



झारखण्ड राज्य सहकारी दूध उत्पादक महासंघ लिमिटेड



**Jharkhand State Cooperative Milk Producers' Federation Ltd**  
**Medha Dairy, Near Birsa Munda Jail, Hotwar, Ranchi – 835217**

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**TENDER FOR**  
**DESIGN, FABRICATION AND INSTALLATION OF ROAD MILK TANKER**  
**BARRELS**

**TENDER No. JMF/RMT BARREL/HOTWAR/2018-19/02**

Date of Publish of Tender : 15 Aug 2018

Last date for submission of sealed tender : 05 Sep 2018 by 17:00 hrs

Name of Tenderer: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone no: \_\_\_\_\_

Email Id \_\_\_\_\_



**Quotations are invited for Design, Fabrication and Installation of Road Milk Tanker, Single/Double Compartment Barrel**

The Jharkhand State Cooperative Milk Producers' Federation Ltd. (JMF), registered under Jharkhand Co-operative Societies Act, 1935 is engaged in milk procurement, processing and marketing activities of item milk and milk products in the state of Jharkhand and is popularly known for its brand 'Mother Dairy- Medha'. Under an MoU, the Federation is being run and managed by the National Dairy Development Board (NDDB).

Offers/Quotations are invited in a Sealed Envelope from reputed manufactures/suppliers for the Design, Fabrication and Installation of Road Milk Tanker Barrels. Technical details of items can be seen in the enclosed format.

Offers/Quotations may be submitted to the undersigned **on or before Sep 5, 2018 by 17:00 hrs** in a sealed cover super-scribed clearly with **"Offers for Design, Fabrication and Installation of 8KL & 20KL Road Milk Tanker Barrels"**.

**This tender document contains the following: -**

- i) Tender Document with Terms & Conditions
- ii) Tenderer Profile-Annexure-I
- iii) Technical Specification-Annexure-II
- iv) Financial/Commercial Bids-Annexure-III

**Instructions for submitting of Tender:**

1. The tender is being invited under two bid systems i.e.,
  - a. Technical Bid and
  - b. Commercial/Financial Bid.
2. The interested supplier/manufacturer is required to submit the **Technical Bid** in a separate sealed envelope super-scribing *"Technical Details- Tender for Design, Fabrication and Installation of 8KL & 20KL Road Milk Tanker Barrels"* and **Commercial/Financial Bid** in a separate sealed envelope super-scribing *"Commercial/Financial Bid for Design, Fabrication and Installation of 8KL & 20KL Road Milk Tanker Barrels"*.
3. The 'Technical Bid' should contain all the details and required documents as mentioned in the Annexure-II.
4. Bids received in any manner other than as prescribed above are liable to be rejected summarily.

**General Terms and Conditions**

1. The tenderer need to fulfil its complete detail as requested in the prescribed format enclosed as Annexure -I "Proforma for filing Tender".



2. The tenderer must follow the specifications while quoting for Equipment as mentioned in enclosed Annexure – II.
3. The tenderer must quote the rate of equipment(s) on F.O.R. Destination basis inclusive of P&F, Taxes, Insurance, Freight/Transportation charges etc.
4. The tenderer need to quote the rate for the item(s)/ material(s) as per the format enclosed as “Annexure-III (Commercial/Financial Bid)”.
5. The quoted rate shall be valid for 90 days from the date of opening of offers/bids.
6. All entries in the ‘Tender Form’ should be legible and filled clearly. If the space for furnishing information is insufficient, a separate sheet duly signed by the authorized signatory may be attached. No overwriting or cutting is permitted in the Price Bid Form (Annexure-III -Commercial/Financial Bid). In such cases, the tender shall be summarily rejected.
7. On awarding of the order to qualified supplier/ manufacturer, the party has to Design, Fabrication and Installation of 8KL & 20KL Road Milk Tanker Barrels at the quoted rate as per enclosed specification and as per the delivery schedule stipulated in the purchase/work order
8. The tenderer must indicate their GST and PAN nos as mentioned in the proforma, falling which the offer of the party will be summarily rejected.
9. The Company guarantees that the goods manufactured by it and delivered hereunder will be free of defects in materials and workmanship for a period of twelve (12) months from the date of shipment.
10. On receiving orders from JMF, the supply of Product at Jharkhand Milk Federation, Ranchi or any location specified by it shall be the responsibility of the supplier. The rejected material, if any, shall have to be lifted by the supplier at their own cost within a week time from the date of intimation from JMF. JMF shall not be responsible for any deterioration due to delayed lifting of the rejected material by the supplier.
11. Material to be suitably packed to prevent damages during transit.

**Payment Terms and Conditions:**

1. 30% Advance against Bank Guarantee valid till the supply is affected. 60% within 30 days from the date of receipt and its acceptance. 10% after one year from the date satisfactory Commissioning and performance trial. However, this can be released along with 60% payment against submission of a bank guarantee for 10% value valid for one year from the date of Commissioning.
2. The tenderer shall have to pay Earnest Money Deposit (EMD) 1% of the total quoted value in form of crossed Demand Draft (DD) in favour of “Jharkhand State Cooperative Milk Producers Federation Ltd”, payable at Ranchi while submitting the tender. Submission of earnest money by any mode other than specified above shall not be accepted and the related tender shall not be eligible for consideration.



3. Earnest money deposit (EMD) of unsuccessful tenderers will be returned back within 60 days from the date of opening of the tenders. The earnest money deposited of the successful tenderer shall be released on completion of successful supply of entire quantity allotted /ordered within the stipulated period.
4. No interest will be paid on the earnest money for the period during which it (the earnest money) lying deposit with the Jharkhand Milk Federation.
5. JMF reserves the right to accept or reject any or all the offers without assigning any reason thereof. Managing Director, JMF shall be Arbitrator in case of any disputes and his decision will be final and binding on both the parties. For all legal matters & dispute Ranchi court shall be our Jurisdiction. Any money found recoverable shall be recovered under the public Demand Recovery Act without prejudice to any other mode of recovery.

**General Manager,**  
**Jharkhand Milk Federation**  
Medha Dairy Plant,  
Beside Birsa Munda Central Jail  
Hotwar, Ranchi-835217  
Jharkhand



**ANNEXURE-I**  
**TENDERER'S PROFILE**

1. Name of the Tenderer/Company:.....
2. Nature of the Tenderer/firm: .....  
(Proprietorship/Partnership/Pvt. Ltd. Co./Any other firm)
3. Address of the Tenderer: .....  
.....  
.....
4. Contact Info:  
Telephone Nos. ....  
Mobile.....  
E-mail: .....
5. GSTIN No. .... PAN No.: .....
6. Bank Details:  
Bank name .....  
Account No. .... IFSC Code .....

To be submitted in separate sealed cover

I / We hereby declare that the information furnished above are true and correct.

Date:

Place:

(Signature & seal of the Tenderer)

Name:

Designation:



## ANNEXURE-II

### TECHNICAL SPECIFICATIONS

#### ROAD MILK TANKER BARRELS

**CAPACITY & QUANTITY: 2 nos. of 8000 L & 2 nos. of 20000 L**

**CAPACITY: 8000 L Double compartment Barrels**

**QUANTITY: 2 Nos.**

**SCOPE OF WORK:** Design, Fabrication and installation of Road Milk Tanker on the chassis to be provided by JMF and Supply to Medha Dairy, Hotwar, Ranchi, a unit of Jharkhand Milk Federation, Ranchi.

**ELIGIBILITY:** The bidders should have completed at least one purchase order for similar nature of work (i.e., supply of barrel for milk tankers) for a value not less than Rs. 30.00 lakhs in co-operative dairies/NDDB in last 3 years

#### 1.0 FUNCTIONAL REQUIREMENTS

##### 1.1 General Description

The fixed chassis double compartment tanker would be used to transport pasteurized, chilled milk on rough surfaces and asphalt road over long distances.

##### 1.2 Chassis

The barrel should be mounted on chassis. The details of the chassis shall be provided subsequently.

The chassis will be supplied to you as free issue.

#### 2.0 DESIGN REQUIREMENTS

##### 2.1 Capacity:

The insulated barrel would be round in shape & double compartment having brimful capacity of maximum permissible but not less than 8000 L.

##### 2.2 Dimensions:

The length and diameter of the barrel should be such that the available length and width of the chassis are fully utilized.



### 2.3 Height:

The maximum over all height of the tanker should not exceed 3250 mm.

### 2.4 Slope:

The barrel bottom of the inner shell should slope towards the outlet provided at the rear end of barrel for free and complete drainage of liquid.

### 2.5 Insulation:

The insulation should withstand high temperature of 98<sup>o</sup> C in place cleaning. It should not permit more than one Deg.C rise in emp. in 18 hours when temp gradient is 35<sup>o</sup> C. & milk temp. is 4<sup>o</sup> C.

### 2.6 Interlocking:

Interlocking arrangement is to be made in such a way that the manway should remain open during CIP cleaning.

### 2.7 CIP Lines :

There shall be single CIP connection on the man way and leading to a 2 nos. stationary spray ball of 100 mm dia. The connection shall be of 38 mm size having SMS male connection. All the CIP lines should be located inside the barrel with CIP inlet inside the dust cover. All the CIP lines should be of welded construction.

### 2.8 Blank Nuts:

All the blank nuts provided should be of SMS type. The blank nuts should be permanently fixed to barrel by SS chain of 3 mm rod links.

### 2.9 Outlet:

The outlets should be of cup type with easy access from bottom (i.e. the bottom portion of outer shell below outlet cups should have 300 x 300 mm opening with bolted cover for inspection chamber made from AISI 304) and fully supported by AISI 304 gussets. The inspection cover should have a handle and also ¼" dia SS 304 pipe one side welded with cover plate and other side threaded. This shall act as weeping hole.

### 2.10 Finish:

All the visible welding joints are to be ground smoothly. All the inner surfaces of inner shell should be original 2B finish or polished to 150 grits. The outside surfaces of outer shell should be left with original 2 B mill finish or should be finished to 150 grit.

### 2.11 Barrel:



The insulated barrel should be round in shape and should be of double compartment construction having brimful capacity of maximum permissible but not less than 9000 L.

#### 2.12 Dish Ends:

All dished ends should be independent dished ends. There should not be any common or partition dished end.

### 3.0 SCOPE OF SUPPLY

#### 3.1 Inner Shell

3.1.1 Inner shell shall be fabricated of stainless steel AISI 304 sheet of 2 mm thickness.

#### 3.1.2 Inner Dished Ends

3.1.2.1 The crown radius, knuckle radius and straight portion of inner dished ends should be fabricated from 3 mm thick SS sheet conforming to AISI 304. The dish shall be formed by pressing and/or spinning but not manually - 2 nos.

3.1.2.2 The ratio of crown radius to knuckle radius should be around 10.

3.1.3 The all welding joints of inner barrel should be done from inside as well as from outside.

3.1.4 The bottom portion of SS barrel below the manway opening should be suitably strengthened by providing extra padding plate of 5mm thick to avoid cracking or sinking of the barrel bottom. The padding plate should not be directly welded to inner shell, it should be welded through SS cleats.

