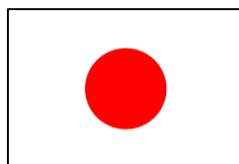


Fire Prevention Measures & Equipment Certification System



Feb 25th & Mar 3rd 2022



KUWAHARA Takahiro, International Fire Standards Specialist,
Fire Prevention Div., Fire & Disaster Management Agency

1. Fire Prevention Scheme

2. Certification to Fire Equipment

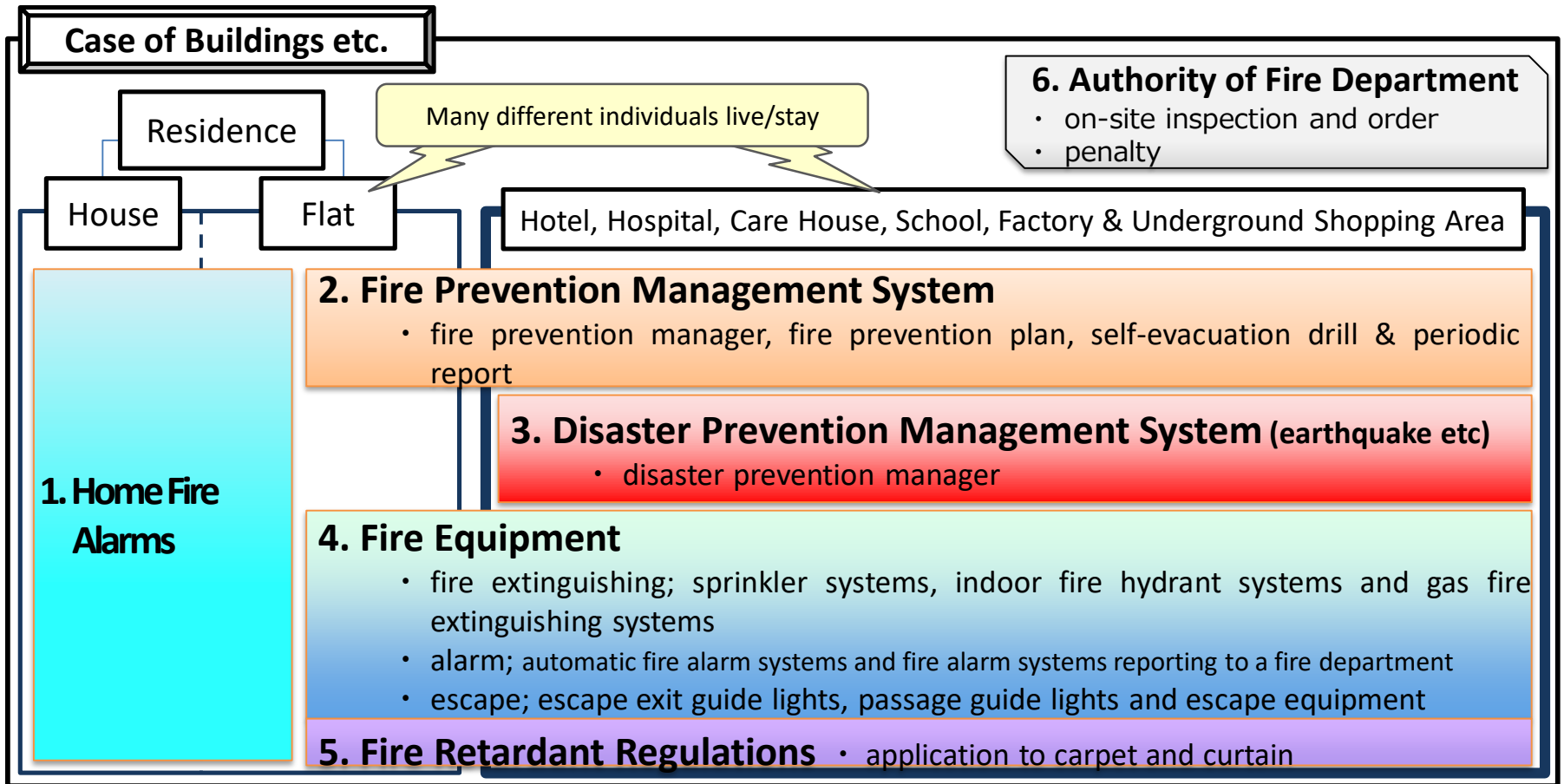
3. Flexibly Settable Fire Equipment

4. Publication

Overview of Fire Prevention Scheme in Japan

◆ Fire safety to Fire Prevention Properties* through both prevention equipment driven Approach and non - equipment employed measure

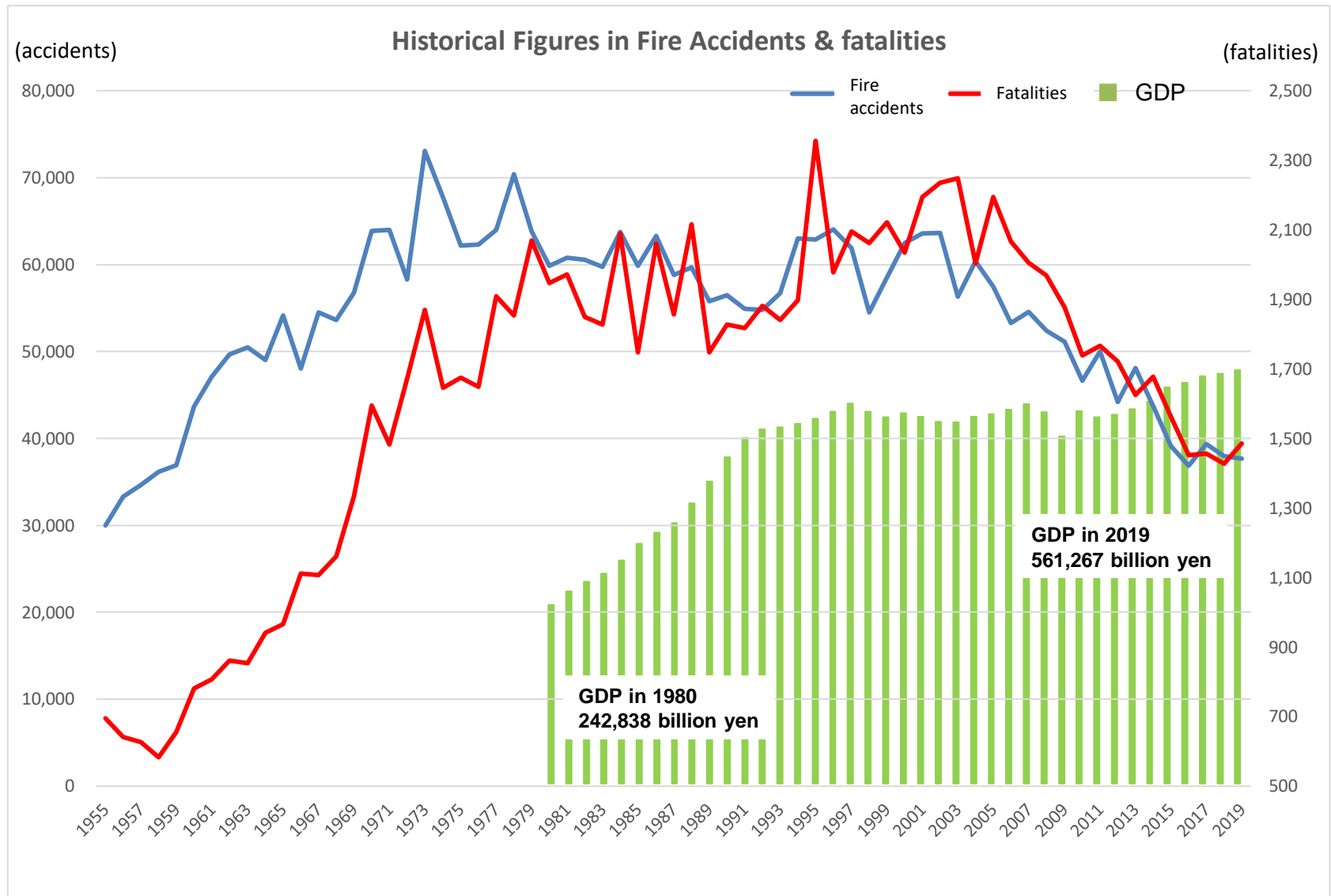
*a forest, or a vessel and vehicle, a ship moored at a dock or a pier, a building or other structure or any other object



7. Regulation to equipment and appliances that use fire; cooking stoves, boiler etc. - structure, position etc.

Trend in Fire Accidents & Fatalities

- Fire accidents and fatalities from fire in Japan, which had increased in line with economic growth, turned to downward trend in around 2000.



Development in Fire Prevention with Lessons from Fire Accidents

From Showa Era to Early Heisei Era

- From 1965 to 1998, large scale fire accidents occurred causing mass casualties – such as hotels and department stores
- Utilized lessons from fire accidents to make the installation requirement of fire equipment stricter – such as sprinkler systems and automatic fire alarm systems
- Retroactive application of the standard in fire equipment in 1974
- Regulations without requirement of equipment, e.g. Fire Prevention Manager System (1960) and Fire Safety Certification Mark (1980)

Recent Phenomenon

- Recent years have seen frequent fire accidents at small sized facilities, industrial places and multi-tenant buildings with a number of fatalities
- Strengthened installation requirement of sprinkler systems and automatic fire alarm systems to care houses and other similar facilities, making the regulations accept newly developed devices - e.g. packaged automatic fire extinguisher and wireless automatic fire alarm systems
- New measures in non-equipment related measures newly introduced e.g. periodic inspection and reporting system (2002) and naming regulation-breached-buildings (2014)
- Increase in fatalities from residential fire led to home fire alarms installation requirement (2006)

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Purpose of Certification System

Requirements for fire equipment

- Precaution against fire all the time
- Proper operations in case of fire, etc.

What is necessary for these requirements

- Define performance and functions that the equipment must make sure to do
- **Design and manufacture the equipment with ensuring the appropriate performance and functions**
- Proper installation
- Proper control and maintenance

Technical standards

Inspection and self-labeling system

Installation standards / inspection

Check list / report

Items subject to the inspection/self-labeling systems

Fire equipment and tools which come under the followings.

- Since the equipment is used and operated only in emergency conditions such as fire incident, it is difficult for users to check its performance in advance
- Malfunction of the equipment will cause serious troubles for fire-fighting activities

Subject to inspection

The equipment that is strongly required to be inspected in advance by a third party.

Subject to self-labeling

The equipment which is not necessarily supposed to be inspected by a third party but may have the securement of its performance under the responsibility of manufacturers.

Inspection & Self-labeling systems

Regulation of sales of the fire equipment and tools

The system prohibits sale, display, construction usage, etc, of items without attached the marking specified by laws

Inspection system

(Certification by competent authorities)

Carried out by
inspection agency



Marking specified by laws

Conducting inspection
and
granting compliance
marking

Self-labeling system

(Self-certification)

Carried out by
manufacturer










Marking specified by laws

Class	Equipment and tools subject to inspection	Equipment and tools subject to self-labeling system
Applicable items	12 items	6 items
Outline of System	<ul style="list-style-type: none"> ▪ Approval and grant of a model number. ▪ Japan Fire Equipment Inspection Institute or a registered inspection authority verifies that the product conforms to the granted model and gives an acceptance marking if the test is passed. ▪ Without this acceptance marking stamped, sale, display, construction usage, etc., are prohibited. 	<ul style="list-style-type: none"> ▪ Notification to Minister for Internal Affairs and Communications ▪ Manufacturer or importer does a self check if the product complies with Ministerial Ordinance and attaches the correspondent compliance marking. ▪ Without this compliance marking stamped, sale, display, construction usage, etc., are prohibited.
Implement-ing body	Japan Fire Equipment Inspection Institute or a registered inspection authority	Manufacturers or importers

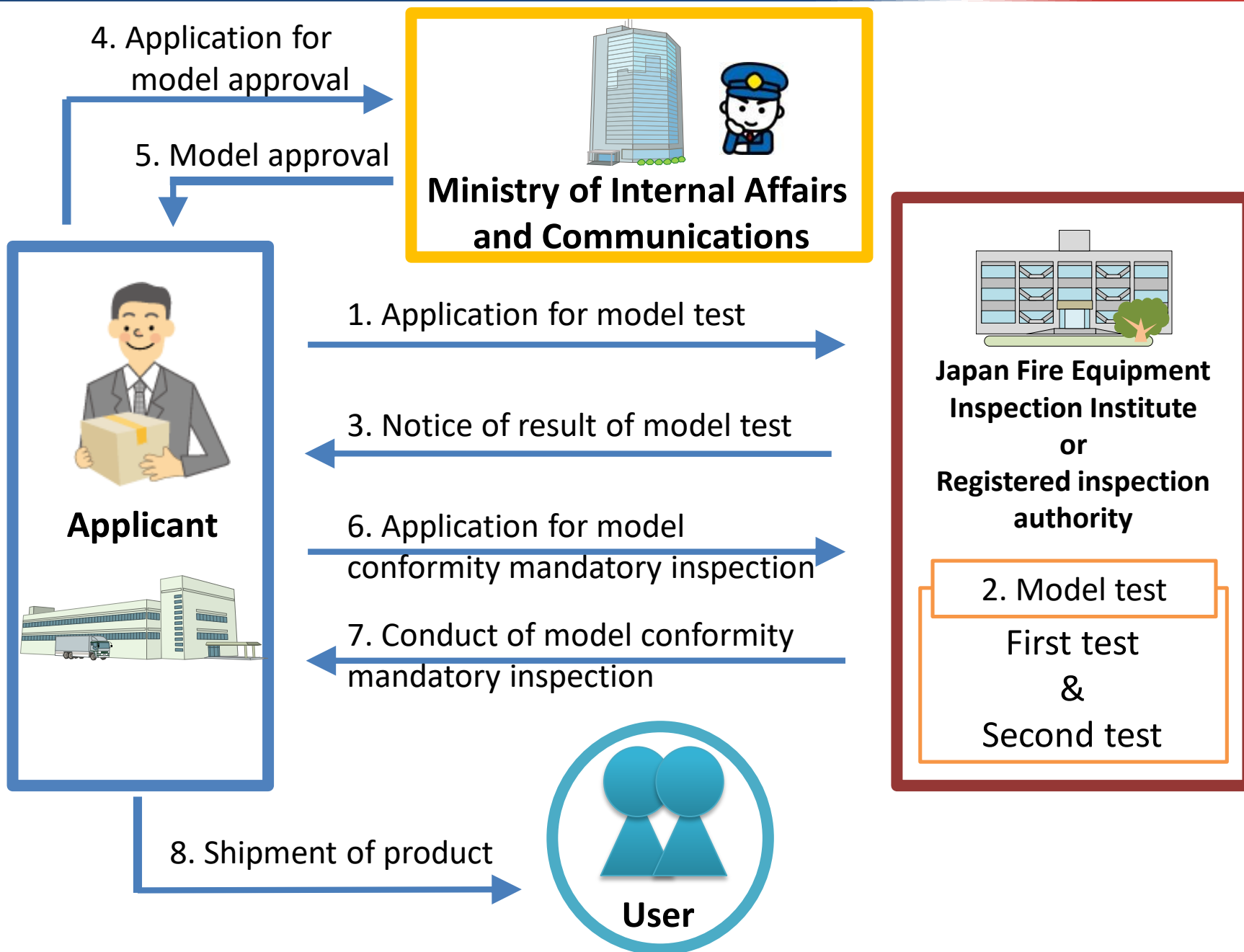
Equipment & Tools Subject to Inspection

Type	Item
Fire Extinguishing	1. Fire Extinguishers 
	2. Fire Extinguishing Agents 
	3. Form of Fire Extinguishing Agents 
	4. Closed Sprinkler Heads 

Type	Item
Fire Extinguishing	5. Water Flow Detecting Devices 
	6. Deluge Valves 
Evacuation	7. Metallic Escape Ladder 
	8. Descending Lifelines 

Type	Item
Alarms	9. Detectors, and Manual Call Points of Fire Detection and Alarm Systems  感知器 発信機
	10. Transmitter 
	11. Control panel 
	12. Home fire alarms 

Flow Chart of Mandatory Inspection



Equipment & Tools Subject to Self-Labeling

1. Power Driven Fire Pumps



Fire Pumper Vehicle



Portable Fire Pumper

3. Fire Suction Horses



5. Aerosol Type Disposable Fire Extinguishers



2. Fire Hoses



4. Couplings for Fire Hoses

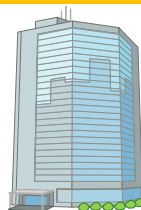


6. Electric Leakage Fire Alarm Devices

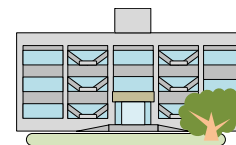


Flow Chart in Self-Labeling System

2. Reporting



**Ministry of Internal Affairs
and Communications**



**Japan Fire Equipment
Inspection Institute**

1. To check conformity
of product to the
standards

3. Self model conformity
Inspection/Lot inspection

**Manufacturer
or
Importer**



Allowed to outsource the conformity checks
described at 1&3 to Japan Fire Equipment
Inspection Institute.

4. Shipment of product



User

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Home Fire Alarms

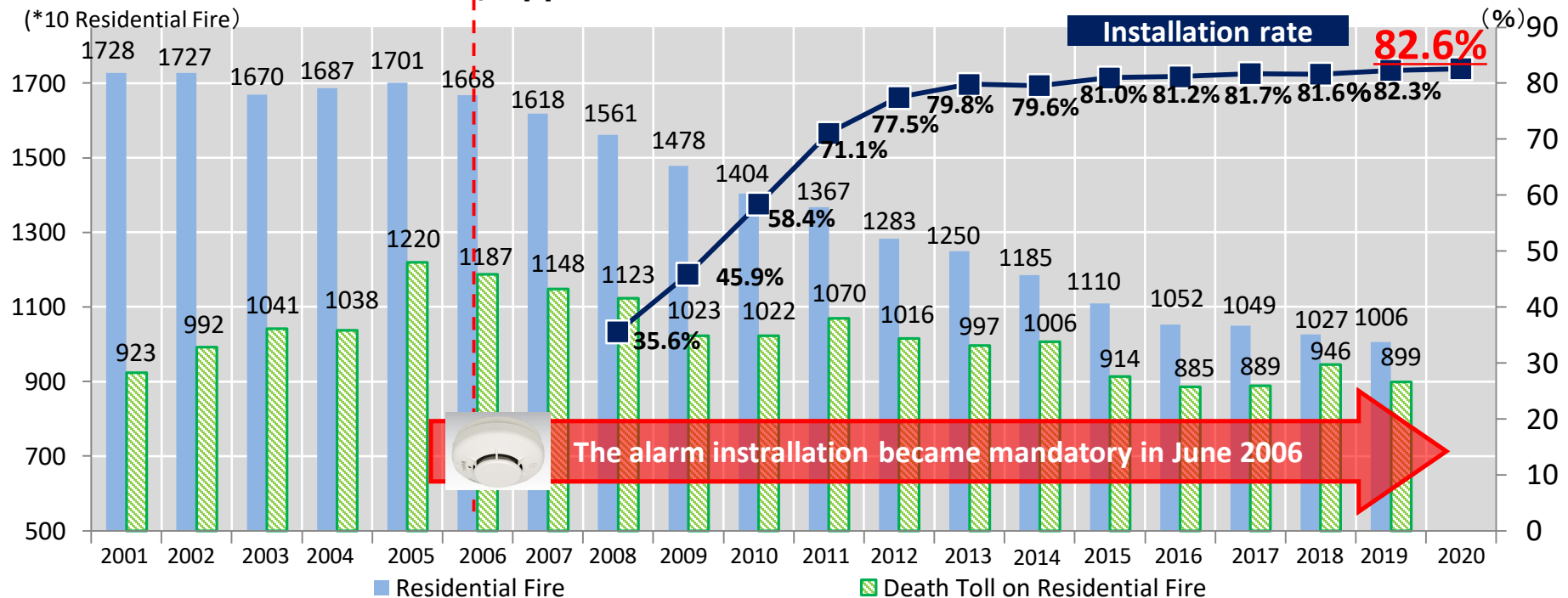
Home fire alarms quickly detect occurrence of fire incident in house to residents – composed mainly of detector and alarm equipment.

Advantageous Aspects

1. Alarm goes off in case of technical failure or dead battery.
2. Inspection button on the alarm enables a check of the alarm sound – which makes it easy to do maintenance work.
3. Possible to be placed on ceiling and wall, where smoke of fire accident can be detected easily.
4. Anti-false operation system is in place – against cooking smoke, cigarette, bug & dust



■ Installation Rate in 2020; approx. 80%



- Installation of residential alarm becoming compulsory in 2006 contributes to reduction fire accident and death toll
- Houses with fire alarm have 40% lower death and half less property/economic damage

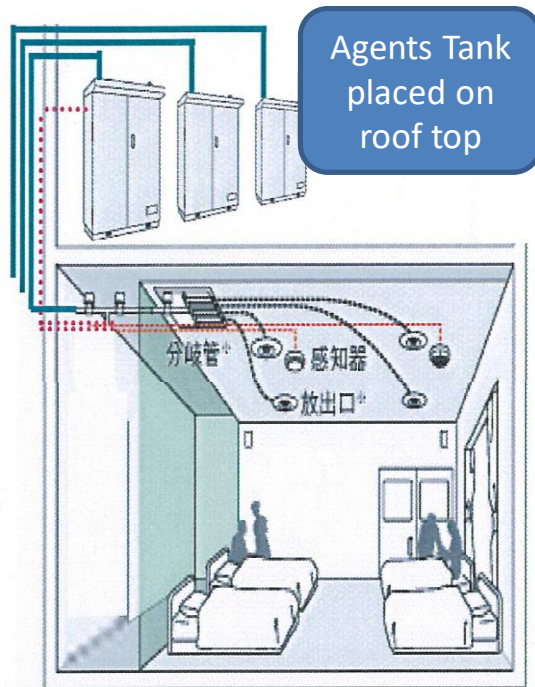
Automatic Fire Extinguisher – Packaged Type & Connected to Water Pipe

Failures in first response fire fighting at hospitals and care houses, where people with difficulty walking are staying, could mean mass casualties.

⇒ Installment of sprinkler systems to these facilities is essential.

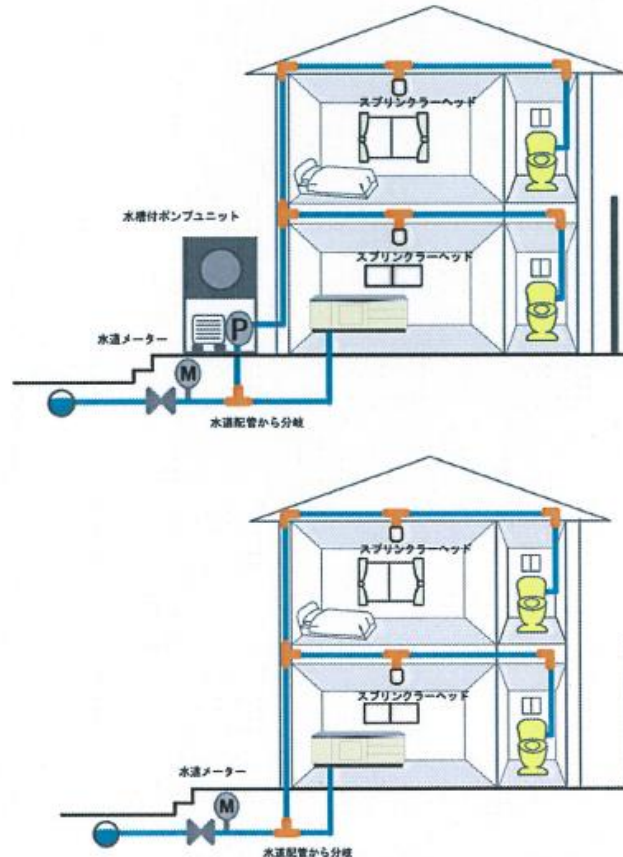
- Samples of automatic fire extinguishers including sprinkler systems without pump and water tank

Packaged Automatic Fire Extinguisher

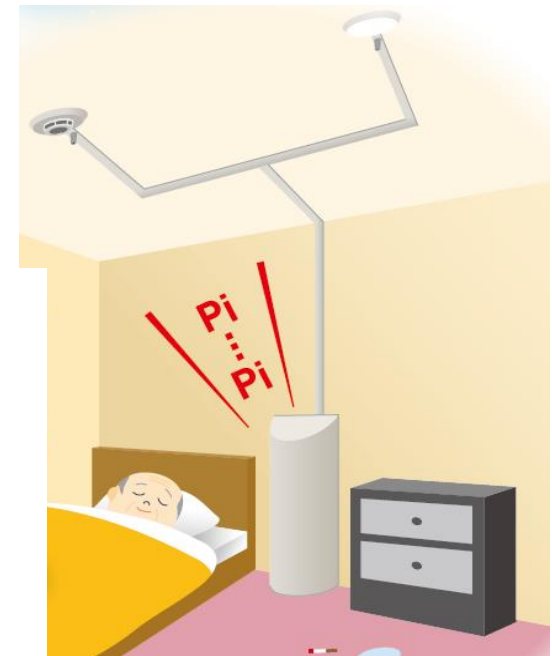


Space-saving design
and no need to prepare
water tank

Automatic Fire Extinguisher Connected to Water Pipe



Packaged Automatic Fire Extinguisher for Small-sized Facilities

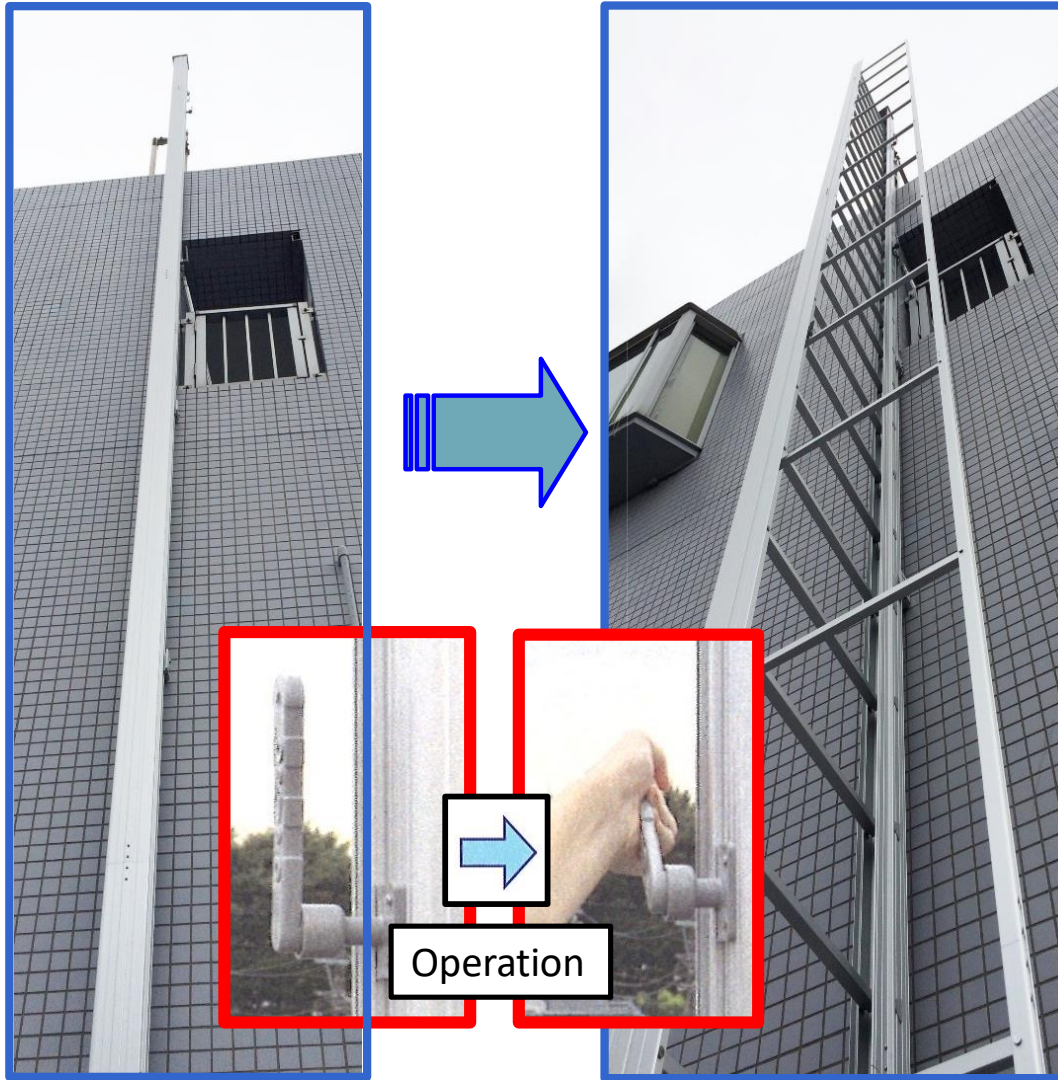


Major device-setting-
work is not needed

Just One Operation for Escape Ladder with Easy-to-Use & No Failure

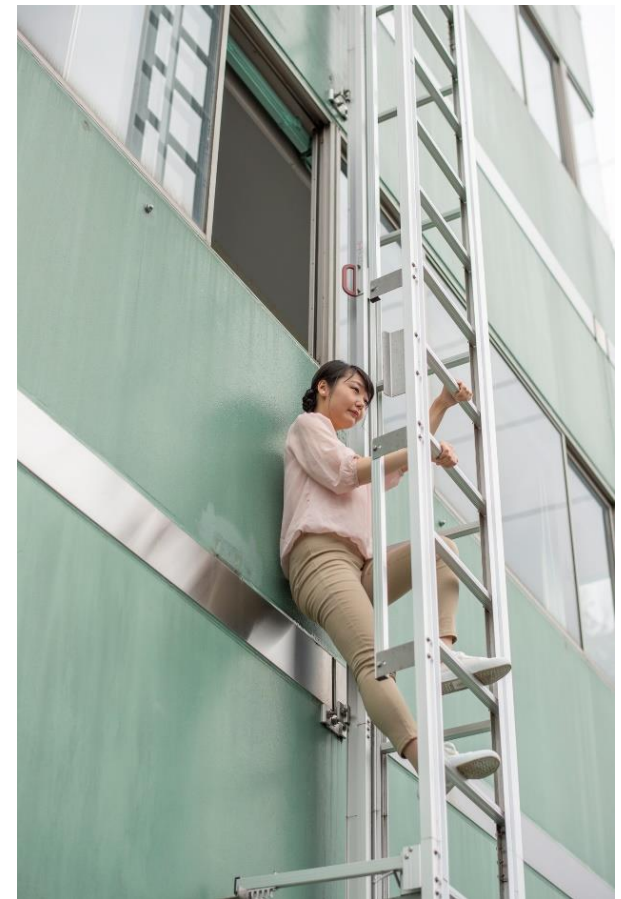
Just one step operation enables the escape ladder to be usable

⇒ Swift evacuation in fire accident



Stored

Open to use



Example of use

1. Fire Prevention Scheme

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Brochure on Japanese Fire Equipment

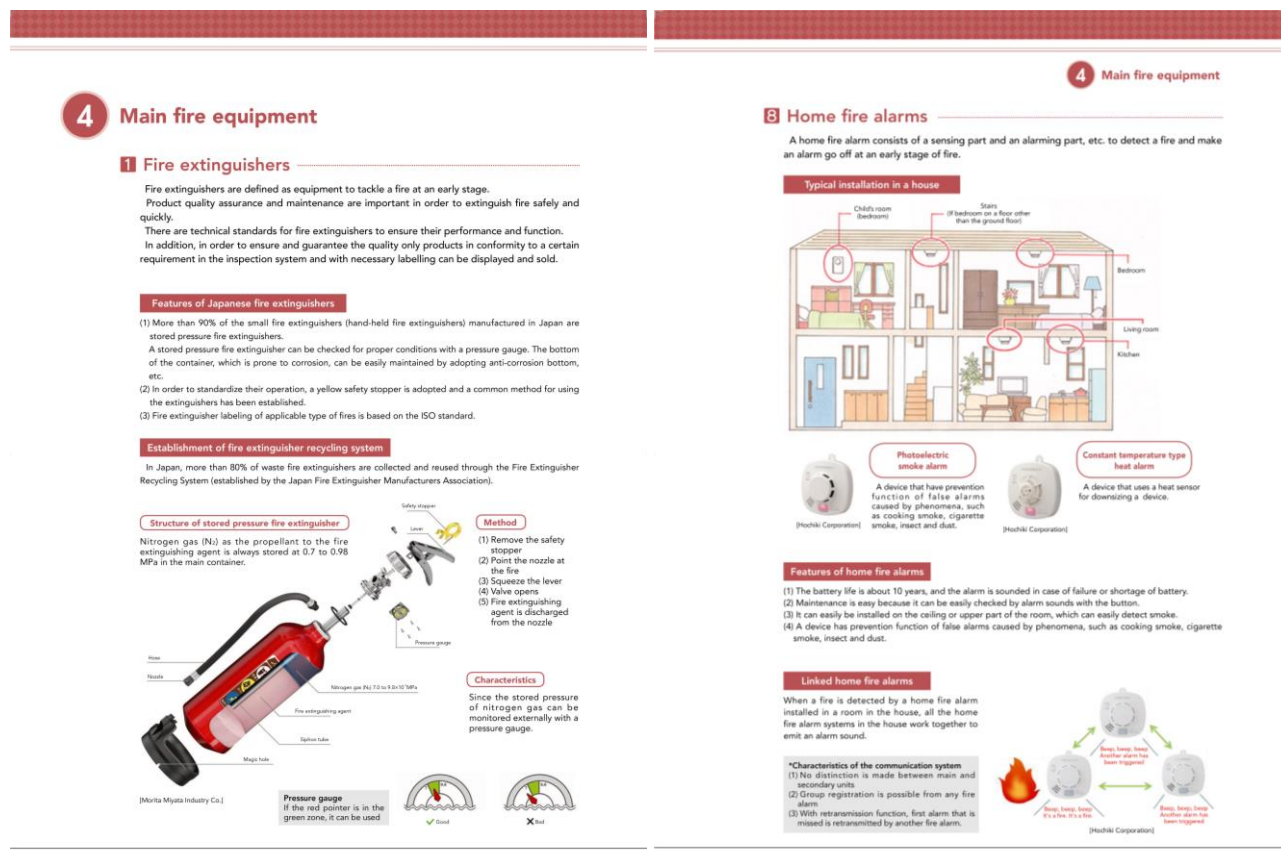
- Comprehensive explanation about excellency of Japanese fire equipment, standard and certificate
- Description of feature of equipment and standard & certificate as well as introduction of character, quality and sample of use of product



The cover features a blue background with a white circular emblem containing a stylized flame and smoke. Below the emblem, the text 'Overview of Fire Equipment in Japan' is displayed. At the bottom, there are icons representing various fire equipment: a fire extinguisher, a fire alarm, a fire hydrant, a fire truck, and a fire station.

Overview of Fire Equipment in Japan

- 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.



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

- (1) 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.
- (2) In order to standardize their operation, a yellow safety stopper is adopted and a common method for using the extinguishers has been established.
- (3) 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 (N₂) as the propellant to the fire extinguishing agent is always stored at 0.7 to 0.98 MPa in the main container.

Method

- (1) Remove the safety stopper
- (2) Point the nozzle at the fire
- (3) Squeeze the lever
- (4) Valve opens
- (5) Fire extinguishing agent is discharged from the nozzle

Characteristics

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

Pressure gauge

If the red pointer is in the green zone, it can be used.

4 Main fire equipment

B 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

Chimney room (bedroom), Stairs (if bedroom on a floor other than the ground floor), Bedroom, Living room, Kitchen.

Photoelectric smoke alarm

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

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.

Inspection System & Regulations on FDMA Website



Introduction Role of the Fire and Disaster Management Agency

[Determined to protect! For the safety and security of Japan](#)

Inspection System for Fire Protection Machinery and Tools

[Outline of the Legal System]

[Fire Services Law, Regulations, and Fire Prevention Administration Fire Services Law](#)

Note : The full text of Japanese Fire Service Law in English, please refer to the web site of the "International fire service information center".

Fire Service Law : (http://www.kaigai-shobo.jp/pdf/Fire_Service_Act_eng.pdf)

Cabinet Order for Enforcement of The Fire Service Law : (http://www.kaigai-shobo.jp/pdf/Cabinet_Order_for_Enforcement.pdf)

[Inspection System](#)

[Outline of the Machine or Tool, etc. subject to Inspection and Self-labeling]

[Machine or tool, etc. subject to Inspection](#)

(Fire extinguishers, Fire extinguishing agents for extinguishers, Foam concentrates, Detectors or manual call points, Input/output devices, Control panels, Home disaster prevention alarm, Automatic closed sprinkler heads, Water flow detecting devices, Deluge valves, Metallic escape ladders, Descending lifelines)

[Machine or tool, etc. subject to self-labeling](#)

(Power driven fire pumps, Fire hoses, Fire suction hoses, Insertion or screw type couplings, Aerosol type disposable fire extinguishers, Electric leak fire alarm devices)

[Japanese Fire Standards](#)

Summary of Inspection

Ministerial Ordinance regarding regulations

Explanation on inspection
<http://www.fdma.go.jp/en/>



Japanese Fire Standards

1. [Fire extinguishers](#) — 消火器
2. [Fire extinguishing agents for extinguishers](#) — 消火器用消火薬剤
3. [Foam concentrates](#) — 泡消火薬剤
4. [Detectors or manual call points](#) — 感知器又は発信機
5. [Input/output devices](#) — 中継器
6. [Control panels](#) — 受信機
7. [Home disaster prevention alarm](#) — 住家用防犯警報機
8. [Automatic closed sprinkler heads](#) — 閉鎖型スプリンクラーヘッド
9. [Water flow detecting devices](#) — 流水検知装置
10. [Deluge valves](#) — 一斉開放弁
11. [Metallic escape ladders](#) — 金属製避難はしご
12. [Descending lifelines](#) — 線降機
13. [Power driven fire pumps](#) — 動力消防ポンプ
14. [Fire hoses](#) — 消防用ホース
15. [Fire suction hoses](#) — 消防用吸管
16. [Insertion or screw type couplings](#) — 挿込式又はねじ式の結合金具
17. [Aerosol type disposable fire extinguishers](#) — エアゾール式簡易消火具
18. [Electric leak fire alarm devices](#) — 漏電火災警報器
19. [Fire trucks](#) — 消防車

A series of regulations