



R K Rajawat
Associate Director
BTDG, BARC
rkraj@barc.gov.in



Government of India
Bhabha Atomic Research Centre
Accelerator and Pulse Power Division

Engg. Hall No.4, Trombay,
Mumbai-400085
Tele: (+9122)25593785

Ref.: BARC/APPD/SM/2019/20

Date: 04-02-2019

Subject: Inviting quotations for fabrication and supply of enclosure and fittings of MARX generator.

Quotations are invited limited to the suppliers having experience in high voltage pulse power fabrication for the fabrication and supply of enclosure and fittings of MARX generator as per details below and drawings attached,

S. no.	Description	Quantity	Dimensional Accuracy
1.	Teflon disks having dimensions as per drawing.	90 pieces.	as per drawing
2.	Perspex ring	1 piece.	as per drawing
3.	Perspex support rod	24 pieces	as per drawing
4.	SS MARX enclosure	1 piece.	as per drawing

1. For any clarifications the supplier can contact Dr. S. Mitra SO/F, APPD / Sh. Senthil K, SO/E, APPD on any working day (Monday to Friday) on telephone Nos. 25590172/0166 or email: sabyam@barc.gov.in. Detailed part drawing will be given to interested parties only on request.
2. Fabricator must have prior experience in high voltage fabrication and should have the facility of measuring capacitance and high voltage testing.
3. Payment for the above work will be made after satisfactory completion of job and on production of bill & advanced stamped receipt along with the copy of registration. No advance payment will be made for this work since ours is a Government organization. Income-tax @2% & surcharge on Income-tax @15% will be deducted from the bill and a TDS (tax deducted at source) certificate will be issued as per Income-tax rules. Suppliers should submit their offers along with the following information.
 - (a) period of validity, terms & conditions of the offer,
 - (b) Approximate period of completion of the task and
 - (c) copy of the registration and income-tax clearance certificate.

Additional Information:

Your sealed quotation (in your letter head) including all details, like taxes to be paid, transport charges etc., duly indicating our reference number mentioned above, due date on the envelop, may be sent to "**Head, APPD, Engg. Hall No.4, Trombay, MUMBAI-400085**", by 19th February, 2019. It is mandatory that the tender must be sent by Speed-post only. The quotations received after the due date & by FAX/email/courier will not be considered.

Yours faithfully,

(R. K. Rajawat)
AD, BTDG and Head APPD, BARC

Copy to: A.P.O., GSS Section, Central Complex, BARC.

ANNEXURE-I

Specification sheets for fabrication and supply of enclosure and fittings of MARX generator

Components should be fabricated as per drawings mentioned above and specifications given below. In case of doubt in understanding please ask for clarification.

1. General:

- (b) The metal components are Electrical in nature and experiences very high field stress. Hence the fabrication, welding and testing should be in accordance with the procedure laid down by ASME code for boilers and pressure vessels.
- (c) The fabricated parts should have super-finished surfaces as given in the drawings. The stainless steel plates/rods of SS-304L should be used in fabrication and then the surfaces are to be polished.
- (d) The fabricators must submit their own fabrication drawings after acceptance of work order. The fabrication drawings should be got approved before starting the job.
- (e) The indenter reserves the right to make modifications and alterations in the drawings as well as to inspection at every stage of fabrication, testing and assembly. The fabricators should carryout minor modifications without extra cost.
- (f) Suppliers should mention by which method they machine stainless steel Parts, either by lathe or CNC machines.

2. Materials:

- a) All the stainless steel parts mentioned in the drawings of are to be fabricated using the SS-304L stainless steel rods of suitable diameter extruded rods and suitable thickness SS-304L stainless steel plates. Perspex components must be fabricated from good quality imported POLYCAST PERSPEX sheet or rod with good surface finish should be used. The surfaces are to be polished by buffing after fabrication. The fabricated parts should have super-finished surfaces as given in the drawings
- b) Stainless steel Bolts Nuts and washers are to be used for assembly with new PCD holes. The sharp corners are to be rounded off before polishing.

3. Fabrication:

- a) The fabrication of components shall be in accordance with best quality shop practice and conform strictly with dimensions, tolerances and instruction given in the drawings & specifications. All the finished parts are true, flat, smooth, mirror polished, corners rounded off, free of weld spatter, etc. Exposed surface shall be protected from damage at all times.

- b) All the fabricated parts should have super-finished surfaces as given in the drawings to RMS $0.8\mu\text{m}$ by grinding, machining, lapping with abrasives and electro-polishing if necessary.
- c) A general tolerance of $\pm 0.1\%$ on all fabricated parts and 0.05% on machined parts shall be provided unless otherwise specified. Similarly a general tolerance of $\pm 0.30'$ shall be provided on all angles. All gasketed surfaces should be super-finished to RMS $0.8\mu\text{m}$.

4. Welding:

- a) All the welding shall be electric arc. The root pass of all weldings shall be made using TIG welding with continuous inert gas like argon gas backing followed by shielded, metallic arc welding.
- b) The welding procedures shall be qualified and approved under section IX of ASME Boiler and Pressure Vessel code and shall also be submitted to and approved by Indenter before commencing fabrication.
- c) All the welds are to be inspected and shall be ground smooth. Completed welds shall be smooth and free from any drop-through spatter, cracks undercut or lack of penetration.

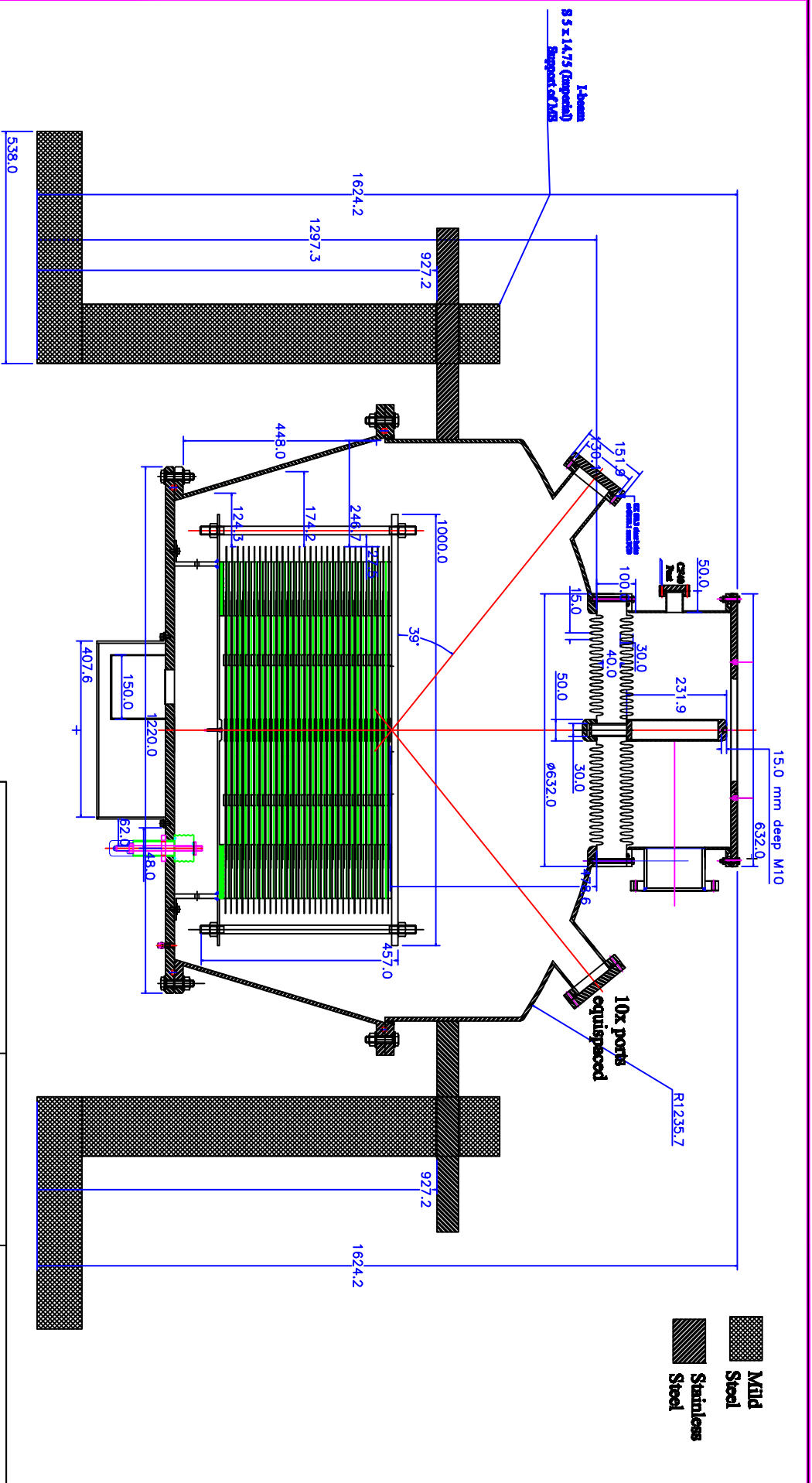
5. Testing:

- a) Hydrostatic Test: The equipment shall be hydrostatically tested for 20 minutes at 1.5 times the operating pressure of 5 kg/cm^2 . Distortion or leakage will not be permitted. If any closing flanges are required for testing, it is responsibility of fabricator to do the same.
- b) Air Leak Test: Air leak test shall be performed following the hydrostatic test. Prior to performing this test, the part shall be thoroughly dried at a temperature of $70^{\circ} - 80^{\circ}\text{C}$ for 15 minutes while being purged with dry air.

6. Cleaning:

- a) All inside surfaces shall be degreased and then flushed with clean water. The degreasing agent shall not contain halogens. Final cleaning shall be performed with hot water wash using a commercial detergent followed by hot water rinse. Surfaces shall be completely cleaned and degreased.

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IT MUST BE RETURNED WITH QUOTATION OR UPON DELIVERY OF MATERIAL AND
EQUIPMENT MUST NOT BE USED EXCEPT BY PERMISSION OF THE OWNER.



NO.	LOC.	DESCRIPTION	DESN DATE	APPD DATE	REVISIONS

GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED		
LINEAR DIMENSIONS	LENGTH OF BEARING	SURFACE FINISH
UF70	6 ± 0.1	SIDES OF ANGLES
6 - 30 ± 0.2	1 - 6 ± 1°	IN METRIC 315/CLA
30 - 120 ± 0.3	30 - 120 ± 0°30'	CHAMFER 1 x 45°
120 - 315 ± 0.5	120 - 400 ± 0°10'	
315 - 1000 ± 0.8		
1000 - 2000 ± 1.2		
2000 - 4000 ± 2.0		

AutocAD FILE No.:		W.O. NO.:		CODE NO.:	
PROJECT OR SECTION		TITLE:		APPTD. Dr. Anubhav Sharma	
1 MV Mark generator		Chamber & Assembly Chamber & Support		REVISION NO. OR BEIN.	
DESIGNED: Sanyam 04/02/2019		GOVERNMENT OF INDIA		SCALE: N.T.S.	
CHKD: Sanyam 14/02		BHABHA ATOMIC RESEARCH CENTRE		FRON.	
DESIGN: Sanyam 14/02		ACCELERATOR & PULSE POWER DIVISION		DRAWING NO. 1MV MARK	
				REV. 0	