#### 3.2 Stiffening Rings

3.2.1 Adequate numbers of stiffening rings fabricated from standard mild steel sections should be provided on inner shell so as to form a complete cage type structure.

3.2.2 Compressed asbestos flats of minimum 5 mm thickness should be provided towards inner as well as outer shell on the stiffening rings to avoid Heat Bridge.

3.2.3 The stiffening rings shall be welded to SS fabricated cleats which should be welded to inner barrel. Sufficient nos. of cleats should be provided on





circumference of inner shell to hold the stiffening rings in position and also to take care of expansion and contraction of the inner shell. Centre to centre line distance between two SS cleats should not be more than 500 mm.

3.2.4 There shall be proper supporting structure for outer shell and dished ends.

3.2.5 The place where outer shell welding joint is coming on the MS stiffening structure, a AISI 2 mm plate should be provided over the structure to work as back up plate for welding.

### 3.3 Insulation

3.3.1 The inner shell shall be properly insulated in five layers of insulation as give below:

1<sup>st</sup> layer should be of 15 mm thick polyurethane foam (PUF) having density of 35 Kg/m<sup>3</sup> and applied radially.

2<sup>nd</sup> layer should be of 15 mm thick polyurethane foam (PUF) having density of 35 Kg/m<sup>3</sup> and applied longitudinally.

3<sup>rd</sup> layer shall be 50 mm thick expanded polystyrene foam (EPS) having density of 16 – 20 kg/cm<sup>3</sup> applied radially.

4<sup>th</sup> layer should be of 15 mm thick polyurethane foam (PUF) having density of 35 Kg/m<sup>3</sup> and applied longitudinally.

5<sup>th</sup> layer: Finally, aluminium foil of 0.07 mm thickness shall be provided as cover and moisture barrier over the insulation.

3.3.2 The inside of outer shell and outside of inner shell shall be coated with two pore free coats of high melting point bitumen of 90/15 and 80/25 grade respectively or it could be painted with bitumen paint.

3.3.3 Wherever the welded joints of outer shell comes in contact with insulation the entire length of the welding joint shall be insulated with 150 mm wide and full depth with resin bonded fibre glass wool density 24 Kg/m<sup>3</sup>.

### 3.4 Outer Shell

3.4.1 The outer shell should be fabricated out of stainless steel sheet 2mm thick conforming to AISI 304.

#### 3.4.2 Outer Dished Ends



3.4.2.1 The crown radius, knuckle radius and straight portion of outer dished end shall be fabricated from 3 mm thick SS sheet conforming to AISI 304. The dished end shall be fabricated by pressing and / or spinning but not manually.

3.4.2.2 The ratio of crown radius to knuckle radius should be around 10.

3.4.2.3 4 mm thick 50 SS flat shall be provided to facilitate welding of outer dished ends to outer shell. The flat should be properly supported from horizontal members of cage structure.

3.4.3 Dust Cover: A lockable round dust cover resting on round dust cover bed shall be supplied. The dust cover and dust cover bed shall be manufactured from AISI 304 SS sheet of 2 mm thickness. The dust cover should have gasket fitted at the edge and shall also have 4 nos. of louvers 90 degree apart to act as breathers. The hinges of dust cover shall have stopper to permit opening of the dust cover only by 100 degree angle. The dust cover shall have rubber gasket at the edge. The dust cover should open in opposite side of catwalk way.

#### 3.4.4 Rear Side Skirting

The rear end of barrel shall be provided with side skirting upto the height of side gutter cum walkway. The rear and side skirting should be manufactured from AISI 304 SS sheet 2 mm thick. The one end of side skirting shall be welded to the barrel, bottom to be welded to rear platform. One side shall be welded to barrel. The other side shall be folded and welded to drain pipe of side gutter.

3.4.5 Rear Platform: The rear dimpled platform shall be fabricated from AISI 304 dimpled SS sheet 2 mm thick. The rear platform shall be welded to valve box and shall be flushed with valve box.

A proper structure shall be provided below the rear platform. The structure shall be bolted to chassis member.

#### 3.4.6 Grab Handles:

3.4.6.1 Two 500 mm grab handle one each on either side of rear outer dished end should be provided. The grab handles should be made from 25mm SS pipe of 14G.

3.4.6.2 Two grab handles at top one on each side. It shall be provided to full length of barrel and shall be manufactured from 25 dia SS pipe. It shall have proper supports.

#### 3.4.7 SS Steps

Both sides of rear side skirting should have one footstep each to climb on side gutter cum walk way. The step should be manufactured from 25 dia SS pipe of 14G.

#### 3.5 MS Runner



3.5.1 The complete insulated barrel should be mounted on MS runner of suitable design. The thickness of MS runner shall be suitably worked out but shall never be less than 5 mm thick to avoid corrosion. The barrel shall be fixed to chassis by EN8 'U' bolts and nuts with cotter split pin or counter nuts. Suitable fabricated MS spacers should be provided on the chassis wherever 'U' bolts are provided, Aluminium cast packing shall be provided between U bolts and chassis.

3.5.2 Adequate numbers of gussets fabricated out of 3 mm thick SS sheet conforming to AISI 304 shall be provided. Between SS gussets and outer shell of 75 mm wide AISI 304 SS sheet 3 mm thick padding plate extending at least 25 mm more than gusset on both ends shall be provided. The gussets shall be full welded to padding plate and MS runner. The SS padding plate shall be full welded to outer shell. The gusset shall cover at least 30% of the outer shell circumference.

