

WAP / M / SPECN-1 / 077 / 1999

ALT	DATE	JOB No.	APPROVAL

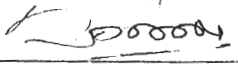
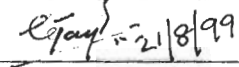
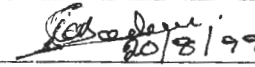
**GOVERNMENT OF INDIA
(Ministry of Railways)**

PL.No. 83981822 - 2.25 MHz
83981836 - 5.00 MHz

**SPECIFICATION FOR
AUTOMATED ON-LINE IMMERSION
UT TRANSDUCER**

ISSUED BY

**MECHANICAL DRAWING OFFICE
WHEEL & AXLE PLANT
YELAHANKA, BANGALORE-560 064
INDIA**

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SPECIFICATION FOR AUTOMATED ON-LINE IMMERSION TRANSDUCER FOR UT

1.0 SCOPE:

1.1 This specification covers the design, manufacture and supply of water immersion converging type of ultrasonic transducers with sealed cable having UHF connector at connecting end to the equipment. The transducers shall be supplied at Wheel & Axle Plant, Yelahanka, Bangalore, as per instructions and conditions of contract.

2.0 GENERAL DESCRIPTION:

- 2.1 The water immersion focused transducers are used for testing rim section of railway cast steel wheels using on-line automatic Ultrasonic Flaw Detector(UFD) while wheel rests vertically on rollers in water and rotates. The transducers are mounted on to a set of independent manipulators which are immersed in water tank. As wheel rotates, these transducers scan the rim section. The transducers should have the capability of with standing water pressure at a depth of three feet with normal turbulence of water and remain all through day and night.
- 2.2 Immersion converging type transducers are to be specifically designed to generate ultrasound of specific frequency, transmit and receive ultrasound from the test objects in water.
- 2.3 Immersion transducer should have high sensitivity and ability of converging the UT beam energy in a small area where the defects like porosity, shrinkage cavities normally found in castings are to be detected.
- 2.4 The immersion transducer should be manufactured to give the rated performance and unsurpassed service life under rough industrial environmental conditions and produce high sensitivity in immersion testing. The transducers are used continuously all the 3 shifts of duration 8 hours 365 days of the year.
- 2.6 The cylindrical case can accommodate any element size and frequency range, providing flexibility in the choice of focal length given at para 3. The case should be in

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corrosion resistant stainless steel to give longer life in service.

2.7 Each transducer should accompany with transducer technical characteristics certificate and safety data sheet.

3.0 THE STANDARD TECHNICAL PARAMETERS/CHARACTERISTICS REQUIRED;

3.1 Imersion Tansducer of 2.25 Mhz Converging Type

- 3.1.1 Frequency : 2.25 Mhz +/- 10%
- 3.1.2 Case length : 45mm ±3mm
- 3.1.3 Case diameter : 30 ±0.2 mm
- 3.1.4 Focal length : Minimum: 75 mm
: Maximum: 470 mm
- 3.1.5 Focal type : Spherical
- 3.1.6 Nominal element size: Shall be specified by the manufacturer.

3.2 Immersion Transducer of 5.0 Mhz Converging Type

- 3.2.1 Frequency : 5.0 Mhz
- 3.2.2 Case length : 45 ± 3mm
- 3.2.3 Case diameter : 30 ±0.2 mm
- 3.2.4 Focal length : Minimum: 75 mm
: Maximum: 480 mm
- 3.2.5 Focal type : Spherical
- 3.2.6 Nominal element size: Shall be specified by the manufacturer.

4.0 OTHER PARAMETERS (FOR GUIDANCE ONLY):

- 4.1.1 Water path to be used : 20 to 50 mm
(Interface distance from transducer to

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rim surface of cast
steel wheel)

- 4.1.2 Test material thickness (Rim) : 110 to 150 mm cast steel wheel
- 4.1.3 Material depth at which casting defects expected : 50 to 70 mm

5.0 PACKAGE:

- 5.1 Each transducer should be housed in a case packed with foam with respective transducer characteristic data sheet containing above parameters also.

6.0 CREDENTIALS:

The supplier should produce credentials of having supplied similar convergent transducers.

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