strictly; and thus, a sense of unfairness was intensified.

For this reason, the Ordinance for Enforcement was revised in 1966 to be divided into the following 4 new ordinances that were established according to the types of gas and handling thereof: The General High Pressure Gas Safety Ordinance, the Liquefied Petroleum Gas Safety Ordinance, the Refrigeration Safety Ordinance, and the Container Safety Ordinance (hereinafter referred to as “the General Ordinance,” “the LPG Ordinance,” “the Refrigeration Ordinance,” and “the Container Ordinance,” respectively).

Among them, the General Ordinance is characterized by a complex and wide-ranging format of ordinance, as it was adopted to regulate the handling of all high pressure gases that were not included in the scopes of the Refrigeration Ordinance and the LPG Ordinance.

In the meantime, industrial complexes centering around oil refining and petrochemical industries began to develop around 1958. Consequently, disasters and accidents started to occur frequently around 1960. This brought the need to individually regulate the plants in industrial complexes as well as plants that had scales of operations similar to those in industrial complexes. As a result, the Industrial Complex Safety Ordinance (hereinafter referred to as “the Industrial Ordinance”) was established in 1975 as additional ordinance to the General Ordinance and the LPG Ordinance. The Industrial Ordinance was then fully revised in 1986 as an ordinance that encompasses the General Ordinance and the LPG Ordinance.

Accordingly, the current General Ordinance, composed of the following 15 Chapters, stipulates safety with respect to the high pressure gases, which are not included in the scope of the Refrigeration Ordinance and the LPG Ordinance, while also excluding the safety of the production of high pressure gases, subject to the Industrial Ordinance:

This document explains the overview of the ordinance in accordance with the Chapters of the General Ordinance; provided, however, many of the exceptive clauses are excluded. Therefore, details of the provisions shall be verified with the original text of the General Ordinance.

2. Overview of the General High Pressure Gas Safety Ordinance

2-1. General Provisions (Chapter I)

Article 1 Scope of Application

Article 1 defines the scope of application of the General Ordinance. As explained above, the scope of application of this Ordinance includes the safety of all types of handling for all high pressure gases, except for the gases under the scope of the Refrigeration Ordinance and the LPG Ordinance and for the type of handling under the scope of the Industrial Ordinance.

Furthermore, refrigerant gas (high pressure gas) within refrigeration equipment which is subject to the Refrigeration Ordinance is included in the scope of the Refrigeration Ordinance; provided, however, the General Ordinance is to be applied to actions such as storage of the refrigerant gas in a container outside of the refrigeration equipment or filling of the refrigerant gas to the refrigeration equipment. In addition, the scope of application of the Industrial Ordinance is limited only to the production of high pressure gas using stationary production equipment. As a result, the General Ordinance is to be applied to the production activity with mobile production equipment and other types of handling (sale, transport, consumption, etc.) in an industrial complex. (The Liquefied Petroleum Gas Safety Ordinance is to be applied in the case of liquefied petroleum gas.)

Article 2 Definitions of Terms

Article 2 defines the meanings of the terms used in the General Ordinance. Terms that are especially important are explained here, as it is difficult to understand the contents of this Ordinance without first understanding the meanings of these terms.

(1) Inert gas (item (iv))

The gases in group 18 of the periodic table, along with nitrogen, carbon dioxide, and non-flammable fluorocarbons, are defined as the inert gases.

(2) Class 1 Protected Properties (item (v))

Processing equipment or storage equipment of high pressure gas shall be installed with a distance greater than what is specified between such equipment and the buildings, facilities, etc., that are specified for the purpose of preventing harm to many and unspecified persons and damages to the important buildings and facilities, in case a disaster or accident of high pressure gas occurs and affects the surrounding area. The specified facilities and buildings from which a safety setback is required are referred to as Class 1 Protected Properties and include those buildings and facilities that are used by many and unspecified persons, such as schools other than universities, hospitals, residential care institutions, cultural properties, museums, etc.

(3) Class 2 Protected Properties (item (vi))

Buildings other than those specified as Class 1 Protected Properties that are used for residence are referred to as Class 2 Protected Properties, for which a safety setback distance from processing equipment, storage equipment, etc., of high pressure gas is also provided, as is the case for Class 1 Protected Properties. However, the setback distance is smaller than that for Class 1 Protected Properties, as the number of residents per dwelling unit is smaller compared to Class 1 Protected Properties.

(4) Storage tanks (storage vessels) (item (vii))

Storage tanks (storage vessels) are storage equipment for high pressure gases that cannot be transported on the ground surface. In this case, the size of internal volume does not matter.

(5) Storage equipment (Circular Notice Related to the General Ordinance)

Storage equipment is a container, which is connected to processing equipment or pressure reduction equipment of high pressure gas through storage vessels/tanks and pipes, and which stores a high pressure gas in high pressure state. For example, storage equipment may incorporate a raw material tank, intermediate tank, product tank, and containers that are connected by pipes.

(6) Storage capacity (item (ix))

Storage capacity is a maximum amount of high pressure gas that can be stored in a storage tank or a container. The amount is calculated by a formula specified for each type of gas.

(7) Filled containers, containers with residual gas (item (x), item (xi))

A filled container is a container that is currently filled with a high pressure gas, and from which no more than 1/2 of a full container of gas has been used (consumed). On the other hand, a container with residual gas refers to a container that is currently filled with a high pressure gas and is not a filled container, meaning that the remaining weight of the gas inside the container is no more than 1/2 of that of a full container.

(8) Mobile production equipment, Stationary production equipment (item (xii), item (xiii))

Mobile production equipment is production equipment of high pressure gas that can be transported on the ground surface. For example, a tanker truck with a pump, a portable air compressor, unit-type production equipment that is not fixed to the ground by a foundation, etc., fall under this category. On the other hand, stationary production equipment is production equipment of high pressure gas that is fixed to the ground surface.

(9) Gas equipment, High pressure gas equipment (item (xiv), item (xv))

Among the production equipment (excluding pipeline for production), gas equipment refers to the parts passed through the gas of the high pressure gas being produced, including the raw material gas and low pressure gas before reaching the state of high pressure (pumps, compressor, towers and vessels, heat exchanger, pipes, joints and connectors, valves, and other associated accessories).

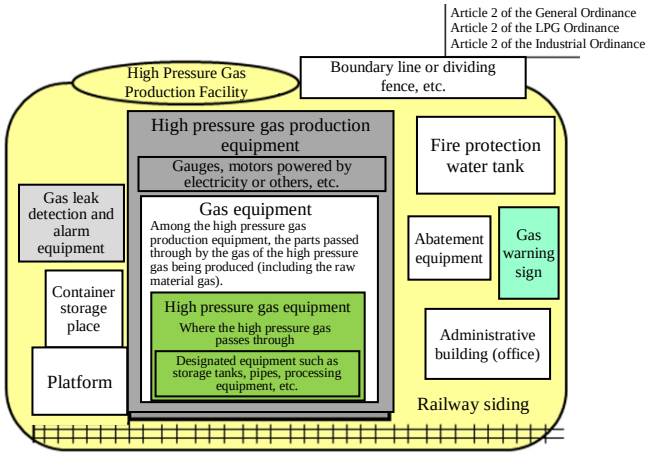


Diagram 1: A concept of a high pressure gas production facility

High pressure gas equipment refers specifically to the gas equipment through which the high pressure gas being produced passes. Needless to say, the processing equipment is one of the high pressure gas equipment.
In addition, (high pressure gas) production equipment referred herein includes all the equipment necessary for the production of a high pressure gas. For instance, in addition to the gas equipment, furnace, gauges, motors powered by electricity or others, gas cylinder trolleys for discharging residual gas from used cylinders, etc., are also considered production equipment.

A (high pressure gas) production facility refers to a business entity that is equipped with production equipment and other necessary elements, such as a railway siding, building structures for offices, etc., platform, container storage place, gas leak detection alarms, fire prevention and extinguishing equipment, warning signs, abatement equipment, etc. The relationships between these elements are shown in Diagram 1.

(10) Processing equipment, Processing capacity (item (xvi), item (xviii))

Equipment, etc., which transforms a gas into a high pressure gas by means of compression, liquefaction, and other methods, or which transfers the high pressure gas is referred to as processing equipment. A volume of gas that processing equipment can process in a day (a volume converted to a normal state) is called the processing capacity.

On a different note, filling a high pressure gas into a container without using processing equipment is considered production of high pressure gas; provided, however, that a lack of processing equipment means that the processing capacity is 0 and thus such equipment alone is considered production equipment of a Class 2 Producer. Photo 1 shows specific examples of processing equipment, while Diagram 2 shows the main calculation formulas of processing capacities.

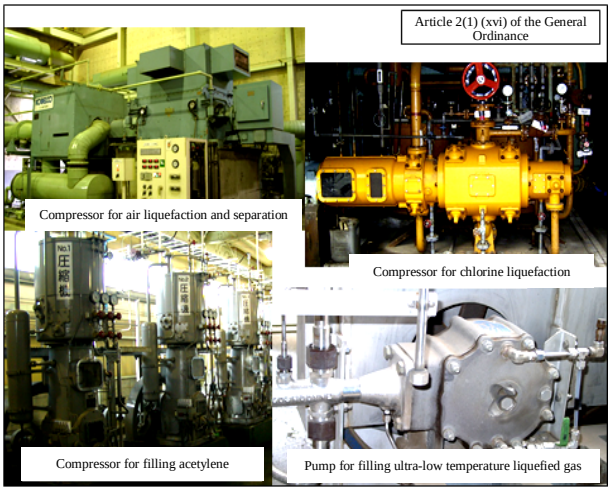


Photo 1: Examples of processing equipment

(11) Pressure reduction equipment, Processing capacity (item (xvii), item (xviii))

Pressure reduction equipment is equipment installed in facilities for consumption of Specific High Pressure Gases to convert a high pressure gas into a non-high pressure gas.

For example, an evaporator, a pressure reducing valve, etc., at the Specific High Pressure Gas consumption facilities fall into this category of equipment.

Article 2 (1)(xviii) of the General Ordinance

Processing capacity (Q): A volume of gas that can be processed in a day by means of compression, liquefaction, and other methods (a volume (m^3) converted to a state with a temperature of 0°C and a pressure of 0 Pa)

Pump: $Q_1 = W_1 \times 24 \times \rho \times 22.4/M$
Compressor: $Q_2 = W_2 \times 24$
Evaporator: $Q_3 = W_3 \times 24 \times 22.4/M$
Condenser: $Q_4 = W_4 \times 24 \times 22.4/M$

W_1: Maximum discharge rate of a pump (L/hour)
W_2: Maximum discharge rate of a compressor (m^3/hour)
W_3: Nominal capacity of an evaporator (kg/hour)
W_4: Nominal capacity of a condenser (kg/hour)
ρ: Liquid density (kg/L)
M: Molecular weight

Diagram 2: Calculation formulas of processing capacities

In addition, a value of the processing capacity of pressure reduction equipment (m^3/day) is defined as the amount of high pressure gas inflow (m^3/day) to said pressure reduction equipment.

(12) Class 1 Equipment Setback, Class 2 Equipment Setback (item (xix), item (xx))

Class 1 Equipment Setback refers to the minimum distance to be maintained from the exterior of storage equipment or processing equipment of a high pressure gas production facility to Class 1 Protected Properties. Similarly, Class 2 Equipment Setback is the minimum distance to Class 2 Protected Properties. In addition to the storage equipment and processing equipment for production, a Class 1 Storage Place, a Class 2 Storage Place, and storage equipment and a pressure reduction equipment of Specific High Pressure Gas consumption equipment shall also maintain distances greater than those of the Class 1 Equipment Setback and Class 2 Equipment Setback. Calculation formulas for these setbacks are specified for each class of flammable gas, toxic gas, oxygen, and other high pressure gases. The distances are to be calculated according to the value of storage capacity for storage equipment and the value of processing capacity for processing equipment. Furthermore, even a container storage place is subject to a setback requirement if it falls under the category of storage equipment. Diagram 3 shows the Class 1 Equipment Setbacks and Class 2 Equipment Setbacks.

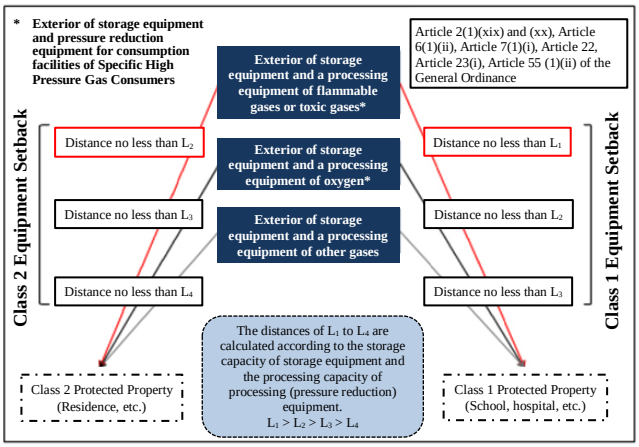


Diagram 3: Class 1 Equipment Setback, Class 2 Equipment Setback

(13) Class 1 Storage Setback, Class 2 Storage Setback (item (xxi), item (xxii))

A container storage place of a high pressure gas production facility, Class 1 Storage Place, or Class 2 Storage Place, where containers stored thereto are not connected to pipes (not storage equipment), shall maintain a distance no less than the Class 1 Storage Setback between the exterior thereof and Class 1 Protected Properties and a distance no less than the Class 2 Storage Setback between the exterior thereof and Class 2 Protected Properties; provided, however, that the storage places of containers for high pressure gases other than flammable gas and toxic gas are exempt from such requirements if the size of the storage place is less than 25 m^2.

These required setback distances shall be calculated according to the size of a container storage place and are allowed to be reduced with the installation of barrier walls. Nevertheless, the provisions do not allow reduced setback distances with installation of barrier walls for a storage place of toxic gas containers, to which the Industrial Ordinance is applied.

Diagram 4 shows the Class 1 Storage Setback, the Class 2 Storage Setback, and the reduced setbacks with a barrier wall installation.

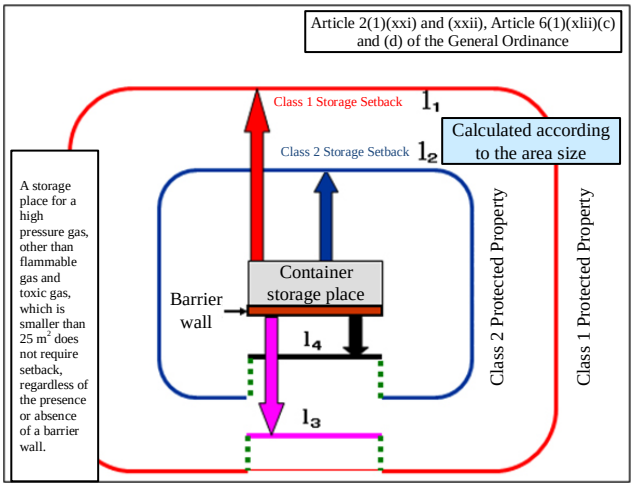


Diagram 4: Setbacks of a container storage place, which is not storage equipment

(14) Compressed natural gas (CNG) filling station, liquefied natural gas (LNG) filling station, Compressed hydrogen (CHG) filling station (item (xxiii), item (xxiv), item (xxv))

Stationary production equipment with processing equipment that fills containers for fuel systems fixed on vehicles with compressed natural gas, liquefied natural gas, or compressed hydrogen. A liquefied petroleum gas (LPG) filling station under the LPG Ordinance has the same definition.

2-2. Permission, etc., for Production and Storage of High Pressure Gas (Chapter II)

Articles 3 to 17 Permission, etc., for Production of High Pressure Gas

Production of high pressure gas (except those persons who intend to produce high pressure gas for the purpose of refrigeration) is regulated in the following categories based on the scale of production:

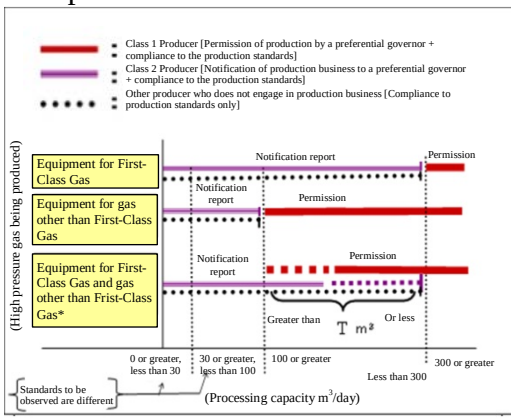
1) Class 1 Producer

A person who intends to produce high pressure gas, using equipment with a processing capacity that is equal to or greater than what is specified (300 m^3/day for production of First-Class Gas, or 100 m^3/day for production of gas other than First-Class Gas) (except those producers who use only the Specified Equipment), and who has obtained a permission of the prefectural governor, as provided in paragraph (1) of Article 5 of the High Pressure Gas Safety Act (Refer to Diagram 5). Permission in this case shall be obtained for each place of business (plant).

*The First-Class Gases include helium, neon, argon, krypton, xenon, radon, nitrogen, carbon dioxide, fluorocarbon (except for flammable species), and air. In addition, with regard to storage the categories of Second-Class Gas and Third-Class Gas exist; provided, however, that all the gases other than the First-Class Gases are classified as the Second-Class Gas because no gas is currently specified as Third-Class Gas.

2) Class 2 Producer

A person who engages in the business of producing high pressure gas (who repeatedly and continuously produces high pressure gas), other than those who fall under the category of 1). Notification report shall be submitted to the prefectural governor for each plant.



* When the production equipment for First-Class Gas and for gas other than First-Class Gas are installed.

When compared to the calculated value (T) of the formula below, the sum of daily processing capacities for a plant is greater than 100 m^3 and less than or equal to 300 m^3, and is:

- Greater than or equal to T ⇒ Class 1 Producer
- Less than T ⇒ Class 2 Producer

$T = 100 + 2/3 \times S$

S: Processing capacity of First-Class Gas (Greater than 0 m^3/day and less than 300 m^3/day)

Diagram 5: Classification of permission, notification, etc., of high pressure gas production plants

3) Other production

In addition to high pressure gas production conducted by the other persons categorized as 1) and 2), production of high pressure gas by a shock absorber, etc., as listed in item (i) of Article 13 of the General Ordinance, and production of high pressure gas by an automobile accumulator for collection and use of braking energy, as prescribed in item (ii) of Article 13, are included in this category. In this case, although permission by and notification to the prefectural governor are not necessary, the production of high pressure gas shall conform to the technical standards specified.

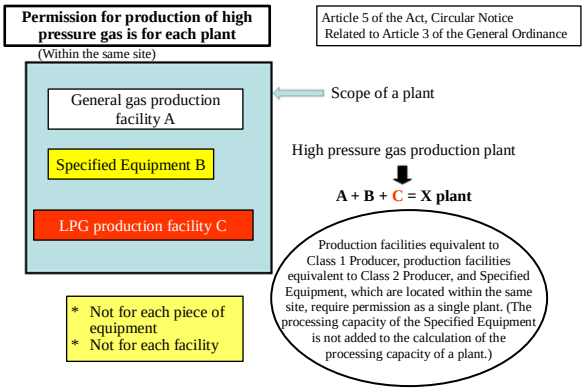


Diagram 6: Scope of a plant (other than those under the Refrigeration Ordinance)

Under the General Ordinance, the LPG Ordinance, and the Industrial Ordinance, all production facilities in a single site are handled as a group when several production facilities are established within the same site. The processing capacity of the group is the sum of processing capacities of all the production facilities, excluding the Specified Equipment. A site where a group of production facilities is established is handled as a single place of business (plant), which is the base unit for permission and notification. The permission or notification shall be processed based on the processing capacity of a plant. (Refer to Diagram 6)

On a different note, it shall be noted that the concept of the scope of a "plant," which consists of a base unit for permission and notification, is different under the Refrigeration Ordinance.

(1) Article 3 Application for Permission of Class 1 Producer

A person who intends to obtain a permission for production of high pressure gas, pursuant to the provisions of Article 5, paragraph (1), item (i) of the High Pressure Gas Safety Act, shall submit an application for permission to produce high pressure gas in the form specified by an ordinance of Ministry of Economy, Trade and Industry (METI) and a production plan (a written statement with information about performance and processing capacity of the processing equipment, conformity thereof to the technical standards, etc., and drawings of the location, etc., of production facilities) to the prefectural governor who has jurisdiction over the location of the plant.

(2) Article 4 Submission of Notification of the Business of Class 2 Producer

A person who intends to make a notification of a Class 2 Producer shall submit a notification report of high pressure gas production business in the form specified by an ordinance of METI and a detailed statement of production facilities, etc., (a written statement with information about performance and processing capacity of the processing equipment, conformity thereof to the technical standards, etc.) to the prefectural governor who has jurisdiction over the location of the plant.

(3) Articles 5 to 8-2 Technical Standards for Class 1 Producers

The technical standards for Class 1 Producers are set forth in the following categories according to the type of production equipment used at the production facilities:

1) Article 6 Stationary production equipment
2) Article 6-2 Cold evaporator
3) Article 7 Compressed natural gas filling station
4) Article 7-2 Liquefied natural gas filling station
5) Article 7-3 Compressed hydrogen filling station
6) Article 8 Mobile production equipment
7) Article 8-2 Mobile Compressed hydrogen filling station

The technical standards for the production with stationary production equipment prescribed in Article 6 [1) above] are the principle standards, and are composed of paragraph (1) providing 43 items pertaining to the location, construction, and equipment of the production facilities, and paragraph (2) providing 8 items pertaining to the production methods.

The technical standards for production with other production equipment [2) to 6) above] which are common with the technical standards for stationary production equipment cite the provisions of Article 6, while the standards that require specific ordinance according to the type of production equipment provide the specific ordinance in their individual provisions.

Although the detailed descriptions of the technical standards are not explained here, [3-1] summarizes the comparison of the main items of the general technical standards for production with stationary production equipment, to which Article 6 is applied; the technical standards for the small-scale Class 2 Producer as explained in the subsequent paragraph, to which Article 12 is applied; and the technical standards for production that does not require permission or notification, etc., to which Article 13 is applied.

(4) Articles 10 to 12 Technical standards for Class 2 Producers

Production with equipment with a processing capacity of 30 m^3/day or greater used to be classified as that by a Class 1 Producer. Consequently, the technical standards for current Class 2 Producers are divided into two categories: Article 11, applicable for production with a processing capacity of 30 m^3/day or greater, and Article 12, applicable for production with a processing capacity of less than 30 m^3/day.

That being said, the standards provided in Article 11 essentially cite the entire technical standards for Class 1 Producers prescribed in Articles 6 to 8, and thus are exactly the same as those for Class 1 Producers.

(5) Article 13 Technical standards for other production

The provisions of the technical standards for production which does not require permission or notification cite the essential parts of standards provided in Article 6, such as pressure resistance and airtightness, restrictions of materials, etc.

(6) Articles 14 to 17 Procedures etc., for alteration work of facilities for production

In addition to the procedures to apply for a permission of alteration work pertaining to Class 1 Producers (Article 14), the specific scope and the procedures for minor changes, which do not require application of permission for change, pursuant to the proviso of Article 14, paragraph (1) of the High Pressure Gas Safety Act, are also stipulated (Article 15). Furthermore, notification report of alteration work pertaining to Class 2 Producers (Article 16) and the scope of minor changes (Article 17) are also prescribed, as with the case for Class 1 Producers.

Articles 18 to 30 Permission, etc., for Storage of High Pressure Gas

Other than the storage of high pressure gas by a Class 1 Producer in accordance with the terms of permission, a person who stores high pressure gas, the volume of which exceeds 0.15 m^3 (10 kg = 1 m^3 for liquefied gas; the same shall apply for 3-2.), shall comply with the technical standards of storage methods when storing high pressure gas.

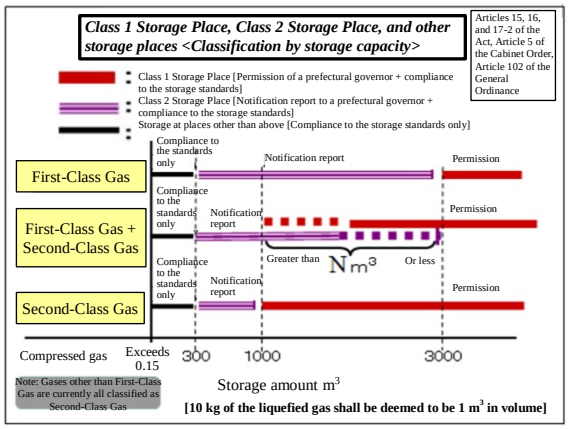
Moreover, a permission by or notification to the prefectural governor as well as a storage place which satisfies the specified technical standards are required for the storage of high pressure gas of the volume listed below or more:

1) Class 1 Storage Place

A person who stores a high pressure gas, the volume of which is equal to or is greater than the volume specified by Article 5 of a Cabinet Order for each type of gas (3,000 m^3 for First-Class Gas*, 1,000 m^3 for Second-Class Gas; refer to Diagram 7 for other cases), shall obtain a permission from the prefectural governor.

2) Class 2 Storage Place

A person who stores a high pressure gas, the volume of which is equal to or greater than 300 m^3, and who is not 1) shall submit a notification report to the prefectural governor.



When compared to the calculated value (N) of the formula below, the total amount of high pressure gas stored in a storage place is greater than 1,000 m^3 and less than or equal to 3,000 m^3, and is:

$N = 1000 + 2/3 \times M$

M: Amount of First-Class Gas stored (greater than 0 m^3 and less than 3,000 m^3)

- Greater than or equal to N ⇒ Class 1 Storage Place
- Less than N ⇒ Class 2 Storage Place

* Storage amount and N of a liquefied gas are to be calculated by considering that 10 kg of liquefied gas is equal to 1 m^3 in volume.

Diagram 7: Class 1 Storage Place, Class 2 Storage Place and others storage
< Classification by storage capacity >

(1) Article 18 Technical standards of storage methods

Technical standards of storage methods are divided into the provisions for storage tanks and the provisions for containers. The main provisions concerning storage in storage tanks are as follows:

1) Storage in a place with good ventilation;
2) Isolation from fire and flammable or pyrophoric substances;
3) Restriction of volume of liquefied gas to be filled into a storage tank (Max. 90%);
4) Safety measures to be taken during repair or cleaning of storage tanks;
5) Restriction of load on the valves; etc.

Furthermore, the main provisions for storage in containers include the standards pertaining to the container storage place for production (Article 6(2)(viii)), etc., in addition to 1) above.

(2) Article 20 Application for permission of a Class 1 Storage Place

A person who intends to obtain a permission of a Class 1 Storage Place shall submit an application for permission to set up a Class 1 Storage Place in the form specified by an ordinance of METI and other documents (a written statement with information about conformity to the technical standards, etc., and drawings of the location of the storage place and conditions of surrounding area, etc.) to the prefectural governor who has jurisdiction over the location of the storage place.

(3) Article 25 Submission of notification to set up a Class 2 Storage Place

A person who intends to submit a notification of a Class 2 Storage Place shall submit a notification report to set up a Class 2 Storage Place in the form specified by an ordinance of METI and other documents (a written statement with information about conformity to the technical standards, etc.) to the prefectural governor who has jurisdiction over the location of the storage place.

(4) Articles 21 to 23 Technical standards for Class 1 Storage Places

The technical standards pertaining to the location, construction, and equipment of Class 1 Storage Places are divided into the provisions for storage tanks and the provisions for containers. The former is stipulated in Article 22 while the latter is stipulated in Article 23. Both provisions are prescribed by citing the necessary parts of the technical standards for production.

(5) Article 26 Technical standards for Class 2 Storage Places

The provisions of the technical standards pertaining to the location, construction, and equipment of Class 2 Storage Places cite the provisions of Article 22 and Article 23, and thus are exactly the same as the technical standards for Class 1 Storage Places.

(6) Articles 27 to 30 Procedures etc., for alteration work of a storage place

In addition to the procedures to apply for permission of alteration work for a Class 1 Storage Place (Article 27), the specific scope and the procedures for minor changes that do not require application for permission, pursuant to the proviso of Article 19, paragraph (1) of the High Pressure Gas Safety Act, are also stipulated (Article 28). Furthermore, notification report of alteration work for a Class 2 Storage Place (Article 29) and the scope of minor changes (Article 30) are also prescribed, as with the case for Class 1 Producers.

Articles 31 to 36 Completion Inspection

(1) Article 31 Application, etc., for a Completion Inspection

With respect to the production facility of Class 1 Producers or Class 1 Storage Places, a person who intends to apply for a Completion Inspection therefor by the prefectural governor shall submit an application for Completion Inspection of a production facility or an application for Completion Inspection of a Class 1 Storage Place in the forms specified by an ordinance of METI to the prefectural governor who has jurisdiction over the location of each plant or storage place. Furthermore, when the conformity of the production facility or the Class 1 Storage Place to the technical standards is verified in the Completion Inspection, the Completion Inspection Certificate shall be issued by the prefectural governor.

(2) Article 33 Scope of alteration work which does not require a Completion Inspection

Alteration works for a Class 1 Producer or a Class 1 Storage Place that require a permission of a prefectural governor but do not require a Completion Inspection are prescribed.

(3) Article 35 Methods of Completion Inspection

The methods of Completion Inspection to be conducted by the prefectural governor are specified both for production facilities and for Class 1 Storage Places in an Appended Table.

(4) Article 36 Period of validity of a Designated Equipment Inspection Certificate, etc.

Completion Inspection for Designated Equipment is not required for the period of 3 years, in cases where, within the specified period, it can be verified to have passed the Designated Equipment Inspection with the presentation of the Designated Equipment Inspection Certificate, or it can be verified to have been manufactured by a Registered Manufacturer of Designated Equipment with the presentation of the Designated Equipment Standards Conformity Certificate.

2-3. Notification, etc., of Sales Business of High Pressure Gas (Chapter III)

(1) Article 37 Notification of Sales Business pertaining to Dealers

A person who intends to make a notification of the business of selling high pressure gas shall submit a notification report of sales business of high pressure gas in the form specified by an Ordinance of METI and other documents (a written statement with information about conformity to the technical standards, etc.) to the prefectural governor who has jurisdiction over the sales location.

