

**Government of India
Bhabha Atomic Research Centre
Post Irradiation Examination Division, Radiological Laboratories
Trombay, Mumbai 400 085**

Tel: 25594047, Fax: 2550 5151

Ref: PIED/NHF/AB/2018/485A

02.05.2018

To,

Sub: Fabrication and supply of lead filled stainless steel cask for high level solid waste transfer

Dear Sir,

Please send us your lowest quotation for the fabrication and supply of lead filled stainless steel cask for high level solid waste transfer as per the enclosed drawing and terms and condition given below:

Scope of work:

- a) Fabrication of lead filled stainless steel cask as per attached schematic drawings.
- b) Supply of all the materials as per drawing.
- c) Cask shall be filled with lead. Supply of lead is in scope of fabricator. Lead shall be Pb 99.99 grade as per IS – 27.
- d) **Quantity** of cask to be fabricated = **One unit**.
- e) Lead pouring shall be done as per procedure given below.
- f) All the components of the cask shall be fabricated with **AISI 304 stainless steel** except fasteners. Test certificate for chemical composition and mechanical properties shall be produced.
- g) Fabricator shall prepare fabrication drawings based on information of these design drawings indicating complete fabrication details, dimension tolerances, weld size, bill of materials etc and submit four copies of these drawings for departments approval.
- h) The fabricator shall maintain a detailed record that lists description & marking of each piece material used in fabrication and shall correlate this with material test reports. This record shall be incorporated into the fabrication record.
- i) The cask lifting trunions on the outer shell shall be positioned accurately as per drawing to achieve perfect balancing.

- j) Flanges in the inner cavity shall be machined from ultrasonically tested thick plate plates to achieve proper fit up and required leak tightness.
- k) Gasket seating surface shall have surface roughness less than 1.6micron or surface finish shall be better than ∇∇∇ finish.
- l) All the sharp corners shall be ground to radius of 3mm to avoid the injury to operational persons
- m) Welding processes and filler metals : Only approved procedure and qualified welders as per ASME section IX shall be permitted to carry out the welding. Any inert gas shielded arc-welding process i.e. GTAW may be used with the electrodes approved by the Purchaser's representative. The electrodes to be used are E 308 type.
- n) Welding procedure specification (WPS) & Procedure Qualification Record (PQR) as per ASME Section IX App. B QW 482 and QW 483 shall be furnished and got approved by the Purchasers' representative and forms part of the Fabrication Report.
- o) All welding shall be done by approved welder. Welder Performance Qualification shall be furnished as per ASME Section IX App. B QW 484A and got approved by the Purchasers' representative.
- p) Following NDT on the welding shall be carried out during and after the welding.
 - I The weld groove surfaces and heat-affected zones shall be 100% tested by D.P. test.
 - II Root run, back chipped surfaces and final run on both the sides of butt welds shall be 100% tested by D.P. test.
 - III Root pass and final run on both the sides of fillet welds and butt welds shall be 100% tested by D.P. test.
- q) STAGES OF INSPECTION :
 - (i.) Material Identification
 - (ii.) Welder's Qualification and Welding Procedure Qualification
 - (iii.) Dimensional inspection in Tack weld conditions of cask.
 - (iv.) DP test and inspection after completion of the welding
 - (v.) Hydro Test
 - (vi.) DP Test
 - (vii.) Lead pouring
 - (viii.) Function testing of the assembly, balancing of trunions with cask and cage etc.
 - (ix.) Hydro Test as per ASME Sec VIII Div 1
- r) Lead pouring as per approved procedure

- s) Assembly and inspection cask at your works.
- t) Finishing, buffing, polishing, packing and final dispatch.
- u) Minor changes or modifications in design that may be incorporated for ease of fabrication or to improve the performance of the product shall be considered within the scope of the specified work.
- v) A material record shall be kept and shall specify the following:
 - I Product form and heat number, if any.
 - II Correlation of part and test report.
 - III Component name or part number.
- w) Material test reports for each item of the materials, or other evidence of acceptability, shall be incorporated into the fabrication record after the material has been accepted.
- x) Welding procedure, procedure qualification and welder performance records shall form part of the fabrication record.
- y) Reports of all inspections and tests, including liquid penetrant examinations, dimensional inspections shall be prepared .
- z) Safe delivery to RLG Zonal Stores, BARC, Mumbai

LEAD POURING PROCEDURE:

1. Lead pouring shall be done in a single, continuous operation so as to assure no high, local streaming at lead interfaces resulting from multiple pours (like lamination etc.). All lead contact surfaces of the assembly shall be zinc coated for minimum 100 micron thickness for proper lead bonding as per latest IS 5905/1975.
2. The temperature of molten lead shall be maintained at about 375°C and pouring path shall be continuously heated to prevent solidification of lead on the way.
3. The lead pouring rate in kg/hr: The lead pouring rate shall be indicated and shall be such that no voids are formed during lead pouring.
4. The ambient temperature around the cone before lead pouring and during lead pouring shall be indicated and maintained.
5. Details of jigs and fixtures shall be prepared and got approved by the purchaser's representative for preventing distortion during lead pouring.
6. Details of hydro test conducted: The hydro test shall be compatible to the lead molten condition during lead pouring for withstanding a pressure of 1.5 times hydrostatic pressure due to molten lead for 30 minutes. Any leakage shall be repaired and test re-conducted to assure there are no leakages.

7. Measurement of lead volume: Lead volume shall be obtained by measuring volume of water occupied, and by calculation.
8. Volumetric efficiency: Volumetric efficiency (weight of Lead used /lead required) shall be minimum 98%. The weight of the CTP prior to lead pouring and after lead pouring shall accurately measured to check the correct volumetric efficiency of lead filling.
9. Preheating of the assembly: The assembly shall be preheated upto about 325 °C and preheating is discontinued during lead pouring so that the zinc coating does not get peeled off.
10. Arrangements for monitoring the temperature at outer and inner surface of the assembly during lead pouring shall be made.
11. Number of risers and pour points: The number of pour points and risers shall be such that the lead pouring is smooth and free from voids/ laminations.
12. Assembly cooling arrangements: These cooling arrangements, if any, shall be such that continuous refilling (lead pouring) can be carried out accounting for contraction of molten lead during the solidification at the top section of the assembly.
13. Additional stiffeners shall be provided to prevent distortion of the assembly and its internals while pouring lead. Design of such stiffeners is in the scope of the fabricator.
14. The lead pouring shall be performed in accordance with the approved procedure and a copy of the lead pouring procedure shall be incorporated into the fabrication record.

Please note the following :

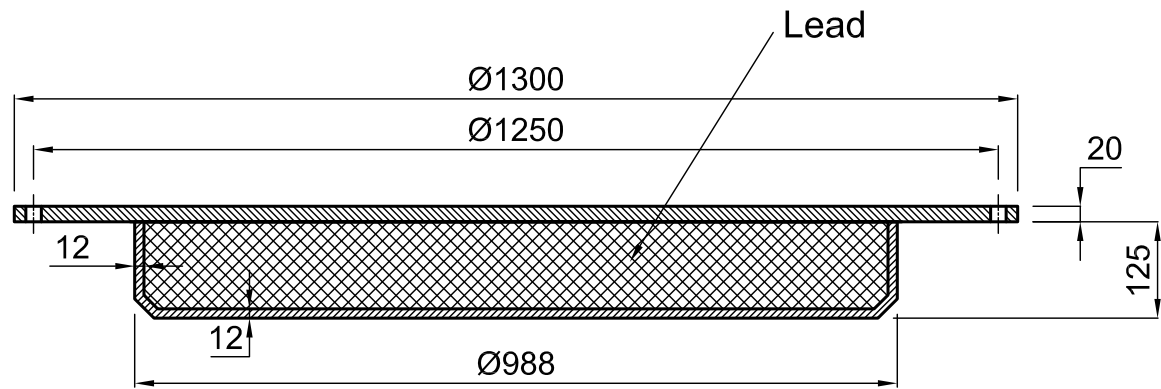
1. The work is to be completed within 45 days of receiving the firm work order from us.
2. The sealed quotations shall reach the office of the Head PIED, New Hot Cells Facility, RLG, Mumbai – 85 on or before **15.05.2015 by Registered Post of Indian postal services.**
3. Please address your offer to: **Anil Bhandekar, SO/G, Post Irradiation Examination Division, RLG, BARC, Trombay, Mumbai-400 085.**
4. The quotations are to be sent in a sealed envelope with the following information marked on top of the envelope: "Quotation for fabrication and supply of stainless steel cask"
5. Offers sent by telegram, telex, fax or e-mail will **not** be considered.
6. All taxes should be mentioned clearly.
7. Quotation should be in the printed letter head /quotation format which should consist of Sales Tax Registration Number, PAN Number of the firm, Service Registration Number, etc.
- 8. Quotation shall be signed by proprietor or authorized person and affix company seal.**
9. Computer generated quotation form will not be accepted.
10. Item is required for research purposes. Therefore, excise duty will not be applicable. The necessary excise duty exemption certificate will be issued. Supplier has to quote the price exclusive of excise duty.
11. Income Tax @2%, surcharge on IT as applicable and educational cess @3% (on IT & surcharge) will be deducted at source from your bill
12. Offer should be on free delivery basis to RLG Zonal Stores, BARC, Trombay.
13. Delivery period should be mentioned with all the possible consideration.
14. Payment will be made within 30 days from the date completion.