3.5.3 The MS runner should be welded to 5 mm thick MS plate of 100 mm width which shall be bolted to the chassis. Wherever holes are available on the chassis the same shall be fully utilized to prevent sliding of the barrel on chassis.

3.5.4 12mm thick bellatte packing shall be provided between runner and chassis throughout the length.

3.5.5 A 3 mm SS padding plate shall be provided between outer shell and MS runner. Padding plate will be continuous and throughout the length. It will be full welded to outer shell. MS runner will be full welded to SS padding plate.

### 3.6 Rub Rail:

Suitable size and type of rub rail shall be provided on both the side to the full length of barrel. The rub rail will be fitted on side gutter cum walk way.

### 3.7 Side Gutter Cum Walk Way:

175 mm wide side gutter cum cat walk way shall be provided on both the sides, to the full length of barrel. The gutters shall be properly supported by SS gussets to the barrel and shall have enough slope towards rear end. It shall not be visible from rear end (i.e., covered by rear end skirting). Both the gutters shall be provided with SS drain pipe at rear end which should work as edge stiffening for rear end skirting. The SS drain pipe should not be visible and it should be concealed in rear end skirting plate.

### 3.8 Top Walk Way:

The top walk way made from minimum 2.5 mm thick AISI 304 SS dimpled sheet with a width of 400 mm shall be provided at the top of the tanker between the two manways. The top walk way should be supported/ fixed with proper structure.



### 3.9 Side Ladders:

For access to top walk way, approach ladders fabricated from 25 mm dia 14 G SS pipes with suitable number of SS rungs should be provided on both the sides. The ladders should be fixed to barrel by SS pipes legs and SS cups type arrangement.

### 3.10 Manway

3.10.1 SS manway of 500 dia at top centrally located for each compartments shall be provided with slit type breathers and dust cover opening in opposite direction of top cat walk way. It will have manway neck and SS flange.

3.10.2 Manway neck should be manufactured from AISI 304 3 mm thick SS sheet.

3.10.3 The manway SS flange should be manufactured from AISI 304 SS 10 mm thick material. The manway flange should be machined only after fitting it with the manway neck.

3.10.4 The manway cover will be insulated cover manufactured from AISI 304 SS sheet 2 mm thick.

3.10.5 The manway cover flange shall be 10 mm, 50 mm wide manufactured from AISI 304. The flange shall be machined only after complete assembly is over.

3.10.6 Manway gasket: A gasket manufactured from food quality nitrile rubber shall be provided on SS manway flanges.

3.10.7 The gap between SS flange of manway cover and SS flange of manway neck shall not be more than 0.5mm when manway cover is in close position and gasket is not fixed.

3.10.8 The manway cover shall be provided with 51dia SS breathers for pressure and vacuum release.

### 3.11 Dip Stick

A SS conforming to AISI 304 quality dip stick in each compartment calibrated at 100 L interval shall be provided underneath manway cover (i.e., on the neck of manway) for each compartment.

### 3.12 CIP Arrangement

The takers should be provided with CIP arrangement for thorough cleaning for inner barrels.



3.12.1 Spray Balls: 2 spray balls of 100 dia complete with cotter split pin type arrangement for in place cleaning ending into a 38 dia 14 G SS pipe shall be provided for each compartment. The spray ball shall be tight fit with the pipe.

3.12.2 Header: A SS 304, 10 G 38 dia header to connect the both spray balls should be provided. The ends of header should be closed by half round ends having 5 nos. of 2 dia spray holes. 3 nos. of 2 dia spray holes should be provided on the header towards top at every 300 mm distance and 30 degree apart.

3.12.3 CIP Inlet: A common CIP inlet near the manway neck and the under the dust cover should be provided. The CIP inlet should be interlocked with manway cover i.e., when CIP is being done manway cover should remain open.

### 3.13 Outlet

Adequate size of cup type milk outlet for each compartment fabricated from 3 mm thick SS sheet conforming to AISI 304 with 51 mm, 1.6 mm SS pipe and 51 mm SMS two way butter fly valve having one end SS flange and other end SMS union with blank nut permanently fixed to valve box shall be provided. The SS butterfly valve shall have hole to hole distance of 100 x 70 mm. The welded joint of outlet SS pipe with outlet cup should be strong enough. The two way valves should be properly supported by 25 mm SS pipe. The outlet pipe shall be properly supported from the barrel. The cup shall have proper supporting. The outlet pipe shall protrude out of the outer shell by about 80 mm for convenient fixing and removal of mounting bolts.

### 3.14 Valve Box

A suitable size valve box housing two way butterfly valves and sample bottle rack shall be provided. The valve box floor shall be provided with a drain pipe and floor shall be slopped towards drain. The valve box shall be flushed with rear platform. The AISI 304 SS sample bottles rack shall be provided which can hold six sample bottles. The box shall enough space for C spanner to be used on SMS union and for tightening the mounting bolts on the flange side of the valve.

### 3.15 Rear Bumper

A heavy duty rear bumper of MS in suitable thickness shall be provided. The width of the bumper shall be the maximum width of barrel. The bumper shall be provided with two step ladder. There shall be clear gaps of 75 mm between rear platform and bumper.

### 3.16 Rear Mudguards

Round shape mudguards on rear wheel of the chassis fabricated from 14 G Aluminium sheet shall be provided.

### 3.17 Rear side skirting with platform :



The rear end of barrel shall be provided with side skirting upto the height of side gutters cum walkway. The side skirting shall be manufactured from AISI 304, 2 mm thick SS sheet. One end should be welded to the barrel, bottom to be welded to rear platform and one end should be folded and welded to drain pipe of side gutters. A rear platform from AISI 304, 2.5 mm SS sheet should be provided which should be flushed with outlet valve box. The rear platform should be welded to side of valve box. It should have proper supporting structure.

### 3.18 Logo

The Medha Dairy logo shall be sand blasted on rear outer dish. It shall be 500 mm painted in pherozy blue after sand blasting.

### 3.19 Painting

All the MS surfaces including MS runner, complete MS cage structure chassis etc. should be coated with two coats of anti-corrosive primer after de-rusting and degreasing. All the visible MS surfaces and Mudguards shall be coated with two coats of ICI Duco or equivalent automobile paint of oxford blue colour.

If the barrel manufacturer is unable to supply the barrel within the delivery period mentioned in the purchase order, they have to re-paint the entire cabin with at least one coat of paint on inside as well on outside before dispatching the tanker from it's works. The shade of paint should be exactly the one the cabin is painted with and type should be DUCO-ICI automobile.

### 4.0 TESTS

4.1 All the welding of inner shell should be subjected to dye penetration test and barrel shall be tested for hydro test at 0.35 Kg/cm<sup>2</sup> before insulation.

4.2 The insulation test will be done by filling the tanker with 4 Deg.C water and handling for 24 hours with temperature gradient of 35 Deg.C without rise in the temperature more than 1 Deg. C.

### 5.0 General

5.1 Load on any axle should not exceed maximum load specified in 'F' form provided from chassis manufacturer. These are also generally mentioned in approved drawings. If load exceeds tanker would be rejected.

5.2 Barrel capacity on negative side can be accepted upto 25 litres maximum for any size tanker barrel capacity in litres as mentioned in the specification. If variation on lower side is more than 25 litres, tanker would be accepted with proportionate penalty (minimum penalty being Rs. 3000/-). But if variation is more than 200 litres, tanker would be rejected.



5.3 Any increase in barrel capacity can be accepted provided total load does not exceed maximum axle load specified in 'F' form/ approved drawing. However, no extra payment would be made for extra capacity.

#### 6.0 REMARKS

6.1 Approval of this design from RTO / other authority is the supplier's responsibility.

6.2 Drawings of the Road Milk Tanker to be submitted for JMF's approval shall have following details:

- a) Plan, elevation and cross sectional view.
- b) Fitment of barrel to the chassis.
- c) General note containing details like welding, insulating tests, finishing, painting etc.
- d) Bill of material.
- e) Approx. load distribution chart on various axle.

Drawing for approval should be submitted within 4 weeks from the date of order to JMF.

6.3 The supplier shall be responsible to intimate non-use of the chassis to the concerned RTO immediately on receipt of chassis at their works, for which the relevant documents would be forwarded to them by the cab builders. It shall also be the responsibility of the barrel supplier to obtain the temporary registration for onward dispatch of the tanker to the end-users after completion of the job.

No extra charges on this account will be paid to you.

#### 7.0 **Inspection of barrel by JMF:**

Inspection of tanker barrels at various stages of fabrication shall be carried out by JMF to check the following:

- Thickness of sheet used in fabrication of inner barrel and outer cladding
- DP Test and water fill-up test of inner barrel
- Test of Insulation density and thickness
- Final inspection on completion of tanker barrel fabrication



**CAPACITY: 20000 L Barrel, Single compartment**

**QUANTITY: 2 Nos.**

**SCOPE OF WORK:** Design, Fabrication and installation of Road Milk Tanker on the chassis to be provided by JMF and Supply to Medha Dairy, Hotwar, Ranchi, a unit of Jharkhand Milk Federation, Ranchi.

## 1.0 FUNCTIONAL REQUIREMENTS

### 1.1 General Description

The fixed chassis single compartment tanker would be used to transport pasteurized, chilled milk on rough surfaces and asphalt road over long distances.

### 1.2 Chassis

The barrel should be mounted on chassis. The details of the chassis shall be provided subsequently.

The chassis will be supplied to you as free issue.

## 2.0 DESIGN REQUIREMENTS

### 2.1 Capacity:

The insulated barrel would be round in shape and single compartment having brimful capacity of maximum permissible but not less than 20000 L.

### 2.2 Dimensions:

The length and diameter of the barrel should be such that the available length and width of the chassis are fully utilised.

### 2.3 Height:

The maximum over all height of the tanker should not exceed 3250 mm.

### 2.4 Slope:

The barrel bottom of the inner shell should slope towards the outlet provided at the rear end of barrel for free and complete drainage of liquid.

### 2.5 Insulation:

The insulation should withstand high temperature of 98 Deg.C in place cleaning. It should not permit more than one Deg.C rise in emp. in 18 hours when tempgradient is 35 Deg.C. & milk temp. is 4 Deg.C.

### 2.6 Interlocking:





Interlocking arrangement is to be made in such a way that the manway should remain open during CIP cleaning.

#### 2.7 CIP Lines :

There shall be single CIP connection on the man way and leading to a 2 nos. stationary spray ball of 100 mm dia. The connection shall be of 38 mm size having SMS male connection. All the CIP lines should be located inside the barrel with CIP inlet inside the dust cover. All the CIP lines should be of welded construction.

#### 2.8 Blank Nuts :

All the blank nuts provided should be of SMS type. The blank nuts should be permanently fixed to barrel by SS chain of 3 mm rod links.

#### 2.9 Outlet :

The outlet should be of cup type with easy access from bottom (i.e. the bottom portion of outer shell below outlet cup should have 300 x 300 mm opening with bolted cover for inspection chamber made from AISI 304) and fully supported by AISI 304 gussets. The inspection cover should have a handle and also ¼" dia SS 304 pipe one side welded with cover plate and other side threaded. This shall act as weeping hole.

#### 2.10 Finish :

All the visible welding joints are to be ground smoothly. All the inner surfaces of inner shell should be original 2B finish or polished to 150 grits. The outside surfaces of outer shell should be left with original 2 B mill finish or should be finished to 150 grit.

#### 2.11 Barrel :

The insulated barrel should be round in shape and should be of single compartment construction having brimful capacity of maximum permissible but not less than 20000 L.

#### 2.12 Dish Ends:

All dished ends should be independent dished ends. There should not be any common or partition dished end.

### 3.0 SCOPE OF SUPPLY

#### 3.1 Inner Shell

3.1.1 Inner shell shall be fabricated of stainless steel AISI 304 sheet of 2.5 mm thickness.

#### 3.1.2 Inner Dished Ends



3.1.2.1 The crown radius, knuckle radius and straight portion of inner dished ends should be fabricated from 3.5 mm thick SS sheet conforming to AISI 304. The dish shall be formed by pressing and/or spinning but not manually - 2 nos.

3.1.2.2 The ratio of crown radius to knuckle radius should be around 10.

3.1.3 The all welding joints of inner barrel should be done from inside as well as from outside.

3.1.4 The bottom portion of SS barrel below the manway opening should be suitably strengthened by providing extra padding plate of 5mm thick to avoid cracking or sinking of the barrel bottom. The padding plate should not be directly welded to inner shell, it should be welded through SS cleats.

### 3.2 Stiffening Rings

3.2.1 Adequate numbers of stiffening rings fabricated from standard mild steel sections should be provided on inner shell so as to form a complete cage type structure.

3.2.2 Compressed asbestos flats of minimum 5 mm thickness should be provided towards inner as well as outer shell on the stiffening rings to avoid heat bridge.

3.2.3 The stiffening rings shall be welded to SS fabricated cleats which should be welded to inner barrel. Sufficient nos. of cleats should be provided on circumference of inner shell to hold the stiffening rings in position and also to take care of expansion and contraction of the inner shell. Centre to centre line distance between two SS cleats should not be more than 500 mm.

3.2.4 There shall be proper supporting structure for outer shell and dished ends.

3.2.5 The place where outer shell welding joint is coming on the MS stiffening structure, a AISI 2 mm plate should be provided over the structure to work as back up plate for welding.

### 3.3 Insulation

3.3.1 The inner shell shall be properly insulated in five layers of insulation as give below:



1<sup>st</sup> layer should be of 15 mm thick polyurethane foam (PUF) having density of 35 Kg/m<sup>3</sup> and applied radially.

2<sup>nd</sup> layer should be of 15 mm thick polyurethane foam (PUF) having density of 35 Kg/m<sup>3</sup> and applied longitudinally.

3<sup>rd</sup> layer shall be 50 mm thick expanded polystyrene foam (EPS) having density of 16 – 20 kg/cm<sup>3</sup> applied radially.

4<sup>th</sup> layer should be of 15 mm thick polyurethane foam (PUF) having density of 35 Kg/m<sup>3</sup> and applied longitudinally.

5<sup>th</sup> layer: Finally, aluminium foil of 0.07 mm thickness shall be provided as cover and moisture barrier over the insulation.

3.3.2 The inside of outer shell and outside of inner shell shall be coated with two pore free coats of high melting point bitumen of 90/15 and 80/25 grade respectively or it could be painted with bitumen paint.

3.3.3 Wherever the welded joints of outer shell comes in contact with insulation the entire length of the welding joint shall be insulated with 150 mm wide and full depth with resin bonded fibre glass wool density 24 Kg/m<sup>3</sup>.

### 3.4 Outer Shell

3.4.1 The outer shell should be fabricated out of SS sheet 2mm thick conforming to AISI 304.

#### 3.4.2 Outer Dished Ends

3.4.2.1 The crown radius, knuckle radius and straight portion of outer dished end shall be fabricated from 3 mm thick SS sheet conforming to AISI 304. The dished end shall be fabricated by pressing and / or spinning but not manually.

3.4.2.2 The ratio of crown radius to knuckle radius should be around 10.

3.4.2.3 4 mm thick 50 SS flat shall be provided to facilitate welding of outer dished ends to outer shell. The flat should be properly supported from horizontal members of cage structure.

3.4.3 Dust Cover: A lockable round dust cover resting on round dust cover bed shall be supplied. The dust cover and dust cover bed shall be manufactured from AISI 304 SS sheet of 2 mm thickness. The dust cover should have gasket fitted at the edge and shall also have 4 nos. of louvers 90 degree apart to act as breathers. The hinges of dust cover shall have stopper to permit opening of the dust cover only by 100 degree angle. The dust cover shall have rubber gasket at the edge. The dust cover should open in opposite side of catwalk way.

#### 3.4.4 Rear Side Skirting

The rear end of barrel shall be provided with side skirting upto the height of side gutter cum walkway. The rear and side skirting should be manufactured



from AISI 304 SS sheet 2 mm thick. The one end of side skirting shall be welded to the barrel, bottom to be welded to rear platform. One side shall be welded to barrel. The other side shall be folded and welded to drain pipe of side gutter.

3.4.5 Rear Platform : The rear dimpled platform shall be fabricated from AISI 304 dimpled SS sheet 2 mm thick. The rear platform shall be welded to valve box and shall be flushed with valve box.

