Specifications of Ultrasonic Immersion Testing System   (Qty: One)

The system should be able to analyze (testing, inspection, and demonstration) the metallic sheets/plates, laminated plates, rods and composites, etc. having dimensions: (L = 1000 mm; W = 200 mm; T = 10 mm in case of plate/laminated plates). It should also be able to detect any subsurface flaw/defect within laminated plates with high precision and accuracy.

1. Major Sub-Systems

   a. Control equipment cabinet
   b. Electronics system multichannel modules
   c. PLC based computerized control for operation of entire system. Data processing system with latest configuration of industrial computer
   d. Inline digital/thermal strip chart recording and also storage of real time ultrasonic signal from all channels into PC hard disc
   e. S.S or equivalent corrosion resistance strong body immersion water tank with closed loop water supply system
   f. Automatic defect marking system
   g. Backup of softwares installed on industrial PC, PLC configuration file, user program and factory acceptance test from cyber security point of view.

2. Description of Test Object

Sr#	Category	Description
1	Test object	Aluminum alloy, stainless steel or other similar material
2	Test system mode	Immersion mode
3	Condition of object	Cold worked, hot worked, stress relived, annealed, etc.

3. Test System Capacity and Functional Requirements

Sr#	Category	Description
1	Overall system	Fully integrated imaging system including ultrasonic electronics, scanning mechanics, axis motion control, and data acquisition and processing software.
2	Scope of Testing	Multi-channel ultrasonic monitoring system. The system should have resolution of minimum of 0.01 mm. The system should have capacity to detect sub surface defect $\geq 0.5 \times 0.5$ mm.
3	Probes,manipulator, probe holder and channels	Interchangeable probe holder, adjustable (0°-90° XY and YZ) and additional fine adjustment of relative probe position.
4	Accuracy	Flaw detection: ± 1dB or better
5	Operation mode	Preferred system is Pulse-echo (Pulse echo and

		transmission mode in one system must be quoted separately)
6	Scan presentations	A, B and C-Scans
7	Axes	Three linear motorized axes X Y and Z (1000 x 700 x 600 mm)
8	Scanner	Horizontal and vertical planar scanning.
9	Immersion tank	Suitable water immersion S.S tank, inlet, outlet, flap and close in both auto and manual operation shall be provided. Also, tank shall be connected with close and rugged water loop supply system with filtration to maintain the water level without any air bubble in the immersion tank. The tank size should be enough to accommodate the product size of dimension: L = 1000 mm; W = 200 mm; T = 10 mm.
10	Probe manipulators	Manipulators shall be provided that must have each probe mounting arrangements. All manipulators shall have the provision for adjusting and angulations of the probe precisely.
11	PLC control system	Electronic controlled-based commercial industrial PLC commanded by an independent computer. PLC application program project file shall be supplied on CD-ROM in English language with all passwords. PLC development software package shall be supplied with original license. The subsystems of PLC systems like power supply shall be of same make as of PLC.
12	PC	Computerized control with latest industrial computer. The entire operation of automatic ultrasonic test system shall be interfaced to a latest industrial heavy-duty standard computer.
13	Software	Software of systems should be based on MS windows for automatic ultrasonic inspection for setting UT parameters, report generation and post data analysis, etc. UT software shall be designed to compatible to the latest Windows. UT software complete setup file shall be supplied with lifetime original license key. Software should be compatible for digital data acquisition and UT image analysis of sample image in A, B and C-scan mode. Software should be friendly interface and easy to use. Fast programmability for self-learning. Suitable integration of software with system mechanics and electronics.
14	Electronics	Low noise electronics for ultrasonic acquisition. Control system, safety system and emergency stop button.
15	Detailed specifications of	Following specifications or better are required: • Model: USIP-40; Make: Krautkramer/GE

	flaw Detector	inspection Technologies or equivalent European made only
		• 19" rack mount version
		• Probe connectors: T (Transmitter) and R (Receiver)
		• RF out socket: Radio frequency output (for oscilloscope etc.)
		• Pulse repetition frequency: 4 to 20KHz or above
		• Coarse grain settings: 0-110 dB in 1dB step
		• Fine grain settings: 1 dB in 10 continuous steps
		• Transducer Frequency: 0.5-30 MHz or above
		• Rectifier: Full-Wave, Positive Half-Wave, Negative Half- Wave & RF Mode
		• Back wall Echo Attenuation: Full dynamic range of 110 dB
		• Sound Velocity: 500-20000 m/sec
		• Suppressions: 0-80% screen height
		• Evaluation gates: Four gates (Interface, A, B, C)
		• Amplitude Resolution: 0.5% of display range
		• Thickness measurement modes: Measurements should be selectable between (i) Initial pulse or interface echo, and (ii) Gates A, B or C between gates A and B,
		• Input Connectors (standard 37-pin/25-pin/or 9-pin) for X, Y and Z encoder pulses
		• Standard software for computerized motion control of robotic arm (with which to attach an ultrasonic immersion probe) in X, Y and Z directions is a must
		• Software for digital data acquisition and UT image analyses of sample image in A, B and C scan
16	Power Supply	Available: 400 V; 50 Hz; 3-Phase System power requirement: As suitable