KERALA STATE CO-OPERATIVE FEDERATION FOR FISHERIES DEVELOPMENT LTD, KAMALESWARAM, TRIVANDRUM.695009, KERALA STATE

Phone: 0471 – 2457172, 2457756 Fax: 0471 – 2457752

TENDER NOTICE NO. I

Competitive tenders in separate sealed covers super scribed with the name and number of tender are invited in two-bid system for the supply and erection of the following machinery/equipments for its Glucosamine Plant as per European Pharma copeia standards from the manufacturers, authorised distributors reputable suppliers and sole agents.

Tender No.	Description.	Tender No.	Tender document price (Non-Refundable)
Tender-I.	Purchase of chemical process plant & machinery Glass lined reactors and accessories	I	Rs1000+tax

The tender forms with detailed specifications and terms and conditions may be had from Matsyafed Head Office at Trivandrum on payment of Rs 1000+ tax and is not refundable under any circumstances. or can be downloaded from the web site www.matsyafed.org

The tenderers can submit tenders for either all the machinery/equipment or in part.

Due date and time for receipt of tenders at 3 PM on 23.09.2010

Due date and time for opening of tenders at 4 PM on 23.09.2010

The tender documents should contain two parts namely technical bid and financial bid.

The technical bid should contain

a) Prescribed tender form duly signed and sealed

b) Detailed technical specifications with out price quote.

c) Original brochure & literature supporting the technical Specification.

d) Earnest Money Deposit of Rs 100000 (one lakh)

e) Agreement in Rs100 stamp paper

f) List of installations in India, fully your own installed or part.

g) Details of service facility

h) Compliance to payment condition

i) Delivery period

k) Warranty

l) Training details etc

j) Place of delivery) The bidder should submit a quality assurance plan for the equipment they intend to supply

k) The organizational chart and balance sheet of the bidding firm also to be submitted

The Financial bid should contain

a) Price of the equipment and its accessories

b) AMC details

c) Price list of essential spare parts

d) Compliance to Terms & conditions and Time schedule

The tenders duly filled and signed by the tendered along with necessary documents should be submitted to the Managing director, Kerala state co-operative federation for fisheries Development Ltd (MATSYAFED), Kamaleswaram, Manacaud. P.O Trivandrum-695009 on or before 3 pm on 23.9.2010.

Specimen of the agreement to be submitted in stamp paper is in the last page of the tender form. Earnest Money Deposit (EMD) amount of Rs 100000 (One lakh) shall be submitted by way of demand draft, deposit receipt or bank guarantee in favour of The Managing Director, Kerala state co-operative federation for fisheries Development Ltd (MATSYAFED), Kamaleswaram, Manacaud.P.O., Trivandrum-695009. In the case of bank guarantee, its validity should be u to 30/6/2011.

The technical bids will be opened at 4 PM on 23.09.2010 at the office Managing Director,conference hall in the presence of such tenderers or their authorized representatives who may be present at that time.

The financial bids of the technically qualified firms will be opened at a later stage and the date will be intimated. The Managing Director, MATSYAFED, Trivandrum reserves the

right to accept or reject all or any tender at his sole discretion without assigning any reason. For legal purposes, the cause of action will be deemed to have arisen in Trivandrum, Kerala state.

TERMS AND CONDITIONS

1. The latest model shall be quoted and certified.
2. The Technical bid will be examined by a committee decided by the management to assess the technical capability, credibility and authenticity of the bidder.
3. The quoted price should include cost of the equipment, freight, all duties and taxes, insurance, installation and commissioning charges separately.
4. Payment condition:
   If the price is quoted in Indian rupees, 90% payment will be released after successful commissioning.10% of the price will be retained as security deposit and will be released on completion of the guarantee period.
5. Factory site/Installation site
   All the equipments/machinery as per this tender is to be delivered & installed in the factory site in **Paravoor** village in **Alappuzha** district
6. The installation should be done by the supplier.
7. Delivery period: The equipment and its accessories should be completely supplied, installed and commissioned within 3 months from the date of supply order.
8. Warranty:- The entire equipment and its accessories should have comprehensive warranty from the date of acceptance. Specify the warranty period
9. The rates and terms of AMC (both comprehensive and labor) for a minimum period of 5 years after the warranty period shall be clearly specified. The labor AMC amount will be taken in to consideration for final selection.
10. Training should be given to the staff free of cost.
11. List of installations in India over past 5 years shall be provided
12. Duely completed tender document through registered post or in person will only be accepted as per the time schedule.
13. The detailed specification of the equipment are given in the website: www.matsyafed.org

SD/-

THE MANAGING DIRECTOR
KERALA STATE CO-OPERATIVE FEDERATION FOR FISHERIES DEVELOPMENT LTD.
KAMALESWARAM, MANACAUD P.O, THIRIVANANDAPURAM PIN - 695009, KERALA Phone: 0471 – 2457172,2457756
Fax: 0471-2457752

ANNEXURE-1

AGREEMENT
[to be executed on Rs.100/- Kerala Stamp Paper (non-judicial) and submitted with the tender documents – technical proposal]

Articles of agreement executed on this the ..... day of two thousand ..... BETWEEN the Managing director, Kerala state co-operative federation for fisheries Development Ltd(MATSYAFED),Kamaleswaram, Manacaud. P.O Trivandrum-695009 herein after called MATSYAFED and ……..…….....……
…… (here enter name and address of the tenderer) (hereinafter referred to as "the bidder") of the other part.

WHEREAS in response to the Notification No ……dated ..... the bidder has submitted to MATSYAFED a tender for the supply and erection of the machinery/equipments fro its Glucosamine plant as per European pharma copeia standards subject to the terms and conditions contained in the said tender.

WHEREAS the bidder has also deposited with MATSYAFED, a sum of Rs. …… (Rupees ……only) as earnest money for execution of an agreement undertaking the due fulfillment of the contract in case his tender is accepted by Matsyafed

NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows:

1. In case the tender submitted by the bidder is accepted by Matsyafed, and the contract for the supply & erection of the machinery/equipments for its glucosamine plant has been awarded to the bidder, the bidder shall within 14 days of acceptance of his tender, execute an agreement with Matsyafed incorporating all the terms and conditions under which Matsyafed accepts his tender.
2. In case the bidder fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, MATSYAFED shall have power and authority to recover from the bidder any loss or damage caused to Matsyafed by such breach as may be determined by Matsyafed by appropriating the earnest money deposited by the bidder and if the earnest money is found to be inadequate, the deficit amount may be

recovered from the bidder and his properties movable and immovable in the manner hereinafter contained.

3. All sums found due to Matsyafed under or by virtue of this agreement shall be recoverable from the bidder and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as Matsyafed may deem fit.

In witness where of Sri.……. (here enter name and designation) for and on behalf of Matsyafed and Sri. .....….…..….....
.....

the bidder have hereunto set their hands, the day and year shown against respective signatures
Signed by ……. (date) …… (for matsyafed)

In presence of witnesses:

1.

2.

Signed by ……. (date) …… (for bidder)

In the presence of witnesses:

1.

2.

ANNEXURE-II

CONTRACT AGREEMENT
(to be executed by the successful bidder on award of the contract on Rs. 100/- Kerala Stamp Paper (Non Judicial)

This agreement made on this …… day of ……. between the Managing director, Kerala state co-operative federation for fisheries Development Ltd (MATSYAFED),Kamaleswaram, Manacaud. P.O., Trivandrum-695009, herein after called MATSYAFD which expression shall include its administrators, successors, executors and assigns) of the one part and …….. (name of contracting company), a company/firm incorporated under the …… …… having its registered Office at ……..…

……. (herein after referred to as "Contractor", which expression shall include its administrators, successors, executors and permitted assigns) of the other part.

WHEREAS MATSYAFED has invited bids for supply and erection of the machinery/equipments for its Glucosamine plant as per European pharma copeia standards from manufacturers ,authorized distributors/reputable suppliers (briefly describe scope of the works) as per its Tender notice No. ……dated ……..

AND WHEREAS *…….……... had participated in the above referred bidding vide their proposal no. ……. dated …….. and Matsyafed accepted the aforesaid proposal and awarded the contract to *…….……..... on terms and conditions contained in its work order No. …….dated …… and the

documents referred to therein,which have been accepted by *……. resulting into a "Contract".

NOW THEREFORE THIS DEED WITNESSETH AS UNDER:-

1. AWARD OF CONTRACT

1.1 MATSYAFED has awarded the contract to *…… for the work of the supply and erection of …… on the terms and conditions contained in its work order No.……dated..... and the documents referred to therein. The award has taken effect from …… …… ie., the date of issue of the aforesaid letter. The terms and expressions used in this Agreement shall have the same meaning as are assigned to them in the "Contract Documents" referred to in the succeeding Article.

2. CONTRACT DOCUMENTS

2.1 The contract shall be performed strictly as per the terms and conditions stipulated as per the following documents attached herewith (hereinafter referred to as "Contract Documents"):

i) MATSYAFED's Tender Documents in respect of tender No. ……..dated ……consisting of Notice inviting Tender and conditions of contract including all amendments issued vide its letter(s) no(s). …… dated …… .

(Volume-I)

ii)Matsyafed's Schedule and Technical Specification (including Amendments issued vide its letter no…….

.....…… dated …….. .

(Volume-II)

iii) ..... proposal no……...

…….....… dated …… along with proposal sheets, payment terms and work schedules submitted by Contractor for the supply and erection of the Glucosamine plant

(Volume-III)

* Brief name of the contracting company

iii) Agreed Minutes of the meeting held on …… between MATSYAFED and the Contractor.

(Volume-IV)

iv) MATSYAFED's Work Order No. ……..dated …….. duly accepted by the Contractor.

(Volume-V)

2.2 All the aforesaid contract documents shall form an integral part of this Agreement, in so far as the same or any part thereof conform to the Bid Documents (Volume I & II) and what has been specifically agreed to by Matsyafed in its Work Order. Any matter inconsistent there with, contrary or repugnant thereto or any deviations taken by the Contractor in its Proposal" (Volume-.III) but not agreed to specifically by Matsyafed in its Work Order shall be deemed to have been withdrawn by the Contractor. For the sake of brevity, this Agreement along with its aforesaid contract documents shall be referred to as the "Agreement".

3. CONDITIONS AND COVENANTS

3.1 The scope of contract, consideration, terms of payment, price adjustment, taxes wherever applicable, insurance, liquidated damages, performance guarantee and all other terms and conditions are contained in MATSYAFED's Work Order No. ..……dated…….. read in conjunction with other aforesaid contract documents.

The contract shall only be performed by the Contractor strictly and faithfully in accordance with the terms of the Agreement.

3.2 The scope of work shall also include supply and installation of all such items which are not specifically mentioned in the contract documents, but which are needed for successful, efficient, safe and reliable operation of the equipment unless otherwise specifically excluded in the specification under "exclusions" or Work Order.

3.3 TIME SCHEDULE

Time is the essence of the contract and schedules shall be strictly adhered to. The Contractor shall perform the work in accordance with the agreed schedule as given in the work order.

3.4 The Contractor guarantees that the equipment package under the contract shall meet the ratings and performance parameters, as stipulated in the Technical Specifications and in the event of any deficiencies found in the requisite performance figures, the MATSYAFED may at its option reject the equipment package or alternatively accept it on the terms and conditions and subject to levy of the liquidated damages in terms of contract documents. The amount of liquidated damages so leviable shall be in accordance with the contract documents and without any limitation.

3.5 It is further agreed by the Contractor that the contract performance guarantee shall in no way be construed to limit or restrict the Matsyafed 's right to recover the damages/compensation due to short-fall in the equipment performance figures as stated in para 3.4 above or under any other clause of the Agreement. The amount of damages/compensation shall be recoverable either by way of deduction from the contract price, contract performance guarantee and/or otherwise.

3.6 This agreement constitutes full and complete understanding between the parties and terms of the presents. It shall supersede all prior correspondence to the extent of inconsistency of repugnancy to the terms and conditions contained in the Agreement.

Any modification of the Agreement shall be effected only by a written instrument signed by the authorised representatives of both the parties.

4. SETTLEMENT OF DISPUTES

4.1 It is specifically agreed by and between the parties that all the differences of disputes arising out of the agreement or touching the subject matter of the agreement, shall be decided by process of settlement & arbitration as specified in the relevant clauses of the conditions of the contract and the provisions of the Indian Arbitration Act, 1940 shall apply and Kerala Courts at Alappuzha alone shall have exclusive jurisdiction over the same.

4.2 Notice of default given by either party to the other party under the Agreement shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto if delivered against acknowledgement or by telex or by registered mail with acknowledgement due, addressed to the signatories at the address mentioned herein above.

IN WITNESS WHEREOF, the parties through their duly authorised representatives have executed these presents (execution whereof has been approved by the competent authorities of both the parties) on the day, month and year first above mentioned at Thiruvananthapuram.

For KERAL STATE CO-OPERATIVE FEDERATION FOR FISHERIES DEVELOPMENT LTD

(Signature)

(Name), (Designation)

(Seal)

for Contractor (Contractors signature)

(Name), (Designation)

(Seal)

Witnesses:

1.

2.

Witnesses:

1.

2.

KERALA STATE CO-OPERATIVE FEDERATION FOR FISHERIES DEVELOPMENT LTD (MATSYAFED)
Specification sheet for Tender No. I

PURCHASE OF CHEMICAL PROCESS PLANT
Glass Lined Reactors & Accessories

Sl. No.	Description	Purpose	Qty	Rate /unit	Amonut	Remarks
1	a. MS Glass lined reactor cap.1.6KL b. All glass overhead assembly for above reactor	a. To carry out acidic reactions , b. facilitate reflux & distillation	01 01 set			For details ref. Anx-1.A For details ref. Anx-1.B
2	**a.** MS Glass lined reactor cap.2.0KL **b.** MS Glass lined condenser 8.0 sqm **c.** MS Glass lined receiver cap.160 ltrs. **d.** MS Glass lined pipe lines. 150 dia vapour line, 50 dia reflux & distillate line	a. To carry out acidic reactions b,c,d.: To facilitate reflux, distillation & vacuum distillation	02 O2 set			For details ref. Anx-2.A For details ref. Anx-2.B For details ref. Anx-2.C For details ref. Anx-2.D
3	a.MS Glass lined reactor cap.3.0 KL b. All glass overhead assembly for above reactor	a. To carry out acidic reactions , b To .facilitate reflux & distillation	02			For details ref. Anx-3.A For details ref. Anx-3.B