A proper structure shall be provided below the rear platform. The structure shall be bolted to chassis member.

3.4.6 Grab Handles:

3.4.6.1 Two 500 mm grab handle one each on either side of rear outer dished end should be provided. The grab handles should be made from 25mm diaSS pipe of 14G.

3.4.6.2 Two grab handles at top one on each side. It shall be provided to full length of barrel and shall be manufactured from 25 dia SS pipe. It shall have proper supports.

3.4.7 SS Steps

Both sides of rear side skirting should have one footstep each to climb on side gutter cum walk way. The step should be manufactured from 25 dia SS pipe of 14G.

3.5MS Runner

3.5.1 The complete insulated barrel should be mounted on MS runner of suitable design. The thickness of MS runner shall be suitably worked out but shall never be less than 5 mm thick to avoid corrosion. The barrel shall be fixed to chassis by EN8 'U' bolts and nuts with cotter split pin or counter nuts. Suitable fabricated MS spacers should be provided on the chassis wherever 'U' bolts are provided, Aluminium cast packing shall be provided between U bolts and chassis.

3.5.2 Adequate numbers of gussets fabricated out of 3 mm thick SS sheet conforming to AISI 304 shall be provided. Between SS gussets and outer shell of 75 mm wide AISI 304 SS sheet 3 mm thick padding plate extending at least 25 mm more than gusset on both ends shall be provided. The gussets shall be full welded to padding plate and MS runner. The SS padding plate shall be full welded to outer shell. The gusset shall cover at least 30% of the outer shell circumference.

3.5.3 The MS runner should be welded to 5 mm thick MS plate of 100 mm width which shall be bolted to the chassis. Wherever holes are available on the chassis the same shall be fully utilized to prevent sliding of the barrel on chassis.



3.5.4 12mm thick bellatta packing shall be provided between runner and chassis throughout the length.

3.5.5 A 3 mm SS padding plate shall be provided between outer shell and MS runner. Padding plate will be continuous and throughout the length. It will be full welded to outer shell. MS runner will be full welded to SS padding plate.

### 3.6 Rub Rail:

Suitable size and type of rub rail shall be provided on both the side to the full length of barrel. The rub rail will be fitted on side gutter cum walk way.

### 3.7 Side Gutter Cum Walk Way:

175 mm wide side gutter cum cat walk way shall be provided on both the sides, to the full length of barrel. The gutters shall be properly supported by SS gussets to the barrel and shall have enough slope towards rear end. It shall not be visible from rear end (i.e., covered by rear end skirting). Both the gutters shall be provided with SS drain pipe at rear end which should work as edge stiffening for rear end skirting. The SS drain pipe should not be visible and it should be concealed in rear end skirting plate.

### 3.8 Top Walk Way:

The top walk way made from minimum 2.5 mm thick AISI 304 SS dimpled sheet with a width of 400 mm shall be provided at the top of the tanker between the two manways. The top walk way should be supported/ fixed with proper structure.

### 3.9 Side Ladders:

For access to top walk way, approach ladders fabricated from 25 mm dia 14 G SS pipes with suitable number of SS rungs should be provided on both the sides. The ladders should be fixed to barrel by SS pipes legs and SS cups type arrangement.

### 3.10 Manway

3.10.1 SS manway of 500 dia at top centrally located for the compartment shall be provided with slit type breathers and dust cover opening in opposite direction of top cat walk way. It will have manway neck and SS flange.

3.10.2 Manway neck should be manufactured from AISI 304 SS sheet 3 mm thick.

3.10.3 The manway SS flange should be manufactured from AISI 304 SS 10 mm thick material. The manway flange should be machined only after fitting it with the manway neck.

3.10.4 The manway cover will be insulated cover manufactured from AISI 304 SS sheet 2 mm thick.



3.10.5 The manway cover flange shall be 10 mm, 50 mm wide manufactured from AISI 304. The flange shall be machined only after complete assembly is over.

3.10.6 Manway gasket: A gasket manufactured from food quality nitrile rubber shall be provided on SS manway flanges.

3.10.7 The gap between SS flange of manway cover and SS flange of manway neck shall not be more than 0.5mm when manway cover is in close position and gasket is not fixed.

3.10.8 The manway cover shall be provided with 51 dia SS breathers for pressure and vacuum release.

### 3.11 Dip Stick

A SS conforming to AISI 304 quality dip stick in each compartment calibrated at 100 L interval shall be provided underneath manway cover (i.e., on the neck of manway) for each compartment.

### 3.12 CIP Arrangement

The takers should be provided with CIP arrangement for thorough cleaning for inner barrels.

3.12.1 Spray Balls: 2 spray balls of 100 dia complete with cotter split pin type arrangement for in place cleaning ending into a 38 dia 14 G SS pipe shall be provided for each compartment. The spray ball shall be tight fit with the pipe.

3.12.2 Header: A SS 304, 10 G 38 dia header to connect the both spray balls should be provided. The ends of header should be closed by half round ends having 5 nos. of 2 dia spray holes. 3 nos. of 2 dia spray holes should be provided on the header towards top at every 300 mm distance and 30 degree apart.

3.12.3 CIP Inlet: A common CIP inlet near the manway neck and the under the dust cover should be provided. The CIP inlet should be interlocked with manway cover i.e., when CIP is being done manway cover should remain open.

### 3.13 Outlet

Adequate size of cup type milk outlet for the compartment fabricated from 3 mm thick SS sheet conforming to AISI 304 with 51 mm, 1.6 mm SS pipe and



51 mm SMS two way butter fly valve having one end SS flange and other end SMS union with blank nut permanently fixed to valve box shall be provided. The SS butterfly valve shall have hole to hole distance of 100 x 70 mm. The welded joint of outlet SS pipe with outlet cup should be strong enough. The two way valve should be properly supported by 25 mm SS pipe. The outlet pipe shall be properly supported from the barrel. The cup shall have proper supporting. The outlet pipe shall protrude out of the outer shell by about 80 mm for convenient fixing and removal of mounting bolts.

#### 3.14 Valve Box

A suitable size valve box housing two way butterfly valve and sample bottle rack shall be provided. The valve box floor shall be provided with a drain pipe and floor shall be sloped towards drain. The valve box shall be flushed with rear platform. The AISI 304 SS sample bottles rack shall be provided which can hold six sample bottles. The box shall enough space for C spanner to be used on SMS union and for tightening the mounting bolts on the flange side of the valve.

#### 3.15 Rear Bumper

A heavy duty rear bumper of MS in suitable thickness shall be provided. The width of the bumper shall be the maximum width of barrel. The bumper shall be provided with two step ladder. There shall be clear gaps of 75 mm between rear platform and bumper.

#### 3.19 Rear Mudguards

Round shape mudguards on rear wheel of the chassis fabricated from 14 G Aluminium sheet shall be provided.

#### 3.20 Rear side skirting with platform :

The rear end of barrel shall be provided with side skirting upto the height of side gutters cum walkway. The side skirting shall be manufactured from AISI 304, 2 mm thick SS sheet. One end should be welded to the barrel, bottom to be welded to rear platform and one end should be folded and welded to drain pipe of side gutters. A rear platform from AISI 304, 2.5 mm SS sheet should be provided which should be flushed with outlet valve box. The rear platform should be welded to side of valve box. It should have proper supporting structure.

#### 3.21 Logo

The Medha Dairy logo shall be sand blasted on rear outer dish. It shall be 500 mm painted in pherozy blue after sand blasting.

#### 3.19 Painting

All the MS surfaces including MS runner, complete MS cage structure chassis etc. should be coated with two coats of anti-corrosive primer after de-rusting



and degreasing. All the visible MS surfaces and Mudguards shall be coated with two coats of ICI Duco or equivalent automobile paint of oxford blue colour.

If the barrel manufacturer is unable to supply the barrel within the delivery period mentioned in the purchase order, they have to re-paint the entire cabin with at least one coat of paint on inside as well on outside before dispatching the tanker from its works. The shade of paint should be exactly the one the cabin is painted with and type should be DUCO-ICI automobile.

#### 4.0 TESTS

4.1 All the welding of inner shell should be subjected to dye penetration test and barrel shall be tested for hydro test at 0.35 Kg/cm<sup>2</sup> before insulation.

4.2 The insulation test will be done by filling the tanker with 4 Deg.C water and handling for 24 hours with temperature gradient of 35 Deg.C without rise in the temperature more than 1 Deg. C.

#### 5.0 General

5.1 Load on any axle should not exceed maximum load specified in 'F' form provided from chassis manufacturer. These are also generally mentioned in approved drawings. If load exceeds tanker would be rejected.

5.2 Barrel capacity on negative side can be accepted upto 25 litres maximum for any size tanker barrel capacity in litres as mentioned in the specification. If variation on lower side is more than 25 litres, tanker would be accepted with proportionate penalty (minimum penalty being Rs. 3000/-). But if variation is more than 200 litres, tanker would be rejected.

5.3 Any increase in barrel capacity can be accepted provided total load does not exceed maximum axle load specified in 'F' form/ approved drawing. However, no extra payment would be made for extra capacity.

#### 6.0 REMARKS

6.1 Approval of this design from RTO / other authority is the supplier's responsibility.

6.2 Drawings of the Road Milk Tanker to be submitted for JMF's approval shall have following details:

- a) Plan, elevation and cross sectional view.
- b) Fitment of barrel to the chassis.
- c) General note containing details like welding, insulating tests, finishing, painting etc.
- d) Bill of material.
- d) Approx. load distribution chart on various axle.





Drawing for approval should be submitted within 4 weeks from the date of order to JMF.

6.3 The supplier shall be responsible to intimate non-use of the chassis to the concerned RTO immediately on receipt of chassis at their works, for which the relevant documents would be forwarded to them by the cab builders. It shall also be the responsibility of the barrel supplier to obtain the temporary registration for onward dispatch of the tanker to the end-users after completion of the job.

No extra charges on this account will be paid to you.

**7.0 Inspection of barrel by JMF:**

Inspection of tanker barrels at various stages of fabrication shall be carried out by JMF to check the following:

- Thickness of sheet used in fabrication of inner barrel& outer cladding
- DP Test and water fill-up test of inner barrel
- Test of Insulation density and thickness
- Final inspection on completion of tanker barrel fabrication



**Annexure-III**  
**(COMMERCIAL/FINANCIAL BID)**

Sl. No.	Description Goods	Qty	Unit	Basic Price	Taxable Value	GST @ %	Insurance	Freight	Total FOR Amount (In Rs.)
1	Design, Fabrication and Installation of 8KL Road Milk Tanker, Double Compartment Barrels	2	Nos						
2	Design, Fabrication and Installation of 20KL Road Milk Tanker, Single Compartment Barrels	2	Nos						

Note:

(a) In case of discrepancy between unit price and total price, the unit price shall prevail.

Total bid price in Rs. \_\_\_\_\_

In words \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Name \_\_\_\_\_

Business Address \_\_\_\_\_

Place:

Date: