

RAIL COACH FACTORY, KAPURTHALA

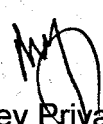
MD46111

Date: 29.08.2019

Sub: Issue of Specification no.MDTS-26001, Rev-04 for Special Terms and condition for procurement of Retention Tank system for LHB Coaches.

Please find enclosed the specification no. MDTS-26001, Rev-04 for Special Terms and condition for procurement of Retention Tank system for LHB Coaches.

All concerned are requested to take the necessary action.

 29/08/2019
(Abhey Priya Dogra)
Dy CME/D-2

Dy CPLE-II

Copy to: -

CQM, CPLE, CWE/Fur, CMM/RCF, CMT, CMM/TKJ
SSE/Record (With Original Specification)
SSE/Lib/Design
SSE/Design/RCF/TKJ



SPECIFICATION	SPECIAL TERMS AND CONDITION FOR PROCUREMENT OF RETENTION TANK SYSTEM FOR LHB COACHES	MDTS 26001 REV: 04 PAGE 1 OF 10 Date 16.08.2019
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Name	Designation	Signature	Date	Leve
T.P. Singh	SSE/Fur(D-2)		16.08.17	Prepared
Ravi Ranjan Kumar	ADE/FUR		23.08.19	Agreed
Abhey Priya Dogra	Dy.CME-2		23.08.19	Reviewed
Manish Bhimte	CDE		26.8.19	Approved

Rev	Details of Changes	Date
03	<p>Clause 7.5 added-for testing of Dye Penetrate Test of welds by inspecting agency on at least 5% quantity offered for inspection.</p> <p>In Clause 10 of annexure-A, requirement of certification for welder added as per ISO 9606 part-1.</p> <p>In clause 2.1 and in clause -10 of annexure-A, requirement of CNC laser cutting machine added. Availability of CNC laser cutting machine is must for "approved vendors". However, development order can be places on a firm having valid tie-up in the form of MOU with the agency having CNC laser cutting machine in-house in working order.</p>	10.03.17
04	<ol style="list-style-type: none"> Clause 8 for warranty revised from Clause 3200 of Indian Railway Standard conditions of contract specifying warranty /guarantee to 84 months from the date of supply or 72 months from the date of commissioning of coach. Filler metal specification IS: 5206-1983 equivalent to DIN 8556 is added in Clause 4.2.1. 	16.08.17

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1. PREAMBLE :

- 1.1. IR-DRDO retention tank system containing anaerobic bacteria converts human fecal solid matter into inoffensive liquid & gases.
- 1.2. This Special terms and conditions specify the equipment requirements to be fitted on different types of LHB coaches on Indian Railways. This also includes installation/commissioning.
- 1.3. Firm should have well-established stainless steel manufacturing facilities or have supplied these types of tanks in past or similar fabrications items. List of M&P and records of previous supplies to be submitted along-with the offer. In absence of this information offers shall be deemed as incomplete and may not be considered.

2. ELIGIBILITY CRITERIA:

- 2.1. The tenderer must submit detailed clause-wise comments on the specification and specify mention about the availability of in-house CNC Laser cutting machine in working order. Availability of CNC laser cutting machine is must for "approved vendors". However, development order can be placed on a firm having valid tie-up in the form of MOU with the agency having CNC laser cutting machine in-house in working order. A copy of MOU is to be submitted along with the tender in absence of above, offer shall be deemed as incomplete and may not be considered.
- 2.2. Since anaerobic IR-DRDO retention tank have complexity in manufacturing and requires development time bulk or regular procurement orders should only be given to the firms who have successfully supplied anaerobic IR-DRDO retention tanks to RCF/ICF IR in past, and have the infrastructure as mentioned in Annexure-A. Availability of infrastructure as mentioned in Annexure-A is must for development orders.

3. SCOPE OF SUPPLY:

- 3.1. Retention tank with accessories as per drawing indicated in the tender description.
- 3.2. Notice "Jointly developed by IR and DRDO" will be in the scope of tenderer. This will be pasted on the tank.
- 3.3. Traceability plate of stainless steel either engraved or punched shall be in welded on suitable visible location of retention tank as indicated in drawing, describing; Firm's name, Year of manufacture and manufactured and manufactured by in house CNC laser cutting machine or from outside agency.
- 3.4. Notices for users and maintenance personnel will be in the scope of tenderer. This will be supplied and fixed in the coach, as decided between the tenderer and IR in three languages. Quantity in numbers will be the same as the firm has order for IR-DRDO retention tank.
- 3.5. Firm has to give equipments along with its accessories for pressurising the flushing water on lavatory pan. This pressurising equipment can be assisted pneumatically or electrically or by both. CDTs type pan will be provided in oriental or European toilets in these in these coaches. 110 V DC and 6 bar pneumatic pressure will be available in these coaches.
- 3.6. Supply, installation and commissioning will be in the scope of tenderer.

4. Technical Requirements:

- 4.1. For selection of material & electrode and manufacturing process, firm should follow the guidelines mentioned in the annexure-B along with flow chart.

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- 4.2. All components and sub-assemblies will be manufactured to a standard for high level of ruggedness, corrosion resistance, and reliability and long-life. There should be no maintenance requirement like painting, lubrication, oiling, periodic tightening of fasteners etc. All fasteners should be of locking type and should not get loose due to coach vibration. If due to any technical/commercial reason, a component/part or sub-assembly does not meet these requirements. It should be clearly spelt out in the offer and the maintenance requirements shall be furnished. However if any choking or mal function occurs due to any unforeseen reason, tenderer will rectify it under warranty with proper tools and equipments to ensure cleanliness and hygiene in the depot.
- 4.3. The tenderer must have adequate plant and manufacturing capacity to manufacture and supply the tank system being offered to IR within the delivery schedule. Tenderer should have supplied these types of tanks or similar fabrication items.
- 4.4. The tenderer should have established quality control system and organisation to ensure quality of the product and should be an ISO 9000 certified company or should have an internationally certified quality control system.
- 4.5. The tenderer should have adequate financial stability and status to meet the obligations under the contract and should submit a report from a recognized bank or a financial institution. The tenderer should also submit a copy of his company's annual report of last three years.

5. OPERATING CONDITIONS :

5.1. Ambient Conditions :

-4°C to 55°C with 100% humidity and dust. Retention tank system should not get damaged in these conditions. Quality of manufacturer should be excellent. Temperature variations can be quite high in the same journey or short period of time. Most coaches are based in coastal cities, with continued exposure to salt laden air.

5.2. Car-Body dynamics and forces on retention tank system :

±100 mm vertically.

±55 mm laterally

±10 mm longitudinally

±4° bogie rotation about center pivot.

Maximum Speed of train – 130 KMPH.

Fitment installation and commissioning with two security ropes of SS should be done to ensure safety along with positive mounting.

6. MARKING :

- 6.1. Manufacturer's name with the serial/batch number along with month and year of manufacture shall be marked at a visible location for identification.
- 6.2. Separate indication as 'Jointly developed by IR and DRDO shall be marked.
- 6.3. Notices for users and maintenance personnel shall also be supplied for fixing in the coach, as decided between the tenderer and IR in three languages.

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7. Testing and Approval of prototype :

- 7.1. Tenderer must submit and get approval of quality Assurance Plan from CDE/RCF before taking up prototype manufacture.
- 7.2. One Prototype of each variant shall be inspected at firm premises on test stand by CDE/RCF. After inspection at firm premises on test stand same prototype will be fitted on coach for fitment approval before bulk supply. Supplier has to incorporate any changes noticed during the inspection without any additional cost. Bulk manufacturing will be commenced only after clearance of prototype by CDE/RCF.
- 7.3. Test certificates to be submitted by the manufacture for raw material and testing of all critical components/assemblies.
- 7.4. If supplier upgrades any component/sub-system on this equipment, he shall get it approved by RCF before its implementation.
- 7.5. Inspection agency shall carry out Dye Penetrate Test of welds on atleast 5% quantity offered for inspection. Acceptance standards for welds shall be as per EN25817-1992 TIG welding intermediate(C).

8. WARRANTY :

Tender shall ensure Warranty for 84 Months from the date of supply or 72 months from fitment, whichever is earlier. During warranty, the tenderer shall rectify the equipment by replacing or repairing components at his cost. The warranty period would get extended on pro-rata basis if warranty replacement/repairs is not provided within 5 days of notice. If tenderer fails to provide warranty in 5 days of notice, Railway reserves the right to cancel balance contract.


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Annexure-A

Infrastructure Requirements

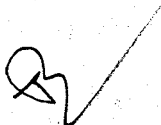
1. Separate covered area for manufacturing of stainless steel components to avoid iron contaminations and also having adequate space underneath for storage of raw materials. The covered area should have display board showing different colour shades nominated to different grades of steel to avoid mix up of materials.
2. Availability of CNC laser profile cutting machine in-house is must for "approved vendor". However, developmental order can be placed on a firm having valid tie-up in the form of MOU with the agency having CNC laser cutting machine in-house in working order. A copy of MOU to be submitted along with the tender. During inspection of material, the firm should be able to submit documentary evidence in form of challan, invoice, transport bill etc, in support of having cut the components from CNC profile laser cutting machine from outside agency. Railway or inspecting agency on behalf of railways may visit/verify the availability and use of laser cut machine with tied up agency.
3. Adequate drilling facilities of suitable of suitable capacities and standard makes should be available.
4. The firm shall have at least one press brake of suitable capacity along-with punch and dies for component forming.
5. Only TIG welding with Argon shielding gas should be used for fabrication of tanks. For this minimum two TIG welding plants should be available with the tenderer.
6. Adequate Nos. of hand grinders for removal of fins & burrs shall be available.
7. Handling equipments such as slings, hooks and lift truck forks should be protected with clean wood, cloth or plastic buffers to reduce contact with the iron surface.
8. Proof of procurement of raw material from reputed stainless steel manufacturer and their test certificate shall be enclosed by inspection agency along-with the inspection certificate.
9. The raw materials e.g. electrodes and hardware should be procured from the authorized distributor of original manufacturer and firm should procure material with test certificate.
10. The welders shall be certified as per ISO 9606 part-1. The welders shall also have adequate experience of TIG welding.
11. The fabricator shall have adequate fabrication and process capability to obtain all the tolerances and geometrical tolerances and shall have arrangement of jig/fixture/clamping device for main assembly & sub-assembly work.
12. The firm must have the immersion tanks with FRP lining for acid cleaning, neutralization and water rinsing.
13. **Testing Facilities:**
 - (a) **Chemical Lab:** The firm shall be ready for carrying out spectographic analysis of the material from NABL certified lab at their own expense as and when required.
 - (b) **Physical Testing Lab:** The firm shall be ready for carrying out testing for UTS, Yield strength from NABL certified lab at their own expense as and when required.
 - (c) **Other Testing Facilities:** The firm shall possess the following:
 - i. The firm shall have suitable arrangement in house for testing the leakage's etc.
 - ii. The firm shall have adequate facilities for preparation of test sample. Facilities like machining, grinding, polishing etc. should be available in house.
 - iii. Adequate number of fine punches for stamping marking particulars on finished components.