Yours sincerely,

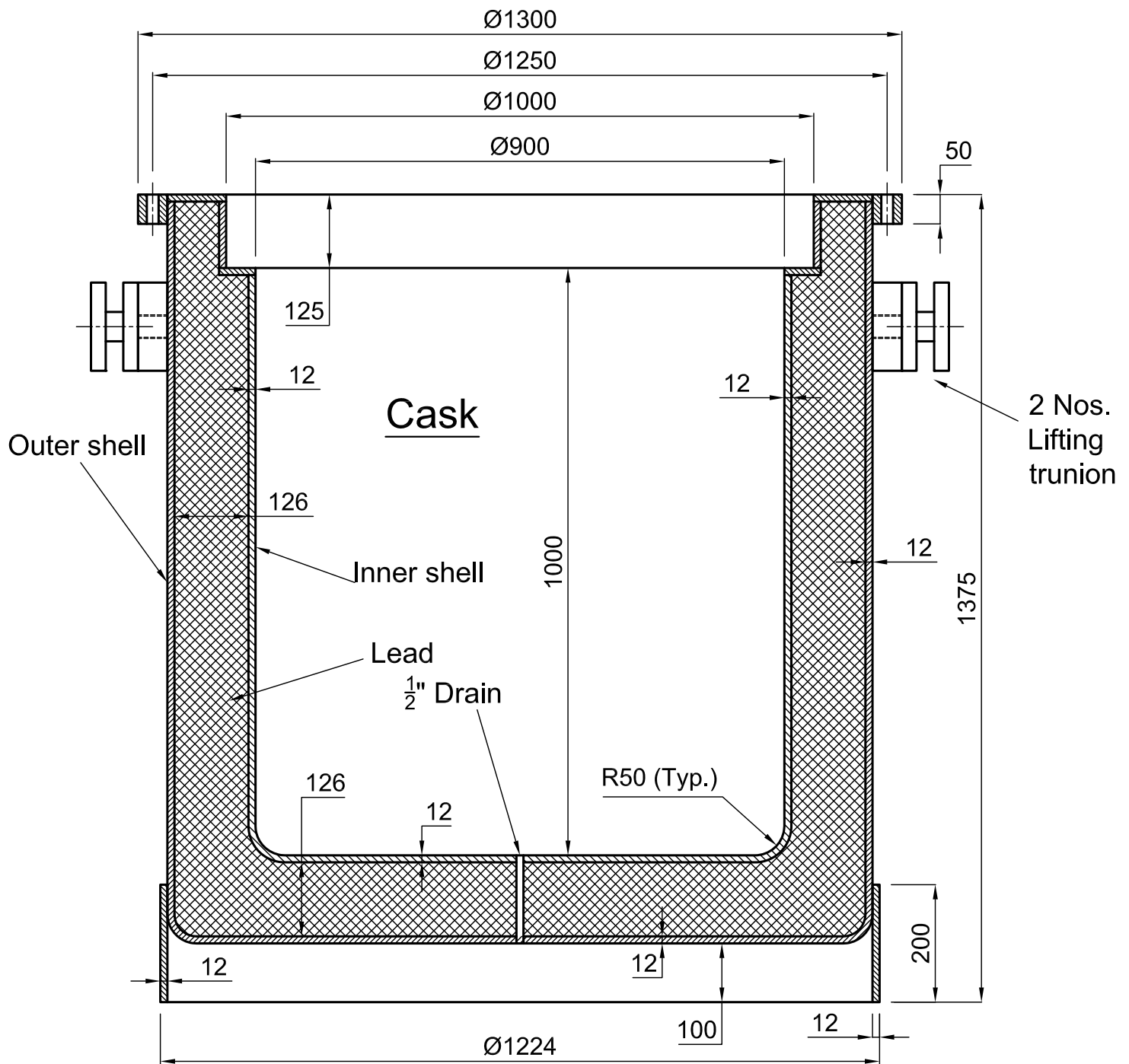


ANIL BHANDEKAR
Scientific Officer
Government of India
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Trombay, Mumbai - 400 085.

Anil Bhandekar
SO/G, PIED



Cask Lid



Cask

High Level Solid Waste Transfer Cask
 Material - AISI 304 & Lead Pb99.99
 Qty. One Unit