

# TENDER DOCUMENT

FOR

**SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND TRIAL  
RUN OF BULK MILK COOLERS AT DIFFERENT UNITS OF OMFED.**



**THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD.  
BHUBANESWAR**

**Phone : (0674) – 2540273 / 2546030 ,2540417, Tele Fax : (0674)-2540974**

**E-mail : omfed @ yahoo.com**

SEP - 2017

Cost Rs. 10000/- +12% GST

The Odisha State Cooperative, Milk Producers' Federation Ltd.  
D-2, SAHID NAGAR, BHUBANESWAR-751 007.  
Ph No- 2546030/2540273/2540417, Fax No (0674)2540974

**Bid Identification No. CSS/RKVY/158/BMC/17**

1. OMFED invites **Techno-commercial offer from reputed Manufacturer/Authorized dealer/Authorized Distributor for supply, installation , testing commissioning & trial run of Bulk Milk Cooler at different Units of OMFED.** The tender is invited on-line through 'e'-procurement of Govt. of Odisha web Portal ([www.tenderorissa.gov.in](http://www.tenderorissa.gov.in)). The bidders should have the necessary portal enrolment with his own Digital Signature Certificate.

Estimated Cost (Rs.)	Cost of tender paper.(Rs.)	Availability of tender for on line bidding		Date of opening	Bid Security (Rs.), (EMD)	Period of completion
		From	To			
8,73,08,419.00	10,000 +12% GST	27/09/2017	13/10/2017	18/10/17 On 11.00 am	2% of the Estimated Cost	120 Days

2. Bid documents consisting of specifications, the schedule of quantities and the set of terms and conditions of contract and other necessary documents can be seen in the website: <https://tendersorissa.gov.in>. The corrigendum/amendment to this notice if required shall be published only in the OMFED web site [www.omfed.com](http://www.omfed.com) and will not be published again in news paper.

3. The **Bid documents will be available** in the website: <https://tendersorissa.gov.in> from **10.00 AM of 27.09.2017 to 5.00 PM of 13.10.2017 for online bidding.**

4. (i) The tender paper cost (in shape of D/D) & EMD (i.e 2% of estimated cost) in the form of D/D in original,

(ii) Photo Copy of VAT, PAN, Registration Certificate of firm, Experience Certificate, other documents as per DTCN with duly signed by the bidder. (only Papers relating to Technical Bid)

As mentioned 4 (i) & (ii) shall have to be deposited in three different sealed envelope within 10.00 A.M. from **16.10.2017 to 05:00PM of 17.10.2017** at the OMFED Corporate office, Bhubaneswar.

Non submission of cost of bid document and bid security within the period shall debar from participating in the online bidding system and his portal registration shall be cancelled. His name shall also be informed to the registering authority for cancellation of his registration.

5. Bids shall be received only **"on line" on or before 5.00 PM of 13.10.2017.**

6. Bids received on line shall be opened at **11.00 A.M. on 18.10.2017 at OMFED Corporate office** in the presence of the bidders. Bidders who participated in the bid can witness the opening of bids after logging on to the site through their DSC. If the office happens to be closed on the last date of opening of the bids as specified, the bids will be opened on the next working day at the same time and venue.

7. It is for the information of all concerned, that **EMD** is binding for all participates i. e. 2% of the estimated cost except valid NSIC certificate holder.

8. The cost of bid documents & EMD in demand draft issued from any **Nationalized Scheduled Bank may be prepared in favour of OMFED, payable at Bhubaneswar.**

9. Other details can be seen in the bidding documents.

10. The management reserves the right to cancel any or all bids without assigning any reason.

**Sd/-  
Managing Director, OMFED**

**Eligibility Criteria**

- The Manufacture should have supplied and successfully commissioned a minimum 300 numbers of BMC of capacity 2 KL during the financial year 2014-15, 2015-16 & 2016-17 only in the Milk Cooperatives.
- The Manufacture annual sales turnover only in 2 KL BMC segment should not be less than Rs. 125 Lakhs during the financial year from 2014-15, 2015-16 & 2016-17.
- The Manufactures should be empanelled under NDDDB.
- The BMC should confirm to the quality standard as specified under BIS/ISI.
- The Manufacturing company should have ISO certification.

**Completion Period**

Supply Installation, Commissioning and trial run within 120 days from the date of acceptance of the order.

**Terms of Payment**

- Bills in triplicate shall be submitted with the ordering quantity.
- 75% on safe arrival of BMC at site.
- 25% after successful commissioning subject to satisfactory performance.
- PSD @ 10% of the billed value shall be retained by ordering authority for a period of 02 years from the date of handing over and shall be released subject to satisfactory performance and clearance at the end of ordering authority..

**Penalty**

- Penalty @ 0.5% of the order value/ week shall be imposed for delay in execution beyond the time frame.

## **Documents to be submitted in the technical bid**

- Valid ISO/BIS certificate if any.
- Certificate from the client with detail contact address to establish supply of the items which are functional.
  - Proof of sales turn over.
  - Undertaking by the bidder that the bidder is not black listed by any Co-operative Milk Union/ State Milk Federation.
  - Audited profit and loss account for the year 2014-15,2015-16, & 2016-17
  - IT return for the financial year 2015-16.
- Credentials in support of supply and installation of BMC set.
- Completion and performance certificate issued by the clients are to be furnished.
- Demand Draft towards tender paper cost as applicable.
- Printed technical literature / catalogue of the offered model (s) of the equipment.
- Duly filled in Manufacturers' authorization form (for authorized channel partner)
- Xerox copies of PAN / Service Tax Registration / VAT/ CST./GST
- Demand Draft towards EMD i.e 2% of the estimated cost.

## **Terms and Conditions**

- Bidders advised to visit site prior to the tender.
- The offer is valid for a period of one year from the date of notification and the offer is valid for a period of one year from the date of price bid open.
- The offered price shall be on FOR site and shall include supply, installation, testing, commissioning and trial run and shall inclusive of all taxes, duties, royalties as applicable including GST.
- The offered price should be uniform against each capacity for all site inside the state of Odisha irrespective of distance.
- The set shall be covered under one year guaranty period from the date of handing over and one year free service after expiry of guaranty period.
- The bidder can't stipulate any terms and conditions of his own beyond the tender requirements.
- The bid shall be rejected if not complied with the tender requirement.
- The quantity mentioned here is likely to vary subject to availability of funds.
- All statutory approval is within the scope of the bidder.
- It is mandatory on the part of bidder to quote for all the item as mentioned in the BOQ falling which the offer shall not be consider.

- In case ISI / BIS certification / empanelled under NDDDB certification is not produced the bid shall be rejected.

### MILK UNION WISE REQUIREMENT OF BMC OF DIFFERENT CAPACITIES

Sl. No.	Name of Milk Union	5000 LPD	2000 LPD	1000 LPD	500 LPD	TOTAL
1	Cuttack	2 6	19 7 20			
2	Puri	4	8 –			
3	Sambalpur	6	4			
4	BKN	3	3 3			
5	Balasore	3 4	4 6 2			
6	Dhenkanal	1	1			
7	Keonjhar	0	3 2 21			
8	Koraput	0	8			
9	Mayurbhanj	0	3			
11	Ganjam		2			
11	Others			5	5	
	<b>Total</b>	<b>29</b>	<b>97</b>	<b>5</b>	<b>5</b>	<b>136</b>

## TECHNICAL BID

Sl. No.	Description	Details
1	Name of the Company	
2	Office address	
3	Phone no, Fax no, E-mail	
4	Corporate Head quarter address & Contact no	
5	Local office address & contact no. in Odisha	
6	Website address	
7	Nature of Ownership	
8	Regd. No. with date	
9	Details of Statutory Certificate/ License/ Clearance	
10	CST No	
11	VAT No	
12	TIN. No	
13	PAN	
14	Service Tax Regd. No.	
15	DD for tender cost	
	GST NO	

Signature & Seal

Name

Address

E-mail Id

Cell No.

Land Line-

## **T EXPANSION TYPE BULK MILK COOLERS**

**CAPACITY: 5000 LPD, 2000 LPD, 1000 LPD & 500 LPD**

### **TECHNICAL SPECIFICATIONS**

#### **General Description**

Design, supply, installation, testing and commissioning of Direct Expansion type bulk milk cooling systems including all accessories & items given in the detailed scope of supply, on turnkey basis. Two milking system has been configured such that volume of each milking is as under:

- i) Milking in the morning (up to 10 AM) - 50%
- ii) Milking in the evening - 50%

#### **1. Functional Requirement**

These systems would be installed in village Dairy Co-operative Society (DCS), which collects milk everyday in the morning & evening from milk producers. The milk so collected shall be stored in the bulk milk cooler and cooled from ambient temperature to 4 degree centigrade. The stored milk shall be despatched to dairy plant through insulated road milk tanker once in a day.

#### **2. Design Requirement**

##### **2.1. Capacity**

The net capacity of the bulk milk cooler shall be as mentioned above and as per the requirement given in the enquiry/ tender document. However, the gross capacity in all the sizes shall be at least 10% higher than the rated capacity to avoid spillage of milk due to agitation.

#### **3.0 Applicable manufacturing/ design code**

##### **3.1 Bulk Milk Cooler (BMC)**

The tank shall meet the requirements of ISO 5708 Type 2A II (Latest version) for milk collection cycle of two times in a day with not more than 3 hours cooling time

from 35<sup>0</sup> C to 4<sup>0</sup> C for entire milk and not more than 1 & 1/2 hour for second milking i.e. from 10<sup>0</sup> C to 4<sup>0</sup> C.

- **Direct expansion type, stainless steel, Bulk Milk Cooler with vertical open/ closed type tank.**
- **The Bulk Cooler should be designed to cool milk within three & half hours or less from 35<sup>0</sup> C to 4<sup>0</sup> C and should work at an ambient temperature of 50<sup>0</sup>c.**
- **The system shall be designed for automatic operation.**
- **The system shall be provided with SS balance tank with covers in line with the capacity of Bulk Milk Cooler and SS 304 SS pipes of required**
- **Size from balance tank via milk transfer pump up to BMC. The outlet of BMC will be connected through milk transfer pump to flexible hose pipe.**

### **3.2 Tank**

The tank shall be of an established and proven design, in regular production and use, and not a prototype unit.

(Note: All milking means quantity of milk received in either morning shift or evening shift. When a Tank for two milking is either empty or contains 50% of its' rated volume of milk at 4<sup>0</sup> C, and 50% of the rated volume of milk at 35<sup>0</sup> C is added in one batch, all of the milk shall be cooled to 4<sup>0</sup> C in not more than the specified cooling time.

