

**Comparison Chart: "Japanese Residential Fire Alarm Detectors Standard vs. ISO Smoke Alarm Standard (Outlines)**

Item	Ministerial Ordinance for Technical Standards of Residential Fire Alarm Detectors and Residential Automatic Fire Alarm Systems (Draft)	ISO 12239 (2003-12)
Scope (Article 1)	Technical Standards and Requirements of Residential Fire Alarm Detectors and Residential Automatic Fire Alarm Systems	Standards and Requirements of Smoke Alarms, but, excluding those to be incorporated into a system with a separate control panel (Fire Alarm System).
Terms and Definitions (Article 2)	<p>1. Residential Fire Protection Alarm Detector: A device that automatically detects smoke and generates an alarm condition in residential home.</p> <p>2. Residential Automatic Fire Alarm Systems: Systems that detect smoke and generates automatically an alarm condition in residential home.</p> <p>3. Ionization Type Residential Fire Alarm Detector: A device that generates an alarm condition by detecting a change in ionization current.</p> <p>4. Photoelectric Type Residential Fire Alarm Detectors: A devices that generates an alarm by detecting a change in the amount of light on photo-electric element.</p> <p>5. Automatic Test Function: Automatic confirmation test function that confirms the functional integrity of the Residential Fire Alarm Detector and the Residential Automatic Fire Alarm System are being maintained properly.(option)</p> <p>6. Ancillary alarm devices: A device that initiate fire alarms supplemental upon receipt of a fire alarm signal form the control panel of the Residential Automatic Fire Alarm Systems.(option)</p>	<p>Smoke Alarm: A device containing within one housing all components (excluding the power source) that are capable of detecting smoke and generating an alarm signal.</p> <p>※</p> <p>No Term Definitions is given (Only name of term is given).</p> <p>No Term Definitions is given (Only name of term is given).</p> <p>No Term Definitions is given</p> <p>※</p>
Construction and Performance (Article 3)	<p>1. The Device shall be capable of generating a alarm condition with absolute certainty. Also, it shall be so designed and constructed for easy of handlings and easy access for replacing of accessory parts.</p> <p>2.The device shall be so designed and constructed that its mounting and removal are to be carried out easily</p> <p>3. The device shall have a durable contraction.</p> <p>4. Packaging boxes shall not cause a distortion of its shapes a normal usage ambient temperature changes.</p> <p>5. All wirings shall have an enough current rating and their connection shall be properly terminated.</p> <p>6. All components must be installed properly and securely without causing any functional abnormality of the device.</p> <p>7. The electrically live parts shall have a proper protection that prevents contacting from the outside by a person.</p> <p>8. Air movements directly to the sensing chamber portion of the detector shall not cause a remarkable affect on its functions.</p> <p>9. Mounting The Residential Fire Alarm Detector with 45 deg. Inclination angle shall not cause abnormal functions.</p> <p>10. The Residential Fire Alarm Detector shall maintained its alarm sound output level of at least 70db for 1 min. away from 1m distance from the devices with the conditional values indicated below:</p> <p>① Battery Power Operated Residential Fire Alarm Detectors: At the lowest voltage limit that can maintain proper functioning of the smoke alarm.</p> <p>② Residential Fire Alarm Detector with power source other than battery: At the voltage between 90% and 110% of the rated voltage.</p> <p>③ Fire alarm signals other than audible sound shall be capable of providing of alarming of fire breakout effectively and ,also, with absolute certainty.</p>	<p>With exception Battery and fuse, the user can not carry out parts replacement and repair of any part of the device.</p> <p>(No applicable provision )</p> <p>The standard provide the requirements for each type of component to be used.</p> <p>(No applicable provision)</p> <p>The smoke alarm with internalwire conections shall be so designed that it shall not display any sign of danger under normal operation mode and, also, under a fault condition.</p> <p>(No applicable provision )</p> <p>Provisions relating to protection from electrical shock and insulation are provided.</p> <p>There is a provision a directional dependency.</p> <p>(No applicable provision )</p> <p>Smoke alarm shall be capable of proving an alarm output level of at least 85 db at 3m form the device. However, the a alarm sound output level of 70 db is permitted where local regulations permit a lower alarm sound output level.</p> <p>①The battery operated device: It shall be capable of alarming of 85 (75) db and 82 (67)~ 105 (105) of the sound output levels after 1 min and 4 min of commencing of an abnormal condition alarm value of the batteries respectively.</p> <p>② For those devices operating other than battery, more than 85(75) db after 1 min. and more than 85(70) db ~ 105(105) after 4 min.</p> <p>(No applicable provision )</p>

	11. The battery power operated Residential Type Fire Detector shall be so designed that the battery replacement shall be done easily, also, shall be capable of generating automatically of a warning signal by a means of a flashing indicator lamp for more than 72 hours continuously when its battery power capacity level that can maintain a proper function of the detector has just commenced, or shall be capable of transmitting of audible sound for the same battery status for at least 72 hours continuously.	The battery operated smoke alarm, at the point when a battery low condition commences the smoke alarms should be capable of to produce audible alarm sound for at least 4 min. and, also, should be capable of producing a battery trouble sound for at least 20 days.
	12. The detector with an alarm silencing function with switching operation, the state being in alarm silence mode shall be less than 15 min. and shall have be capable of automatic reset.( Optional )	The alarm silence function of the Smoke Alarm shall disable or desensitize the smoke alarm for at least 5 min. and shall be restored within 15 min.(option)
	13. A photo reception element of the PhotoelectricType Residential Fire Alarm Detector shall be of an semi-conducts element.	(No applicable provision )
	14. The sensor chamber shall be designed with a mesh with less than 1mm of opening or a thin sheet with small holes that prevents from the ingress of insects.	Smoke Alarm is designed so that a sphere of diameter larger than 1.3±0.05mm cannot pass into the smoke sensing chamber.
	15. The Residential Fire Alarm Detector using radio active material as a source of sensing element, the source element shall be of sealed source and shall be prevented from a direct contact from the outside, and shall have an adequate means of protection for breakage in case of fire.	For those smoke alarms using radio active material as a source of sensing element, should comply with applicable national standards.
	16. The Residential Fire Alarm Detector with an automatic testing function, it shall be capable of indicating any abnormal functions by a means flashing indicator or by a means of audible warning sound for more than 72 hours contentiously. (option)	(No applicable provision )
	17. Transformers of the Residential Fire Alarm Detector shall have the equivalent level of performance specifications to those of transformers that meet the Technical Standards of Electrical Component and their capacity shall be capable of withstanding for a continuous use at the maximum current rating.	The transformers shall comply with the requirements provided in IEC 60065.
Connection of Accesseories (Article 4)	Those accessories that are likely to cause detrimental effects to the functioning of the Residential Fire Alarm Detector shall not be connected.	The Smoke Alarm may have a provision of connection to external ancillary devices. But open- or short-circuit failure to these connections shall not prevent the correct operation of the smoke alarm.
Tests (Article 5) 1. Air Movement Test	The ionization type Residential Fire Alarm Detector shall not generate an alarm signal when it is thrown in an air current having a velocity of 5 m / s for 5 minute.	The Smoke Alarm operation with a scattered or a transmitted light principles shall not change its response threshold value is not unduly affected when subjected to the air movement of 1m/s. The Smoke Alarms operating with an ionization sensing element, the smoke alarm shall not unduly prone to fault conditions and false alarms when subjected you the air movement of 5m/s for 5 min.
2. Dazzling Test	Photoelectric type Residential Fire Alarm Detector shall not generate an alarm signal when it is subjected to a repetitious irradiation of 5000 lux of a white lamp of a 10 sec. of irradiation for 10 time and a 5 min. of continuous irradiation respectively.	The Smoke Alarm operating with a scattered or transmitting light principle shall not emit either alarm or a fault signal after subjected to an irradiation of switch ON and OFF of 4 circular fluorescent lamp (32W) simultaneously for 10s each for 10 time and a continuous irradiation of the 4 lamps for 1min.
3. Ambient Temperature Test	The Residential Fire Alarm Detector shall not result in abnormal operating condition in an ambient temperature conditions of more than 0 deg C and less than 40 deg C.	The Smoke Alarm shall be capable of maintaining its drifting of response threshold values to be within a specified range of value when subjected to an ambient temperature of 0 deg C and 40 deg. C.

4. Corrosion Test	The Residential Fire Alarm Detector with corrosion portion shall be capable of withstand corrosive effect and shall not result in abnormal condition when exposed to in the atmosphere containing of 45 deg of SO <sub>2</sub> gas for 4 days. ( optional)	After conditioning the Smoke Alarm in a test chamber with 25PPM of S O <sub>2</sub> gas at temperature of 2 5 °C、 relative humidity of 9 3 % for 4 days, a change of response threshold value shall be within a certain range of value.
5. Vibration Test	After subjecting the Residential Fire Alarm Detector with its power source connected to a vibration of a total amplitude of 1mm that sweeps at 1000 times/min for 10 min and the specimen without power source connected to a vibration a total amplitude of 4mm that sweeps at 1000 times/min for 60 min, it shall not effect of its normal function.	① After subjecting the Smoke Alarm to 1 sweep of cycle of a vibration frequency ranging 10- 150Hz with an acceleration amplitude of 5 m S <sup>-2</sup> to each of 3 axes direction of x y z , a change of response threshold value of the Smoke Alarm shall be within a certain range of value ② After subjecting the Smoke Alarm to 20 sweeps of cycle of a vibration frequency ranging 10- 150Hz with an acceleration amplitude of 10m S <sup>-2</sup> to each of 3 axes direction of x y z , a change of response threshold value of the Smoke Alarm shall be within a certain range of value
6. Impact Test	After subjecting the Residential Fire Alarm Detector to an impact of maximum cancellation of 50g on the surface 5 times from different directions shall not effect of its normal function.	After receiving an impact of an aluminum alloy sticker hammer swinging from a position producing an impact energy of 1.9J with the hammer velocity of, a change in the threshold of the specimen shall be within the specified angel.
7. Impact Voltage Test (Optional)	The specimen shall not produce any abnormal function upon subjecting its external lead wire to the pulse voltage of 500V and the pulse widths of 1 μs and 0.1μs at the repeat cycle of 100Hz for 15 sec.	After applying 500V or 1kV of pulse voltage to the external lead wire of the Smoke Alarm for 3 times each application being 1 min, a change in the threshold of the Smoke Alarm shall be within a certain range of value.
8. Humidity Test	During exposure of the specimen with power-on condition to in an air environment having 4 0 °C temperature and 9 5 % of relative humidity for 4 days, the Residential Fire Alarm Detector shall not result in an abnormal monitoring condition.	Expose the Smoke Alarm to be tested to an initial air temperature of 4 0 ± 2 °C、 and a relative humidity of less than 4 5 % . After 2 hours, increase the relative humidity to 9 3 ± 3 % over a period of 1 hour and maintain these condition for 4 days. After 4 days of exposure to these condition, a change in response threshold value of the specimen should be within the specified range
9. Insulation Test	The insulation resistances across the extra wiring terminals, and across the charged-live parts and the metallic surface of the packaging box shall be more 50MΩ when measured with a direct current 500V insulation tester.	The insulation resistance across the primary power source and the terminals of different polarities and the basic insulation parts shall be more than 2MΩ when measured with a 500V direct current.
10. Dielectric Strength Test	The Residential Fire Alarm Detector shall be capable of withstanding for 1 min when subjected to an alternate current of 500V (for those rating greater than 60V shall be subjected to 1000V).	The Smoke Alarm shall withstand application an alternate current of 1410V for those primary power source with a rating of less than 150V for 1 min (while for those with rating of more than 150V shall be applied with 2120V and those of portion across the basic insulation parts shall be applied a voltage according to the curve A.).
Tests (Article 5 -2)	The room in which the testing of Residential Fire Alarm Detector shall be controlled to a temperature of more than 5 deg C and less than 35 deg C of temperature and more than a relative humidity of more 45% but less than 85%.	Atmospheric conditions for test shall be as follow: temperature -- 15 to 35 deg C relative humidity -- 25 to 75 % air pressure -- 86 to 106 kPa
Sensitivity (Articles 6 and 7)	<p>① Sensitivity of Ionization Type Residential Fire Alarm Detector Operational Test: Generating an alarm signal within 60 sec (1st. Class - 0.26 2nd Class - 0.32 of smoke density) Non-operational Test: No alarm generation for 5 min ( 1st Class - 0 . 1 2、 2nd Class - 0 . 1 6 of smoke density ) . ※A smoke density value is a ratio of change in ionization current under 2 0 ~ 4 0 c m / s of air velocity.</p> <p>② Sensitivity of Photoelectric Type Residential Fire Alarm Detector Operational Test: Generating an alarm signal within 60 sec upon exposing to 1st Class: 7 . 5 %/m、 2nd Class: 15%/m of smoke density respectively. Non-Operational Test: No alarm generation for 5 min during exposure to 1st Class: 2.5%/m、 2nd Class - 5%/m of smoke density. ※A smoke density value is a rate light obscuration under 2 0 ~ 4 0 c m / s of air velocity.</p>	<p>① The Smoke Alarm shall comply to the all of the following test fires: a TF2 (Smoldering wood fire) b TF3 (Glowing smoldering cotton fire) c TF4 (Flaming polyurethane fire) d TF5 (Flaming n-Heptane fire)</p> <p>② The judgments of compliances of the specimen shall be based on whether the responses are made within the specified range of a rate of ionization current change or a rate of light obscuration change and within the time specified for each type of smoke alarm.</p> <p>③ A ratio of change in response threshold values of the specimen of before and after the environment tests shall be less than 1.6.</p>

Marking (Article 8)	<ul style="list-style-type: none"> <li>① Wording of "Residential Fire Alarm Detector"</li> <li>② Type and Class, and Model Number</li> <li>③ Year of Manufacture</li> <li>④ Name of Manufacturer or Trade Name</li> <li>⑤ For those with corrosion protection, the wording of "Corrosion Protection Model" should be placed. (Option)</li> <li>⑥ Manufacturer Recommend Date of Exchange ( Exception: Device with Automatic Test Function)</li> <li>⑦ For Device with Automatic Test function (Optional), the wording of "Automatic Test Function Model" shall be placed.</li> <li>⑧ In case of confirming this Ministerial Ordinance by a third party, the name of third party shall be given with brief statement of purpose of doing so</li> </ul>	<ul style="list-style-type: none"> <li>① Model Number of Smoke Alarm</li> <li>② ISO Standard Number ISO12239) and Date of Issuance</li> <li>③ Date of Manufacture or Lot Number</li> <li>④ Name of Manufacturer or Name Distributor or Trade Mark and Address ( no such requirement)</li> <li>⑥ Manufacturer Recommend Date of Exchange (No applicable provision )</li> <li>(No applicable provision )</li> </ul>
Ancillary Alarm Device (Article 9)	<ul style="list-style-type: none"> <li>① A acoustic pressure of fire alarm of ancillary alarm device shall be capable of providing a sound output level of more than 70db from 1 meter of the distance for a period of 1 min. from the device with 90%~ 110% of its power source rating.</li> <li>② For those smoke alarm initiating fire alarm signal other than by a means of audible sound, such signal shall be capable of generating an alarm signal effectively with absolute certainty</li> </ul>	※
Marking (Article 10)	<ul style="list-style-type: none"> <li>① The wording of Ancillary Alarm Device shall be placed.</li> <li>② Year of Manufacturer</li> <li>③ Name of Manufacturer or Trade Name</li> <li>④ Confirmation of compliance to the provisions of this ministerial ordinance by the 3rd party, state a purpose and the name of the party concerned.</li> </ul>	※
Exceptions (Article 11)	<p>(1) For those residential fire alarm detectors and ancillary devices of residential automatic fire alarm systems that operates on newly developed technologies, the Minister of Internal Affairs and Communications Ministry shall have an authority vested in him, irrespective of the provisions of this ordinances, to ordain these devices to be complying to the Technical Standards and Requirements of the Minister of Internal Affairs and Communications if their shapes, constructions, materials, and functions are found and approved to be equivalent or more with respect to those of devices complying to this ordinance by the Minister of the Internal Affairs and Communications.</p> <p>(2) The preceding provision shall be correspondingly applied to those of residential fire alarm detectors manufactured in forging countries. In this case, "those residential fire alarm detectors and ancillary devices of residential automatic fire alarm systems that operates on newly developed technologies" shall be changed its reading as "those residential fire alarm detectors that are manufactured in forging countries".</p>	(No applicable provision )

※The Residential Automatic Fire Alarm System is a system comprising of detectors and a control panel and, therefore, is out of the scope of ISO 12239.