ANNEXURE- 1.A

DOCUMENT NAME :	DATA SHEET FOR 1.6 KL MSGLR FLANGE TYPE
DOCUMENT NUMBER :	CON / KER / DS 1.6 KL / 01

SI. No.	OPERATING CONDITIONS	Shell	Vendor Compliance	Remarks
01	Diameter (mm)	**1400		
02	Height/length/width TT (mm)	**1800		
03	Process fluid	HCI ,methanol &R.M		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature oC	-20 to 150		
06	Specific Gravity	0.8 to 1.8		
07	Liq. Level max. m3	2		
08	Corrosives	YES		
09	pH	2 to 10		
10	Fluid Viscosity (cp)	max. 15,000		
11	Orientation	Vertical		
12	Minimum stirring volume	**100		
13	Minimum thermo well touching volume	**400		
14	Agitator	Anchor		
15	Operating Volume m3	1.6		
16	Water filled volume m3	2.3		
17	Insulation Hot	NA		
18	Insulation Cold	NA		
19	End covers: 10 % Tory spherical end	required		
SI No	**OPERATING CONDITIONS**	**Jacket**	**Vendor Compliance**	Remarks
01	Diameter (mm)	**1500		
02	Height/length/width - TT (mm)	**		
03	Process fluid	STEAM/CWS /CHB		
04	Pressure kg/cm2 (g)	4		
05	Temperature deg. C	-20 to 220		
06	Specific Gravity	0.4 to 1.2		
07	Liquid. Level max. m3	**		
08	Corrosives	None		
09	pH	Neutral		
10	Fluid Viscosity (cp)	25-200		

11	Operating Volume m3	**		
12	Water filled volume m3	**		
13	Insulation Hot	50 mm (Glass /Rock wool)		
	Cold	32 mm (PUF)		
14	Cladding	Required		
15	End covers: 10 % Tory 'spherical end	required		
SI No	**DESIGN CONDITIONS**	**SHELL**	**Vendor Compliance**	**Remarks**
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6 & F.V.		
03	Temperature deg C	**-28 to 200		
04	Hydro test Kg/cm2(g)	**9		
05	Vac. Test up to 760 mm Hg	Required		
06	Joint Efficiency	85%		
07	Radiography	100% Dish 10% Shell		
08	Corrosion Allowance (Wetted/non. Wetted/G.L)	1.0/00/00 mm		
09	Weight Empty Kg	**2900		
10	Weight Operating Kg	**1600		
11	Weight Water Full Kg	**4500		
12	Heat transfer area	**6.2 sq.m		
13	Surface Finish Ext	Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint		

01	**DESIGN CONDITIONS**	**JACKET**	**Vendor Compliance**	Remarks
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6		
03	Temperature oC	**-30 to 220		
04	Hydro test Kg/cm2(g)	**9		
05	Radiography Shell/head	**Nil		
SI No	**DESCRIPTION**	**MATERIAL OF CONSTRUCTION**	**Vendor Compliance**	**Remarks**
01	Shell	SA 516 Gr. 380 + GL		
02	End top	SA 516 Gr. 380+ GL		
03	End Bottom	SA 516 Gr. 380+ GL		
04	Nozzles	SA 516 Gr. 380 + GL		
05	Jacket	SA 516 Gr. 380		
06	Flanges	SA 216 Gr. WCB		

07	Body flanges	SA 836 M or SA 181 M + GL		
08	Bolts} Ext.	IS 1367 CL 4/4.6		
09	Nuts } Int.	IS 1367 CL 4/4.6		
10	Gasket	PTFE enveloped food grade		
11	Supports	SS 304		
12	Earthling Boss	SS 304		
13	Lifting Lugs	MS		
14	Jacket cladding	SS 304		
NOZZLE TYPE	**SIZE**	**DISCRIPTION / PURPOSE**	**Vendor Compliance**	**Remarks**
N1	350 x 450 mm	MANHOLE WITH 100MM DIA. SIGHT GLASS.		
N2				
N3	100 mm dia	CHARGING LINE		
N5	100 mm dia	ADDITION LINE		
N6	200 mm dia	VAPOR LINE		
N7	100 mm dia	LIGHT GLASS		
N9	200 mm dia	INCLINED THERMO WELL		
N10	100 mm dia	VENT / RUPTURE DISC / SRV		
	100 mm dia	SPARE		

M	150 mm dia	ANCHOR AGITATOR ENTRY		
L	100 mm dia	B.O.VALVE		
N11	50 mm dia	JACKET INLET		
&	50 mm dia	JACKET OUTLET		
N14	½" BSPT	JACKET DRAIN		
N12	½" BSPT	JACKET VENT		
&	50 mm dia.	JACKET INLET SPARE		
N15	50 mm dia	JACKET OUT LET SPARE		
T11				
N13				
Sl.No.	**GENERAL DATA REQD.**		**Vendor compliance**	**Remarks**
1	Heat transfer area	**6.20 sq. mtrs.		
2	Approx weight	**~ 2900 kgs.		
3	Weight full of water	** ~4500 kgs.		
4	Shell O/D	**1400 mm.		

5	Jacket OD	**1500 mm		
6	Main Shell thickness	**16 mm.		
7	Main dish thickness	**18 mm.		
8	Jacket Shell thickness	**10 mm.		
9	Jacket dish thickness	**10 mm		
10	Reactor body height	: **1800 mm.		
11	Total height of reactor	: **~3300 mm		
12	Motor	: **TEFC Flange mounted flame proof, 5.0 HP, 1440 RPM, 415 V AC, 50 Hz., Frame size E-132M,Make Crompton Greaves		
13				
14	Gear box	: **Inline Helical gear (Make Bonfiglioli), Model **AS55, Ratio : 29.8:1		
15				
	Shaft Seal	: Single Mechanical Seal reputed make with C V/s ceramic and kalrez O ring		
	External Surface Prep.	: Grit blasting Base Coat of Epoxy Red oxide Primer. Final Coat of Epoxy Light Gray Paint		
	SS Cladding	Mat finish to 80 Grit.		

AGITATOR DETAILS			**Vendor compliance**	**Remarks**
Type	Anchor	SWD** 1250		
Speed	**48	RPM		
Shaft diameter	**80	mm		
Motor power	**5.0	HP		
Run out	**0.08 max.at seal portion	mm		

SI No	Notes
1.	Top dish and exposed shell to be Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint
2.	Jacket to have spirals at 125mm pitch
3.	Spare nozzles to be provided with Gasket and Blinds
4.	Thermo well shall be provided with tantalum tip
5.	Reactor shall be plug free
6.	All nozzles shall be provided with blind flanges
7.	FBV with temperature indicator is required
8.	** Vendor to verify the design and give specifications
9.	Vendor to quote along with the supply. erection & commissioning
10.	Vender to submit the G.M.P related documents such as IQ,PQ,& dq ETC.
11.	Vendor to submit the guarantee certificate for 18 months.

VENDOR SCOPE OF WORK

Vessel	Yes	Agitator	Yes
Access Ladder	NA	Drive Motor	Yes
Blind Flanges	Yes	Drive Assembly	Yes
Fasteners	Yes	End Bolts	Yes
Gaskets	Yes		Yes

INSPECTION AND TESTING

Test Certificate	To be offered	To be Witnessed by the party.
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	Yes	Yes
Spark test	Yes	Yes

Current drawn on load / no load in RYB	Yes	Yes

Prepared by	Approved by
Checked by	Authorized by

KERALA STATE CO-OPERATIVE FEDERATION FOR FISHERIES DEVELOPMENT LTD

ANNEXURE - 1B

DOCUMENT NAME	DATA SHEET FOR ALL GLASS OVER HEAD ASSEMBLY FOR 1.6KL GLR
DOCUMENT NUMBER	CON/KER/DSAGOA/23

Sl. No.	Operating conditions	For rest of the items like Below/Vapour column/reflex Divider/reducer sub cooler/receiver with vent etc.	Vendor compliance	Remarks
01	Diameter	250 mm OD. heavy duty.		
02	Process fluid	Methanol/Hcl		
03	Pressure Kg/cm 2(g)	3/F.V		
04	Temperature.0 C	-20 to 100		
05	Specific gravity	0.4 to 1.2		
06	Corrosives	Yes		
07	pH	2 to 12		
-8	Fluid Viscosity(cp)	2-25		
-9	Length mm	** 100		
10	Glass Reflux divider out let size	**50 mm..		
11	Glass sub cooler	** 0.35 sqm		
12	Glass receiver	100ltr		
Sl. No.	**Design conditions**	**For rest of the items like Below/Vapour column/reflex Divider/reducer sub cooler/ receiver with vent etc**	**Vendor compliance**	**Remarks**
01	Design code	Std practice		
02	Pressure Kg/cm 2(g)	**3& F.V		
03	Temperature.0 C	**-28 to 200		
04	Hydro Testkg/cm2(g)	**3.0/		
05	Vac. Test. 760 mm Hg	** Required		

06 07 08	Corrosion allowance (wetted/non .wetted) Weight Empty Kg. Heat Transfer area	**1.0/00/00 mm ** ** 6sqm		

Sl. No.	Design conditions	Material of Construction	Vendor compliance	Remarks
01 02 03 04 05 06	Shell Flanges Bolts} Ext. Nuts}int. Gasket Supports	Boro silicate Transparent glass Aluminium with anti corrosive treatment Gl Gl' Teflon GI Pipe and CI with anticorrosive treated fittings		
Nozzle Type	**Size**	**Material of Construction**	**Vendor compliance**	**Remarks**
N1 N2 N3 N4 N5	250 mm dia 50 mm dia 25 mm dia 25 mm dia 80 mm dia	** Vapour inlet **Condensate inlet **Water Inlet(on tube side) **Water out let (on the tibe side) **Vent (for shell side)		

General Data Reqd

Nozzle Type	Size	Material of Construction	Vendor compliance	Remarks
N1 N2 N3 N4 N5 06 07 08	Heat Transfer Area Approx. Weight Weight full of water Shell OD mm Shell length mm Main shell thickness Tube thickness Condenser type	**6 sq mts ** .... kgs ** ..... kgs **250 mm **800 X3 **..... mm **..... mm Shell and coil type ,vertical.		

SI No	Notes
1.	Spare Nozzles to be Provided with Gasket and Blinds
2.	All nozzles shall be provided with blind flanges
3.	** vender to verify the design and give specifications
4.	The overhead assembly should be fitted on a 1.6 kl GLR Nozzle with all self supporting G.I. Pipe structure with necessary anti corrosive painted CI fittings.
5.	Vendor to quote along with the supply. errection & commissioning
6.	Vender to submit the G.M.P related documents such as IQ,PQ,& DQ ETC.
7.	Any other accessories and other additional features can be quoted as optional
	Vendor to issue 18 months guarantee fro the date of supply.

INSPECTION AND TESTING	To be offered	To be Witnessed by party
Test Certificate	Yes	.
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check		Yes

Prepared by	Approved by
Checked by	Authorized by

ANNEXURE-2-A

DOCUMENT NAME :	DATA SHEET FOR 2.0 KL MSGLR FLANGE TYPE
DOCUMENT NUMBER :	CON / KER / DS 2.0 KL / 02

SI. No.	OPERATING CONDITIONS	Shell	Vendor Compliance	Remarks
01	Diameter mm	**1400		
02	Height/length/width TT mm	**2000		
03	Process fluid	HCI ,methanol &R.M		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature oC	-20 to 150		
06	Specific Gravity	0.8 to 1.8		
07	Liq. Level max. m3	2.5		
08	Corrosives	YES		
09	pH	2 to 10		
10	Fluid Viscosity (cp)	Max 15,000		
11	Orientation	Vertical		
12	Minimum stirring volume	**100		
13	Minimum thermo well touching volume m3	**450		
14	Agitator	Anchor		
15	Operating Volume m3	2.0		
16	Water filled volume m3	2.6		
17	Insulation Hot	NA		
18	Insulation Cold	NA		
19	Cladding ss 304 (3 MM THK)	Required		
20	End covers: 10 % Tory spherical end	required		
SI No	**OPERATING CONDITIONS**	**Jacket**	**Vendor Compliance**	**Remarks**
01	Diameter mm	**1500		
02	Height/length/width - TT mm	**		
03	Process fluid	STEAM/CWS /CHB		
04	Pressure kg/cm2 (g)	4		
05	Temperature deg. C	-20 to 220		

06	Specific Gravity	0.4 to 1.2		
07	Liquid. Level max. m3	**		
08	Corrosives	None		
09	pH	Neutral		
10	Fluid Viscosity (cp)	25 – 200		
11	Operating Volume m3	**		
12	Water filled volume m3	**.....		
13	Insulation Hot	50 mm glass rock wool.		
14	Cold	32 mm PUF		
15	End covers: 10 % Tory spherical end	required		
SI No	**DESIGN CONDITIONS**	**SHELL**	**Vendor Compliance**	**Remarks**
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6 & F.V.		
03	Temperature deg C	**-28 to 200		
04	Hydro test Kg/cm2(g)	**9		
05	Vac.Test mm Hg	Required		
06	Joint Efficiency	85%		
07	Radiography	100% Dish 10% Shell		
08	Corrosion Allowance(Wetted/non.Wetted/G.L)	1.0/00/00 mm		
09	Weight Empty Kg	**3200		
10	Weight Operating Kg	**2000		
11	Weight Water Full Kg	**5800		
12	Heat transfer area	**7.3 sq.m		
13	Surface Finish Ext	Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint		

Sl.No.	**DESIGN CONDITIONS**	**JACKET**	**Vendor Compliance**	**Remarks**
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6		
03	Temperature oC	**-30 to 220		
04	Hydro test Kg/cm2(g)	**9		
05	Radiography Shell/head	**Nil/full		

