

JIS

JAPANESE INDUSTRIAL STANDARD

Horn type loudspeakers

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1. Scope

This Japanese Industrial Standard specifies electrodynamic horn type loudspeakers, which are intended for use in general loudspeaker equipment of electrical communication apparatus (hereinafter referred to as the "loudspeakers").

Remarks 1. Loudspeaker means an apparatus composed of horn and driving unit, hereinafter referred to as the "unit", and a loudspeaker integrated in one body is called as "combination type" and that whose horn and unit are separable is called as "separate type". However, loudspeakers employing cone speaker as the driver are excluded from application of this Standard.

2. The following Standards are cited in this Standard:

JIS C 0010-Basic Environmental Testing Procedures General and Guidance

JIS Z 8703-Standard Atmospheric Conditions for Testing

2. Definitions

- (1) bore of horn The outside diameter of horn opening.
- (2) throat The sound path at the joint of horn and unit.
- (3) reference point of loudspeaker The geometric centre of horn opening on the plane passing the horn opening periphery.
- (4) reference axis of loudspeaker The straight line perpendicular to the plane passing the horn opening periphery and passes the reference point.
- (5) rated impedance This means the absolute value of input impedance assigned by the manufacturer for the purpose of matching of loudspeaker and amplifier and measurements, and expressed as the electrical impedance, in ohms (Ω), at the input terminals (of voice coil or of primary side of matching transformer being connected with the voice coil, if provided) at a frequency of 1 kHz.
- (6) input It means the electric power P which is calculated from rated impedance Z and input terminal voltage U by the equation given below, and is expressed in watts (W).

$$P = \frac{U^2}{Z}$$

- (7) rated input This means the input which is assigned by the manufacturer to operate the loudspeaker appropriately and is expressed in watts (W).

- (8) output sound pressure frequency characteristic The frequency characteristic of sound pressure level measured at a point on the reference axis 1 m apart from the reference point when a constant sinusoidal voltage corresponding to an input of 1 W is applied to the input terminals of loudspeaker.
- (9) output sound pressure level This means the average value of sound pressure levels at the appropriate frequencies prescribed in 3.5 in the characteristic of (8), and is expressed in decibels (dB). Provided that, 2×10^{-5} Pa is taken as 0 dB.
- (10) reproducing frequency band The frequency band in which the sound pressure level does not fall below the output sound pressure level of (8) by 20 dB or more in the characteristic of (8). If the trough of frequency characteristic in this frequency band is narrower than 1/9 octave, such trough is neglected.
- In the reproducing frequency band, the lower limit frequency shall be the lower threshold frequency (f_L) and the upper limit frequency shall be the higher threshold frequency (f_H).
- (11) abnormal sound Unordinary sound which can be perceived on the reference axis at a distance of 1 m or more when the loudspeaker is driven by a programme signal of rated input.
- (12) polarity of voice coil When a direct current is applied to a voice coil, if the coil moves along the direction of sound radiation, the terminal fed by plus side of the direct current is called as (+) terminal, and that by minus side as (-) terminal.

3. Performance

3.1 Insulation resistance The insulation resistance shall be not less than 1 M Ω between the voice coil and body, and not less than 10 M Ω between the body and primary side of matching transformer, if provided, when the test of 5.2.2 is carried out.

3.2 Voltage-proof No abnormality shall appear when the test of 5.2.3 is carried out.

3.3 Operation No abnormality shall appear when the test of 5.2.4 is carried out.

3.4 Rated impedance The value of rated impedance shall be within $\pm 15\%$ from the marked value when measured in accordance with 5.2.5. The rated impedances of voice coil are classified into five kinds given in Table 1.

Table 1. Rated impedances

					Unit: Ω
Rated impedance of voice coil	4	8	16	32	48

3.5 Output sound pressure level For loudspeakers with bore dimension of 200 mm or more, the average value of sound pressure levels measured at 4 frequencies i.e. 500 Hz, 1 kHz, 1.5 kHz and 2 kHz shall be not less than 104 dB, and for those with bore dimension of less than 200 mm, the average value of sound pressure levels measured at 4 frequencies i.e. 1 kHz, 1.5 kHz, 2 kHz and 3 kHz shall be not less than 98 dB, when the test of 5.2.6 is carried out. Provided that, the bore of modified shape loudspeaker shall be understood to correspond the bore of circular one with the same opening area.

3.6 Reproducing frequency band The loudspeaker shall satisfy the marked reproducing frequency band when tested in accordance with 5.2.6.

3.7 Rated input There shall be no abnormality when the loudspeaker is subjected to the operation test in accordance with 5.2.4 and to the continuous loading test in accordance with 5.2.7 by applying the rated input to the loudspeaker.

The values of rated input shall be the values of twelve kinds given in Table 2 or the values of Table 2 multiplied by 1/10 or 10.

Table 2. Rated input

Unit: W

Rated input	10	12	15	20	25	30	35	40	50	60	70	80
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3.8 Resistance to vibration The loudspeaker shall be so constructed that it can sufficiently withstand the vibration expected in normal service condition and shall not show any abnormality when subjected to the vibration test of 5.2.8.

3.9 Waterproof The loudspeaker shall be so constructed that it can withstand the rainfall expected in outdoor use, and the insulation resistance shall be not less than 1/10 of the respective value specified in 3.1 when the loudspeaker is subjected to the waterproof test of 5.2.9.

3.10 Resistance to heat The loudspeaker shall be so constructed from suitable materials that it can withstand the high temperature expected in indoor and outdoor use, and shall not show any abnormality when subjected to the heat resistance test of 5.2.10.

3.11 Resistance to cold The loudspeaker shall be so constructed from suitable materials that it can withstand the low temperature expected in indoor and outdoor use, and shall not show any abnormality when subjected to the cold resistance test of 5.2.11.

4. Shape, dimensions and appearance

4.1 Appearance General finish, assembly, etc. shall be in good state.

4.2 Dimensions The dimensions of horn bore, positions and dimensions of fixing holes of mounting metal fittings, dimensions of joint part and diameter of throat, and the tolerances thereon shall be as given in the following sub-clauses:

- (1) **Dimension of horn bore** The dimension of horn bore shall be expressed by the dimension of outside diameter when the horn is circular, and by the dimensions of major axis and minor axis when modified shape, and the tolerances on the marked dimensions shall be as given in Table 3.