If a volume of milk corresponding to the second milking is added to the tank, the total volume of the milk shall be cooled to 4<sup>0</sup>C in not more than specified cooling time.)

### **3.3. Refrigeration System**

The refrigeration system shall be designed to meet performance ratings of positive displacement of condensing units specified in ARI Standard 520-2004. & ISO 5708 Type 2A II.

### **3.4 Accessories**

BMC control panel, temperature sensor, electrical switch gears, control valves & fittings etc. shall be approved make only and shall meet the requirement of latest relevant Indian Electricity Rules. ISO/BIS standards.



## **4.0 Scope of the bidder**

### **4.1 Scope**

The bidder's scope starts from SS 304 tray, having an outlet connection, for receiving the milk. The milk shall flow through SS 304 pipe by gravity into bulk milk cooler. Wherever gravity flow is not possible, the milk from the tray shall be collected in a balance tank and from the balance tank it shall be pumped to bulk milk cooler. The balance tank shall be of AISI 304 construction, for bulk milk cooler (BMC) upto 2000 litres capacity the minimum capacity of tank shall be 100 litres and for BMC of more than 2000 litres capacity the tank shall have minimum capacity of 200 litres. From BMC, the milk shall be transferred to Road Milk Tanker (RMT) through flexible hose and milk transfer pump either installed on the RMT or through the pump supplied along with BMC. Bidders should furnish separate prices for gravity fed system as well as for pumped system.

### **4.2 Supply**

The bulk milk cooler shall be a complete unit with the refrigeration system, agitator(s), lockable inlet & outlet valve with strainer. Also includes supply of tank with SS 304 filter for pumped system, SS piping & milk hose, unions and milk transfer pump of 5000 LPH, SS 304 pipes & fittings, food grade quality flexible hose of adequate length, erection materials, pipe supports, floor interconnecting cables, cable conduits shall also be supplied, earth pit CI covers & earthing as required by local electrical regulation.

The indicative distances between SS collection tray to balance tank - 2 m, between balance tank to bulk milk cooler - 5 m, BMC to Mains power point & DG set – 20 m may be considered for calculating cable & SS piping requirement supports etc. However the exact distances shall be as per site conditions and the complete piping & cabling necessary for installation shall be supplied.

### **4.3 Installation & Commissioning**

The total job is on turnkey basis and includes supply, installation, testing, commissioning and training of the field personnel. Minor civil works, providing & grouting supports are included in the scope. Giving satisfactory training to the staff of the collection centre and trial runs for the complete unit. Moreover, supplier has to demonstrate performance trial runs after commissioning of the unit to the Federation.

### **4.4 Tank Evaporator**

Laser welded with Operating pressure of 30 bars and crash test pressure of 60 bars. In case of rectangular/circular type bulk milk cooler, the evaporator shall be fixed at the bottom plate of the inner tank. For closed tank of 3000/5000 litre, the evaporator shall be up to 1/3 height of the tank. For 2000, 3000 & 5000 litre tanks, two condensing unit complete with compressor shall be provided & hence total evaporative area shall be divided and separated into two sections. Each section shall have separate suction & discharge connecting to each compressor.

#### **4.5 Tank Fittings & Accessories**

Top cover with locking arrangement, top cover lifting handle, outlet valve and blank union with locking arrangement, inspection window, agitator. All SS fittings shall be of SMS standard. "No-foam" type inlet (For Close Type). Tank with gravity feeding system shall be provided with one AISI 304 funnel with SS fine wire mesh. The preferred shape of the tank shall be circular circular/horizontal rectangular with an open-able top cover up to 2000 litre capacity whereas for 3000/5000 litre BMC, Tank shall be completely closed type cylindrical with circular/elliptical dish ends & with manhole on top cover. The shape of the BMC tank shall conform to international sanitary design. For closed type Tanks, proper SS Ladder to be provided for approaching top manhole .

#### **4.6 Ball Feet**

An AISI 304 adjustable ball feet tamper proof & lockable with 50mm height adjustment.

### **5. Constructional Features**

#### **5.1 Bulk Milk Cooling Tank**

##### **5.1.1 Material of construction(MOC)**

Tank inner, outer, intermediate dimpled jacket & top openable cover shall be fabricated from Stainless Steel AISI 304 material. All piping, fittings, filter, lockable cover, agitator shaft & blade adjustable ball feet made out of AISI 304 for 50 mm height adjustment. Also Dip stick, outlet & inlet valves & blank flanges ,ladder, manhole of about 45 cm diameter for closed type milk cooling tank etc shall also be made out of AISI 304.

The filter screen shall be from AISI 304 fine wire mesh. All the gaskets shall be of food grade nitrile or neoprene rubber material. The skid on which tank & refrigeration unit is mounted shall be of galvanized steel. The bottom evaporation surface in contact with milk shall be passivity by standard treatment to impart corrosion resistance.

The skid made out of heavy MS box section & shall be hot dip galvanized on which tank & refrigeration unit is mounted.

##### **5.1.2 Shape & Orientation**

The preferred shape of the tank shall be vertical cylindrical / horizontal rectangular or U-shape for capacity up to 2000 L with an openable top cover. The BMCs higher than 2000 L capacity shall be closed type circular/elliptical with top man hole. For capacities above 2000 liters energy efficient closed type units should be preferable.

### 5.1.3 Milk Cooler Tank & Evaporator

The AISI 304 tank for the BMC should be either in rectangular, circular or elliptical orientation, which imparts smooth distribution of the fat in Milk when agitators is set into operation.

The tank shall be so designed that all surfaces in contact with Milk are readily accessible either in their position or after dismantling to permit thorough cleaning.

#### 5.1.4 Inner Vessel:-

All joints shall be welded, any filler rod being suitable for the parent metal .All welds shall be ground smooth and free from crevices, porosity and brittleness. All Milk contact metallic surfaces for the inner vase and its attachment should have finish not less than 150 grit finish.

Any permanent attachment to the inner vessel shall be welded with fillet radii not less than 6 mm. All parts of the inner vessel shall drain directly to the outlet.

Internal corner from round the bottom of the inner vessel and outlet shall be of not less than 25mm in radius .

In case of rectangular type of BMC, the evaporator shall be dimpled jackets fixed as the bottom plates of the inner tank. The Evaporator plate should be imported laser welded. Whereas in cylindrical/elliptical tank the jackets shall be at least upto 1/3 height of the tank. In case of double compressor total evaporator shall be divide and separated into two sections. Each section shall have separate suction and discharge connecting to each compressor . the evaporator surface in contact with the Milk should be passivated by standard treatment to impart corrosion resistance.

#### 5.1.5 Tank Fittings & accessories

- Out let 51 mm butter fly valve
- Tank cleaning Brushes (One tank cleaning brush and one pipe cleaning brush. The total no. of supply shall be 73 means each BMC unit shall have one no. SS hooks to be provided for 500 LPD, 1KL, 2KL & 5KL BMC.
- The tank shall be provided with SS inlet with special “ no foam” design, outlet 38 mm butter fly valve & blank union with locking arrangement, inspection window/manhole with locking arrangement for closed tanks, agitator and top cover with locking arrangement.
- At the bottom of the outlet cup on the outer surface, a temperature sensor shall be permanently fixed. It shall sense the temperature of the surface at the outlet and transmit the signal to the digital indicator. The digital type temperature indicator shall be provided in the control panel.
- The tank shall be provided with SS calibrated dipstick to measure the volume of milk inside the tank. The dip stick shall be graduated from 10% or less to not less than 100% of the rated volume. Each division on dip stick shall represent a volume not greater than 0.5% of the rated volume. The tank shall be equipped with agitator(s) capable of producing a uniform distribution of fat in the milk. All fittings shall be of SMS standard.

- The BMC shall be provided with AISI 304 filter with SS fine wire mesh suitable to filter extraneous matter such as dust particles, hay, flies, cow dung pieces/ particles etc. . It should be placed on the balance tank. The filter shall be designed & installed in such a way that it can frequently and easily cleaned.
- Top cover lifting handle and approach ladder for manhole cover shall be in an in built feature of the unit. The tank shall be provided with AISI 304 adjustable feet tamper proof type having provision of 50 mm height adjustment. Number of feet shall be minimums 4 for all capacities.
- Tank cleaning Brushes (One tank cleaning brush and one pipe cleaning brush. 4no. SS pipe hooks to be provided for 2kl BMC and 39 nos. for 5kl BMC 19 nos for keeping SS pipe and milk hose pipe

### **5.1.6 Stainless Steel Sanitary Milk Pump**

Where the Gravity flow system through reception tray shall be supplied for 500 Liter BMC and pump feed system shall be supplied for 1 KL to 5 KL BMC. The BMC is not possible due to insufficient level difference, a suitable capacity milk pump shall be supplied for pumping of milk from balance tank to BMC. Pump impeller & casing shall be made out of SS AISI 304 material. All milk contact surface shall be finished to min. 150 grit. The pump should be of sanitary design. Inlet & outlet of the pump shall ends with SMS union.

The pump shall be provided with approved make motor having 'E'/F class insulation and IP 55 protection. The flanged end motor shall have stainless steel shaft having hygienic mechanical sealing arrangement to prevent leakage from pump casing to rotor side of the motor. Pump shall be covered with SS shroud having air ventilation grill. The pump shall have SS adjustable ball feet.

### **5.1.7 Insulation**

The insulation of the tank shall be done by injection, in situ, of high density (minimum 40 kg/m<sup>3</sup>, CFC free and environmental friendly) polyurethane foam without having any imperfection and hygroscopic. 50 mm thickness in the walls & 90mm below the evaporator. The efficiency of insulation should be such that at max 50 degree C. ambient temperature, the rate of rise of the mean temperature of the milk, initially at about 4 Deg. C shall not exceed by one Deg. C in four hours when the rated volume is allowed to stand undisturbed as per the requirement of ISO 5708 2A II ( latest version) when the refrigeration unit is not working. Efficiency of Insulation 0.019 w.m/k.

### **5.1.8 Cleaning In Place (CIP)**

For closed type configuration, facilities for Cleaning- In- Place shall be provided which shall include CIP spray ball (s) or deflector plate and piping from milk reception/balance tank through milk transfer pump to bulk milk cooler.

### **5.1.9 Welding & Finishing**

Inner, outer, intermediate dimpled jacket and nozzle connections shall be welded with TIG process only. The inner shell and all other product contact surface shall be polished up to minimum 150 grit finish. The outer surface to be polished with 150 grit dull finish or a circle finish.

