Electro-Acoustic Transducer for Near-field Measurements

Naval Physical and Oceanographic Laboratory, Kochi, has designed, engineered, and rigorously tested a piezoelectric ceramic transducer that is used to radiate low-frequency sound when electrically excited and to generate voltage when excited by an acoustic wave. The transducer is a component of the Near-field Acoustic Characterization System designed and developed by NPOL for sonars. It is small with respect to the wavelength of interest and does not cause deterioration in the performance of the sonar when it permanently installed near the sonar array. Therefore, it is especially suited for near-field measurements. However, the multi-purpose transducer is suitable for several underwater applications.

The transducer is comprised of piezoceramic, rubber, synthetic, and metal components. The rubber used in the transducer is designed and developed by NPOL. The piezoceramic components are available in India. Materials for the synthetic and metal components are also available in India. Special facilities are required for mixing the rubber and moulding the transducer.

Drawings that are used to manufacture components, and detailed instructions for assembly of the components and moulding the transducer have been used to manufacture several transducers. All manufacturing processes are now finalized. The largest dimension of the transducer is about 40 mm.

The transducer is designed to meet detailed specifications. Acceptance test procedures are finalized. Each transducer will be tested before acceptance by Indian Navy.

The technology for manufacturing the transducer is ready for transfer to Indian industries. Technology will be transferred only to industries with experience in manufacture of underwater transducers. Industries that accept the ToT may manufacture and supply the transducers to any agency only after obtaining prior permission from DRDO.

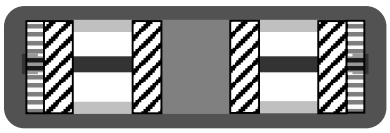

Fig. 1. Schematic of the electro-acoustic transducer for near-field measurements.