SI No	DESCRIPTION	MATERIAL OF CONSTRUCTION	Vendor Compliance	Remarks
01	Shell	SA 516 Gr. 380 + GL		
02	End top	SA 516 Gr. 380+ GL		
03	End Bottom	SA 516 Gr. 380+ GL		
04	Agitator	SA 106 GR B + GL		
05	Nozzles/ Man way	SA 516 Gr. 380 + GL		
06	Jacket	SA 516 Gr. 380		
07	Flanges	SA 216 Gr. WCB		
08	Body flanges	SA 836 M or SA 181 M + GL		
09	Bolts} Ext.	IS 1367 CL 4/4.6		
10	Nuts } Int.	IS 1367 CL 4/4.6		
11	Gasket	PTFE enveloped food grade		
12	Supports	SS 304		
13	Earthling Boss	SS 304		
14	Lifting Lugs	MS		
NOZZLE TYPE	**SIZE**	**DISCRIPTION / PURPOSE**	**Vendor Compliance**	**Remarks**
N1	350 x 450 mm	MANHOLE WITH 100 DIA SIGHT GLASS.		
N2	100 mm dia	CHARGING LINE		
N3	100 mm dia	ADDITION LINE		
N5	200 mm dia	VAPOR LINE		
N6	100 mm dia	LIGHT GLASS		
N7	200 mm dia	STRAIGHT THERMOWELL		
N9	100 mm dia	VENT / RUPTURE DISC / SRV		
N10	100 mm dia	SPARE		

M	150	ANCHOR AGITATOR ENTRY		
L	100	B.O.VALVE		
N11 & N14	50	JACKET INLET		
N12 & N15	50	JACKET OUTLET		
T11	½" BSPT	JACKET DRAIN		
N13	50	JACKET VENT		

GENERAL DATA REQD.	
Heat transfer area	**7.30 Sq. Mtrs.
Approx weight	**~ 3800 Kgs.
Weight full of water	** ~5800 Kgs.
Shell O/D	**1400 mm.
Jacket OD	**1500 mm
Main Shell thickness	**16 mm.
Main dish thickness	**18 mm.
Jacket Shell thickness	**10 mm.
Jacket dish thickness	**10 mm
Reactor body height	**2000 mm
Total height of reactor	**~3400 mm
Motor	**TEFC Flange mounted flame proof, 7.5 HP, 1440 RPM, 415 V AC, 50 Hz., Frame size E-132M,Make Crompton Greaves
Gear box	**Inline Helical gear (Make Bonfiglioli), Model **AS55, Ratio : 29.8:1
Shaft Seal	Single Mechanical Seal reputed make with C V/s ceramic and kalrez O ring
External Surface Prep.	Grit blasting Base Coat of Epoxy Red oxide Primer. Final Coat of Epoxy Light Gray Paint

AGITATOR DETAILS		
Type	Anchor	SWD** 1250
Speed	**48	RPM
Shaft diameter	**80	mm
Motor power	**7.5	HP
Run out	**0.08 max. at seal portion	mm

SI No	Notes
1.	Top dish and exposed shell to be Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint
2.	Jacket to have spirals at 125mm pitch
3.	Spare nozzles to be provided with Gasket and Blinds
4.	Thermo well shall be provided with tantalum tip
5.	Reactor shall be plug free
6.	All nozzles shall be provided with blind flanges
7.	FBV with temperature indicator is required
8.	**vendor to verify the design & give specifications
9	Vendor to quote along with the supply. erection & commissioning
10	Vender to submit the G.M.P related documents such as IQ,PQ,& dq ETC.
11	Any other accessories and other additional features can be quoted as optional
	Vendor to submit guarantee certificate for 18 months.

VENDOR SCOPE OF WORK

Vessel	Yes	Agitator	Yes
Access Ladder	NA	Drive Motor	Yes
Blind Flanges	Yes	Drive Assembly	Yes
Fasteners	Yes	End Bolts	Yes
Gaskets	Yes		

INSPECTION AND TESTING

Test Certificate	To be offered	To be Witnessed by the party.
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	Yes	Yes
Spark test	Yes	Yes
Current drawn on load / no load in RYB	Yes	Yes

Prepared by	Approved by
Checked by	Authorized by

ANNEXURE-2B

DOCUMENT NAME :	DATA SHEET FOR MSGL 8.0 SQM CONDENSER
DOCUMENT NUMBER :	CON / KER / DS 8 SQM / 03
DATE / REVISION	24-09-2009 / REV – 00

SI. No.	OPERATING CONDITIONS	Shell	Vendor Compliance	Remarks
01	Diameter mm	**850		
02	Height/length/width TT mm	**2250		
03	Process fluid	HCI vapors ,methanol		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature deg C	-20 to 120		
06	Specific Gravity	0.8 to 1.8		
07	Liq. Level max. m3	**		
08	Corrosives	YES		
09	pH	2 to 10		
10	Fluid Viscosity (cp)	~3000		
11	Orientation	Vertical		

SI No	OPERATING CONDITIONS	Jacket	Vendor Compliance	Remarks
01	Diameter mm	**850		
02	Process fluid	CWS /CHB/steam		
03	Pressure kg/cm2 (g)	4		
04	Temperature deg. C	-20 to 220		
05	Specific Gravity	0.4 to 1.2		

06	Corrosives	yes		
07	pH	02 to 10		
08	Fluid Viscosity (cp)	2 – 25		
09	Insulation cold	50 mm		
10	Cladding 3 mm thk SS 304	Required.		

SI No	DESIGN CONDITIONS	SHELL	Vendor Compliance	Remarks
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6 & F.V.		
03	Temperature deg C	**-28 to 200		
04	Hydro test Kg/cm2(g)	**9		
05	Vac .Test mm Hg	Required		
06	Joint Efficiency	85%		
07	Radiography	100% Dish 10% Shell		
08	Corrosion Allowance (Wetted/non. Wetted/G.L)	1.0/00/00 mm		
09	Weight Empty Kg	**2000		
10	Heat transfer area	**8.0 sqm		
11	Surface Finish Ext	Grit blasting, base coat epoxy redoxide primer & final coat of epoxy light gray paint		

Sl. No	DESIGN CONDITIONS	JACKET	Vendor Compliance	Remarks
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6		
03	Temperature oC	**-30 to 220		
04	Hydro test Kg/cm2(g)	**9		
05	Radiography Shell/head	**Nil/full		
06	Insulation	50 mm PUF		

07	Cladding	Required		

SI No	DESCRIPTION	MATERIAL OF CONSTRUCTION	Vendor Compliance	Remarks
01	Shell	SA 516 Gr. 380 + GL		
02	End top	SA 516 Gr. 380+ GL		
03	End Bottom	SA 516 Gr. 380+ GL		
04	Nozzles	SA 516 Gr. 380 + GL		
05	Jacket	SA 516 Gr. 380		
06	Flanges	SA 216 Gr. WCB		
07	Body flanges	SA 836 M or SA 181 M + GL		
08	Bolts} Ext.	IS 1367 CL 4/4.6		
09	Nuts } Int.	IS 1367 CL 4/4.6		
10	Gasket	PTFE food grade		
11	Supports	SS 304		
12	Earthling Boss	SS 304		
13	Lifting Lugs	MS		
14	Jacket cladding.	SS 304 sheet with 3 mm thk.		

NOZZLE TYPE	SIZE	DISCRIPTION / PURPOSE	Vendor Compliance	Remarks
N1	200	VAPOR INLET		
N2	50	CONDENSATE OUTLET		
J1	50	JACKET INLET (FOR INNER SHELL)		
J2	50	JACKET OUTLET (FOR INNER SHELL)		
J3	50	JACKET INLET (FOR OUTER SHELL)		
J4	50	JACKET OUTLET (FOR OUTER SHELL		
J5	½ bspt	JACKET VENT.		

GENERAL DATA REQD.	
Heat transfer area	**8.0 Sq. Mtrs.
Approx weight	**~ 2000 Kgs.

Weight full of water Shell O/D Jacket OD Main Shell thickness Main dish thickness Jacket Shell thickness Condenser body height External Surface Prep. *Condenser type*	-- **850 mm. **950 mm **14 mm. **16 mm. **8.0 mm. : **2250 mm. Grit blasting Base Coat of Epoxy Red oxide Primer.Final Coat of Epoxy Light Gray Paint Shell in a shell type (double pipe) jacketed.

SI No	Notes
1	Top plate and exposed shell to be Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint
2.	Jacket to have spirals at 60 mm pitch
3.	Spare nozzles to be provided with Gasket and Blinds
4.	Condenser shall be plug free
5.	All nozzles shall be provided with blind flanges
6.	**vendor to verify the design & give specifications
7.	
8.	Vendor to quote along with the supply. errection & commissioning
9	Vender to submit the G.M.P related documents such as IQ,PQ,& dq ETC.
10	Any other accessories and other additional features can be quoted as optional Vendor to issue a Guarantee certificate for 18 months.

VENDOR SCOPE OF WORK

Condenser	Yes	Agitator	-- NA
Access Ladder	NA	Drive Motor	-- NA
Blind Flanges	Yes	Drive Assembly	-- NA
Fasteners	Yes	End Bolts	Yes
Gaskets	Yes		

INSPECTION AND TESTING

Test Certificate	**To be offered**	**To be Witnessed by the party.**
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	Yes	Yes
Spark test	Yes	Yes
Current drawn on load / no load in RYB	Yes	Yes

Prepared by	Approved by
Checked by	Authorized by

ANNEXURE-2C

DOCUMENT NAME :	DATA SHEET FOR 160 LITRS MSGL RECEIVER FLANGE TYPE
DOCUMENT NUMBER :	CON / KER / DS 160 LITRS / 04
DATE / REVISION	24-09-2009 / REV – 00

SI. No.	OPERATING CONDITIONS	Shell	Vendor Compliance	Remarks
01	Diameter mm	**800		
02	Height/length/width TT mm	**810		
03	Process fluid	HCI ,methanol &R.M		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature deg. C	-20 to 150		
06	Specific Gravity	0.8 to 1.8		
07	Liq. Level max. m3	0.160		
08	Corrosives	YES		
09	pH	2 to 10		
10	Fluid Viscosity (cp)	~5000		
11	Orientation	Vertical		
12	Operating Volume m3	0.160		
13	Water filled volume m3	0.250		
14	End covers: 10 % toriespherical end	required		

SI No	OPERATING CONDITIONS	Jacket	Vendor Compliance	Remarks
01	Diameter mm	**900		
02	Height/length/width - TT mm	**		
03	Process fluid	STEAM/CWS /CHB		
04	Pressure kg/cm2 (g)	4		
05	Temperature deg. C	-20 to 220		
06	Specific Gravity	0.4 to 1.2		
07	Liquid. Level max. m3	**		
08	Corrosives	None		
09	pH	Neutral		
10	Fluid Viscosity (cp)	2 – 25		
11	Operating Volume m3	**		
12	Water filled volume m3	**		
13	Insulation Cold	50 mm PUF		

14	End covers: 10 % Tory spherical end	Required		

SI No	DESIGN CONDITIONS	SHELL	Vendor Compliance	Remarks
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6 & F.V.		
03	Temperature deg C	**-28 to 200		
04	Hydro test Kg/cm2(g)	**9		
05	Vac. Test 760 mm Hg	Required		
06	Joint Efficiency	85%		
07	Radiography	100% Dish 10% Shell		
08	Corrosion Allowance (Wetted/non Wetted/G.L)	1.0/00/00 mm		
09	Weight Empty Kg	**760		
10	Weight Operating Kg	**160		
11	Weight Water Full Kg	**1000		
12	Heat transfer area	**1.2 sq. m		
13	Surface Finish Ext	Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint		

Sl. No	DESIGN CONDITIONS	JACKET	Vendor Compliance	Remarks
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6		
03	Temperature deg C	**-30 to 220		
04	Hydro test Kg/cm2(g)	**9		
05	Radiography Shell/head	**Nil/full		

SI No	DESCRIPTION	MATERIAL OF CONSTRUCTION	Vendor Compliance	Remarks
01	Shell	SA 516 Gr. 380 + GL		
02	End top	SA 516 Gr. 380+ GL		
03	End Bottom	SA 516 Gr. 380+ GL		
04	Nozzles/ hand hole	SA 516 Gr. 380 + GL		
05	Jacket	SA 516 Gr. 380		
06	Flanges	SA 216 Gr. WCB		
07	Body flanges	SA 836 M or SA 181 M + GL		

08	Bolts} Ext.	IS 1367 CL 4/4.6		
09	Nuts } Int.	IS 1367 CL 4/4.6		
10	Gasket	PTFE food grade		
11	Supports	SS 304		
12	Earthling Boss	SS 304		
13	Lifting Lugs	MS		
	Insulation & Cladding.	PUF & SS 304 Sheet 3 mm Thk.		

NOZZLE TYPE	SIZE	DISCRIPTION / PURPOSE	Vendor Compliance	Remarks
N1	150	HAND HOLE WITH 50 DIA SIGHT GLASS.		
N2	50	CHARGING LINE		
N6	80	VACUUM LINE		
N10	50	LIGHT GLASS		
M	80	SPARE		
L	100	B.O.VALVE		
N11 & N14	40	JACKET INLET / JACKET OUTLET		
T11	½" BSPT	JACKET VENT		
N13	½" BSPT	JACKET DRAIN		

GENERAL DATA REQD.	
Heat transfer area	**1.2 Sq. Mtrs.
Approx weight	: **~ 760 Kgs.
Weight full of water	:** ~1000 Kgs.
Shell O/D	**800 mm.
Jacket OD	: **900 mm
Main Shell thickness	: **14 mm.
Main dish thickness	: **16 mm.
Jacket Shell thickness	: **08 mm.
Jacket dish thickness	: **08 mm
Receiver body height	: **810 mm.
Total height of reactor	: **~810 mm
External Surface Prep.	: Grit blasting Base Coat of Epoxy Red oxide Primer. : Final Coat of Epoxy Light Gray Paint

SI No	Notes
1.	Top dish and exposed shell to be Grit blasting, base coat epoxy redoxide primer & final coat of epoxy light gray paint
2.	Jacket to have spirals at 75mm pitch
3.	Spare nozzles to be provided with Gasket and Blinds
4.	Thermo well shall be provided with tantalum tip
5.	Receiver shall be plug free
6	All nozzles shall be provided with blind flanges
7	Vendor to issue 18 months Guarantee certificate.
7.	FBV with temperature indicator is required
8	**vendor to verify the design & give specifications
9.	Vendor to quote along with the supply, erection & commissioning.
10	Vendor to submit the G.M.P. related documents such as IQ,PQ &DQ etc.
11.	Any other accessories & other additional features can be quoted as optional.

VENDOR SCOPE OF WORK

Vessel	Yes	Agitator	NA
Access Ladder	NA	Drive Motor	NA
Blind Flanges	Yes	Drive Assembly	NA
Fasteners	Yes	End Bolts	Yes
Gaskets	Yes		

INSPECTION AND TESTING

Test Certificate	To be offered	To be Witnessed by the party.
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	Yes	Yes
Spark test	Yes	Yes
Current drawn on load / no load in RYB	Yes	Yes

Prepared by	Approved by
Checked by	Authorized by

ANNEXURE - 2 D

DOCUMENT NAME :	DATA SHEET FOR M.S GL.PIPING FOR 2.0KL DISTILLATION STET UP
DOCUMENT NUMBER :	CON / KER / DS GLP/25

SI. No.	OPERATING /DESIGN CONDITIONS	Client specifications	Vendor compliance	Remarks
01	Diameter mm	Vapour column 150 mm dia.		
02	Height/length/width TT mm	**Refer the drawing		
03	Process fluid	HCI ,methanol &R.M		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature Deg C	-20 to 150		
06	Corrosives	YES		
07	pH	2 to 10		
08	Fluid Viscosity (cp)	~5000		
09	Orientation	Vertical/Horizontal		

SI. No.	OPERATING /DESIGN CONDITIONS	Client specifications	Vendor compliance	Remarks
01	Diameter mm	Reflex Line		
02	Height/length/width TT mm	**50 mm dia Refer the drawing		
03	Process fluid	HCI ,methanol &R.M		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature oC	-20 to 150		
06	Corrosives	YES		
07	pH	2 to 10		
08	Fluid Viscosity (cp)	~5000		
09	Orientation	Vertical/Horizontal		

SI No	Notes
1.	MS. exposed portion should be grit blasted and epoxy spray painted
2.	** vender to verify the design and give specifications
3.	Vendor to quote along with the supply. errection & commissioning
4.	Vender to submit the G.M.P related documents such as IQ,PQ,& dq ETC.
5.	Any other accessories and other additional features can be quoted as optional
6.	There may be slight variations in the dimensions at sight, vendors are requested to take the proper dimensions. and
7	carry out the work accordingly. The offer should include the provision for the same.
8	Vendor to issue 18 months Guarantee certificate.

INSPECTION AND TESTING	To be offered	To be witnessed by party
Test Certificate	Yes	Yes.
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	Yes	Yes
Spark test	Yes	Yes

Prepared by	Approved by
Checked by	Authorized by

ANNEXURE-3-A

DOCUMENT NAME :	DATA SHEET FOR 3.0 KL MSGLR FLANGE TYPE
DOCUMENT NUMBER :	CON / KER / DS 3.0 KL / 05

SI.No.	OPERATING CONDITIONS	Shell	Vendor Compliance	Remarks
01	Diameter mm	**1600		
02	Height/length/width TT mm	**2225		
03	Process fluid	HCI ,methanol &R.M		
04	Pressure kg/cm2 (g)	6 & FV		
05	Temperature oC	-20 to 150		
06	Specific Gravity	0.8 to 1.8		
07	Liq. Level max. m3	3		
08	Corrosives	YES		
09	pH	2 to 10		
10	Fluid Viscosity (cp)	~15000 Max		
11	Orientation	Vertical		
12	Minimum stirring volume	**150		
13	Minimum thermo well touching	**600		
14	volume m3	3		
15	Agitator	Anchor		
16	Operating Volume m3	3.0		
17	Water filled volume m3	3.8		
18	End covers: 10 % Tory spherical end	required		

SI No	OPERATING CONDITIONS	Jacket	Vendor Compliance	Remarks
01	Diameter mm	**1700		
02	Height/length/width - TT mm	**		
03	Process fluid	STEAM/CWS /CHB		
04	Pressure kg/cm2 (g)	4		
05	Temperature deg. C	-20 to 220		
06	Specific Gravity	0.4 to 1.2		
07	Liquid. Level max. m3	**		
08	Corrosives	None		
09	pH	Neutral		
10	Fluid Viscosity (cp)	2 – 25		

11	Operating Volume m3	**		
12	Water filled volume m3	**		
13	Insulation Hot	50 mm Glass wool		
14	Cold	32 mm PUF		
15	End covers: 10 % Tory spherical end	Required		
SI No	**DESIGN CONDITIONS**	**SHELL**	**Vendor Compliance**	**Remarks**
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6 & F.V.		
03	Temperature deg C	**-28 to 200		
04	Hydro test Kg/cm2(g)	**9		
05	Vac. Test 750 mm Hg	Required		
06	Joint Efficiency	85%		
07	Radiography	100% Dish 10% Shell		
08	Corrosion Allowance (Wetted/non. Wetted/G.L)	1.0/00/00 mm		
09	Weight Empty Kg	**4100		
10	Weight Operating Kg	**3000		
11	Weight Water Full Kg	**7900		
12	Heat transfer area	**9.3 sqm		
13	Surface Finish Ext	Grit blasting, base coat epoxy redoxide primer & final coat of epoxy light gray paint		

Sl. No.	**DESIGN CONDITIONS**	**JACKET**	**Vendor Compliance**	**REMARKS**
01	Design code	ASME Sec VIII . Div.1		
02	pressure Kg / cm2 (g)	6		
03	Temperature oC	**-30 to 220		
04	Hydro test Kg/cm2(g)	**9		
05	Radiography Shell/head	**Nil/full		
	Insulation Hot	50 mm rock wool		
	cold	32 mm PUF		

SI No	DESCRIPTION	MATERIAL OF CONSTRUCTION	Vendor Compliance	Remarks
01	Shell	SA 516 Gr. 380 + GL		
02	End top	SA 516 Gr. 380+ GL		
03	End Bottom	SA 516 Gr. 380+ GL		
04	Agitator	SA 106 GR B + GL		
05	Nozzles/ Man way	SA 516 Gr. 380 + GL		
06	Jacket	SA 516 Gr. 380		
07	Flanges	SA 216 Gr. WCB		
08	Body flanges	SA 836 M or SA 181 M + GL		
09	Bolts} Ext.	IS 1367 CL 4/4.6		
10	Nuts } Int.	IS 1367 CL 4/4.6		
11	Gasket	PTFE food grade		
12	Supports	SS 304		
13	Earthling Boss	SS304		
14	Lifting Lugs	MS		
15	Insulation & cladding.	50 mm glasswool,32 mm PUF & gladded with 3 mm SS 304 sheet.		

