



## Overview of Fire Equipment in Japan



**Fire and Disaster Management Agency**

**<https://www.fdma.go.jp/>**

[Association of Fire Equipment Manufactures in Japan]

**National Fire Equipment Society**

**<https://www.nfes.or.jp/>**

[Certification Authority for Fire and Related Equipment in Japan]

**Japan Fire Equipment Inspection Institute**

**<http://www.jfeii.or.jp/>**

**Fire Equipment and Safety Center of Japan**

**<https://www.fesc.or.jp/>**

Fire extinguishers

Indoor fire hydrant systems

Sprinkler systems

Closed sprinkler heads and Water flow detecting devices

Inert gas fire extinguishing systems

Automatic fire alarm systems

Detectors

Home fire alarms

Escape equipment

Fire fighting pump truck, Portable fire pump and mounted vehicles

Fire fighting clothes, etc.

## Introduction

Japanese fire equipment is highly reliable for ensuring fire prevention of buildings and implementation of rapid and smooth firefighting activities.

This booklet describes the types and characteristics of Japanese fire equipment and introduces some typical examples.

In addition, Japanese standards, certification systems, installation and maintenance systems for fire equipment are also introduced.

We hope that the information in this booklet will enhance your understanding of the high quality and reliable fire equipment in Japan.

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# 1 Fire Safety Measures for Buildings

Fire safety measures in buildings are stipulated in the Fire Service Law and the Building Standard Law.

### Fire Service Law

Fire safety management and fire equipment

- (1) Fire prevention
- (2) Fire detection, notification, and reporting
- (3) First response firefighting
- (4) Evacuation
- (5) Support for firefighting activities

### Building Standards Law

Fire safety measures of buildings, including walls, floors, doors, corridors, stairs and their materials, dimensions, structure, and positions, etc.

- (1) Suppression of flame spread
- (2) Securing evacuation routes
- (3) Collapse prevention structure
- (4) Support for firefighting activities
- (5) Measures against large urban fires

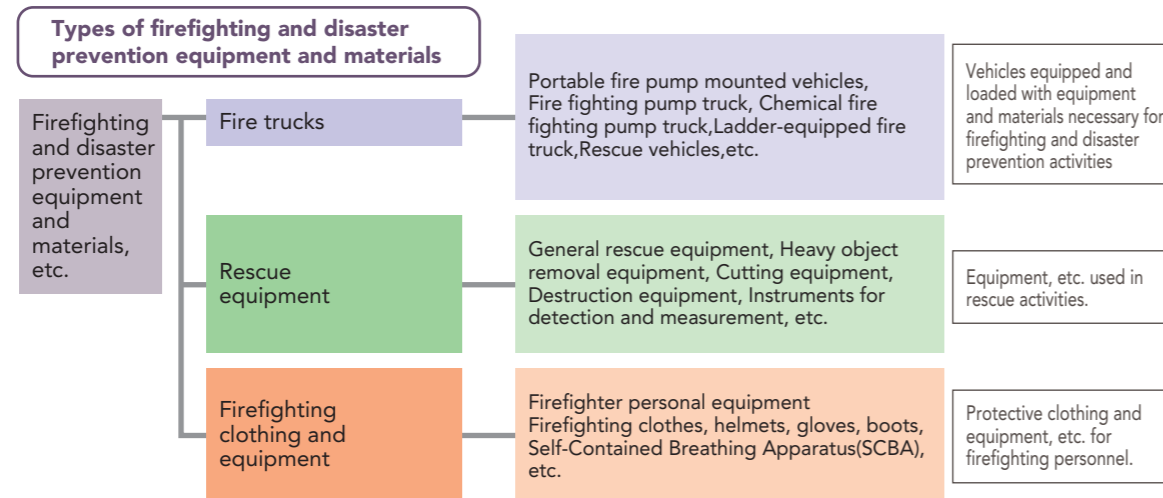
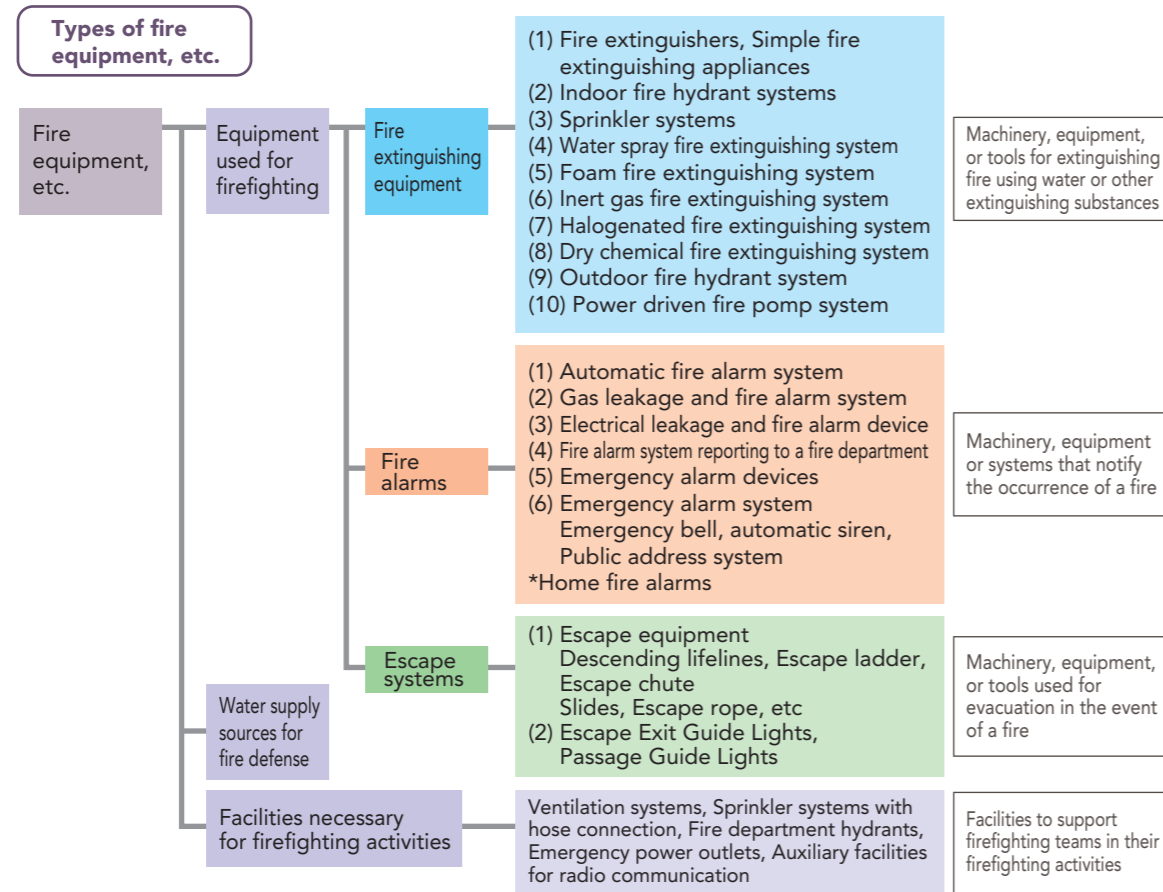
Progress of the fire	Countermeasure	Fire safety measures ● Countermeasures in Fire Services Law [*Countermeasures in Building Standard Law]
(1) Ignition source	Fire management	<ul style="list-style-type: none"> <li>● Safety measures for equipment and appliances that use fire</li> <li>● Management of smoking area and fire supervisor</li> </ul>
(2) Combustible materials	Fire prevention	<ul style="list-style-type: none"> <li>● Fire retardant regulations (curtains, carpets, etc.)</li> </ul>
	Early fire detection	<ul style="list-style-type: none"> <li>● Electric leak fire alarm devices - Gas leak fire alarm system</li> <li>● Automatic fire alarm system (heat, smoke, flame)</li> </ul>
	Fire notification	<ul style="list-style-type: none"> <li>● Emergency alarm system (emergency bell and siren) (public address system)</li> </ul>
(3) Initial fire spread	Reporting a fire	<ul style="list-style-type: none"> <li>● Fire alarm system reporting to a fire department (Fire reporting device)</li> </ul>
	First response firefighting	<ul style="list-style-type: none"> <li>● Fire extinguisher - Simple fire extinguishing appliances</li> <li>● Indoor fire hydrant system</li> <li>● Water spray fire extinguishing system</li> <li>● Sprinkler system</li> <li>● Dry chemical fire extinguishing system</li> <li>● Inert gas fire extinguishing system</li> <li>● Halogenated fire extinguishing system</li> <li>● Foam fire extinguishing system</li> </ul>
(4) Interior	Evacuation	<ul style="list-style-type: none"> <li>● Escape Exit Guide Lights, Passage Guide Lights [*Emergency lighting system]</li> <li>● Escape equipment [*Interior restrictions] [*Fire escape stairs/special evacuation stairs] [*Ventilation systems]</li> </ul>
(5) Single room fire	Prevention of fire spread	<ul style="list-style-type: none"> <li>● Outdoor fire hydrant system</li> <li>[*Fire protection area] [*Fire protection equipment]</li> <li>● Sprinkler systems with hose connection [*Requirement for direct access]</li> <li>● Fire department hydrants [*Emergency entrance]</li> <li>● Water supply sources for fire defense [*Elevator for emergency use]</li> <li>● Ventilation systems - Emergency power outlets</li> <li>● Auxiliary facilities for radio communication</li> </ul>
(6) Fire on entire floor	Full-scale firefighting	

\* Progress of fire : It represents a stage in which a small fire spreads to a single room fire and on entire floor fire.

## 2 Types of Fire Equipment in Japan

Fire equipment in Japan includes the following.

- (1) Fire equipment, etc. to be installed as fire safety measures in buildings
- (2) Fire fighting and disaster prevention equipment and materials used by fire fighting units, etc. for fire fighting and disaster prevention activities



## 3 Features of Fire Equipment in Japan

Japanese fire equipment are designed in consideration of quality and ease of maintenance in order to fully demonstrate the performance and functions required in the event of fire or other disasters.

In manufacturing, the product has undergone thorough quality control in each process from raw materials to products.

### Performance and functions required of fire equipment

Fire equipment for mitigating damage of fire or other disasters (fire prevention, fire detection, early fire extinguishing, evacuation, fire fighting, support for fire fighting, etc. ) must fully demonstrate their performance and functions, so it is crucial for them to have high quality and easy maintained features.

### Technical requirements for fire equipment

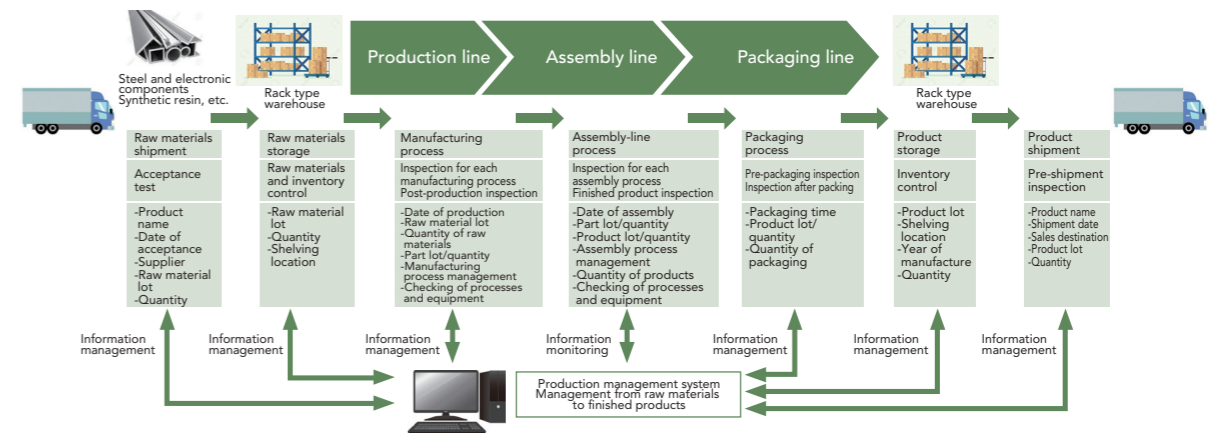
Fire equipment must be developed, designed and manufactured based on strict technical standards. In addition, it is essential to actively adopt new technologies, in accordance with the needs arising from changes in the social environment.

### Quality and reliability of Japanese fire equipment

Japanese fire equipment is developed, designed and manufactured to meet a wide range of requirements, and is characterized by its high quality and high reliability under thorough quality control.

- It also excels in ease of use, maintenance and checking.
- (1) Thorough quality control from design and manufacturing, resulting in stable quality products and high reliability.
  - (2) Easy maintenance, less failure, and high durability.
  - (3) Good visibility of the display and user friendly.

### Example of quality control in a manufacturing plant



# 4

## Main fire equipment

### 1 Fire extinguishers

Fire extinguishers are defined as equipment to tackle a fire at an early stage. Product quality assurance and maintenance are important in order to extinguish fire safely and quickly. There are technical standards for fire extinguishers to ensure their performance and function. In addition, in order to ensure and guarantee the quality only products in conformity to a certain requirement in the inspection system and with necessary labelling can be displayed and sold.

#### Features of Japanese fire extinguishers

- More than 90% of the small fire extinguishers (hand-held fire extinguishers) manufactured in Japan are stored pressure fire extinguishers. A stored pressure fire extinguisher can be checked for proper conditions with a pressure gauge. The bottom of the container, which is prone to corrosion, can be easily maintained by adopting anti-corrosion bottom, etc.
- In order to standardize their operation, a yellow safety stopper is adopted and a common method for using the extinguishers has been established.
- Fire extinguisher labeling of applicable type of fires is based on the ISO standard.

#### Establishment of fire extinguisher recycling system

In Japan, more than 80% of waste fire extinguishers are collected and reused through the Fire Extinguisher Recycling System (established by the Japan Fire Extinguisher Manufacturers Association).

#### Structure of stored pressure fire extinguisher

Nitrogen gas (N<sub>2</sub>) as the propellant to the fire extinguishing agent is always stored at 0.7 to 0.98 MPa in the main container.

#### Method

- Remove the safety stopper
- Point the nozzle at the fire
- Squeeze the lever
- Valve opens
- Fire extinguishing agent is discharged from the nozzle

#### Characteristics

Since the stored pressure of nitrogen gas can be monitored externally with a pressure gauge.

[Morita Miyata Industry Co.]

**Pressure gauge**  
 If the red pointer is in the green zone, it can be used

### 2 Indoor fire hydrant systems

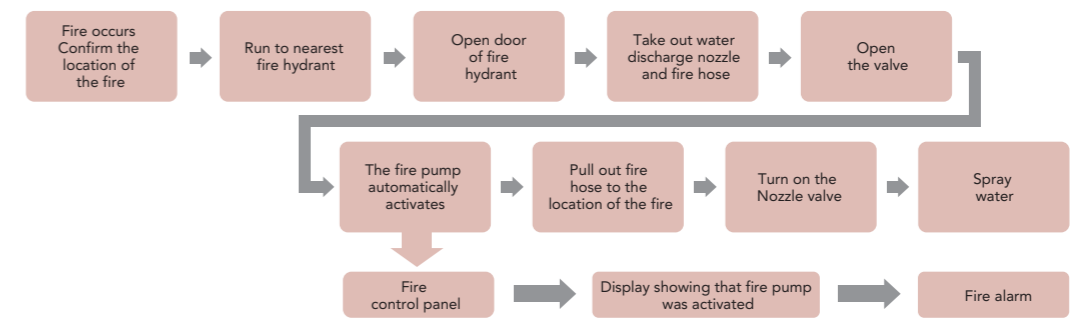
Indoor fire hydrant systems are used for initial fire extinguishing in buildings, and operated manually and spray water for a longer period of than the fire extinguishers.

In Japan, it is recommended to install easy-to-operate fire hydrants that can be easily operated by a single person to discharge water to extinguish a fire quickly and reliably.

