

2026OSB076 [SECTION I D] SCOPE OF WORK

1. General

BHEL, Trichy proposes to manufacture the following semi-ellipsoidal (2:1) dished ends for pressure vessel application:

The dished ends shall be manufactured strictly in accordance with the **BHEL-approved drawing, CQP (Quality plan) and ASME Section VIII, Division 1.**

2. Vendor Qualification

1. The vendor shall be an **ASME-authorized manufacturer holding a valid ASME Section VIII, Division 1 “U” Certificate of Authorization / U Stamp.**
2. The U Stamp authorization shall be valid during the period of manufacture and inspection of the components.
3. The vendor shall submit a copy of the valid **ASME U Certificate of Authorization** along with the offer.
4. The vendor shall have adequate facilities and qualified personnel for forming, welding, heat treatment, NDE and dimensional inspection of the specified components.
5. All manufacturing and inspection activities shall comply with the applicable requirements of ASME Section VIII, Division 1.

3. Raw Material

1. Raw material plates shall be supplied **free of cost by BHEL, Trichy.**
2. The vendor shall collect the plates from BHEL Stores, Trichy and arrange transportation to their works.
3. Complete material identification and heat number traceability shall be maintained throughout the manufacturing process.
4. The vendor shall verify the material identification and condition of the plates before commencement of manufacture.

4. Manufacturing and Forming

The vendor shall carry out all operations required for manufacture of the finished dished ends, including blank preparation, forming, welding, heat treatment/PFHT, trimming, edge preparation, inspection and NDE.

The forming method adopted shall be suitable for the specified material, diameter and thickness and shall be capable of achieving the required 2:1 semi-ellipsoidal profile without unacceptable defects or excessive thinning.

4.1 Chordal Joint / Blank Preparation

Where the forming process involves welded chordal joints in the blank:

1. The chordal joints shall be prepared and welded using qualified welding procedures and qualified welders in accordance with ASME Section VIII, Division 1.
2. The completed chordal joints shall be subjected to the required **Radiographic Examination (RT)**.
3. **PWHT shall be carried out after completion of chordal joint welding**, as required by ASME Section VIII, Division 1 and the approved procedure.
4. The joints shall meet the applicable acceptance criteria before proceeding with subsequent forming operations.

4.2 Crown and Petal Method

Where the dished end is manufactured by the crown-and-petal method, the following sequence shall be followed:

1. Crown and petal blanks shall be individually formed to the required profile.
2. The formed crown and petals shall undergo the specified **Post Forming Heat Treatment (PFHT)**.
3. After completion and acceptance of PFHT, the crown and petals shall be assembled and the crown-to-petal joints shall be welded using qualified welding procedures and qualified welders.
4. The completed crown-to-petal joints shall be subjected to the required **Radiographic Examination (RT)**.
5. Following satisfactory RT, **PWHT shall be carried out on the crown-to-petal weld joints** in accordance with ASME Section VIII, Division 1 and the approved procedure.
6. After PWHT, the weld joints shall be subjected to the applicable final NDE/re-examination as required by the Code & BHEL CQP.

5. Heat Treatment

1. All heat treatment required by the material specification, forming process, drawing and ASME Section VIII, Division 1 shall be carried out by the vendor.
2. PFHT shall be carried out after forming wherever applicable.
3. PWHT of welded joints shall be carried out as required by ASME Section VIII, Division 1.
4. Heat treatment shall be performed using suitable furnace facilities with calibrated temperature measurement and recording systems.
5. Complete heat treatment/PFHT/PWHT charts shall be maintained and submitted to BHEL.

6. Inspection and NDE

The vendor shall carry out all inspection and NDE required by the drawing and ASME Section VIII Div 1 Code, including, as applicable:

- Visual Examination;
- Dimensional and profile inspection
- Finished thickness measurement;
- Radiographic Examination of specified weld joints;
- MT/PT;
- NDE/re-examination after PWHT, wherever required.

All NDE shall be performed using qualified personnel, approved procedures and calibrated equipment as applicable.

6.1 Production Test Coupon / Test Plate:

Production Test Coupon/Test Plate shall be provided for **Category A and Category B welded joints**, as applicable, in accordance with **ASME Section VIII, Division 1, UG-84 and the BHEL Quality Plan**. The test plate/coupon shall undergo the specified **PWHT**, followed by the required **mechanical testing** as per the applicable Code and BHEL Quality Plan.

7. Dimensional and Thickness Requirements

1. The finished dished ends shall conform to all dimensions and tolerances specified in the BHEL drawing.
2. The vendor shall verify the complete profile, including crown, knuckle, straight flange, diameter, depth, ovality and other specified dimensions.
3. The finished thickness shall not be less than the specified minimum thickness at any location.
4. A dimensional and thickness inspection report shall be submitted for each dished end.

8. Tooling and Manufacturing Facilities

1. All dies, tools, fixtures, supports and other special tooling required for manufacture shall be arranged by the vendor.
2. The vendor shall have suitable forming equipment capable of handling the specified diameter and plate thickness.
3. Adequate heat treatment, welding, NDE and inspection facilities shall be available at the vendor's works.
4. Details of the proposed forming method and manufacturing facilities shall be furnished to BHEL for review/approval, wherever required.

9. Quality Documentation

The vendor shall submit, as applicable:

- Material traceability records;
- Welding procedure and welder qualification records;
- Weld joint identification and traceability;
- RT and other NDE reports;
- PFHT/PWHT/heat treatment charts;
- Dimensional and thickness inspection reports;
- Final inspection report;
- Certificate of Conformity;

10. Non-Conformance and Repair

1. Any deviation from the BHEL drawing, applicable specification or ASME Code shall be brought to BHEL's notice.
2. No major repair, rework or alteration affecting the integrity of the component shall be carried out without prior approval of BHEL.
3. Any approved repair shall be carried out using a qualified procedure and shall be subjected to the required NDE and PWHT, wherever applicable.

11. Transportation and Delivery

1. Transportation of raw material from BHEL Stores to the vendor's works shall be in the vendor's scope.
2. The vendor shall arrange safe handling, loading, unloading and transportation of the finished dished ends.
3. The finished dished ends shall be delivered to the **designated shop at BHEL, Trichy**.
4. The vendor shall ensure adequate support and protection of the components against deformation or damage during transportation.