NOZZLE TYPE	SIZE	DISCRIPTION / PURPOSE	Vendor Compliance	Remarks
N1	350 x 450 mm	MANHOLE WITH 100 DIA SIGHT GLASS.		
N2	100 mm dia.	CHARGING LINE		
N3	100 mm dia.	ADDITION LINE		
N5	200 mm dia.	VAPOR LINE		
N6	100 mm dia.	LIGHT GLASS		
N7	200 mm dia.	STRAIGHT THERMOWELL		
N9	100 mm dia.	VENT / RUPTURE DISC / SRV		
N10	100 mm dia.	SPARE		
M	150 mm dia.	ANCHOR AGITATOR ENTRY		
L	100 mm dia.	B.O.VALVE		
N11 & N14	50 mm dia.	JACKET INLET		
N12 & N15	50 mm dia.	JACKET OUTLET		
T11	½" BSPT	JACKET DRAIN		
N13	50 mm dia.	JACKET VENT		

GENERAL DATA REQD.	
Heat transfer area	**9.30 Sq. Mtrs.
Approx weight	**~ 4110 Kgs.
Weight full of water	** ~8365 Kgs.
Shell O/D	**1600 mm.
Jacket OD	**1700 mm
Main Shell thickness	**16 mm.
Main dish thickness	**18 mm.
Jacket Shell thickness	**10 mm.
Jacket dish thickness	**10 mm
Reactor body height	**2225 mm.
Total height of reactor	**~3600 mm
Motor	**TEFC Flange mounted flame proof, 10 HP, 1440 RPM, 415 V AC, 50 Hz., Frame size E-132M,Make Crompton Greaves
Gear box	**Inline Helical gear (Make Bonfiglioli), Model : **AS55, Ratio : 29.8:1
Shaft Seal	Single Mechanical Seal reputed make with C V/s ceramic and kalrez O ring
External Surface Prep.	: Grit blasting Base Coat of Epoxy Red oxide Primer. : Final Coat of Epoxy Light Gray Paint

AGITATOR DETAILS		
Type	Anchor	SWD** 1440
Speed	**48	RPM
Shaft diameter	**80	mm
Motor power	**10	HP
Run out	**0.08 max. at seal portion	mm

SI No	Notes
1.	Top dish and exposed shell to be Grit blasting, base coat epoxy red oxide primer & final coat of epoxy light gray paint
2.	Jacket to have spirals at 125mm pitch
3.	Spare nozzles to be provided with Gasket and Blinds
4.	Thermo well shall be provided with tantalum tip
5.	Reactor shall be plug free
6.	All nozzles shall be provided with blind flanges
7.	FBV with temperature indicator is required
8.	**vendor to verify the design & give specifications
9	Vendor to quote along with the supply, erection & commissioning.
10	Vendor to submit the G.M.P. related documents such as IQ,PQ &DQ etc.
11	Any other accessories & other additional features can be quoted as optional.
12	Vendor to issue 18 months Guarantee certificate.

VENDOR SCOPE OF WORK

Vessel	Yes	Agitator	Yes
Access Ladder	Yes	Drive Motor	Yes
Blind Flanges	Yes	Drive Assembly	Yes
Fasteners□□□□	Yes	End Bolts	Yes
Gaskets □□□□	Yes		Yes

INSPECTION AND TESTING	To be offered	To be witnessed by party
Test Certificate	Yes	Yes.
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	Yes	Yes
Spark test	Yes	Yes

Prepared by	Approved by
Checked by	Authorized by

ANNEXURE - 3B

DOCUMENT NAME :	DATA SHEET FOR ALL GLASS OVER HEAD ASSEMBLY FOR 3.KL GLR
DOCUMENT NUMBER :	CON / KER / DS AGOA/24

SI. No.	OPERATING CONDITIONS	Shell	Vendor Compliance	Remarks
01	Diameter mm	**250		
02	Length/width TT mm	**800 X 3		
03	Process fluid	HCI /methanol		
04	Pressure kg/cm2 (g)	2 & FV		
05	Temperature oC	-20 to 150		
06	Specific Gravity	0.8 to 1.8		
07	Liq. Level max. m3	**		
08	Corrosives	YES		
09	pH	2 to 12		
10	Fluid Viscosity (cp)	5000		
11	Orientation	Vertical coil type		
12	Area Sqm	6.0sqm		
13				

SI No	OPERATING CONDITIONS	Coil	Vendor Compliance	Remarks
01	Diameter mm	**15 OD		
02	Process fluid	CWS /CHB(Dilute Solvent)		
03	Pressure kg/cm2 (g)	3		
04	Temperature deg. C	-20 to 100		
05	Specific Gravity	0.4 to 1.2		
06	Corrosives	No		
07	pH	Neutral		
08	Fluid Viscosity (cp)	2-25		
09	Pitch of the coil	**		

Sl. No.	Operating conditions	Below/Vapour column/reflex Divider/reducer sub cooler/receiver with vent & For rest of the items in the over head assembly	Vendor Compliance	Remarks
01	Diameter	250 mm OD. heavy duty.		
02	Process fluid	Methanol/Hcl		
03	Pressure Kg/cm 2(g)	2/F.V		
04	Temperature.0 C	-20 to 100		
05	Specific gravity	0.4 to 1.2		
06	Corrosives	Yes		
07	pH	2 to 12		
-8	Fluid Viscosity(cp)	2-25		
-9	Length mm	** 100		
10	Glass Reflux divider out let	**50 mm..		
11	size	0.35sqm		
12	Glass sub cooler	100ltr		
	Glass receiver			

Sl. No.	Design conditions	Below/Vapour column/reflex Divider/reducer sub cooler/receiver with vent	Vendor Compliance	Remarks
01	Design code	Std practice		
02	Pressure Kg/cm 2(g)	2& F.V		
03	Temperature.0 C	**-28 to 200		
04	Hydro Testkg/cm2(g)	*2.0		
05	Vac. Test. 750 mm Hg	Required		
06	Corrosion allowance (wetted/non .wetted)	1.0/00/00 mm		
07	Weight Empty Kg.	**		
08	Heat Transfer area	** 6sqm		

Sl. No.	Description	Material of Construction	Vendor Compliance	Remarks
01	Shell	Boro silicate Transparent glass		
02	Flanges	Aluminium with anti corrosive treatment		
03	Bolts} Ext.	Gl		

04	Nuts}int.	Gl’		
05	Gasket	Teflon food grade.		
06	Supports	GI Pipe and CI anticorrosive treated fittings		

Nozzle Type	Size	Material of Construction	Vendor Compliance	Remarks
N1	250 mm dia	Vapour inlet		
N2	50 mm dia	Condensate inlet		
N3	25 mm dia	Water Inlet(on tube side)		
N4	25 mm dia	Water out let (on the tibe side)		
N5	80 mm dia	Vent (for shell side)		

General Data Reqd.

Nozzle Type	Size	Material of Construction	Vendor Compliance	Remarks
N1	Heat Transfer Area	**6 sq mts		
N2	Approx. Weight	** kgs		
N3	Weight full of water	** kgs.		
N4	Shell OD mm	**250 mm		
N5	Shell length mm	**800 X 3		
06	Main shell thickness	** mm		
07	Tube thickness	** mm		
08	Condenser type	Shell and coil type ,vertical.		

SI No	Notes
1.	Spare Nozzles to be Provided with Gasket and Blinds
2.	All nozzles shall be provided with blind flanges
3.	** vender to verify the design and give specifications
4.	The over assembly should be fitted on a 1.6 kl GLR Nozzle with all self supporting G.I.Pipe structure with necessary CI fittings.
5.	Vendor to quote along with the supply. errection & commissioning
6.	Vender to submit the G.M.P related documents such as IQ,PQ,& DQ ETC.
7.	Any other accessories and other additional features can be quoted as optional
8.	Vendor to issue 18 months Guarantee certificate.

INSPECTION AND TESTING	To be offered	To be Witnessed by party
Test Certificate	Yes	Yes
Material	Yes	Yes
Hydro.	Yes	Yes
Dimensional Check	yes	yes

Prepared by	Approved by
Checked by	Authorized by