(2) Articles 38 and 39 Duty of Information Dissemination

Dealers and Sellers who are engaged in the business of selling high pressure gases for specified usages [Refer to 3)] shall inform the items listed in 4) to the buyers of the high pressure gases who are listed in 1), by distributing a written statement at the timing specified in 2), for maintenance of safety.

1) Target audience:
Any person who purchases and consumes high pressure gases listed in 3), and who is not a Class 1 Producer, Dealer, or Specific High Pressure Gas Consumer.

2) Timing of dissemination:
At the time of conclusion of a sales contract and at the time of delivery of high pressure gases if more than a year has passed since the previous time the information was provided.

3) Uses and types of gas for which the information shall be disseminated:
   i) Acetylene, natural gas, or oxygen for welding or thermal cutting
   ii) Liquefied oxygen for home oxygen therapy
   iii) Breathing air for scuba diving, etc.; and
   iv) Nitrox gas.

4) Information to be disseminated:
   i) Compatibility of the consumption equipment to the high pressure gas;
   ii) Precautions for operations, maintenance, and inspection of the consumption equipment;
   iii) Environment where the consumption equipment is used;
   iv) Precautions for changing consumption equipment;
   v) Emergency measures to be taken by the consumers when a gas leak is detected or when other disaster caused by a high pressure gas occurs or is suspected to occur, as well as the matters related to communication of such occurrence to the sales office, etc.; and
   vi) Other information necessary to prevent the occurrence of disasters and accidents caused by a high pressure gas.

(3) Article 40 Technical standards for Dealers and Sellers

Dealers and Sellers shall comply with the technical standards for the sales of high pressure gases. The main items of such technical standard are as follows:

1) Records shall be kept describing the safety maintenance status of the places where high pressure gas was delivered;
2) Filled/empty containers to be delivered shall be free of corrosion, cracks, lines, creases, etc., which hinder the use of such containers, and shall have no gas leak;
3) Filled/empty containers for compressed natural gas to be delivered may not have exceeded the container reinspection period over 6 months or longer and shall have a clear indication of such information;
4) When selling a compressed natural gas to the general consumers who use it as a fuel, the sale shall not take place before verifying the conformity of the consumption equipment therefor to the technical standards specified; and
5) A person selling a compressed natural gas to the general consumers who use it as a fuel shall be equipped with an instrument for a leakage test of pipes.

(4) Articles 37-2 and 41 Other procedures, etc.

Notification report of the succession of a Dealer (Article 37-2) and notification of changes (Article 41) are prescribed.

2-4. Notification of Commencement, etc., of High Pressure Gas Production (Chapter IV)

Procedures, etc., for notification of commencement or discontinuation of the production, storage, and sales of high pressure gas are prescribed.

2-5. Inspection, etc., for Import of High Pressure Gas (Chapter V)

Distributing the imported high pressure gas and the container therefor in Japan without knowing the standards, etc., for production thereof presents a high risk of undermining the maintenance of public safety and prevention of disasters and accidents. Therefore, any person who has imported high pressure gas shall have the imported high pressure gas and the container therefor undergo an import inspection and may not remove them until they have been verified as being in conformity with the specified technical standards for import inspection. In addition, the fundamental idea of import inspection is to verify the contents of imported high pressure gas and to verify that the containers filled with the imported high pressure gas are manufactured in an appropriate manner according to the standards similar to or equivalent to the Japanese standards.

(1) Articles 45, 45-2, and 46-2 Application, etc., for an import inspection

Any person who intends to apply for an import inspection of high pressure gas shall submit an application for import inspection in the form specified by an ordinance of METI and the detailed statements of imported high pressure gas (a written statement with information about pressure and composition of the high pressure gas, name of the plant at which the high pressure gas was produced, as well as the type of container and the name of the plant at which the container was manufactured) to the prefectural governor who has jurisdiction over the location where the high pressure gas was unloaded. Furthermore, aside from a prefectural governor, the High Pressure Gas Safety Institute of Japan and Designated Import Conformity Inspection Body are the agencies that are designated to be able to conduct an import inspection.

(2) Articles 45-3, 47 Technical standards for imported high pressure gas and the methods of an import inspection

Conformity to the technical standards for import inspection means as follows:

1) The imported high pressure gas passes the content verification test:
Inspect the pressure, composition, etc., of the imported high pressure gas by analysis and verification of records, etc. (The technical standards pursuant to Article 12, paragraph (16), item (i) of the Public Notice of Production Details)

2) The imported container passes the safety test of container:
Inspect the degree of safety of the containers for imported high pressure gas by the specified methods of container inspection and verification of records, etc. (The technical standards pursuant to Article 12, paragraph (16), item (ii) of the Public Notice of Production Details)

(3) Article 46 High pressure gases that do not require an inspection

High pressure gas within a shock absorber that satisfies the specified requirements and high pressure gases that present no risk to the maintenance of public safety and the prevention of disasters do not require an import inspection (Detailed explanation is omitted).

2-6. Safety Measures, etc., for Transport of High Pressure Gas (Chapter VI)

The methods of transport of high pressure gas are roughly classified into transport 1) by containers fixed on vehicle (transport by a tanker truck, bundle containers), 2) by containers loaded on vehicle (bulk transport); and 3) by pipelines.

The technical standards, etc., for the transport of high pressure gas, mainly by the methods of 1) and 2), are compared in Table 1. Furthermore, transport by pipelines [3) above] falls under the category of production of high pressure gas and thus shall conform to the provisions regarding pipelines, provided for in Article 6, paragraph (1), item (xliii), pursuant to the provisions of Article 51.

Table 1: Outlines of the technical standards for the transport of high pressure gas (except by pipelines)

Outlines of the technical standards	Transport by containers fixed on vehicle (Article 49)	Other transport (bulk transport) (Article 50)
Mandatory display of warning sign	○ (item (i))	○ (item (i))
Bundle containers and safe construction of bundle containers	○ (item (ii))	No provisions
Prohibition of transport in general FRP composite containers that have exceeded a certain period of time	○ (item (iii))	○ (item (iii))
Temperature restriction of filled/empty containers (40°C or less), etc.	○ (item (iv))	○ (item (ii))
Measures to prevent sloshing within the filled/empty containers of liquefied gas	○ (item (v))	No provisions
Mandatory installation of a height pole	○ (item (vi))	No provisions
Ordinance on the location of the operation box	○ (items (vii) to (ix))	No provisions
Measures to prevent damages on container accessories	○ (item (x))	No provisions
Material restriction for level gauge (flammable gas, toxic gas, oxygen)	○ (item (xi))	No provisions
Obligatory indication of the opening and closing directions and open/close status of valves, etc.	○ (item (xii))	No provisions
Obligatory inspection before and after transport	○ (item (xiii))	No provisions
Requirement to carry a fire extinguishing equipment and necessary materials, etc., when transporting flammable gas, toxic gas, etc.	○ (items (xiv) and (xv))	○ (items (viii) and (ix))
Restriction to park a transport vehicle in an area where protected properties are established in concentration	○ (item (xvi))	○ (item (xi))
Requirement to be transported by a transport overseer who is required to carry his/her license, etc., as well as methods of transport	○ (items (xvii), (xviii) and (xx))	○ (item (xii)) (Article 49 is applied mutatis mutandis)

Measures to be taken when filled/empty containers fall into a dangerous state or when a disaster happens while transporting high pressure gas	○ (item (xix))	○ (item (xii)) (Article 49 is applied mutatis mutandis)
Requirement to carry a yellow card when transporting flammable gas, toxic gas, and oxygen	○ (item (xxi))	○ (item (xiii)) (Article 49 is applied mutatis mutandis)
Fall and overturn prevention for filled/empty containers and prohibition of rough handling	No provisions	○ (item (iv))
Mixed loading restriction of filled/empty containers and dangerous substances as well as mixed loading prohibition of containers for chlorine, etc., and containers for acetylene, ammonia, or hydrogen	No provisions	○ (item (v))
Direction of valves when loading filled/empty containers of flammable gas and filled/empty containers of oxygen on a same vehicle	No provisions	○ (item (vi))
Wooden frame or gasket packing for filled/empty containers of toxic gas	No provisions	○ (item (vii))
Abatement measures on vehicles transporting arsine or hydrogen selenide	No provisions	○ (item (x))

2-7. Technical Standards for Installation of Equipment for Domestic Use (Chapter VII)

Technical standards are prescribed for the work of setting up or changing the equipment for providing general consumers with compressed natural gas for their daily use. (The details of the standards are omitted.)

Liquefied petroleum gas and, for some areas, compressed natural gas were used as fuel at ordinary homes in the 1960s, and thus the consumption thereof was regulated. However, an increase in the number of liquefied petroleum gas related accidents involving general consumers prompted a separation and transfer of ordinances regarding domestically used LPG equipment for general consumers from the High Pressure Gas Safety Act to the LPG Act, which was newly established in 1967. As a result, ordinances concerning the domestically used equipment of compressed natural gas have remained in the provisions under the High Pressure Gas Safety Act to the present.

2-8. Notification, etc., of High Pressure Gas Consumption (Chapter VIII)

Consumption of high pressure gas is regulated in the following two categories:

1) Specific High Pressure Gas Consumer
A person who consumes high pressure gases which require special care with respect to consumption (Refer to Diagram 8) and who shall submit a notification report of consumption to the prefectural governor.

2) Other consumers
Any person who consumes those high pressure gases other than what Specific High Pressure Gas Consumers consume (consumers of flammable gas, toxic gas, oxygen, or air) and who shall comply with the specified technical standards.

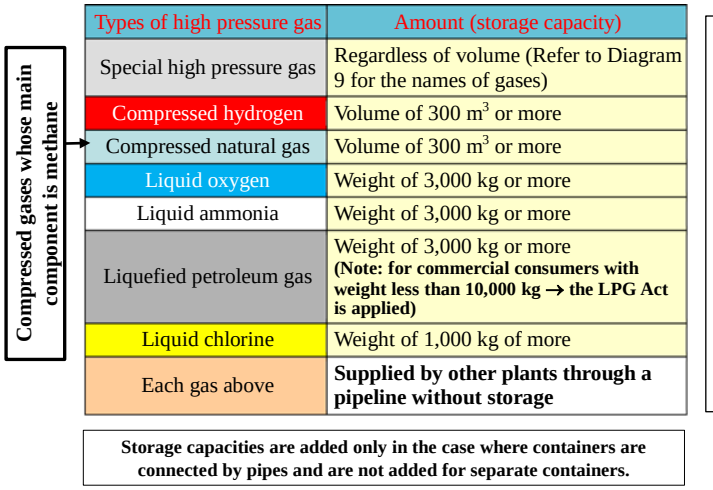


Diagram 8: Specific High Pressure Gas Consumers

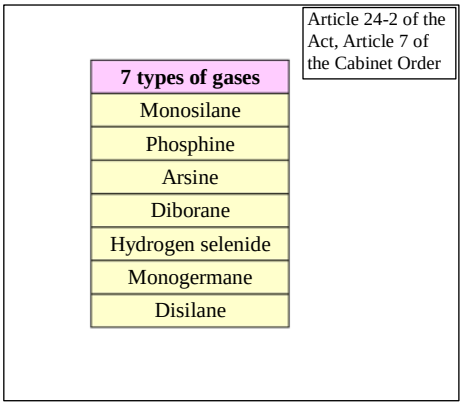


Diagram 9: Types of Special High Pressure Gas

(1) Article 53 Notification of Specific High Pressure Gas Consumption

A Specific High Pressure Gas Consumer shall submit a notification report of Specific High Pressure Gas Consumer in the form specified by an ordinance of METI and the detailed statement of the consumption facility, etc., (a written statement with information about storage capacity of the storage equipment for Specific High Pressure Gas, conformity thereof to the technical standards, etc., and drawings of the location of consumption facility and conditions of surrounding area, etc.) to the prefectural governor who has jurisdiction over the location of the plant.

(2) Article 55 Technical standards for consumption of Specific High Pressure Gases

The provisions of the standards for production facilities of high pressure gases are applied, mutatis mutandis, to many of the technical standards pertaining to the location, construction, and equipment of the facilities that consume Specific High Pressure Gases, except for those pertaining to special high pressure gases (Refer to Diagram 9).

In addition, the standards concerning special high pressure gases were added to the standards under this Article when special high pressure gases were additionally specified as Specific High Pressure Gases in 1992.

The technical standards for the location, construction, and equipment of the facilities under paragraph (i) are divided into the following four categories. The Table 2 shows the corresponding category for each item of said paragraph.

i) Standards applicable to the overall facilities that consume Specific High Pressure Gases;
ii) Standards applicable to the consumption equipment of the facilities that consume Specific High Pressure Gases;
iii) Standards applicable to the storage equipment, etc. (storage equipment, pipeline, and pressure reduction equipment as well as the pipes that are laid between; the same shall apply in 9(2)) (with respect to storage equipment, the said standards are applicable only to the storage equipment that is not subject to the ordinance of Class 1 Storage Place and Class 2 Storage Place); and
iv) Standards applicable only to the facilities that consume special high pressure gases.

Table 2: Technical Standards for Consumption of Specific High Pressure Gases

Article 55, paragraph (1)		i	ii	iii	iv
Item	Outlines of the technical standards				
(i)	Mandatory display of boundary lines and warning signs	○			
(ii)	Requirement to maintain a safety setback for the storage equipment and pressure reduction equipment (with exceptions)	○			
(iii)	Spacing requirement, etc., between storage equipment, etc., and a place where fire is used				○
(iv)	Construction which prevents gas build up for the room where flammable gas consumption equipment is installed (with exceptions)		○		
(v)	Restrictions on materials to be used for consumption equipment		○		
(vi)	Measures to prevent deformation of the foundation of consumption equipment (except pipes)		○		
(vii)	Pressure resistance and airtightness of storage equipment, etc. (except containers)			○	
(viii)	Sufficient strength of storage equipment, etc. (except containers)			○	
(ix)	Separation of pipe systems for exhaust gases that may interact				○
(x)	Airtight structure for consumption equipment, abatement equipment, and exhaust ducts, except for storage equipment, etc.				○
(xi)	Structure of exhaust ducts and periodic inspection, etc. (for specified gases)				○
(xii)	Construction to allow easy emergency evacuation (for the room where consumption equipment is installed)				○
(xiii)	Mandatory installation of a pressure gauge and safety devices on storage equipment, etc. (except containers)			○	
(xiv)	Restriction on positioning of the openings of discharge pipes for safety valves or rupture discs				○
(xv)	Backflow prevention between a pressure reduction equipment and a reaction equipment (for specified gases)		○		
(xvi)	Prevention of fracture caused by the external pressure on low temperature storage tanks for flammable gas		○		
(xvii)	Measures for gas displacement inside consumption equipment, etc.				○

(xviii)	Emergency shut-off measures on pipes of storage equipment				○
(xix)	Installation of micromanometer on exhaust duct of consumption equipment				○
(xx)	Installation of automatic control device for consumption equipment and measures to secure electric power for safety equipment				○
(xxi)	Abatement measures for exhaust gas from consumption equipment				○
(xxii)	Mandatory implementation of abatement measures for consumption equipment (for specified gases)	○			
(xxiii)	Restrictions on connections of pipes, joints and connectors, and valves of consumption equipment (for specified gases)		○		
(xxiv)	Use of double-walled pipes for consumption equipment (for specified gases)		○		
(xxv)	Static electricity removal measures for consumption equipment of flammable gas		○		
(xxvi)	Mandatory installation of gas leak detection alarms	○			
(xxvii)	Mandatory installation of fire prevention and extinguishing equipment (except for liquid chlorine)	○			
(xxviii)	Emergency communication measures within a plant				○
(xxix)	Measures to prevent erroneous operation of valves or cocks of consumption equipment	○			
(xxx)	Subsidence monitoring and prevention measures for storage tanks	○			

Furthermore, the technical standards specifying the consumption methods of specific high pressure gases are provided in paragraph (2), including the standards pertaining to 1) the prohibition of the use of fires around storage equipment, etc.; 2) the inspection of consumption equipment before and after use and an operation inspection therefor at least once a day; and 3) the repair and cleaning of consumption equipment.

(3) Articles 59 and 60 Other technical standards for consumption and specifications of gases which shall comply with said standards

Flammable gases (except those consumed as fuel for vehicles that use high pressure gas for fuel only), toxic gases, oxygen, and the air are specified as the gases which shall comply with the other technical standards for consumption (Article 59).

The other main technical standards for consumption are as follows (Article 60, paragraph (1)):

1) Gentle opening and closing of the valves of filled/empty containers (item (i))
2) Prohibition of rough handling of filled/empty containers (item (ii))
3) Heating methods of filled/empty containers, valves, or pipes (item (iii))
4) Corrosion prevention measures for filled/empty containers (item (iv))
5) Measures to prevent erroneous operation of valves and prohibition of excess load on valves of consumption equipment (items (v) and (vi))
6) Consumption at a place with good ventilation and maintenance of temperature at 40°C or less (flammable gas, toxic gas) (item (vii))
7) Handling restriction of filled/empty containers pertaining to consumption of hydrogen cyanide (item (viii))
8) Measures for gas replacement within the consumption equipment and installation of

backflow prevention devices when consuming ethylene oxide (item (ix))

9) Prohibition of use of fire, removal of flammable or combustible substances, installation of fire extinguishing equipment, etc., around the consumption equipment (flammable gas, oxygen, nitrogen trifluoride) (items (x) and (xii))
10) Static electricity removal measures of storage tanks (item (xi))
11) Measures to prevent accidents such as gas leak and explosions, etc., when consuming acetylene gas or natural gas for welding and thermal cutting (items (xiii) and (xiv))
12) Removal of flammable substances such as petroleum, oil, and grease from valves and tools (oxygen, nitrogen trifluoride) (item (xv))
13) Measures to close valves, prevent containers from falling, and avoid damage to valves after consumption (item (xvi))
14) Standards for repair and cleaning of consumption equipment (item (xvii))
15) Inspection of consumption equipment before and after use and an operation inspection therefor at least once a day (item (xviii))
16) Prohibition of the use of the general FRP composite containers in water (item (xix))

2-9. Technical Standards, etc., for Disposal of High Pressure Gas (Chapter IX)

Article 61 Flammable gases, toxic gases, and oxygen are specified as the gases which shall comply with the technical standards for disposal of high pressure gas.

Article 62 Main technical standards for disposal are as follows:

1) Prohibition of disposal of high pressure gas in container (item (i))
2) Standards for flammable gas disposal (item (ii); refer to Diagram 10)
3) Standard for toxic gas exhaust (item (iii))
4) Gas leak detection measure in case of continuous and repeated disposal (except for oxygen) (item (iv))
5) Removal of flammable substances such as petroleum, oil, and grease from valves and tools (oxygen, nitrogen trifluoride) (item (v))
6) Measures to close valves, prevent containers from falling, and avoid damage to valves after disposal (item (vi))
7) Gentle opening and closing of valves of filled/empty containers (item (vii))
8) Heating methods of filled/empty containers, valves, or pipes (item (viii))

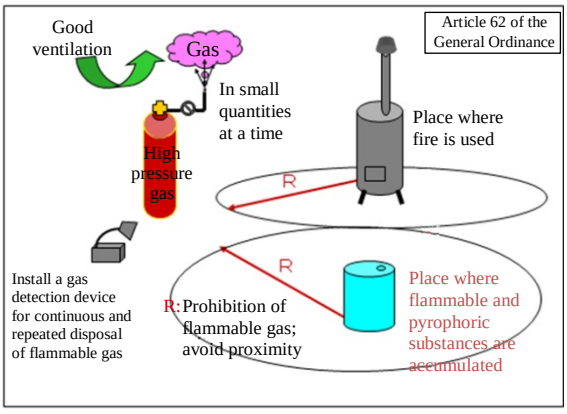


Diagram 10: Disposal of flammable gas

2-10. Voluntary Safety Measures (Chapter X)

Article 63 Preparation and notification of Hazard Prevention Rule

A Class 1 Producer shall comply with the technical standards of production pursuant to Article 8 of the High Pressure Gas Safety Act; provided, however, that the production facilities and the methods of production differ depending on the format of each operation. Therefore, the technical standards need to be supplemented to better maintain the safety in accordance with the individual circumstances of each plant. The Hazard Prevention Rule is the supplemental standards that the producer establishes autonomously in accordance with the circumstances of his/her plant.

(1) Notification of Hazard Prevention Rule

A Class 1 Producer shall draw up a Hazard Prevention Rule and shall submit a notification report thereof to the prefectural governor prior to the commencement of production. Such notification shall be required likewise for any alteration being made to such Hazard Prevention Rule.

(2) Items to be included in the Hazard Prevention Rule

Diagram 11 shows the items to be included in the Hazard Prevention Rule.

1. Standards concerning location, construction, equipment, and production methods for production facilities
2. Safety management system and the scope of duties of the Safety Controller and other personnel
3. Safe operation and handling of production equipment
4. Safety patrol and inspection of production facilities
5. Management of new establishment or extension and repair works of production facilities
6. Measures taken to prevent disaster and training methods therefor
7. Work management of the associated companies
8. Method of making the Hazard Prevention Rule known to employees and measures to be taken against anyone who violates the Rule
9. Record of safety related matters
10. Preparation and procedures for alteration of Hazard Prevention Rule
11. Other matters necessary for the prevention of disasters and accidents

* Measures to be taken when a warning declaration is issued, in case the plants are located within the Areas under Intensified Measures against Earthquake Disaster specified in the Act on Special Measures Concerning Countermeasures for Large-Scale Earthquakes

* Detailed items on tsunami evacuation, training, education, and dissemination for the plants within the designated areas under the Act on Special Measures for Promotion of Nankai Trough Earthquake Disaster Management as well as the Act on Special Measures for Promotion of Disaster Management for Trench-type Earthquakes in the Vicinity of the Japan and Chishima Trenches

Diagram 11: Items to be included in the Hazard Prevention Rule

Articles 64 to 71, 76 to 78 Safety Management System of Production Plants

(1) Safety management system of Class 1 Producers

A safety management system required of a Class 1 Producer varies depending on the scale (processing capacity), etc., of his/her plant. Diagram 12 shows examples of safety management organizational chart for large-scale plants (e.g., plants with a processing capacity of 1,000,000 m^3/day or greater), mid-scale plants (e.g., plants with a processing capacity of less than 1,000,000 m^3/day), and small-scale plants.

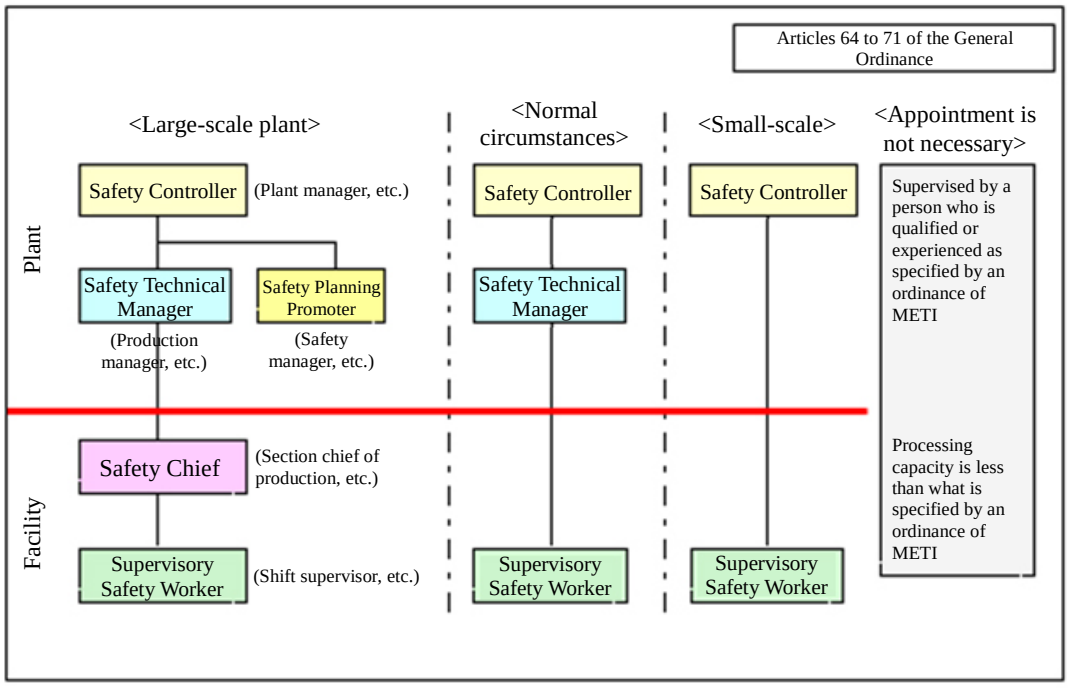


Diagram 12: Examples of appointment of the Safety Controller and Other Personnel

Furthermore, Class 1 Producers who satisfy any of the following requirements are exempt from appointing a Safety Controller and other personnel:

1) A Class 1 Producer of any of the following plant who has a person with specified qualification and experience supervise the safety of production:
   i) A plant that produces sulfur hexafluoride gas, air, liquid helium, liquid argon, liquid nitrogen, liquid oxygen, liquid carbon dioxide, liquid sulfur hexafluoride, or liquid fluorocarbon, using mobile production equipment (e.g., a tanker truck equipped with pumps);
   ii) A plant that produces helium gas, argon gas, nitrogen gas, or oxygen using an evaporator or pressure reducing valves (e.g., cold evaporator); or
   iii) A plant that produces carbon dioxide using an evaporator or pressure reducing valves;

2) A Class 1 Producer whose plant uses a die casting machine, a water pressure accumulator, or an accumulator which uses the air or nitrogen gas of 10 m^3 or less in volume;

3) A Class 1 Producer who has installed stationary production equipment (with an interlocking pressure switch for shutdown) to fill containers with the breathing air for scuba diving, etc., at a processing capacity of less than 1,000 m^3/day, and who

has a person with specified qualification and experience supervise the safety of such production;

4) A Class 1 Producer with the High Pressure Gas Production Safety Management Certificate (except refrigeration) who exclusively fills natural gas into containers for fuel systems at a plant where a compressed natural gas filling station with a processing capacity of less than 250,000 m^3/day has been installed, and who has a person with no less than 6 months of experience in flammable gas production supervise the safety of such production; or

5) A Class 1 Producer with a High Pressure Gas Production Safety Management Certificate (except refrigeration) who exclusively fills the compressed hydrogen into containers for fuel systems at a plant where a compressed hydrogen gas filling station with a processing capacity of less than 250,000 m^3/day has been installed, and who has a person with no less than 6 months of experience in compressed hydrogen production supervise the safety of such production.

(2) Safety management system of Class 2 Producers

A Class 2 Producer who produces by installing pumps for flammable gas, which has a processing capacity of 30 m^3/day or greater, shall have a safety management system in the same way as the Class 1 Producers (Falls under either <Normal circumstance> or <Small-scale> in Diagram 12).

(3) Requirement for appointment, etc., of a Safety Controller and other personnel and their deputies

Appointment requirements, etc., of the Safety Controller and other personnel and their deputies are shown in Table 3.

Diagram 13: Requirements for appointment of a Safety Controller, etc., and their deputies

Safety Controller, etc., and the deputies	Division of appointment	Required qualifications, etc., for appointment	Obligatory training course	Duties, etc.
Safety Controller	for each plant	Position as a general manager of the business	No	General management of all work in relation to safety
Deputy		Position as an assistant to above		
Safety Technical Manager	for each plant	Certificate and experience	No	Assist the Safety Controller and manage technical matters
Deputy				
Safety Planning Promoter	for each plant	Knowledge and experience	Yes	Assist the Safety Controller in planning, maintenance, and promotion of the Hazard Prevention Rule and the Safety Training Program; provide guidance and
Deputy			No	

				recommendation of standards, such as operation standards, etc.; plan and promote emergency drills; investigate the causes when an accident or disaster occurs; collect safety information, etc.
Safety Chief	for each division of the facilities	Certificate and experience	Yes	Assist a Safety Technical Manager (Safety Controller) with respect to technical matters and lead Supervisory Safety Workers
Deputy	No provisions		No	
Supervisory Safety Worker	for each division, line, and shift of the facilities	Certificate and experience	Yes	Monitor, patrol, and inspect the facilities (construction and equipment) and operations (method of production); provide advice on standards for emergency measures and operation standards, etc.; provide emergency responses; and supervise periodical self inspections
Deputy	No provisions		No	

(4) Notification of appointment or dismissal of a Safety Controller and other personnel and their deputies

Diagram 13 summarizes the procedures to notify the prefectural governor of an appointment or dismissal of a Safety Controller and other personnel and their deputies.

(5) Duties of a Safety Controller and other personnel

The duties of a Safety Controller and other personnel are stipulated in Article 32 of the High Pressure Gas Safety Act and Articles 76 and 77 of the General Ordinance (Refer to Diagram 13).

Articles 27-2(5) and (6), 27-3(3), 28, 33(3) of the Act, Articles 67 and 71 of the General Ordinance

Safety Controller and other personnel		Procedures of notification to the prefectural governor
Officials	Deputies	
Safety Controller	○	Upon appointment or dismissal, without delay (on each occasion)
Safety Technical Manager	★	Notify all the personnel who were appointed and dismissed between August 1 of the previous year and July 31 of the current year, after August 1 of the current year without delay (all at once)
Safety Planning Promoter	★	
Safety Chief	★	
Supervisory Safety Workers	★	

(The deputies marked with ○ are required to be appointed and submit the notification of appointment and dismissal. The deputies marked with ★ are required to be appointed but no notification of appointment and dismissal are required.)

Diagram 13: Procedures for Notification of appointment or dismissal of a Safety Controller and other personnel (and their deputies)

(6) Article 68 Participation in the training courses for Safety Planning Promoters, Safety Chiefs, and Supervisory Safety Workers

The Safety Planning Promoters, Safety Chiefs, and Supervisory Safety Workers shall acquire the safety information, skills, and knowledge for the prevention of disasters and accidents caused by high pressure gas at all times as a part of their duties. As a way of acquisition thereof, periodical participation in the training courses on the prevention of high pressure gas accidents, given by the High Pressure Gas Safety Institute of Japan or a Designated Training Agency, is stipulated. However, the deputies for such positions are not obligated to take said courses.

Articles 72 and 74 Safety Management System of Sales Location of High Pressure Gas

A person who engages in sales of the gases listed in the left column of Table 4 shall appoint a Sales Safety Chief from among the holders of the specified certificates (Type 1 Sales Safety Chief Certificates and others) who have experience in production or sales of high pressure gases listed in the right column of the diagram for a period of 6 months or longer.

Types of high pressure gas for sale:	Experience with the following types of gas is required:
Acetylene, arsine, ammonia, chlorine, chloromethyl, arsenic pentafluoride, phosphorus pentachloride, nitrogen trifluoride, boron trifluoride, phosphorus trifluoride, hydrogen cyanide, disilane, sulfur tetrafluoride, silicon tetrafluoride, diborane, hydrogen, hydrogen selenide, phosphine, methane, monogermane, and monosilane	Arsine, disilane, diborane, hydrogen selenide, phosphine, monogermane, or monosilane
Acetylene, hydrogen, methane, arsenic pentafluoride and others, hydrogen cyanide, chlorine, chloromethyl, and ammonia	Ammonia, carbon monoxide, ethylene oxide, chloromethyl, hydrogen cyanide, coal gas, trimethylamine, monomethylamine, or hydrogen sulfide
Acetylene, hydrogen, and methane	Acetylene, oil gas, ethane, ethylene, vinyl chloride, water gas, hydrogen, methane, or methyl ether
chlorine, arsenic pentafluoride, phosphorus pentachloride, nitrogen trifluoride, boron trifluoride, phosphorus trifluoride, sulfur tetrafluoride, and silicon tetrafluoride	sulfurous acid gas, chlorine, arsenic pentafluoride, phosphorus pentachloride, nitrogen trifluoride, boron trifluoride, phosphorus trifluoride, sulfur tetrafluoride, silicon tetrafluoride, bromomethane, or phosgene
Oxygen	Oxygen

Table 4 : Experience of 6 months or more in production or sales of high pressure gases required for appointment of the Sales Safety Chief

Articles 73 and 75 Safety Management System of Specific High Pressure Gas Consumption Plants

Any Specific High Pressure Gas Consumer shall appoint an Operation Safety Chief among the persons listed below:

1) A holder of the specified certificates (Type 1 Sales Safety Chief Certificate, etc.);
2) A person with experience of a year or longer in production or consumption of Specific High Pressure Gases (the same type of Specific High Pressure Gas as the Specific High Pressure Gas to be consumed);
3) A person who has completed the specified training course offered by the High Pressure Gas Safety Institute of Japan; and
4) A person with specified academic background; provided, however, that if he/she is a high school graduate, he/she shall have experience of 6 months or longer in production or consumption of Specific High Pressure Gases (the same type of Specific High Pressure Gas as the Specific High Pressure Gas to be consumed).

2-11. Safety Inspection and Periodical Self Inspection (Chapter XI)

Articles 79 to 82 Safety Inspection

Safety Inspection is an inspection conducted by a third-party body such as the prefectural governor, for the production facilities of Class 1 Producers, which are specified as having the possibility of explosion or other disasters involving high pressure gas (Designated Facilities).

In principle, a Safety Inspection by a prefectural governor, etc., shall be conducted once every year (every specified period (2-4 years) for the facilities specified by a Public Notice). Furthermore, provisions are also provided regarding the Specified Equipment (refer to "15. Accreditation, etc., Regarding Specified Equipment"), the facilities that are excluded from being subject to the Safety Inspection, such as the production facilities other than gas equipment (production facilities other than Designated Facilities), and the facilities that are exempt from the Safety Inspection until the resumption of the use thereof, such as the suspended facilities (which have been notified to the prefectural governor).

The Safety Inspection is conducted to determine whether or not the Designated Facilities conform with the technical standards. "Safety Inspection Standards (KHKS 0850)," established by the High Pressure Gas Safety Institute of Japan, are specified by a Public Notice (Public Notice on the Safety Inspection) to be used as the specific methods of Safety Inspection. (Some inspection methods, such as the Safety Inspection and other inspections for mobile production equipment, are specified in an appended table of an ordinance of METI.)

Articles 83 and 83-2 Periodical Self Inspection

Due to the increased risk of disasters and accidents at the production facilities of Class 1 Producers and Class 2 Producers (only those specified) and at the consumption facilities of Specific High Pressure Gas Consumers, compared to other facilities that handle high pressure gas, periodical self inspections are voluntarily conducted at a fixed interval (more than once a year) by the business operators, as a supplement to the Safety Inspection, to determine whether or not said facilities conform with the technical standards.

The appointed Supervisory Safety Workers (at production facilities) or Operation Safety Chief (at consumption facilities) shall supervise the implementation of a periodical self inspection when such inspection is conducted. In addition, any person who conducts a periodical self inspection shall create and keep the inspection records thereof according to the specified items to be entered in the record, in order to facilitate the maintenance of the facilities after the inspection. Furthermore, the storage of inspection reports by electronic or magnetic means is also accepted.

2-12. Measures Taken to Prevent Disaster (Chapter XII)

When the risk of a disaster involving high pressure gas becomes too high due to a fire, earthquake, typhoon, or other event that has occurred in proximity to a production facility, consumption facility, storage place, or filled/empty containers of high pressure gases, the owner or possessor of such facilities, storage place, or container shall promptly take immediate measures to prevent disaster. Moreover, any person finding such situation shall immediately report it to the nearest government organization concerned with public safety, etc., such as the prefectural governor, etc.

2-13. Accreditation, etc., Regarding Completion Inspection and Safety Inspection (Chapter XIII)

An accreditation system for the Completion Inspection and Safety Inspection was introduced in 1997 as an incentive for technologically advanced plants to allow the administration of Completion Inspection for Designated Alteration Work and Safety Inspection for Designated Facilities by themselves.

This Chapter prescribes the procedures, standards, etc., regarding such accreditation. Diagram 14 shows the general flow of accreditation process of the Completion Inspection. (Procedures and flow of accreditation for the Safety Inspection are mostly the same as procedures and flow of accreditation for the Completion Inspection.)

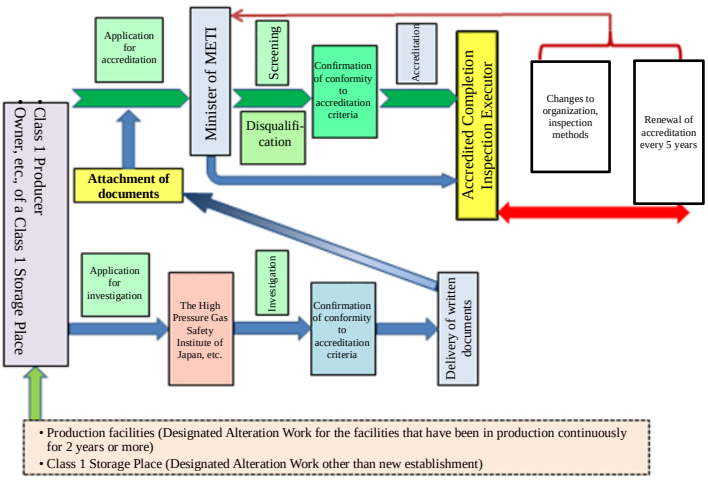


Diagram 14: Procedures, etc., of accreditation for Completion Inspection

In addition, when approved by the Minister of METI, the applicant may undergo an investigation by the High Pressure Gas Safety Institute of Japan or an Investigation Agency of Inspection Organization specified by the Minister of METI. The procedures, etc., for such occasion are also provided in the provisions. However, an Investigation Agency of Inspection Organization specified by the Minister currently does not exist.

2-14. Accreditation, etc., Regarding Specified Equipment (Chapter XIII-2)

Manufacturers or importers of the equipment particularly specified to have no risk of interfering with the maintenance of public safety and the prevention of disasters (Specified Equipment), among the production equipment with the processing capacity equivalent to Class 1 Producer, can apply for an accreditation for a Designated Accreditation Agency for Specified Equipment which owns the Specified Equipment, designated by the Minister of METI, the High Pressure Gas Safety Institute of Japan, or a minister (Articles 56-7 of the High Pressure Gas Safety Act).

In this Chapter, procedures to apply for an accreditation of Specified Equipment, the technical standards for Specified Equipment, the forms of the Specified Equipment Accreditation Certificate, etc., are prescribed.

That said, Specified Equipment by itself is defined as equipment equivalent to that of a Class 2 Producer. A unit-type air liquefaction separation device for the production of nitrogen is a specific example of Specified Equipment regulated under the General Ordinance.

Furthermore, the accreditation is currently conducted only by the High Pressure Gas Safety

Institute of Japan, as there is no Designated Accreditation Agency for Specified Equipment designated by the Minister of METI.

3. Supplement

3-1. Comparison of Technical Standards for Production Facilities with Stationary Production Equipment

Outlines of the technical standards	Plants subject to Article 6 (Class 1 Producers, etc.[*1])	Plants subject to Article 12[*3] (Class 2 Producers[*2])	Producers subject to Article 13 (Other Productions)
Boundary lines and warning signs (Indication of boundary lines and display of warning signs)	○ (paragraph (1), item (i))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Safety setbacks (Ensuring Class 1 Equipment Setback and Class 2 Equipment Setback)	○ (paragraph (1), item (ii))	No provisions	No provisions
Distance to facilities using fire (Spacing distance, measures to prevent gas flow, etc.)	○ (paragraph (1), item (iii))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Spacing between equipment (Ensuring enough spacing between high pressure gas equipment for flammable gas and other high pressure gas equipment)	○ (paragraph (1), items (iv) and (v))	No provisions	No provisions
Measures for identification of flammable gas storage tanks	○ (paragraph (1), item (vi))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Measures to prevent flow of liquefied gas (Dikes, etc.)	○ (paragraph (1), item (vii))	No provisions	No provisions
Restriction on installation of equipment inside and outside of the dikes	○ (paragraph (1), item (viii))	No provisions	No provisions
Measures to prevent gas build up (A room where flammable gas production equipment is installed)	○ (paragraph (1), item (ix))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Airtight structure of gas equipment (except for high pressure gas equipment)	○ (paragraph (1), item (x))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Pressure resistance of high pressure gas equipment	○ (paragraph (1), item (xi))	○ (paragraph (1), item (i)) (Article 6 is cited)	△ (Applicable when production falls under item (i) or (ii))
Airtightness of high pressure gas equipment	○ (paragraph (1), item (xii))	○ (paragraph (1), item (i)) (Article 6 is cited)	△ (Applicable when production falls under item (i) or (ii))
Strength of high pressure gas equipment	○ (paragraph (1), item (xiii))	○ (paragraph (1), item (i)) (Article 6 is cited)	△ (Applicable when production falls under item (i))
Restrictions on materials to be used for gas equipment	○ (paragraph (1), item (xiv))	No provisions	No provisions
Foundation of high pressure gas equipment	○ (paragraph (1), item (xv))	No provisions	No provisions
Subsidence monitoring of storage tanks	○ (paragraph (1), item (xvi))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Seismic resistant design for high pressure gas equipment	○ (paragraph (1), item (xvii))	No provisions	No provisions
Installation of a thermometer and measures to return temperature back to normal range	○ (paragraph (1), item (xviii))	No provisions	No provisions
Installation of a pressure gauge and safety devices	○ (paragraph (1), item (xix))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions

Outlines of the technical standards	Plants subject to Article 6 (Class 1 Producers, etc.[*1])	Plants subject to Article 12[*3] (Class 2 Producers[*2])	Producers subject to Article 13 (Other Productions)
Discharge pipes for safety valves, etc.	○ (paragraph (1), item (xx))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Measures to prevent negative pressure on low temperature storage tanks for flammable gas	○ (paragraph (1), item (xxi))	No provisions	No provisions
Installation of a level gauge on liquefied gas storage tanks	○ (paragraph (1), item (xxii))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Gas replacement, etc., of production equipment for special high pressure gases, etc.	○ (paragraph (1), item (xxiii))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Double valves for storage tanks (Receive and send pipes, etc., of storage tanks for flammable gas, toxic gas or oxygen)	○ (paragraph (1), item (xxiv))	No provisions	No provisions
Emergency shutoff device for liquefied gas storage tanks	○ (paragraph (1), item (xxv))	No provisions	No provisions
Explosion-proof electrical equipment	○ (paragraph (1), item (xxvi))	○ (paragraph (1), item (i)) (Article 6 is cited)	No provisions
Measures to secure electric power for safety equipment	○ (paragraph (1), item (xxvii))	No provisions	No provisions
Rupture prevention measures for acetylene containers, etc.	○ (paragraph (1), items (xxviii) and (xxviii)-2)	No provisions	No provisions
Installation of barrier walls between an acetylene compressor and place for filling/container storage place, etc.	○ (paragraph (1), item (xxix))	No provisions	No provisions
Installation of barrier walls between a compressor and a place to fill a gas of 10 MPa or more, etc.	○ (paragraph (1), item (xxx))	No provisions	No provisions
Mandatory installation of gas leak detection alarms	○ (paragraph (1), item (xxxi))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Measures to prevent temperature rise of storage tanks (Storage tanks, etc., for flammable gas and toxic gas)	○ (paragraph (1), item (xxxii))	No provisions	No provisions
Measures to identify toxic gas facilities and hazard signs	○ (paragraph (1), item (xxxiii))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Method of joining pipes, etc., for toxic gas	○ (paragraph (1), item (xxxv))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Use of double-walled pipes for toxic gas	○ (paragraph (1), item (xxxvi))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Detoxifying equipment for toxic gas equipment	○ (paragraph (1), item (xxxvii))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Measures to remove static electricity (Flammable gas)	○ (paragraph (1), item (xxxviii))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Fire prevention and extinguishing equipment (flammable gas, oxygen, nitrogen trifluoride, etc.)	○ (paragraph (1), item (xxxix))	○ (paragraph (1), item (i)) (article 6 is cited)	No provisions
Emergency reporting equipment	○ (paragraph (1), item (xl))	No provisions	No provisions
Measures to prevent erroneous operation of valves, etc.	○ (paragraph (1), item (xli))	No provisions	No provisions

Outlines of the technical standards	Plants subject to Article 6 (Class 1 Producers, etc.[*1])	Plants subject to Article 12[*3] (Class 2 Producers[*2])	Producers subject to Article 13 (Other Productions)
Standards for container storage place and filled/empty containers (warning signs, setback for storage place, measures to block direct sunlight, structure that prevents build up, abatement equipment, fire extinguishing equipment, etc.)	○ (paragraph (1), item (xlii))	No provisions	No provisions
Standards for pipelines[*4] (warning signs, spacing, pressure resistance, airtightness and strength, measures to prevent corrosion or pressure rise, etc.)	○ (paragraph (1), item (xliii))	No provisions	No provisions
Measures to keep safety valves and stop valves open	○ (paragraph (2), item (i), sub-item (a))	○ (paragraph (2), item (ii)) (Article 6 is cited)	○ (items (i), (ii) and (iii)) (Article 6 is cited)
Limitation of hydrocarbon in the liquid oxygen reservoir of an air separation device	○ (paragraph (2), item (i), sub-item (b))	No provisions	No provisions
Restriction of gases for compression (e.g., Compression of a flammable gas is prohibited when the oxygen content is 4% or more of the total content)	○ (paragraph (2), item (i), sub-item (c))	○ (paragraph (2), item (ii)) (Article 6 is cited)	○ (item (iii)) (Article 6 is cited)
Standard for adding diluent for acetylene	○ (paragraph (2), item (i), sub-item (d))	○ (paragraph (2), item (ii)) (Article 6 is cited)	○ (item (iii)) (Article 6 is cited)
Restriction of oil and grease on air accumulator	○ (paragraph (2), item (i), sub-item (e))	No provisions	No provisions
Handling of valves on filled/empty containers of nitrogen trifluoride	○ (paragraph (2), item (i), sub-item (f))	○ (paragraph (2), item (ii)) (Article 6 is cited)	○ (item (iii)) (Article 6 is cited)
Limitation on amount of liquefied gas to be filled in a storage tank (Maximum 90%; measures for automatic detection and alarm, etc.)	○ (paragraph (2), item (ii), sub-item (a))	No provisions	No provisions
Acoustic inspection of seamless containers before filling	○ (paragraph (2), item (ii), sub-item (b))	○ (paragraph (2), item (ii)) (Article 6 is cited) With exceptions	○ (item (iii)) (Article 6 is cited)
Measures to lock the vehicle when transferring high pressure gas to and from a container fixed on the vehicle	○ (paragraph (2), item (ii), sub-item (c))	No provisions	No provisions
Pressure restriction when filling acetylene	○ (paragraph (2), item (ii), sub-item (d))	○ (paragraph (2), item (ii)) (article 6 is cited)	○ (item (iii)) (Article 6 is cited)
Gas replacement measures when filling ethylene oxide	○ (paragraph (2), item (ii), sub-item (e))	○ (paragraph (2), item (ii)) (article 6 is cited)	○ (item (iii)) (Article 6 is cited)
Removal of oil and grease, etc., from the valves, etc., when filling oxygen and nitrogen trifluoride	○ (paragraph (2), item (ii), sub-item (f))	○ (paragraph (2), item (iii))	○ (item (iii)) (Article 12 is cited)
Restrictions on the place to fill nitrogen trifluoride	○ (paragraph (2), item (ii), sub-item (g))	○ (paragraph (2), item (ii)) (article 6 is cited)	○ (item (iii)) (Article 6 is cited)
Methods of heating filled/empty containers when filling containers with high pressure gas	○ (paragraph (2), item (ii), sub-item (h))	○ (paragraph (2), item (iv))	○ (item (iii)) (Article 12 is cited)
Restriction for filling Non Refillable Containers	○ (paragraph (2), item (ii), sub-item (i))	No provisions	No provisions
Restrictions for filling general FRP composite containers, etc.	○ (paragraph (2), item (ii), sub-item (j))	No provisions	No provisions

Outlines of the technical standards	Plants subject to Article 6 (Class 1 Producers, etc.[*1])	Plants subject to Article 12[*3] (Class 2 Producers[*2])	Producers subject to Article 13 (Other Productions)
Standards for filling high pressure gas	○ (paragraph (2), item (iii))	○ (paragraph (2), item (ii)) (Article 6 is cited) With exceptions	○ (item (iii)) (Article 6 is cited) With exceptions
Obligation to inspect production facilities before and after use and to conduct operation inspection at least once a day	○ (paragraph (2), item (iv))	○ (paragraph (2), item (ii)) (article 6 is cited)	No provisions
Standards for repair and cleaning of gas equipment	○ (paragraph (2), item (v))	○ (paragraph (2), item (ii)) (Article 6 is cited)	No provisions
Measures to avoid excessive force on valves when manipulating valves	○ (paragraph (2), item (vi))	○ (paragraph (2), item (ii)) (Article 6 is cited)	No provisions
Standards for aerosol production	○ (paragraph (2), item (vii))	○ (paragraph (2), item (ii)) (Article 6 is cited)	No provisions
Standards for container storage place and filled/empty containers	○ (paragraph (2), item (viii))	○ (paragraph (2), item (ii)) (Article 6 is cited)	No provisions
Restrictions on location for filling	No provisions	○ (paragraph (2), item (i))	○ (item (iii)) (Article 12 is cited)
Standards for transferring hydrogen cyanide into another container	No provisions	○ (paragraph (2), item (v))	○ (item (iii)) (Article 12 is cited)

*1 Including Class 2 Producers (Only those with a processing capacity of 30 m^3 or greater).
*2 Limited to Class 2 Producers with a processing capacity of less than 30 m^3.
*3 Limited to the plants that are subject only to the provisions of Article 12, paragraph (1), item (i) and paragraph (2), items (i) to (v).
*4 Pipelines referred herein are the pipes through which high pressure gas passes that are laid outside of the plant site.