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- iv. Adequate numbers of measuring instruments such as:
- v. Digital Vernier Calipers - 0 mm to 300 mm.
- vi. Inside & outside Micrometers - Ranging from 0 to 150 mm.
- vii. GO & NO-GO gauges.
- viii. Profile gauges


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Annexure-B

1) Guidelines for selection of material and welding consumables :

- a) **Stainless steel sheets** : Selection of Stainless steel sheets for manufacture of Stainless steel IR-DRDO retention tank must be according to the drawings. The state of material, condition, finish etc. should be as per following guidelines:

Heat treatment condition	The material must be cold rolled skin Passed, solution annealed and de-scaled
Finish	2B
Material grade and Designation	As per drawing provided with tender
Protection procedure	The SS sheets must be protected with LDPE film of 90±10 µms thickness

- The steel sheets shall be cleanly rolled to the dimensions, weights and tolerances specified. These shall be free from cracks, surface flaws, laminations, rough, jagged and imperfect edges, unevenness and other harmful defects detrimental to the end use.
- Supplier must ensure above information on the WTC obtained from SS sheet supplier prior to purchase of the material for IR-DRDO retention tank manufacturing. The inspection agency should also ensure above details on material WTC.

b) **Welding consumables:**

- All the joints shall be TIG welded by a filler rod confirming to table given below:

Parent metal A	Parent metal B	Filler metal (material no. as specified in DIN8556 or IS:5206-1983)
X04Cr17Ni12Mo2Ti to IS: 6911-92, Equivalent to AISI: 316Ti, AISI 316, and AISI 316L.	X04Cr17Ni12Mo2Ti to IS: 6911-92, Equivalent to AISI: 316Ti, AISI 304 and AISI 316L.	SG 1.4430 or IS:5206- 1983 E23.12L
X04Cr19Ni19 to IS: 6911-92 Equivalent to AISI 304	X04Cr19Ni19 to IS: 6911-92 Equivalent to AISI 304	SG 1.4316 or IS:5206- 1983 E19.9L

- Acceptance standards for welds shall be as per EN25817-1992 TIG welding intermediate(C).
- Argon gas: Gr.1 of IS: 5760-1983.
- Grinding wheels shall be free from iron, iron oxide, zinc or other undesirable materials that may cause contamination on the surface.

2) **Recommended practice for welding, cleaning and passivation processes:**i. **Welding process:**

Welding process to be used is DC TIG welding in pulsing mode with digital TIG welding machine only.

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Annexure-B

ii. Cleaning and Passivation:

- Surface contaminants such as free iron, oxide scale, rust, grease, oil, carbonaceous or other residual chemical films, soil, particles, metal chips, dirt or other nonvolatile deposits might adversely affect the metallurgical or sanitary condition or stability of a surface. These may impair the normal corrosion resistance or result in later contamination of the stainless steel or cause product contamination at a later stage and should be cleaned and de-scaled.
- Remove all solid floating particles steel chipping, filing, dust, welding slag before start of the acid cleaning process.
- Acid Cleaning: Nitric-Hydrofluoric acid solution is to be used to remove both metallic contamination and welding and heat treating scales.
- Surface to be de-scaled are to be pre-cleaned prior to chemical treatment. The component/assembly should be totally immersed in the pickling solution. The surface should be in contact with the immersion solution until inspection shows that complete scale removal has been accomplished.
- Rinse the assembly thoroughly with water. Over pickling must be avoided.
- A neutralizing treatment, after completion of acid cleaning and passivation, by using aqueous caustic solution containing NaOH 10% by weight for a period of 5-60 minutes should be used as a final dip to remove smut. After that thorough water rinsing and drying operation is to be carried out. The pH of the rinsing water shall be from 6-8.
- NOTE:** The process of acid cleaning, water rinsing, neutralization treatment, final fresh water rinsing must be done in sequence without giving any waiting time between the processes to avoid staining on the surface.
- Free iron examination test (Ferroxyl test) should be carried out immediately after acid pickling and neutralization treatment to confirm that there is no free iron available on the surface. In case of positive test for free iron the whole process of acid pickling neutralization and water rinse should be repeated.

iii. Solutions in water are as follows:

For acid cleaning :

Conc. HF4	6% by volume
Conc. HNO3	15-20% by volume.
Immersion Time	10-15 Minutes (max.)
Temperature	30-40 °C (When temp. is low exposure time may be increased)

For neutralizing treatment:

NaOH	10% by weight
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For ferroxyl test solution;

Distilled water	01 liter
Nitric acid (Conc.)	20 ml
Potassium Ferricyanide	30g

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**Annexure-B**

Note: Tanks for acid cleaning, neutralizing treatment and water rinsing should be made of stainless steel plates with FRP lining.

