

## **SPECIFICATIONS FOR SINGLE CHANNEL ULTRASONIC TEST SYSTEM**

Single Channel Ultrasonic Testing system for inspection of composite materials and other general applications with the following features.

### **MAIN SYSTEM:**

- 1) The system should be portable (< 5 Kg) and have the user friendly menu driven calibration set up features.
- 2) Gain should be of min 100dB, with 1, 2, 5 and 10 dB increment.
- 3) It should have the frequency bandwidth of 0.3 to 15 MHz.
- 4) PRF should be from 15 Hz to 1 KHz.
- 5) Velocity range: 1000 m/s to 10,000 m/s or better range.
- 6) Display modes: Rectified and RF modes are compulsory.
- 7) Data display: A-Scan, the system with B-Scan will be preferred.
- 8) Capable of working in pulse echo, dual and through transmission techniques.
- 9) Both BNC and LEMO connectors shall be provided to the system.
- 10) The system should have resolution of min 0.1mm
- 11) It should have the audio/visual alarms for gate settings (no.of alarms should be min 2) (manual / automatic).
- 12) It should have the gates (min. of 2 gates) for amplitude and thickness measurements independently.
- 13) The system should have the memory for saving min of 100 set up files.
- 14) It should have the facility to transferring and printing the data through either USB or RS232 ports (preferably USB ports).
- 15) It should have the digital filters with different ranges.
- 16) The depth, size shall be displayed in digital values.
- 17) It should have the measurement facility for amplitude, sound path and depth.
- 18) The testing range shall be min of 0 to 10mm with 0.1, 0.5 and 1mm increments and max of 0 to 5000mm with 1, 5 and 10 mm increments.
- 19) The system should be able to inspect composite materials by phase inversion technique to detect defects/ poor bonding at the interfaces.
- 20) It should have the DACs.
- 21) The system with DGS scales is preferred.
- 22) Correction for curved surfaces shall be provided.
- 23) The system should be able to work with an AC power supply of 200V to 240V, 50Hz.
- 24) The system shall have the built-in charger for charging batteries as well as external charger. The full charged battery should work for at least 6 hrs of operation.

- 25) The system should be capable of working upto 50°C.
- 26) The system shall have TOFD as well as Corrosion Mapping options.
- 27) **Catalogues & brochures** giving complete description and operational details along with photographs of the machine should be submitted along with the quotation for becoming prospective supplier.

**GENERAL ITEMS/ TERMS.**

- I. The system should be quoted separately.
- II. Necessary spares to be provided for trouble free operation of 2 years along with system.
- III. Probes (including testing of composite materials) should be quoted separately with different frequencies and types.
- IV. Optional software, if any should be quoted separately.
- V. The offered system shall be demonstrated at BHEL R&D before technical evaluation.
- VI. Optional features, if any shall be quoted separately.
- VII. Training at BHEL R& D shall be provided for two engineers at BHEL R&D during commissioning.
- VIII. Special tools and accessories to be quoted separately. (Optional)
- IX. The suppliers should provide the list of various organizations (including in India) with their contact addresses, where the Ultrasonic testing equipment has been supplied. Same make instrument should have worked satisfactorily for last two years in two reputed organizations. Certificate to be produced to that extent. Two sets of operating manuals shall be provided.
- X. Commissioning and installation to be done free of cost.
- XI. Instruction manual and service manuals should be provided
- XII. Warranty for one year from the date of commissioning.
- XIII. Should have service centre in India.
- XIV. AMC to be quoted after guarantee period for two years.
- XV. System & spares are mandatory.
- XVI. Delivery should be very prompt.
- XVII. The system (I) and the spares (II) will form the base requirement. Probes (III) and optional s/w (IV) will be included in the given purchase order, if they are within the sanctioned budget in the PIR.

**For any Technical Clarifications please contact –**

**Mr M Swamy, Manager(MTL) / Dr CRK Prasad, AGM(MTL)**

**Email ID : smekala@bhelrnd.co.in / prasadcr@bhelrnd.co.in**