

SCOPE OF WORK FOR LASER CLADDING OF COMPRESSOR ROTOR

W.O. No.: 1344400024

CUSTOMER: BPCL KOCHI, BCL 407A

DESCRIPTION: LASER CLADDING OF ROTOR

ROTOR and DGS area drawings:

DGS area repair: 33320904013-00

Specification for Rotor cladding: TC72023

Base material: Low alloy steel: HY19365

Facilities required for Laser cladding of the compressor rotor:

1. Laser Facility: 5KW direct diode laser
2. Job manipulator: Synchronized robotic set up
3. Over head crane: Min. 5T
4. Job manipulator capacity: Min. 5T
5. Micro and Macro Hardness testers: Min. Hardness required on cladding – Min. 270 BHN
6. Ultrasonic flaw detector
7. Dye penetrant testing facility
8. CNC Lathe for carrying out the pre machining and post machining of the rotor.
Min. Length between centers: 2200 mm
Min. swing over bed: 450 mm
9. Cylindrical grinding machine.
Min. Length between centers: 2200 mm
Min. Center height: 225 mm.

SCOPE OF WORK:

1. Laser cladding on the test sample (HY19365) supplied by BHEL.
2. The minimum thickness of the cladding has to be 0.5 mm
3. The following tests to be carried out on test piece:
 - a. Visual inspection
 - b. Liquid penetrant test / Dye penetrant test
 - c. Ultrasonic test / Non-destructive examination report of the coated parts
 - d. Hardness test: The hardness of the cladding shall be 270 BHN (Min).
 - e. Micro and macro hardness test with photo as per ASME 407
 - f. Chemical analysis of the powder

4. Vendor has to submit the documents for the all the tests conducted for approval by BHEL.
5. Pre machine for laser cladding on the rotor as per the Step 1 of the drawing 33320904013-00.
6. Laser Cladding on the compressor rotor on the DGS area as per the drawing 33320904013-00.
7. The following tests to be carried out on test piece:
 - a. Visual inspection
 - b. Liquid penetrant test / Dye penetrant test
 - c. Ultrasonic test / Non-destructive examination report of the coated parts
 - d. Hardness test: The hardness of the cladding shall be 270 BHN (Min).
 - e. Chemical analysis of the powder
8. Vendor has to submit the documents for the all the tests conducted for approval by BHEL.
9. Finish turning of the dry gas seal zone as per the step 3 of the drawing 33320904013-00 with grinding allowance.
10. Grinding the dimensions as per the step 3 of the drawing 33320904013-00.
11. The Finish machined rotor shall be offered to BHEL for final inspection and acceptance.

BHEL Scope	Vendor scope
Supply of test sample of Raw material spec HY19365	Pre machining of DGS area Laser Cladding of test sample Inspection tests on test sample Laser Cladding of Compressor Rotor on DGS area Inspection tests on DGS area Finish machining of the LASER CLADDED DGS area. In case of any deviation observed while finish machining; the repair work has to be taken up by the vendor.

NOTE:

1. **Laser Cladding on the compressor rotor has to be taken up only after submission of test results of sample piece and further acceptance from BHEL.**
2. **In case of any deviation is observed, while finish machining of the rotor, the vendor has to take up the repair work on the rotor at their works only.**

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