

IEC 711 Ear Simulator Type RA0045

Product Data and Specifications

Typical applications

- *Insert-earphone measurements*
- *Earphone-production tests*
- *IEC 711 Standard measurements*
- *ANSI S23.25 Measurements*
- *ITU-T P.57 Type 2 Recommendation measurements*
- *Telephone testing with pinna simulators*

The IEC 711 Ear Simulator Type RA0045 (Fig. 1) is for making acoustic measurements on earphones coupled to the human ear by ear inserts such as tubes, ear moulds or ear tips. It is delivered with a built-in G.R.A.S. ½-inch pressure microphone Type 40AG and an individual calibration chart for the coupler-microphone combination.

Important! The microphone should not be removed from the coupler since this will jeopardise the factory calibration.

The RA0045 complies with the following international requirements:

- IEC 60711 Ed. 1.OB: *Occluded-ear simulator for the measurement of earphones coupled to the ear by ear inserts.*
- ITU-T Recommendations P.57 (08/96) Series P: *Telephone transmission quality, Objective measuring apparatus: Artificial ears.*

It is also part of the G.R.A.S. Artificial Ear Type 43AC.

The RA0045 can be used with a standard preamplifier, e.g. a ½-inch Preamplifier Type 26AK or a ¼-inch Preamplifier Type 26AC fitted with an adaptor. For a ¼-inch preamplifier, use either the straight Adaptor RA0003 or the right-angled Adap-



Fig. 1 IEC Ear Simulator Type RA0045
Inset shows built-in Microphone Cartridge Type 40AG

tor RA0001 (as in the case of the G.R.A.S. Artificial Ear Type 43AC).

The acoustic input impedance of the RA0045 closely resembles that of the human ear and, as a result, loads a sound source in very much the same way.

In accordance with ITU-T Recommendation P.57 (08/96): Series P: *Telephone transmission quality, Objective measuring apparatus: Artificial ears, Type 3.1-3.4*, the RA0045 can be used with the following G.R.A.S. pinna simulators for testing telephones:

- Low-leak Pinna Simulator Type RA0056
- High-leak Pinna Simulator Type RA0057

The RA0045 embodies a number of carefully designed volumes connected via well-defined and precisely tuned resistive grooves. In an equivalent electrical circuit, capacitors would represent the volumes, and inductance and resistance would represent respectively air mass and air flow within the resistive grooves. Fig. 2 shows a typical coupler frequency response of the RA0045.

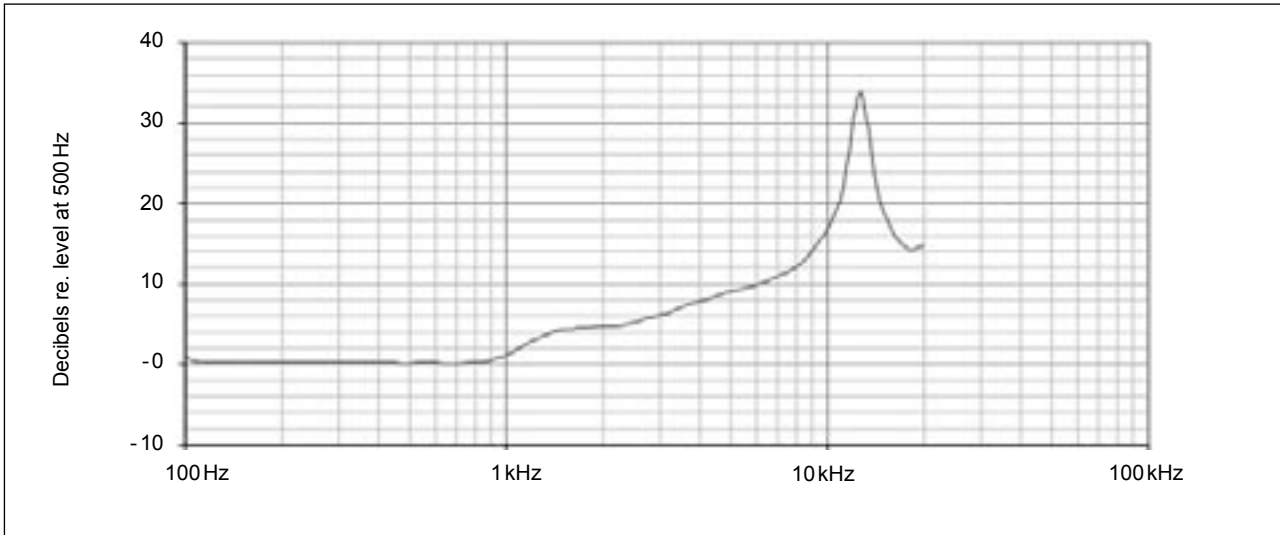


Fig. 2 Type RA0045 - typical coupler frequency response re. 500 Hz

The input impedance is measured using a special impedance probe as described in ITU-T Recommendations P.57 (08/96). This measures the impedance of the RA0045 as seen from the Ear Reference Point (ERP). The impedance is defined as the ratio of the

sound pressure at the ERP to the corresponding particle velocity. The sound pressure is measured with a probe microphone while a constant particle velocity is maintained via a high acoustic impedance sound source.

Specifications

<p>Standards:</p> <p>IEC 711 (1981): Occluded-ear simulators for the measurement of ear-phones coupled to the ear by ear inserts.</p> <p>ITU-T Recommendation P.57 (08/96) “Series P: Telephone transmission quality, Objective measuring apparatus : Artificial ears”</p> <p>Resonant frequency: 13.8 kHz ± 1 kHz</p> <p>Effective volume: 1.28 cm³ ± 0.03 cm³</p> <p>Dimensions:</p> <p>Height: 23.0 mm Diameter: 23.75 mm Weight: 52 gm</p>	<p>Environmental calibration conditions:</p> <p>Temperature: 23 °C ± 3 °C Relative humidity: 60 % ± 20 % Barometric pressure: 101.3 kPa ± 3 kPa</p> <p>Accessories included:</p> <p>External-ear Simulator: GR0408</p> <p>Accessories available:</p> <p>Calibration Simulator: GR0433 Tube Adaptor: GR0436 Stop Washer: GR0434 Ear-mould Simulator: GR0437 Retention Ring: GR0438 Tube Adaptor: GR0440</p>
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G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice