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**Supplied-air respirators**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, and Minister of Health, Labour and Welfare through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS T 8153 : 1990** is replaced with **JIS T 8153 : 2002**.

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## Supplied-air respirators

**1 Scope** This Japanese Industrial Standard specifies supplied-air respirators (hereafter referred to as “respirators”) to be used where there is a fear for human body to be hazarded by inhalation of oxygen deficient atmosphere, granular substances, gas, vapour in places of business such as a factory, mining, a fire scene, ships, tunnels and other places.

**2 Normative references** The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 9809 *Spray guns*

JIS K 6330-2 *Testing methods for rubber and plastics hoses—Part 2 : Hydrostatic testing*

JIS T 8001 *Glossary of terms for respiratory protective devices*

JIS T 8142 *Helmet type and handshield type protectors for welders*

JIS T 8155 *Compressed air open-circuit self-contained breathing apparatus*

JIS T 8159 *Leakage rate testing method for facepieces of respirators*

JIS Z 8731 *Acoustics—Description and measurement of environmental noise*

**3 Definitions** For the purposes of this Standard the definitions given in **JIS T 8001** and the following definitions apply:

- a) **AL mask** the generic name of air-line respirator and combination air-line respirator with auxiliary self-contained air supply;
- b) **maximum working pressure of AL mask** the maximum pressure determined by the manufacturer in the use of AL mask;
- c) **minimum working pressure of AL mask** the minimum pressure determined by the manufacturer in the use of AL mask;
- d) **longest hose** the longest hose determined by the manufacturer for the hose mask use;
- e) **longest medium-pressure hose** the longest medium-pressure hose determined by the manufacturer for the AL mask use.

**4 Classes and types** Classes and types of respirators shall be as given in Table 1.

**Table 1 Classes and types of respirators**

| Class     |                                                                          | Type                 |                     | Class of facepiece and the like to be used |
|-----------|--------------------------------------------------------------------------|----------------------|---------------------|--------------------------------------------|
| Hose mask |                                                                          | Without blower type  |                     | Facepiece                                  |
|           |                                                                          | With blower type     | Electrically-driven | Facepiece, face shield, hood               |
|           |                                                                          |                      | Manual              | Facepiece                                  |
| AL mask   | Air-line respirator                                                      | Continuous-flow type |                     | Facepiece, face shield, hood               |
|           |                                                                          | Demand type          |                     | Facepiece                                  |
|           |                                                                          | Pressure demand type |                     | Facepiece                                  |
|           | Combination air-line respirator with auxiliary self-contained air supply | Demand type          |                     | Facepiece                                  |
|           |                                                                          | Pressure demand type |                     | Facepiece                                  |

## 5 Performance

**5.1 Leakage rate of facepiece** The leakage rate of the facepiece to be used for the respirators, when subjected to the test according to the method specified in 8.1.1, shall comply with Table 2.

**Table 2 Leakage rate of facepiece**

Unit: %

| Class     |                                                                          | Type                 |                     | Leakage rate  |
|-----------|--------------------------------------------------------------------------|----------------------|---------------------|---------------|
| Hose mask |                                                                          | Without blower type  |                     | Less than 0.3 |
|           |                                                                          | With blower type     | Electrically-driven | Less than 1   |
|           |                                                                          |                      | Manual              | Less than 1   |
| AL mask   | Air-line respirator                                                      | Continuous-flow type |                     | Less than 3   |
|           |                                                                          | Demand type          |                     | Less than 0.3 |
|           |                                                                          | Pressure demand type |                     | Less than 0.3 |
|           | Combination air-line respirator with auxiliary self-contained air supply | Demand type          |                     | Less than 0.3 |
|           |                                                                          | Pressure demand type |                     | Less than 0.3 |

**5.2 Airtightness of low-pressure part** The airtightness of low-pressure part of respirator with facepiece, when subjected to the test according to the method specified in 8.1.2, shall be free from air leakage.