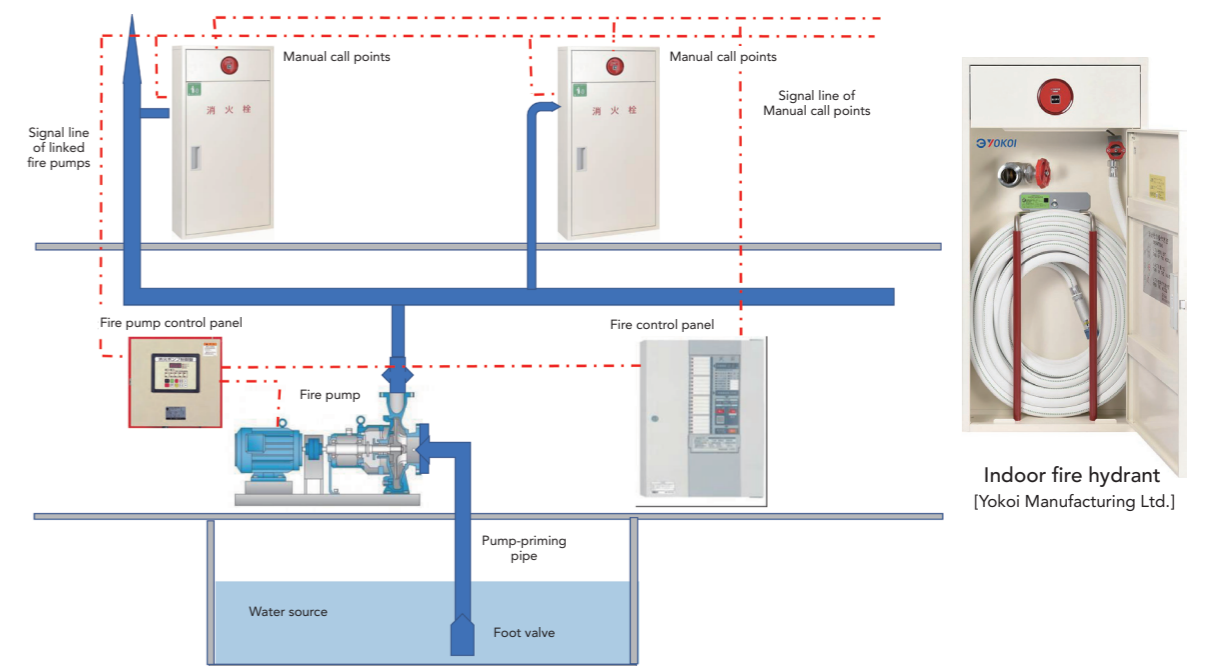
#### Features and structure of easy-to-operate fire hydrants

- Easy-to-operate fire hydrants can be operated by even 1 persons. The fire extinguishing pump is automatically activated in conjunction with the operation of the valve, etc.
- Fire hoses that maintain a circular cross-section with rubber or synthetic resin on the hose jacket are used. It is stored in a circular shape and can be easily pulled out, and used in any length.
- The water discharge nozzle is equipped with the on-off nozzle valve.
- It consists of water source, fire pump, starting device, pump-priming device, indoor fire hydrant box, fire hose, water discharge nozzle, piping, valves, emergency power supply, etc.

#### Steps to using an indoor fire hydrant system



#### Example of indoor fire hydrant system installation



### 3 Sprinkler systems

Sprinkler systems are fire extinguishing systems that detect the heat of a fire and automatically discharge water to extinguish a fire for the early to mid-term period and to prevent the spread of fire.

They are installed in buildings where there is a high risk for the occupants to evacuate or a significant difficulty in fire fighting or rescue operation.

#### Features and structure of sprinkler system

The system monitors the occurrence of fires 24 hours a day, and in the event of a fire, it detects the heat of the fire and automatically discharge water to ensure that it is extinguished.

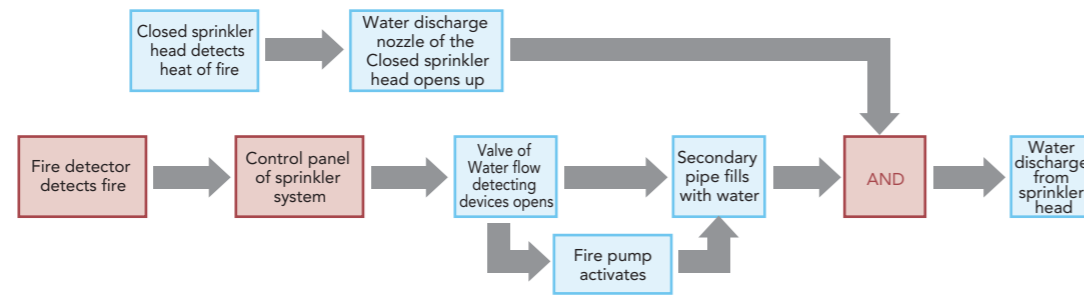
They consist of A water source, Fire pump, Pump-priming system, Control panel, Water flow detecting devices, Closed sprinkler heads, Piping, Valve, Fire department connection, Emergency power supply, etc.

Closed sprinkler heads and Water flow detecting devices, which are important equipment, are subject to the inspection system.

In Japan, many pre-action sprinkler systems are installed to reduce the damage caused by water discharge due to activation other than a fire.

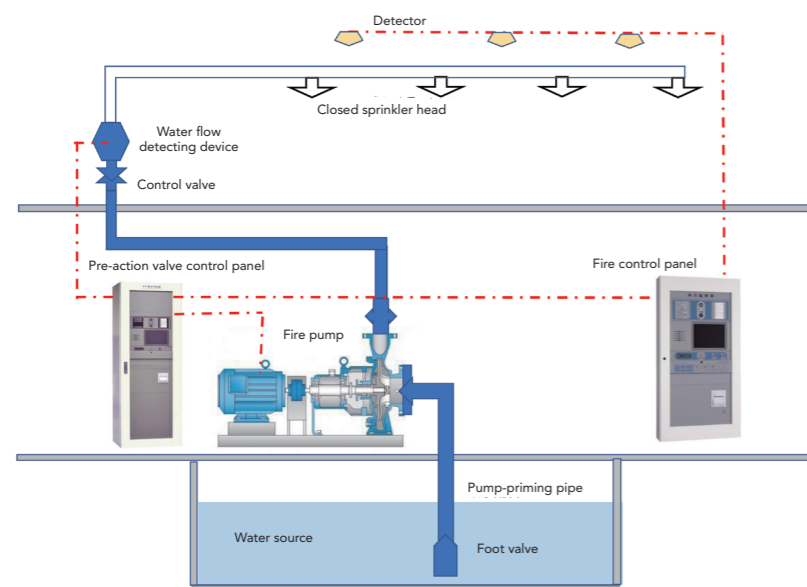
#### Steps to pre-action sprinkler system activation

In general, the valve plug of the water flow detection device is opened in conjunction with the operation of the detector. Furthermore, water is discharged from the sprinkler head once the closed sprinkler head is activated.



#### Example of sprinkler system piping system (pre-action)

Pre-action sprinkler system



Closed sprinkler head (flush type) [Nohmi Bosai Ltd.]



Pre-action water flow detecting device [Nohmi Bosai Ltd.]

### 4 Closed sprinkler heads and Water flow detecting devices

#### Closed sprinkler heads

(1) They consist of a heat-sensitive component that detects the heat of a fire and a component that discharges fire extinguishing water.

(2) There are two types of the heat sensitive components : fusible links consisting of fusible metal material and glass bulbs containing liquid or other substances in glass.

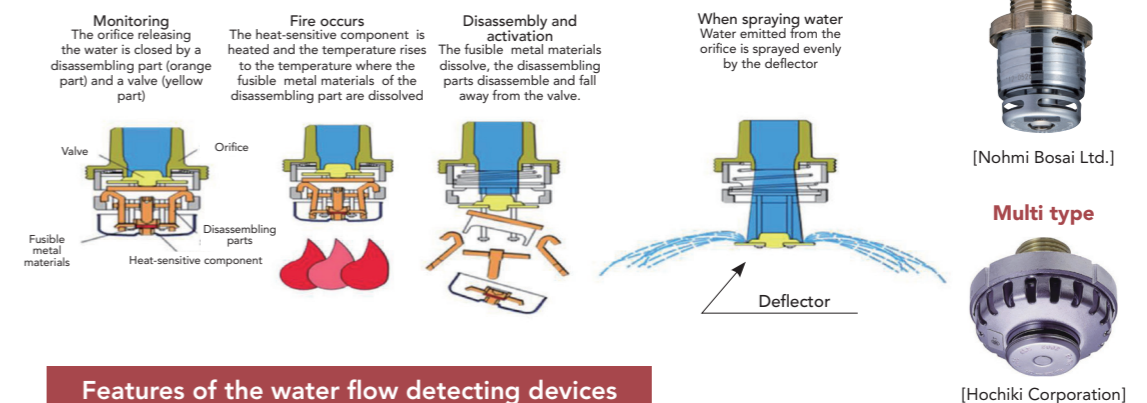
#### Water flow detecting devices

This is a device that emits a signal or alarm by automatic detection of water flow inside the device itself due to the discharge of water from a closed sprinkler head.

#### Features of the closed sprinkler heads

- (1) In Japan, fusible link is the main heat sensitive component of closed sprinkler head.
- (2) Based on its shape, it is called flush type or multi-type.
  - Flush type: The design is good and heat can be efficiently collected.
  - Multi type: Impact resistance is good. Damage caused by impact and operation of failure can be prevented.
- (3) Closed sprinkler heads are available in standard type (effective sprinkling radius: 2.3 m) and high-sensitivity type (effective sprinkling radius: 2.6 m or more), enabling installation according to the conditions of the site.
- (4) The particle size and distribution of water sprayed are uniform, and fire can be extinguished effectively.

#### Flush type head operating conditions



#### Features of the water flow detecting devices

(1) In order to prevent water damage due to accident or malfunction of closed sprinkler heads, a pre-action type is adopted instead of a normal wet type.

(2) Dry water flow detecting device

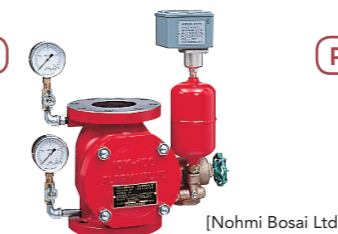
A device in which the primary piping\*1 is filled with pressurized water, etc., and the secondary piping\*2 with pressurized air. When a closed sprinkler heads, etc., is opened, the valve disc opens due to a drop in pressure on the secondary piping, and pressurized water, etc., and water flows out from the primary piping to the secondary piping.

(3) Pre-action water flow detecting device

A device in which the primary piping is filled with pressurized water, etc., and the secondary piping with air. When a detector, fire detection head, or other detection part of a fire alarm system is activated, the valve disc opens and pressurized water, etc., and water flows out from the primary piping to the secondary piping.

\* 1 The primary piping: inlet side of device to the valve disc.  
\* 2 The secondary piping: outlet side of device from the valve disc.

#### Wet-type



[Nohmi Bosai Ltd.]

#### Pre-action type



[Nohmi Bosai Ltd.]

## 5 Inert gas fire extinguishing systems

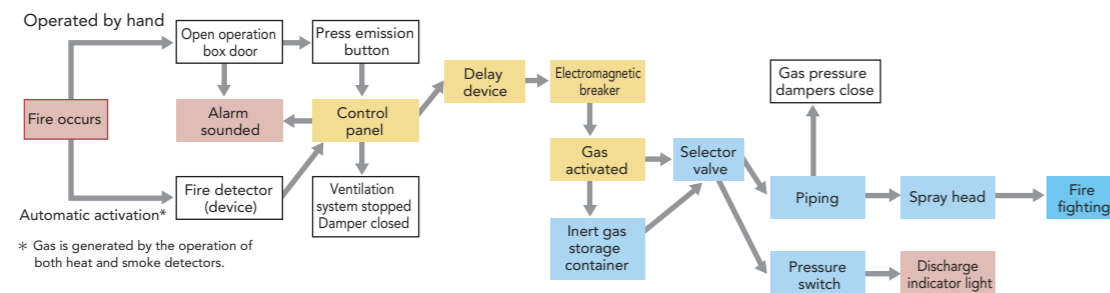
Inert gas fire extinguishing systems installed in areas where water is not applicable as an extinguishing agent or where water damage prevention is required.

This is a facility that uses inert gas (stable gas that does not cause chemical reactions) to reduce the oxygen concentration and make the combustion inactive.

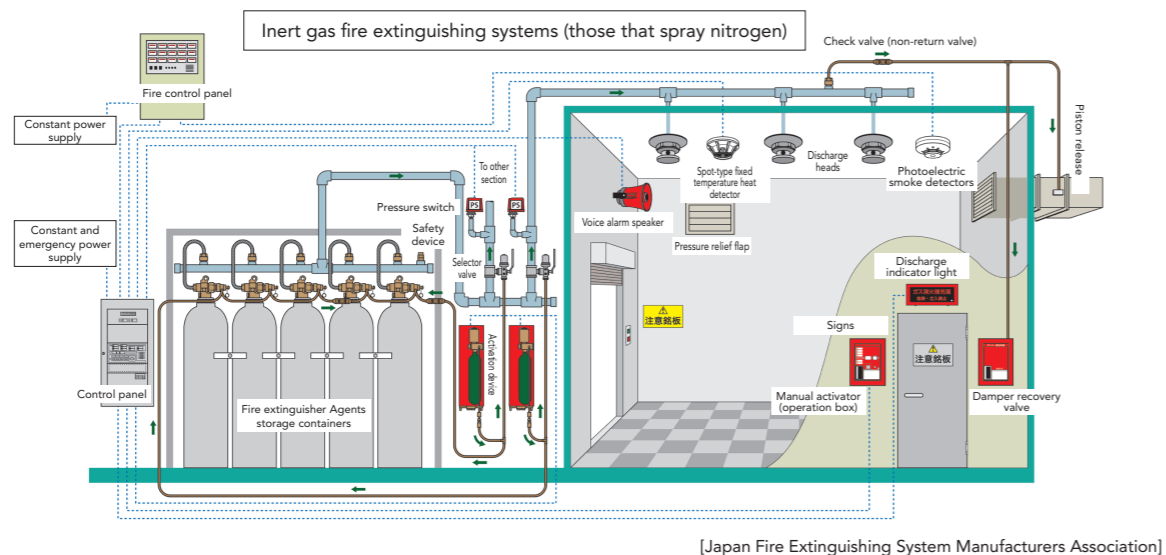
### Features of inert gas fire extinguishing system

- (1) Inert gas fire extinguishing systems are mainly installed in electrical rooms, machine rooms, communication equipment rooms, etc. where few people enter.
- (2) In Japan, carbon dioxide or nitrogen gas is mainly used as the extinguishing agent.
- (3) When releasing the agent, an alarm is to be sounded and a delay time (20 seconds or more, carbon dioxide only) is to be set in consideration of the evacuation time of the occupants.
- (4) Safety measures (such as fire detection double interlock for automatic activation, ventilation systems, separation from adjacent rooms, etc) are taken considering of the effects on the human body.

### Steps to inert gas fire extinguishing system activation



### Example of inert gas fire extinguishing system installation



### Types of fire extinguishing equipment

- Whole area discharge type** ▶▶ Inert gas is discharged to the whole room
- Localized discharge type** ▶▶ Inert gas is discharged to the object on fire.
- Mobile type** ▶▶ A person extends the hose and discharges inert gas to the object on fire

## 6 Automatic fire alarm systems

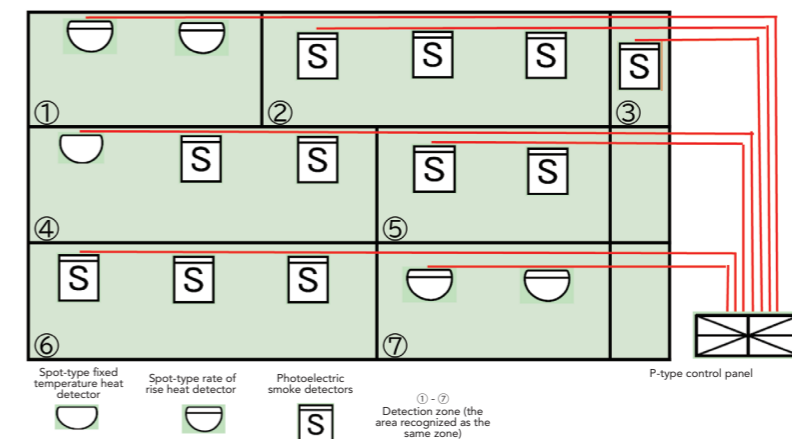
- (1) Automatic fire alarm systems perform a series of operation; detection of heat, smoke or flame of a fire with detector, sending a fire signal to a control panel to make an alarm go off for notification of fire, and prompting evacuation and first response firefighting.
- (2) This is a basic alarm system that provides early warning of a fire to occupants in the building, so that evacuation, fire extinguishing, etc., can be carried out effectively.

### Features of automatic fire alarm systems

- (1) According to the transmission method of fire signal, there are P-type (Proprietary-type ; It also referred as conventional type) systems(equipment centering on P-type control panel) and R-type (Record-type ; It also referred as analog-addressable-type) systems(equipment centering on R-type control panel).
- (2) P-type control panel are installed in small and medium-sized buildings, and R-type control panel are installed in large buildings (over 10,000 m<sup>2</sup>).

### Wiring example of P-type (Proprietary-type) system

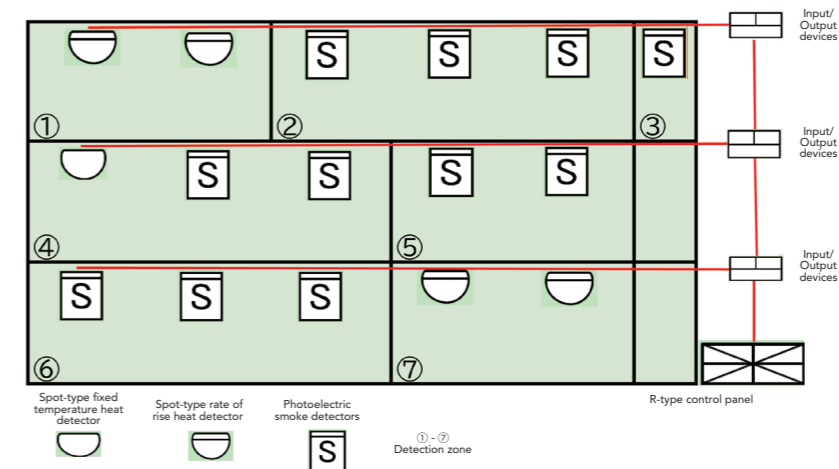
An individual wiring system that interconnects detectors and control panel through common lines for each detection zone



P-type control panel [Hochiki Corporation]

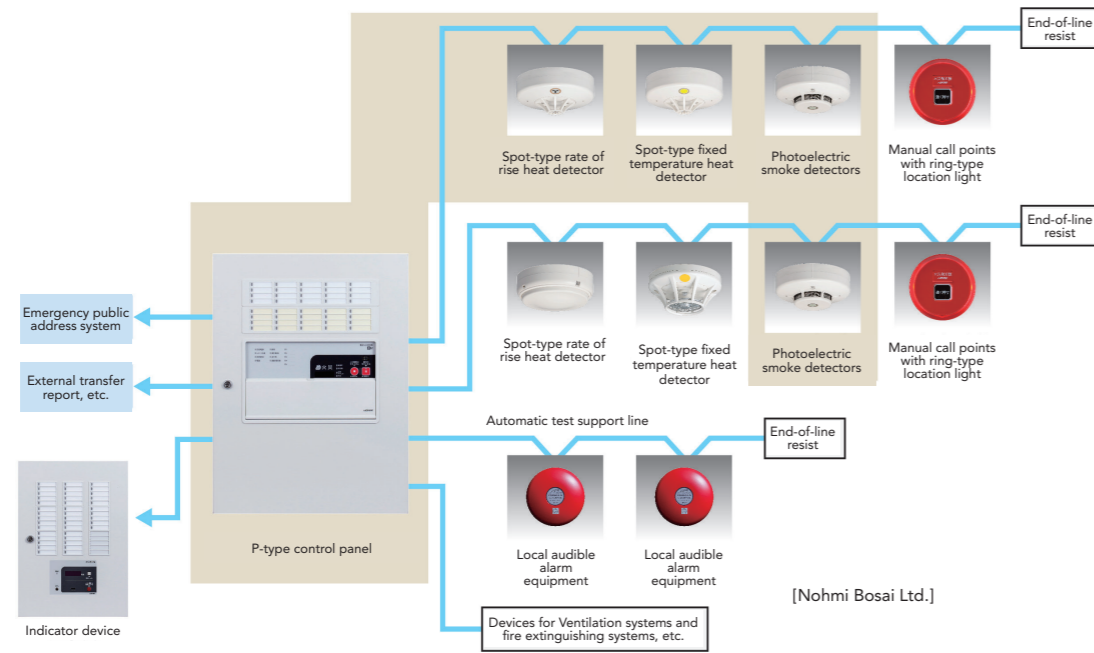
### Wiring example of R-type (Record-type) system

Common wiring system that interconnects detectors and control panel through a common digital transmission lines for multiple detection zone



R-type control panel [Hochiki Corporation]

Composition of automatic fire alarm system: Control panel, Manual call points, Input/Output devices, Indicator lamp, Local audible alarm equipment, Detector



7 Detectors

Installation of detectors

The following detectors are mainly installed in buildings.

- (1) Photoelectric smoke detectors are installed in general rooms.
- (2) Spot-type rate of rise heat detectors and Spot-type fixed temperature heat detectors are suitable for the places where dust, fine particles, high humidity, corrosive gas or smoke is stagnated.
- (3) Optical beam smoke detectors or flame detectors will be installed in areas with high ceilings and large spaces.

Features of Japanese detectors

- (1) The following functions are used to prevent false alarms.
  - Prevention of false alarms caused by phenomena, such as cooking smoke, cigarette smoke, insect and dust.
  - A function is provided to monitor and judge whether fire (sudden rise in temperature and increasing smoke concentration) is continuing.
  - Function to set detector sensitivity to fit the environment of the installation.
- (2) Special specifications (waterproof type, explosion-proof type, corrosion-resistant type) are available for special environments (high temperature, high humidity, condensation, corrosive gas, combustible gas, etc.).

Installation according to the characteristics of the detector

- (1) The appropriate installation method (mounting height from the floor, detection area) is determined according to the type and sensitivity of the detector.
- (2) There is a set of criteria for selecting the most suitable detector for the environment at the installation site.

Spot-type rate of rise heat detectors



[Nittan Co., Ltd.]

Photoelectric smoke detectors



[Nittan Co., Ltd.]

Spot-type infrared (IR) detectors (Flame detectors)

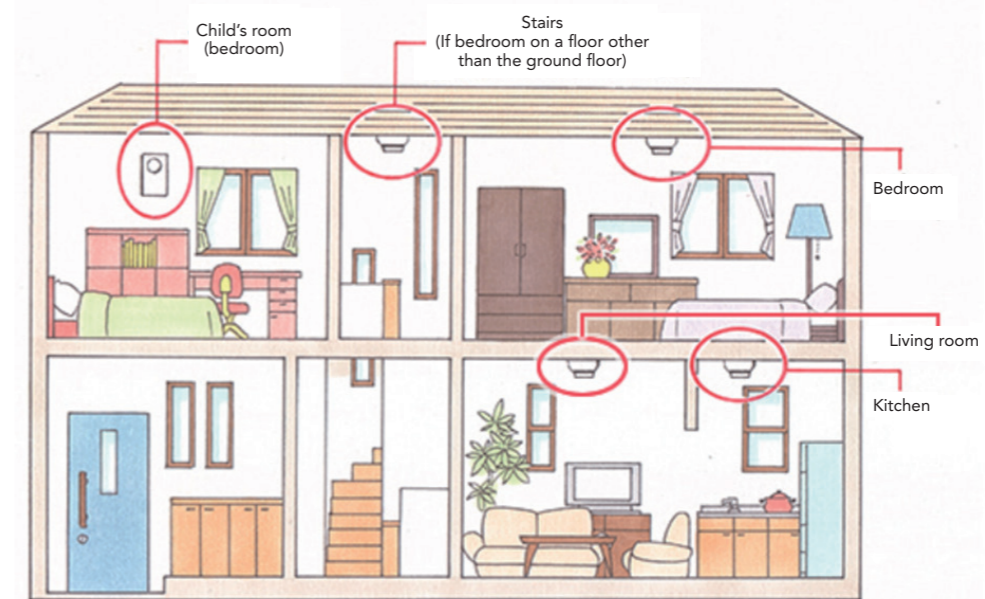


[Nittan Co., Ltd.]

8 Home fire alarms

A home fire alarm consists of a sensing part and an alarming part, etc. to detect a fire and make an alarm go off at an early stage of fire.

Typical installation in a house



[Hochiki Corporation]

Photoelectric smoke alarm

A device that have prevention function of false alarms caused by phenomena, such as cooking smoke, cigarette smoke, insect and dust.



[Hochiki Corporation]

Constant temperature type heat alarm

A device that uses a heat sensor for downsizing a device.

Features of home fire alarms

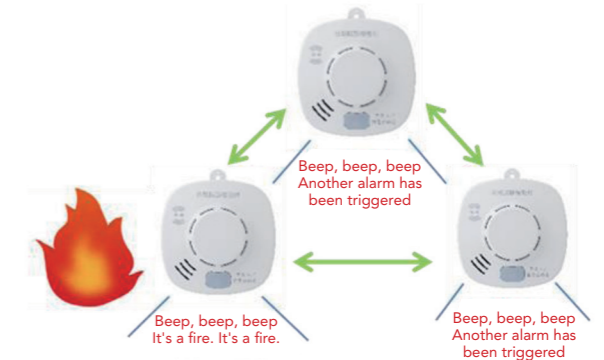
- (1) The battery life is about 10 years, and the alarm is sounded in case of failure or shortage of battery.
- (2) Maintenance is easy because it can be easily checked by alarm sounds with the button.
- (3) It can easily be installed on the ceiling or upper part of the room, which can easily detect smoke.
- (4) A device has prevention function of false alarms caused by phenomena, such as cooking smoke, cigarette smoke, insect and dust.

Linked home fire alarms

When a fire is detected by a home fire alarm installed in a room in the house, all the home fire alarm systems in the house work together to emit an alarm sound.

\*Characteristics of the communication system

- (1) No distinction is made between main and secondary units
- (2) Group registration is possible from any fire alarm
- (3) With retransmission function, first alarm that is missed is retransmitted by another fire alarm.



[Hochiki Corporation]

## 9 Escape equipment

Machinery or equipment used to evacuate in the event of fire.

### Types and features of escape equipment

Type	Details
Escape ladder	Fixed ladder: A ladder that is fixed to a structure and is always usable Including a retractable ladder (a ladder whose horizontal rungs are stored in the vertical bars and can be taken out and made usable when used) and a ladder whose lower part has a structure that can be folded or stretched. Leaning ladder : A ladder used with leaning against a building Hanging ladder : A ladder used with suspended from a building
Escape chute	Chutes that are extended vertically or diagonally for evacuees to slide down inside the chute
Descending lifelines	Devices can be automatically lowered by the user's own weight without the help of others, and have a mechanism that allows continuous and alternating descent



[Naka Corporation]

#### Fixed escape ladder

They are installed on the exterior walls of buildings and can only be operated from the floor to be evacuated for security reasons.



[Oriro Co., Ltd.]

#### Hanging ladder for hatches

Installed on the balcony of a residential building, it can be used to evacuate to the balcony on the floor below.



[Oriro Co., Ltd.]

#### Escape chute

It is made of textiles. The evacuee slides down the inside of the tube.

Left: Diagonal type  
Evacuee slides down like a straight slide.  
Right: Vertical type  
Evacuee slides down like a spiral slide.



[Oriro Co., Ltd.]

#### Descending lifelines

The body is secured by the harness and the descent speed is adjusted by the regulator for safe descent.

## 10 Fire fighting pump truck, Portable fire pump and mounted vehicles

Fire fighting pump trucks used in firefighting activities have various functions depending on the purpose of use. Meanwhile, Portable fire pump, which can be transported easily, enables firefighting in narrow places where fire fighting pump trucks cannot enter.

### Features of fire trucks

- (1) Fire trucks are loaded with fire suction hoses, fire hoses, water spray equipment, etc., used for fire fighting, as well as equipment for rescue activities.
- (2) The control panel of the fire pump is equipped with a function for automatic water spray and monitoring of the water spray status.
- (3) Special trucks equipped with articulated ladders and other ladders have control and monitoring panels for safe operation.
- (4) Heat shielding devices, such as water curtain systems, are installed to protect vehicles and operators from the radiation of fire.
- (5) Rotating lights, sirens, etc. are installed for safe driving as an emergency vehicle.

#### Fire fighting pump truck



[Yoshitani Machinery Works Co.]

#### Fire truck with articulated ladder



[Nihon Kikai Kogyo Co.]

#### Ladder-equipped fire truck



[Morita Corporation]

### Features of Portable fire pump

- (1) Compact and light, can be transported easily, and can be operated smoothly even in a narrow space.
- (2) Can be mounted on a vehicle for better mobility.
- (3) Several portable fire pumps can be linked together to send water to distant areas and spray water.
- (4) Good starting ability and operability, and fire extinguishing training is easy.
- (5) There are also models of automatic operation, such as adjustment of the pressure by computer control available.



[Tohatsu Corporation]



[Shibaura Fire Pump Corporation]



## 4 Main fire equipment

### 1 Fire fighting clothes, etc.

An environment where firefighters conduct fire and rescue operation is in harsh condition due to smoke, heat, high humidity and debris of building materials, etc.

Firefighting clothes, helmets, gloves, boots, etc. worn by firefighters in such an environment are required to have certain flame/heat resistance and other heat-protective properties, as well as comfort and mobility, in order to support rapid and smooth activities and ensure safety.

#### Features of firefighting clothes etc.

- (1) Japanese firefighting clothes are made to meet the performance and function required by ISO 11999.
- (2) Firefighting clothes has 3 layer (outer layers, moisture permeable layer and adiabatic layer). The layers provide good flame resistance, heat resistance, mechanical strength, water resistance, and moisture permeability.
- (3) The front opening uses fastener, so it is highly convenient.  
Also, it is fully flame-resistant and heat-resistant by covering the fastener.
- (4) To enhance visibility, Retro-reflective material or fluorescent material are attached to each part of the arm, foot, and torso.
- (5) The sleeves have ristretto, and the collar is 75 mm or more, and it is also excellent to protect the opening.
- (6) Fire prevention gloves are designed ergonomically and support activities.
- (7) Fire fighting boots have anti-electrostatic performance to reduce ignition hazards.

- (1) ISO 11999 refers to PPE for firefighters, test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures
- (2) Standards for firefighting clothes, gloves, helmets, boots, etc. are specified.
- (3) In Japan, voluntary standards that conform to ISO 11999 and take into account the environment during fire fighting activities in Japan are specified. Manufacturing, testing, etc. are conducted based on these standards.

#### Examples of typical firefighting clothes, etc.



[Akao & Co., Ltd.]

[Funayama Corporation]

## 5 Standards and Certification of Fire Equipment in Japan

### 1 Overview of standards and certification systems

In Japan, standards and certification systems have been established in the Fire Service Law to ensure the quality of fire equipment.

#### Objectives

- (1) Prevent defective or faulty products from being distributed in the market.
- (2) Prevent sale and display for the purpose of sale of products that do not conform to the standards.
- (3) Prevent use of non-compliant items for the installation, alteration, or repair of fire equipment.

#### Details of the system

- (1) Approval of sales, etc. of products that meet certain requirements ⇒ Regulation of sales, etc.
- (2) Items for which conformance to the standard cannot be confirmed after installation and use ⇒ Prior confirmation

#### Inspection system

The inspection body shall carry out type-tests and model conformity inspection.

Sales and display for sale can be allowed, only for products that have been labeled as passing of the inspection



#### Self-labelling system

The manufacturer and importer of fire equipment shall inspect themselves.

Sales and display for sale can be allowed, only for products that have been labeled as compliance with the standard.



#### Certification system

A pre-confirmation for fire equipment whose conformity to the standards cannot be confirmed after installation.

## 2 Japanese Standards and ISO Standards

### Standards for Fire Equipment in Japan

- (1) Standards for particularly important items of fire equipment in Japan have been established since 1963, spanning a history of more than 50 years. There are currently 18 items.  
During this period, the standard has been revised from time to time to respond to technological progress, improvements in performance functions and quality, changes in the form of buildings, and even lessons learned from building fires and other disasters, making it a highly reliable standard that ensures the quality of fire equipment.
- (2) The standard specifies the technical criteria for the structure, performance function, etc., which can respond to the purpose of use, role, etc., of fire equipment.
- (3) Standards are formulated by the national government (Fire and Disaster Management Agency) based on the Fire Service Law and are specified as laws and regulations.  
The standards are formulated by a committee consisting of representatives of testing organizations, firefighting organizations, organizations related to manufacturing, organizations related to design and construction, etc., in addition to academic experts who have knowledge of fire equipment, etc. The committee conducts verification tests and other studies.
- (4) Standards are used as follows.
  - 1) Manufacturers, etc.: Development, design, manufacture, etc.
  - 2) Testing organization: Examination, testing, inspection, etc.
  - 3) Firefighting related organizations: Examination, inspection, etc.
  - 4) User such as installer: Maintenance, etc.

### About ISO Standards

- (1) ISO standards are established through deliberation and consideration of drafting by engineers in each country, and through necessary procedures, in order to be accepted throughout the world.
- (2) The technical standards for objects in the ISO standards are performance-based, clarifying the required criteria and providing test methods and judgment criteria to confirm the contents.
- (3) The ISO standard clarifies the scope of application and the definitions of the terms used, and includes not only the contents related to the performance functions of fire equipment, but also the contents of precautions during manufacturing, quality control, and maintenance management.
- (4) Therefore, when each country introduces ISO standards, it is allowed to add contents or exclude some standards in consideration of environmental factors such as the climate and climate of the country.
- (5) ISO standards have been developed for all fields, and many countries have adopted ISO standards as their own standards. However, when introducing ISO standards, it is necessary to consider the culture and climate of the country.
- (6) ISO standards for fire equipment have been discussed and reviewed mainly in Europe and the United States, and many of them are basically based on European or American standards.
- (7) Japan has participated in ISO/TC21 (Technical Committee on Fire Equipment) as a P-member with voting rights for about 40 years since 1979, and has actively participated in the deliberations and studies during this period.  
In addition, about 90 ISO standards have been established during this period.

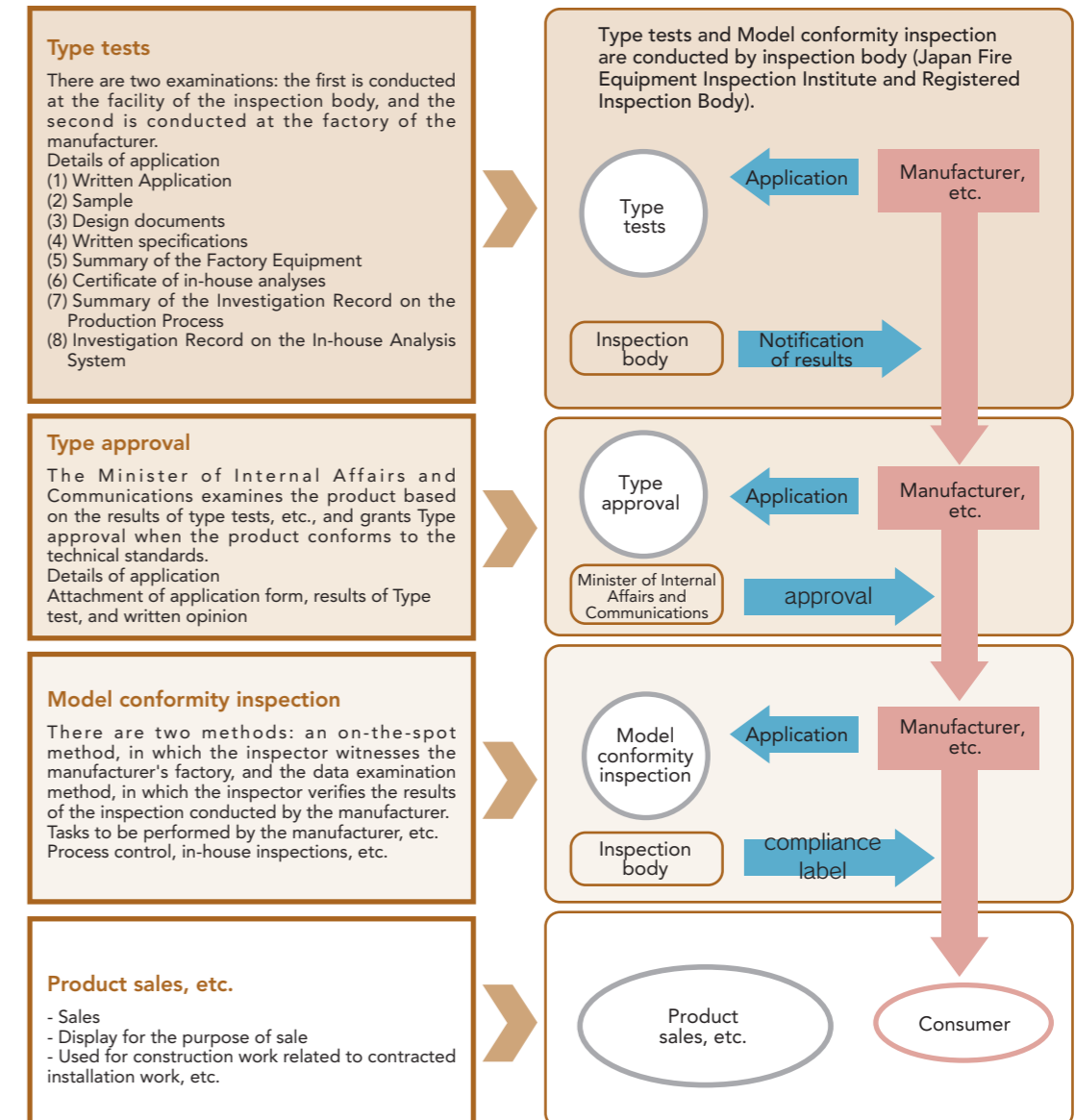
### Relationship between Japanese fire equipment standards and ISO standards

The standards for fire equipment in Japan have been developed and enhanced as appropriate for environmental requirements such as climate and natural features in Japan, so the standard of Japan is older than the ISO standard.

Therefore, although no ISO standards have been introduced in full, some items that were deemed reasonable to be introduced into Japanese standards have been introduced at any time, based on the process of deliberation of ISO standards.

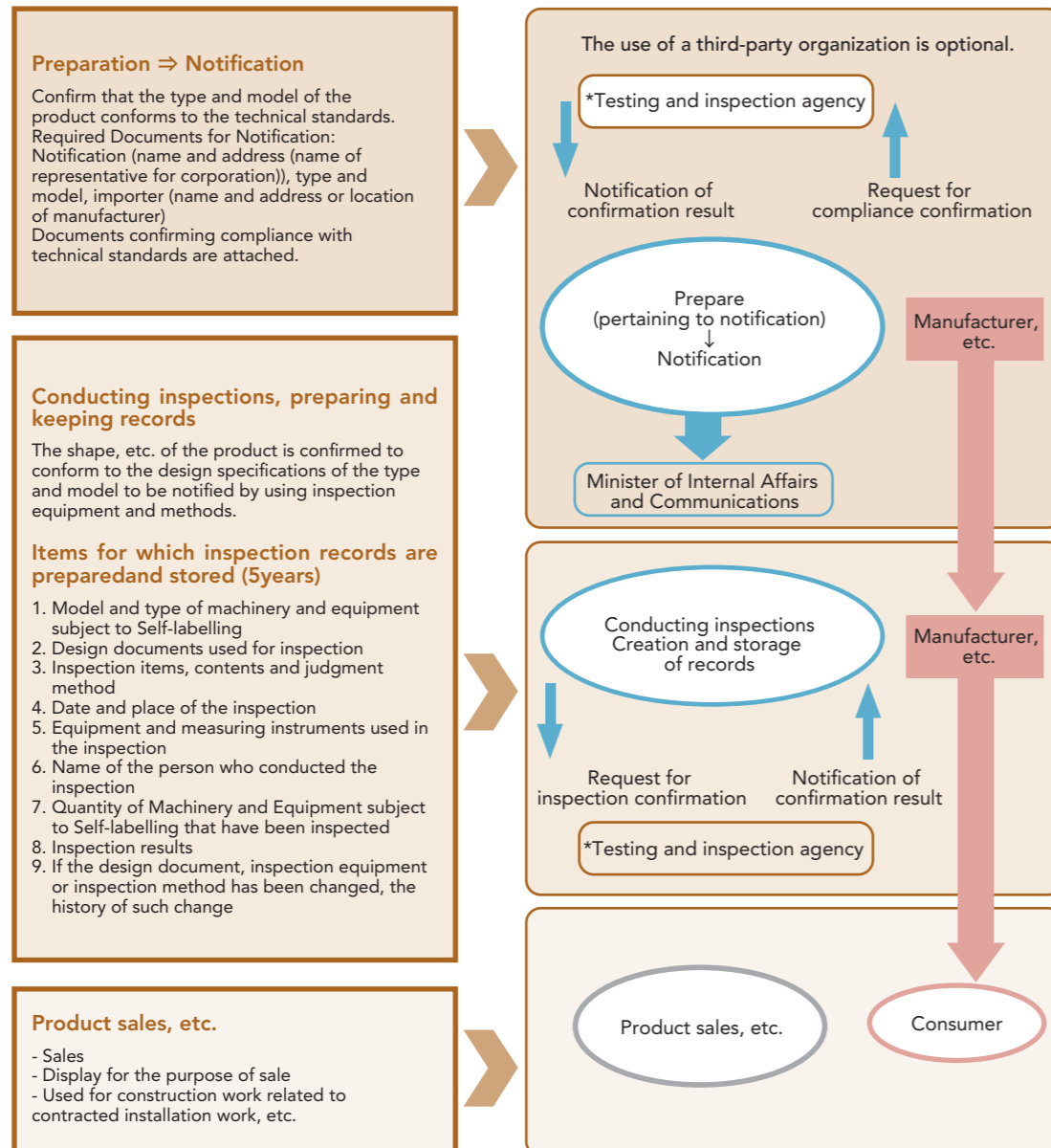
## 3 Inspection system

After the quality of the product has been confirmed, the product shall be sold or installed with the label of compliance.

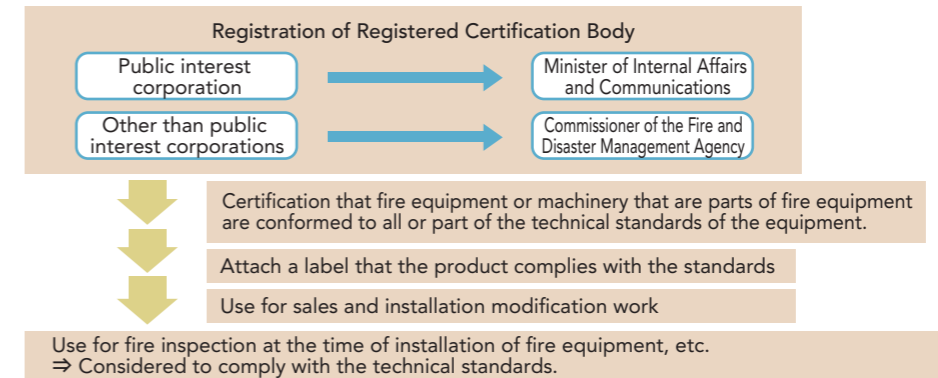


## 4 Self-labelling system

Products shall be sold and installed with the label of conformity.