3) Handling, Storage and Transportation :

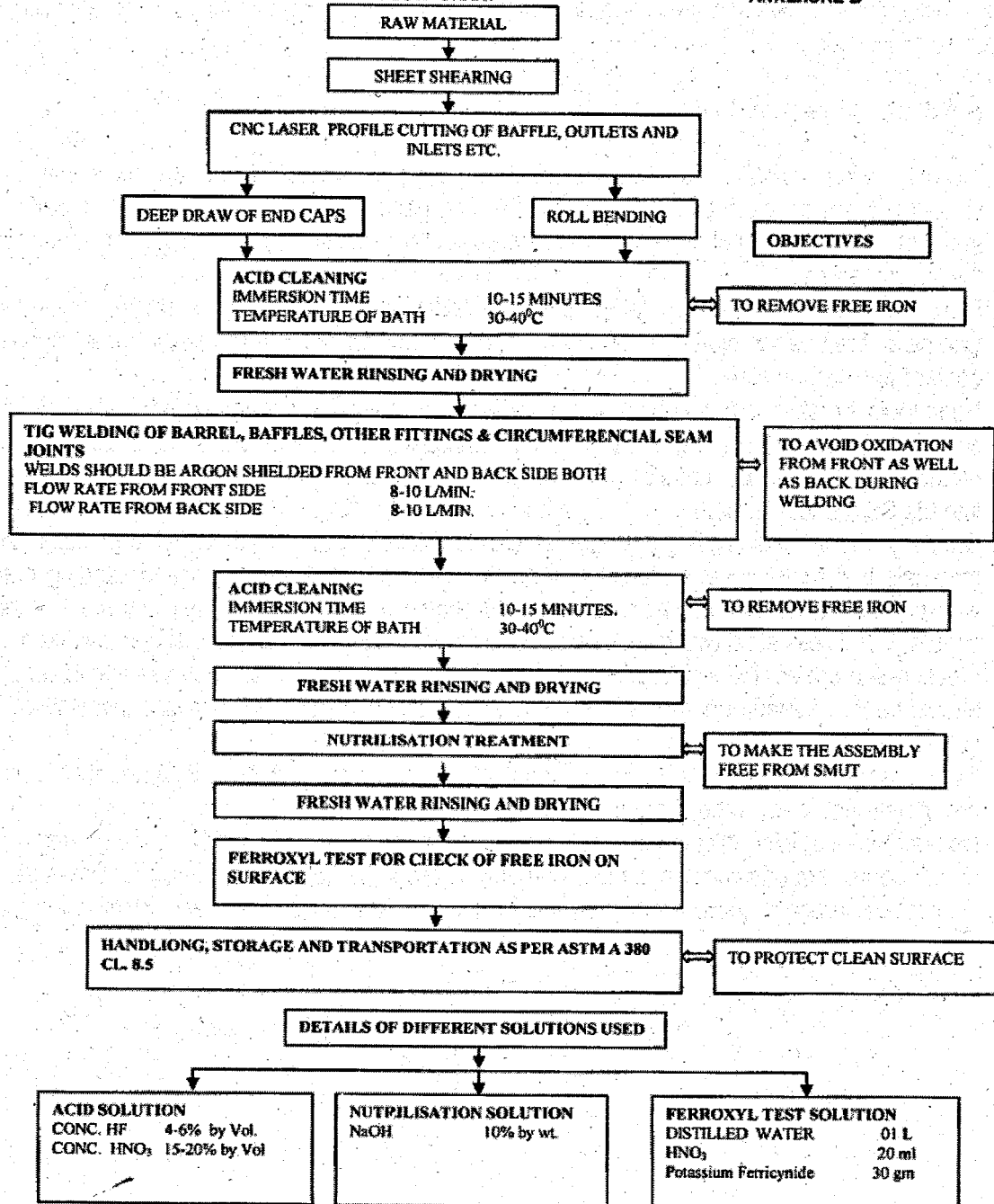
- a) Walking on the stainless steel surface should be avoided, where unavoidable, personal should wear clean shoe covers each time. Kraft paper, blotting paper, paper board or flannel or other protective material should be laid over areas where personals are required to walk. Supplier needs to make all these arrangements.
- b) Shearing tables, press brakes, layout stand and other carbon steel work surfaces should be covered with clean kraft paper, blotting paper, paper board or flannel or other protective material to reduce the contact with carbon steel.
- c) Hand tools, brushes, molding tools and other tools and supplies required for fabrication should be segregated from similar items used in the fabrication of carbon steel equipment and should be restricted to use on one material. Tools and supplies used with other materials should not be brought into the SS fabrication area.
- d) Grinding wheels and sanding material should not contain iron, iron oxide, zinc or other undesirable materials that may cause contamination on the surface. Grinding wheels and sanding material and wire brushes previously used on other metals should not be used on stainless steel. Wire brushes should of stainless steel which is equal in corrosion resistance to the material being worked on.
- e) Measures to protect the cleaned surfaces should be taken as soon as final cleaning is completed and should be maintained during all subsequent fabrication, inspection, storage and installation. The basic guidelines are as follows :
 - f) Do not remove wrappings and seals from incoming materials that is IR-DRDO retention tank until they are at use site, ready to be used or installed.
 - g) Do not store the finished cleaned materials and components stored directly on the ground or floor and
 - h) do not permit these to come in contact with galvanized or carbon steels, Zinc, lead Brass etc.
 - i) Do not use carbon or galvanized steel wire for bundling and galvanized steel identification tags.