## **6. Refrigeration System**

The refrigeration system shall be designed to meet performance ratings of positive displacement of condensing units specified in ARI Standard 520-2004 and with not more than 3.0 hours cooling time from 35 to 4 Deg C for all milking and not more than 1.5 hours for second milking i.e. from 10 to 4 Deg.C.

The refrigeration system shall be of direct extension type, with Freon-22 (R-22) or CFC free environment friendly as refrigerant to cool the raw frame described above. The evaporator(s) of the refrigeration system shall be form a part of the milk tank body as dimpled jacket in the bottom plate in case of rectangular tank or at least up to 1/3 height of the cylindrical/elliptical tank. It would be better in case the system is compatible for the refrigerant R 407C. The refrigeration system shall be direct expansion type to perform cooling function in an ambient temperature of 46 Deg. C. with air cooled condenser.

### **6.1 Compressor**

The refrigeration Single phase for 500 Liter, 1KL & 2KL BMC unit 3 pahse for 5 KL BMC unit shall be adequate enough to ensure that milk is cooled to 4 Deg. C in the prescribed time limit and suitable to operate at 0 Deg C suction temperature and 60 Deg. C condensing temperature (air-cooled condenser) assuming 46 Deg. C ambient temperature ,should also comply ISO 5708 Type 2All(latest version).

The compressor (s) shall be scroll / reciprocating hermetically sealed type essentially suitable for refrigeration application in hot & humid Indian climatic conditions. The motor of the compressor should have a thermostat temperature sensor embedded in windings for protection from excessive heating due to overloading or short circuiting. Similarly, a protection against off cycle migration of refrigerant to the compressor is necessary in the refrigeration unit, preferably a self regulating PTC crank case heater.

The compressor selected should be energy efficient and consume least power to meet the cooling load requirements.

The bulk milk cooler up to capacity of 1000 L shall be provided with single compressor, however for higher capacity two compressors system shall be preferred. In case for a particular capacity, single as well as double compressor systems are available, bidder should quote for both. Similarly, in the offer bidder shall clearly mention whether the offered system shall work on single phase or three phase mains supply. Looking into the non-availability of three phase supply

in most of the rural areas, single-phase systems will be preferable at least upto 2000 lit.

## **6.2 Condenser**

The condenser shall be air cooled finned tube type having sufficient heat transfer area when the unit is operating at extremely high temperature. For each compressor separate condenser and air cooling fan shall be considered. The air circulation pump shall preferably be induced draft type throwing not air out. The condensing temperature should not be less than 60 deg C operating ambient temperature of 46 deg C.

## **6.3 Receiver**

A suitable size liquid receiver of minimum capacity of 6 ltr. to assist system during pump down cycle as well as to store refrigerant incase of maintenance should be provided duly mounted on the skid near compressor(s), as per requirement for different capacity BMC.

## **6.4 Thermostatic Expansion Valve**

Suitable size and capacity Thermostatic valve should be provided in the refrigeration circuit of the bulk milk cooler. The TX valve should be Maximum Operating Pressure type of reputed make and of adequate capacity to feed optimum quantity of refrigerant to the evaporator.

## **6.5 Refrigerant pipe, fittings & controls**

All pipes, valves, fittings & controls shall comply with the latest relevant code applicable. Isolation valves at suction & discharge sides of the compressors should be provided for compressor isolation, during maintenance of the system. The make of each item shall be approved by the client. Copper/ SS tubing shall be routed in such a way that if any leakage occurred during operation can easily be detected and the defective portion can be repaired/ replaced without dismantling the whole system.

## **7.0 Electrical Control Panel**

### **7.1 Control Panel**

Three control panels shall be provided, one for the main power supply tapping, second for the refrigeration unit and the third for the milk tank. Each panel shall be provided with MCB's of suitable ratings for switching and protection as per the system requirement. The incoming and outgoing power supply terminals shall be covered and secured with a lead seal to prevent tampering. The door of the panels should be provided with lockable handles.

## 8.0 Refrigeration Control Panel

The refrigeration unit shall be provided with a control panel made out of Stainless Steel suitable for wall mounting near the unit. The panel shall be provided with motor starters, ON/OFF push buttons & necessary MCBs, control wiring, line voltage controller to guard the compressor against the supply voltage fluctuations. Wall / Tank mounted To be specified by bidder MOC of Panel & Thickness AISI 304 / 1.6mm

In case more than one compressor is provided in the refrigeration system, the control panel shall be provided with a sequence controller & timer to start one compressor at a time to avoid surge on power supply. The panel shall also have facility to operate refrigeration unit on auto/ manual mode. In the auto mode, as soon as the milk temperature reaches to pre-set value, the compressor should be switched off to avoid freezing of .Milk Tank

### 8.1 Control Panel

The milk tank shall be provided with a control panel with inbuilt-timer to control the intermittent operation of the agitator & a digital temperature indicator to indicate the milk temperature to one decimal place with least count of 0.1<sup>0</sup> C on continuous basis. In case of power failure alternate arrangement should be available to know the temperature (stem thermometer). The agitator (s) shall have interlocking arrangement with top cover opening limit switch. The limit switch shall put off the agitator as soon as the top cover opens up.