## 5 Certification system



### Requirements for Registered Certification Body

- The following persons shall perform the services of certification, and the number of such persons shall be two or more for each office where the services of certification are performed.
  - A person who has graduated from a university or a college of technology after completing a course in mechanical engineering, electrical engineering, or industrial chemistry, and has experience of one year or more in total in the field of inspection or certification of fire equipment, etc. or machines and appliances that are parts of such equipment, etc.
  - A person who has knowledge and experience equivalent or superior to those listed in (a)
- Performs certification of fire equipment and machinery using the machinery and equipment to be inspected for conformity to the technical standards for equipment, etc.
- The applicant for registration is not controlled by a business entity that designs, manufactures, processes, or sells, or displays for the purpose of sale, fire equipment, machinery, or appliances with labeling.
- Conformity to the following standards for the proper performance of the services of certification.
  - A manager shall be appointed in the department that performs the work of certification.
  - Documents related to the management of the work of certification and ensuring accuracy shall be prepared.
  - A department or organization shall be established to manage and ensure the accuracy of the certification service in accordance with the description in the document listed in (b).
  - Has a system that enables it to fairly carry out the work of certification for those who wish to be certified nationally.

### Certified items and certification marks

Item	Mark
Water discharge port of indoor fire hydrant and Fire department hydrants, Synthetic resin pipe and pipe joint, Pressurized water supply system using pump, Control panel of pressurized water supply system, General operation panel, Discharge heads, Sound alarm system of fire extinguishing equipment, Container valve, Safety device and Destruction plate of fire extinguishing equipment, Discharge valve, Selector valve of fire extinguishing equipment, control panel of fire extinguishing equipment, Hose of mobile fire extinguishing equipment, Nozzle, Nozzle on-off valve, Hose reel, Constant pressure devices, Fire reporting device, Escape ladder, Slide, Escape rope, Escape Chute, Open spray head, Packaged fire extinguishing system, Packaged automatic fire extinguishing system, Light-storing Passage Guide Lights and high-luminance light-storing Passage Guide Lights, Metal pipe fittings and valves, Pressurized water tank system, Fire department connection used for Sprinkler systems, Sprinkler systems with hose connection and Fire department hydrants	
Fire and heat-resistant electric wires	
Hatch for escape equipment	
Cubicle-type dedicated emergency power receiving equipment, Switchboards and distribution panels for dedicated emergency power receiving equipment that receives power at low voltage, Storage battery equipment, Escape Exit Guide Lights, Fuel cell equipment	
Local audible alarm equipment of automatic fire alarm system, Emergency bell and automatic siren of emergency alarm system, Public address system, Packaged automatic fire extinguishing system, General operation panel, Sprinkler system using water discharge type head, etc.	
Emergency power generator	
Passage Guide Lights that emit light by electric energy	

# 6 Installation and Maintenance Systems of Fire Equipment, etc.

## 1 Fire defense equipment officer system

National qualification with a monopoly on work related to construction and maintenance of fire equipment, etc.

A person who is not fire defense equipment officer shall not perform construction work (limited to that pertaining to installation) or maintenance of the following fire fighting equipment and facilities, etc.

- (1) Fire equipment, etc. to be installed in accordance with the technical standards for location, structure, and equipment of dangerous goods manufacturing facilities, etc. or technical standards for equipment, etc.
- (2) Special fire equipment, etc. that must be installed in accordance with the installation and maintenance plan for equipment, etc.

### Duties of a fire defense equipment officer

Construction work pertaining to the installation of the following fire equipment, etc.	Maintenance of the following fire equipment, etc.
(1) Indoor fire hydrant system (2) Sprinkler system (3) Water spray fire extinguishing system (4) Foam fire extinguishing system (5) Inert gas fire extinguishing system (6) Halogenated fire extinguishing system (7) Dry chemical fire extinguishing system (8) Outdoor fire hydrant system (9) Automatic fire alarm system (10) Gas leakage and fire alarm system (11) Fire alarm system reporting to a fire department (12) Metallic escape ladder (limited to a fixed type) (13) Escape Chute (14) Descending lifelines	(1) Fire equipment, etc. in the left column (2) Fire extinguisher (3) Electrical leakage and fire alarm device

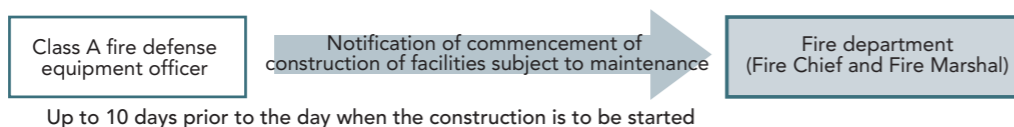
(Scope of work excluded from the monopoly on work)

- (1) Replacement of parts such as hoses or nozzles, fuses, and screws of indoor fire hydrant systems or outdoor fire hydrant systems
- (2) Repair of fire hydrant boxes, hose containment boxes, etc. and other similar items

### Type of licenses of fire defense equipment officer

Class A fire defense equipment officer (construction/maintenance)	Category of fire equipment, etc.	Class B fire defense equipment officer (maintenance)
Special class	Special fire equipment, etc.	--
Category 1	Sprinkler system, water spray fire system, indoor fire hydrant system, outdoor fire hydrant system	Category 1
Category 2	Foam fire extinguishing system	Category 2
Category 3	Inert gas fire extinguishing system, Halogenated fire extinguishing system, Dry chemical fire extinguishing system	Category 3
Category 4	Automatic fire alarm system, Gas leakage and fire alarm system, Fire alarm system reporting to a fire department	Category 4
Category 5	Metallic escape ladder, Escape chute, Descending lifelines	Category 5
--	Fire extinguisher	Category 6
--	Electrical leakage and fire alarm device	Category 7

### Notification of commencement of construction of fire equipment, etc.



Attach a copy of the following documents

- (1) **Fire equipment, etc.**  
Documents concerning the design of the construction for the fire equipment, etc.
- (2) **Special fire equipment, etc.**  
Documents concerning the design of the construction for the special fire equipment, etc., installation and maintenance plans for equipment, etc., a document stating the evaluation results and a document certifying that the person has been certified

## 2 Periodic inspection reporting system for fire equipment, etc.

- System essential for proper maintenance and management of fire equipment, etc.
- Mandatory involvement of related parties (owners, occupants and managers) at building in the fire equipment, etc. will be installed
  - (1) Obligation to install and maintain fire equipment, etc. so that they conform to the standards
  - (2) Obligation to periodically check whether the performance and functions, etc., of fire equipment, etc., are maintained, and to record and store the results thereof, and to report periodically to the fire department.

Person in charge of periodic inspection (1)	Person in charge of periodic inspection (2)
(1) Specified fire prevention property (1,000m <sup>2</sup> or more) (2) Non-specified fire prevention property (1,000 m <sup>2</sup> or more and designated by the Fire Chief, etc.)	(1) Specified fire prevention property (less than 1,000m <sup>2</sup> ) Non-specified fire prevention property (other than those listed on the left)
fire defense equipment officer or qualified fire equipment inspector	Fire prevention managers, etc. fire defense equipment officer or qualified fire equipment inspector

- (1) Type of Inspection → Equipment Inspection / General Inspection
- (2) Recording and storage of inspection results
- (3) Report of inspection results → The related parties at the building report as follows

Building classification	Report to fire department
Specified fire prevention property	Once a year
Non-specified fire prevention property	Once every three years

## 3 Fire equipment inspection qualification system

### Inspection of fire equipment, etc.

- (1) Extremely advanced and specialized knowledge and skills related to fire equipment, etc. are required.
- (2) Qualification is granted by passing a specialized training course (3 days) on knowledge and skills and a final examination.
- (3) Certain requirements (qualifications, experience, background, etc.) are required for the course.
- (4) To renew the qualification, it is necessary to attend a refresher course every five years.

### Type of qualifications 3 types

- Type 1 (Mainly mechanical equipment ⇒ Fire extinguishing equipment)
- Type 2 (Mainly electric system equipment ⇒ Fire alarms, Escape systems)
- Special type (Special fire equipment, etc.)
- \* Special fire equipment, etc. and other equipment, etc. that can be installed in place of the fire equipment, etc. that should be installed originally

### Details of tasks

- 1. Inspection of fire equipment and facilities to ensure that they are maintained and managed in compliance with the standards
  - (1) Equipment inspection: Confirmation of normal operation, proper placement, absence of damage, etc., and other external appearances, and confirmation of functions by appearance or simple operation
  - (2) Overall inspection: Confirmation of overall function by operating or using all or part of the equipment
- 2. Maintenance for malfunctions, defects, etc., requires a qualification of fire defense equipment officer