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FLOW CHART

ANNEXURE-B



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RAIL COACH FACTORY, KAPURTHALA	SPECIFICATION FOR ADHESION PROMOTING PRIMER	MDTS48279 Rev-03 Page 14 of 15 Dated 13.09.2019
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APPENDIX – II

PROCEDURE FOR DETERMINING OF POT LIFE

Take the usable time as the pot life of paint. Condition the components of the coating for one hour at $27 \pm 2^{\circ}\text{C}$ and mix immediately in proper ratio to get approx. 200 ml. of paint in 250 ml. of container. The lid should be loosely placed on the container.

1. Measure the viscosity initially and every hour thereafter. However, the interval may be shortened, if desired.
2. Near the end of the paint's working life, the viscosity builds-up rapidly. During this period, when it appears the paint may be too viscous to spray, remove a small portion and add the appropriate thinner. If the paint can still be thinned, the end of the working life has not been reached. The end of the working life is reached when the paint gels, becomes stringy or cannot be thinned for application.

APPENDIX- III

KEEPING PROPERTIES

When stored under cover in a dry place in the original sealed containers under normal temperature conditions, the material shall retained the properties prescribed in the specification for the stipulated period from the date of manufacture which shall be subsequent to the date of placement of contract.

APPENDIX-IV

TEST METHOD FOR DETERMINATION OF AMINE VALUE

Purpose:

This method determines amine value of Part B of NAPP primer using potentiometric titration.


Safety Precautions:

1. Proper personal protective equipment should be worn during transfer of materials so that injury due to spillage is avoided.
2. Review MSDS for each material before handling.

Reagents:

1. Bromophenol Blue Indicator
2. Isopropanol/DI Water Solution–80/20 by volume
3. 0.5N HCl aqueous solution.


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