

Specification of Portable Hardness Tester for Inlet Edge of LP Moving Blades:

1. **Application:** For measurement of hardness near the inlet edge on the convex side of Steam Turbine LP Moving Blades (with twisted airfoil) after inlet edge hardening. The material of the Blades is 13% Cr steel and the hardness specification in the hardened area is 460 to 520 HV10. A typical LP Moving Blade Drawing indicating the hardened area at which hardness needs to be measured is enclosed as Annexure-1.
2. **Principle of operation:** Ultrasonic Vibration.
3. **Measuring Range:** Vickers Hardness HV 50 to 800.
4. **Reproducibility:** +/- (3% reading) HV or better.
5. Direct reading of hardness.
6. Display of measured values: Digital display with backlight.
7. Memory of test results: 500 tests.
8. Operating Temperature range: 5-45 °C.
9. The equipment shall be operable with Single phase 230 V +10%/-15% and 50 Hz +/- 3 Hz AC power supply.
10. The equipment shall also be operable with Rechargeable battery power supply.
 - (a) 1 No. Rechargeable battery, with minimum 4 hours battery backup, shall be supplied.
 - (b) 1 No. matching Battery Charger 230V shall be supplied.
11. RS232 port for printer and PC connection.
12. All Accessories, special bases, Probes and Probe Attachments required for measurement of hardness near the inlet edge on the convex side of Steam Turbine LP Moving Blades (with twisted airfoil) shall be supplied.
13. Suitability of the Probes, Probe Attachments and Accessories for reliable hardness measurement on curved surface of the blades shall be explained and illustrated with sketches along with the offer.
14. Vickers Standard Hardness Test Block, 1 No., To be supplied along with its Calibration Certificate).
15. Stand for the main unit with holding arrangement for the Probe/Probe Attachment shall be supplied.
16. Carrying Case shall be supplied.
17. Detailed Catalogue of the quoted equipment shall be furnished along with the offer.
18. Commissioning to be done at BHEL.
19. Training for a period of six days in operation & maintenance at BHEL.
20. The supplier should have supplied minimum of three such instruments of the same model in past three years. Performance certificates for satisfactory working over past three years for minimum three instruments shall be furnished.
21. If such an instrument has been supplied to any of the units or regions of BHEL, the instrument(s) must be working satisfactorily for past six months. Performance certificate(s) for satisfactory working of these instrument(s) over past six months shall be furnished.
22. Spares and consumables for five years' trouble-free operation shall be quoted.
23. Warranty for two years shall be provided.