Temperature Display LCD 0 to 100 Deg. C with one decimal accuracy; Management & control of cooling and agitation ; provision for cut-off/ restart, intermittent operation of agitator, auto & manual facility required ; RS232 port for temperature data backup of minimum last 90 days & main cooler faults analysis; in case of open type coolers, agitator should switch off when the lid is opened for safety purpose.

All the pipes shall be clamped properly with fixed support. In case of double compressor system, pipe, fitting & control should be designed in such a way that both the compressors can run independently. The tubing shall be insulated wherever necessary.

## 9. Cables & Electrical Switch gears

All electrical switch gears and controls required for the complete system shall be of reputed make and of suitable rating.

All permanent wiring installed on the tank or associated unit shall be carried out using PVC cable in heavy gauge, screwed galvanized steel conduit or plastic conduit, or in mineral- insulated copper- sheathed cable. Flexible connections shall be made.

## 10.0 Earthing

As per IS: 3043 - 1987 (reaffirmed 2001) - "Code of practice for earthing". Pipe type earthing - 4 nos. to be used. Suitable GI Strip (minimum 25x3 mm) to be used for connecting earth pit with nearest equipment earthing point. From this point earthing to other points can be looped by suitable GI Strip or PVC insulated copper conductor

cable of green color (size minimum 1x 4 Sq mm) The chassis, framework and fixed parts of the metal casing of the tanks where used shall be provided with two separate earthing terminals, Earthing for Alternator & Panels. These terminals shall be provide over metallic coverings) of current carrying cables.

The earthing terminal shall be readily accessible and so placed that the earth connection of the tank are maintained when the cover or any other movable part is removed.

The earthing terminal shall be of adequate size, be protected against corrosion and shall be metallically clean. Under no circumstance shall a movable part of the enclosure be insulated from the part carrying the earthing terminal when the movable part is in place.

The earthing terminal shall be identified by means of the ‘ ‘ marked in a legible and indelible manner on or adjacent to the terminals.

### **10.1 Accessories**

Isolation valves at suction & discharge sides of the compressors, All pipes, valves, fittings & controls shall comply with the latest relevant BIS code applicable, Copper piping between tank and CDU shall be supported/routed by cable tray and cable tray supports.

### **10.2 Accessories for 500 LPD & 1000 LPD BMC**

MS Powder coated 1.6mm enclosure, 32 DP Change over switch, 32 A DP MCB as incoming, 3 nos. 10 A MCB SP for lighting, 3 nos. 20 A MCB SP for geyser/Solar water heater, AMCU etc.

MS Powder coated 1.6mm enclosure, 40 A DP MCB for incoming, 32 A DP MCB for feeding refrigeration panel, 20 A DP MCB for feeding starter of milk pump, 32 A DP MCB for feeding Domestic power DB, 20 A DP MCB as spare.

### **10.3 Accessories for 2000 LPD BMC**

MS Powder coated 1.6mm enclosure, 40 A TPN MCB for incoming, 32 A TPN MCB for feeding refrigeration panel, 20 A TPN MCB for feeding starter of milk pump, 32 A DP MCB for feeding Domestic power DB, 20 A TPN MCB as spare.

### **10.4 Accessories for 5000 LPD BMC**

MS Powder coated 1.6mm enclosure, 60 A TPN MCB for incoming, 40 A TPN MCB for feeding refrigeration panel, 20 A TPN MCB for feeding starter of milk pump, 32 A DP MCB for feeding Domestic power DB, 20 A TPN MCB as spare.



## **10.5 Other Required Accessories**

Isolation valves at suction & discharge sides of the compressors, All pipes, valves, fittings & controls shall comply with the latest relevant BIS code applicable, Copper piping between tank and CDU shall be supported/routed by cable tray and cable tray supports.

## **10.6 Optional Item –**

Heat recovery Unit for 2000 L to 5000 L capacity BMC with necessary piping (Estimated 10 meter)

This system shall be for heating water using heat of one condensing unit of BMC & to store this hot water. It shall consist of evaporator type heat recovery unit. Tank shall be of 200 litre capacity in SS 304, Outlet with 38 MM Butterfly valve with Union. All controls shall be manual.

Installation of all equipment & interconnecting piping ,including minor civil works such as providing galvanized steel supports, SS base plates, clamps etc. required to secure the equipment & piping to walls and floors is included in the scope. Necessary cable trays, GI pipes/ conduits, cable gland sockets at both ends, insulators, junction boxes etc are included in the scope of the contract to lay & connect all electrical and control cables. Cabel trays and supporting steel members such as Galvanized angels/channel/ flats, supply of CI covers for the pits etc shall be used and fixed/ installed at appropriate places to ensure safe installation. The laying of cables on the floor or under the floor should is not permitted.

The owner will undertake major civil works. The supplier shall make all tools & tackles required to execute the job available.

## **11.0 Commissioning**

Supplier shall arrange commissioning & performance trial runs of the bulk milk cooling system to the satisfaction of Milkfed. The supplier shall supply all the consumables required during commissioning of the plant. Along with the bulk milk cooler & DG Sets etc, the bidder shall quote for supply of spares along with prices for the complete system. A set of essential spares for the total installation as required by the user shall be worked out and finalize at the time of finalization of contract.

The cost of spares should not be included in the main bid.

## **11.1 Tool Box**

A standard tool box is required with necessary tools for normal maintenance. It should include Electric Tester, Screw Driver Set, Allen Key 3mm & 6mm, Pipe Wrench 12" Long, Screw Spanner 6", Fix spanner Set 6-27, Gasket for SS Unions/valves- 3 sets

## **11.2 Manual**

Two sets of operation & maintenance manuals in English containing complete details of starting up , putting off , critical checks and day to day maintenance of

the complete system shall be supplied . The manual should also have the required electrical circuit diagrams.

### **11.3 Training**

Supplier shall arrange for training of the team of DCS staff for efficient operation and maintenance of the complete system.

**11.4** After Sales Service, Service Centre and Service Contract(optional) obligation of BMC package supplier for providing after sales service/warranty claims for BMC package components supplied.

**11.5** It would be the responsibility of the contractor, for bought-out components of critical nature such as DG Set and voltage stabilizer, to identify dealers/ agency located in the region where BMC package would be installed. This is to facilitate fulfilling of the warranty obligations as per the contractor and availing timely services by milk collection centers in view.

**11.5** Union has a right to inspect all the components of the bulk milk cooling system during fabrication / manufacturing stage. Before starting the fabrication work supplier shall submit QAP & QIP for approval from client. The milk cooling tank shall be checked with dye penetration test for welding defect, surface roughness check, water tightness test / hydraulic test.

### **12.0 GENERAL SCOPE OF WORK:**

RAW MILK - At max. temp. of 35 deg. C shall be made available at the Dump tank by Co-operative societies/Union.

ELECTRICAL POWER –Electrical power including earthing shall be made available at the incoming feeder of Main Control Panel. In case of power failure, Power supply through DG set shall be made available through a manual change over switch provided in the Main Control Panel.

CHILLED MILK – Co-operative societies/Union shall leave the chilled milk at the outlet of bulk milk cooler at 4 deg. C temperature. VCS/Union will connect the milk pump and hose pipe available on the Road Milk Tanker to the outlet of bulk cooling tank and unload milk.

WATER: Water of suitable quality shall be provided at inlet of Hot water arrangement system. Hot water generator shall generate water of 60 to 65 Deg C for CIP of BMC tank and piping.

Only first charge of refrigerant and oil for cooling tank is included in Bidder scope. Any additional charge of oil and refrigerant if subsequently required shall be provided by Co-operative societies/Union.

All types of consumables process water, electrical power; raw milk, etc. shall be arranged by ordering unions / co-operative societies.

## APPENDIX-II

Format for technical details: (Details to be furnished by the bidder)  
**TECHNICAL SPECIFICATIONS FOR BULK COOLING TANKS CAP.2000 L  
 WITH SINGLE PHASE POWER SUPPLY AND ONE CONDENSING UNIT  
 (OPEN/CLOSED TYPE).**

SI. No	DESCRIPTION	TECHNICAL REQUIREMENT
A.	Bulk Milk Cooler	
1	Rated Capacity	2000 Ltr.
2	Make and model.	To be specified by the bidder
3	Material used for construction	AISI 304
4	Type	Closed/Open Type Horizontal/ Rectangular / Cylindrical / Semi-cylindrical.
5	Overall dimensions and weight.	To be specified by the bidder
6	Thickness of inner and outer shells	1.5 mm for inner 1.2 mm for outer shell
7	Number and RPM of agitator(s).	1 no.25 RPMs (approx).
8	CIP facility: Manual or auto	Manual
9	Insulation type  (b) Thickness © Efficiency	By injection in situ of High Density (min.40 kg/m <sup>3</sup> ) CFC free polyurethane foam without any imperfection and hygroscopicity Minimum 50 MM. It should be such that at 50 deg C ambient the rate of rise of mean temp. of Milk Initially at 4 deg. C shall not Exceed 1 dg. C in 4 hour when rated volume is allowed to stand-still as per requirement of ISO 5708 2A(II)
10	Balance Tank with Filter, in line strainer	Minimum 200 liters capacity.
11	SS Milk transfer pump	Minimum 5000 LPH capacity.
12	Facility to Measure volume:	SS calibrated dip Stick on both sides in the BMC tank with 0.5% calibrating accuracy.
B	Refrigeration unit	
1	Type:	DX-type  Hermetically sealed scroll / reciprocating
2	Compressor:	To be specified by the bidder.
a)	Make	To be specified by the bidder
b)	Model	

13	Condenser: a) Make: b) Model	Air Cooled, finned Tube Type To be specified by the bidder. To be specified by the bidder
14	a) No. of compressor b) Capacity of compressor(s). (Kcal/hr)	Two Min. 10333(Kcal/hr)
C	Design Parameters	
15	a. No. of Fans b) Capacity of the condenser	Min. Two Min. 12400 (Kcal/hr)
16	Overall dimensions and weight of the unit	To be specified by the bidder
17	Type of refrigerant : R-22 or CFC free environment friendly refrigerant refrigeration control panel (Wall/Tank mounted)	Preferably R – 22 To be specified by the bidder
18	Type of refrigerant:R-22 or CFC free Environment Friendly refrigerant Refrigeration Control Panel (Wall/Tank mounted)	Preferably R-22 To be specified by the bidder.
19	Power Supply	Single/Three Phase.
1	Ambient temperature considered for design	46 Deg C
2	Maximum cooling time considered a) ALL milking b) SECOND milking.	3 hrs from 35 Deg C To 4 degC 1.5 hrs from 10 deg. C To 4degC
3	Temperature range considered a) ALL Milking. b) SECOND milking.	35 Deg C To 4 degC 10 deg. C To 4degC

20	Electrical	
1.	Connected load in Watts & Amperes for : a) Compressor(s) b) Condenser fan(s) c) Agitator(s). d) Milk pump	To be specified the bidder To be specified the bidder To be specified the bidder To be specified the bidder
	Maximum / surge current drawn by the compressor(s)	Not more than 30 Amps.
1	Make & model of the voltage stabilizer  rating of the voltage stabilizer	ASABA/SUVIK/MICROTECH/SEN& PANDIT/PACE/POWERENGINEER/ GELCO Min. 15 KVA

NOTE :ALL THE INTER CONNECTING SS PIPES & FITTINGS FOR INSTALLATION & COMMISSIONING OF EQUIPMENTS IS IN SCOPE OF SUPPLY OF BIDDERS. SIMILARLY ALL THE ELECTRICAL SWITCH GEAR ITEMS FOR INTER CONNECTION FOR MAIN CONTROL PANEL, REFRIGERATION CONTROL PANEL, MILK TANK PANEL, ETC. AND CABLES ARE IN THE SCOPE OF SUPPLY. THE EARTHING MATERIAL WHEREVER REQUIRED IS ALSO IN THE SCOPE OF BIDDER.

## APPENDIX-II

Format for technical details: (Details to be furnished by the bidder)  
 TECHNICAL SPECIFICATIONS FOR BULK COOLING TANKS CAP.5000 L WITH THREE  
 PHASE POWER SUPPLY AND ONE CONDENSING UNIT (CLOSED TYP).

S.No	DESCRIPTION	TECHNICAL REQUIREMENT
A.	Bulk Milk Cooler	
1	Rated Capacity	5000 Ltr.
2	Make and model.	To be specified by the bidder
3	Material used for construction	AISI 304
4	Type	Closed Type Horizontal/ Rectangular / Cylindrical
5	Overall dimensions and weight.	To be specified by the bidder
6	Thickness of inner and outer shells	2.0 mm for inner 1.5 mm for outer shell
7	Number and RPM of agitator(s).	1 no.25 RPMs (approx),Make:SIREM
8	CIP facility: Manual or auto	Auto with CIP System
9	Insulation. type  (b) Thickness © Efficiency	By injection in situ of High Density (min.40 kg/m <sup>3</sup> ) CFC free polyurethane foam without any imperfection and hygroscopicity Minimum 50 MM. It should be such that at 50 deg C ambient the rate of rise of mean temp. of Milk Initially at 4 deg. C shall not Exceed 1 dg. C in 4 hour when rated volume is allowed to stand-still as per requirement of ISO 5708 2(II)
10	Balance Tank with Filter, in line strainer	Minimum 200 liters capacity.
11	SS Milk transfer pump	Minimum 10000 LPH capacity.
12	Facility to Measure volume:	SS calibrated dip Stick on both sides in the BMC tank with 0.5% calibration accuracy.
B	Refrigeration unit	
1	Type:	Hermetically Sealed scroll/ reciprocating
2	Compressor: c) Make d) Model	To be specified by the bidder. To be specified by the bidder
13	Condenser: c) Make: d) Model	Air Cooled, finned Tube Type To be specified by the bidder. To be specified by the bidder
14	c) No. of compressor d) Capacity of compressor(s). (Kcal/hr)	Two Min. 25833(Kcal/hr)
15	a) No. of fans b) Capacity of the condenser	Min. Two Min. 25833(Kcal/hr)

16	Overall dimensions and weight of the unit.	To be specified by the bidder.
17	Type of refrigerant:R-22 or CFC free Environment Friendly refrigerant. Refrigeration Control Panel (Wall/Tank mounted)	Preferably R-22 To be specified by the bidder.
18	Power Supply	Three Phase.
C	Design Parameters	
1	Ambient temperature considered for design	46 Deg C
2	Maximum cooling time considered c) ALL milking d) SECOND milking.	3 hrs from 35 Deg C To 4 deg C 1.5 hrs from 10 deg. C To 4deg C
3	Temperature range considered c) ALL Milking. d) SECOND milking.	35 Deg C To 4 deg C 10 deg C To 4 deg C

D	Electricals	
1	Connected load in Watts & Amperes for : e) Compressor(s) f) Condenser fan(s) g) Agitator(s). h) Milk pump	To be specified the bidder To be specified the bidder To be specified the bidder To be specified the bidder
	Maximum / surge current drawn by the compressor(s)	Not more than 67 Amps.
1	Make & model of the voltage stabilizer rating of the voltage stabilizer	ASABA/SUVIK/MICROTECH/SEN& PANDIT/PACE/POWER ENGINEER/GELCO Min.25 KVA

NOTE: ALL THE INTER CONNECTING SS PIPES & FITTINGS FOR INSTALLATION & COMMISSIONING OF EQUIPMENTS IS IN SCOPE OF SUPPLY OF BIDDERS. SIMILARLY ALL THE ELECTRICAL SWITCH GEAR ITEMS FOR INTER CONNECTION FOR MAIN CONTROL PANEL, REFRIGERATION CONTROL PANEL, MILK TANK PANEL, ETC. AND CABLES ARE IN THE SCOPE OF SUPPLY. THE EARTHING MATERIAL WHEREVER REQUIRED IS ALSO IN THE SCOPE OF BIDDER.

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