Further, the low-pressure part of respirator shall be as follows:

- In hose mask without blower, the part from air inlet at hose end to facepiece.
- In hose mask with blower, the part from the opening for connecting hose of the flow control device to the facepiece.

- c) In AL mask, the part from the outlet side of the flow control device or supply valve to the facepiece.

**5.3 Airtightness in actuation of exhalation valve** The airtightness in the actuation of the exhalation valve belonging to the facepiece used for the types other than the pressure demand type shall, when tested in accordance with the method specified in 8.1.3, comply with the following requirements;

- a) when inhaling air, the inside pressure reduction shall immediately occur responding to the inhalation;
- b) the time required for the return of the inside pressure to the normal pressure shall be not less than 15 s.

**5.4 Pressure in facepiece at the time of inhalation** The pressure in the facepiece (hereafter referred to as "pressure in facepiece") of AL masks of demand type and pressure demand type shall, when tested in accordance with the method specified in 8.1.4, comply with the values given in Table 3.

**Table 3 Pressure in facepiece**

| Type of respirator   | Inhalation flow rate<br>l/min | Pressure in facepiece<br>Pa |
|----------------------|-------------------------------|-----------------------------|
| Demand type          | 30                            | -250 to 0                   |
|                      | 115                           | -550 to 0                   |
| Pressure demand type | 0                             | 100 to 600                  |
|                      | 0 to 115 <sup>(1)</sup>       | 0 min.                      |

Note (1) It means that the inhalation flow rate is gradually increased from 0 l/min and the flow rate 0 l/min is not included.

## 5.5 Air-flow resistance

**5.5.1 Air-flow resistance of hose mask without blower** The air-flow resistance of hose mask without blower, when subjected to the test according to the method specified in 8.1.5, shall be not more than 500 Pa to the inhalation of 85 l/min.

**5.5.2 Exhalation resistance of mask with facepiece** The exhalation resistance of the mask with facepiece shall, when tested in accordance with the method specified in 8.1.5 corresponding to the type, comply with the values given in Table 4.

**Table 4 Exhalation resistance of respirators**

| Type of respirators                      | Air-supply flow rate<br>l/min | Exhalation resistance<br>Pa |
|------------------------------------------|-------------------------------|-----------------------------|
| Hose mask without blower type            | 85                            | 250 max.                    |
| Hose mask with blower type               | 115                           | 250 max.                    |
| Continuous-flow type air-line respirator |                               |                             |
| Demand type air-line respirator          | 85                            | 250 max.                    |
| Pressure demand type air-line respirator | 85                            | 900 max.                    |

**5.6 Blower** The blower shall, when tested in accordance with the method specified in 8.1.6, have an air quality of at least 50 l/min in the case where facepiece is used and of at least 120 l/min in the case where face shield and hood are used, at the inhalation inlet of the respiratory inlet covering, and there shall be no abnormality on the bearings and other actuation parts.

In this test, the energy consumption per one piece of air-flow inlet of manual blower shall not exceed 150 W.

**5.7 Filtering efficiency of hose mask with blower** The filtering efficiency of hose mask with blower, when subjected to the test according to the method specified in 8.1.7, shall be not less than 80 %.

**5.8 Maximum working pressure of AL mask** The maximum working pressure of AL mask shall not be more than 0.9 MPa.

**5.9 Air-supply quantity of continuous-flow type air-line respirator** The air-supply quantity of continuous-flow type air-line respirator, when subjected to the test according to the method specified in 8.1.8, corresponding to the class of respiratory inlet covering to be used, shall comply with the value of Table 5.

**Table 5 Air-supply quantity**

Unit: l/min

| Class of respiratory inlet covering to be used | Air-supply quantity |
|------------------------------------------------|---------------------|
| Facepiece                                      | 85 min.             |
| Face shield                                    | 120 min.            |
| Hood                                           |                     |

## 6 Structure

**6.1 Structure, general** Respirators shall be of such structure that air is fed from an air-supply source (air intake in the case of "without blower" type) to the wearer through hose or medium-pressure hose, respiratory inlet covering, and further, comply with the following specification: