

PROPOSAL FOR

MALANGA SLURRY BASED

ENA PLANT

15,000 Liters/Day

Submitted to:

MR. FELIX

ACHILLE

PREPARED BY

IBHA SYSTEMS PVT. LIMITED, PUNE

19th OCT 2022

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ANNEXURE-I**INPUT AND OUTPUT SPECIFICATIONS****A. OUTPUT :-**

1. Total Alcohol @ 96%v/v	:	15 Kilo liter per day.
2. Extra Neutral Alcohol @ 96%v/v	:	14 Kilo liter per day
3. Impure Spirit @ 96%v/v	:	01 Kilo liter per day
4. Dark Effluent + Spent lees	:	170 m ³ /day

B. INPUT :-

1. Malanga slurry without solids @ 23-25% Starch	:	106 Tons per day
2. Soft water for makeup and pump sealing	:	100 m ³ /day
3. DM water for Dilution in Column for ENA	:	50 m ³ /day
4. Steam Saturated	:	4.2 TPH
5. Yeast	:	15-20 kg per day
6. Liquefying Enzyme	:	20 kg per day
7. Saccharifying Enzyme	:	20 kg per day
8. Nutrient (DAP/UREA)	:	15-20 kg per day
9. H ₂ SO ₄	:	15-20 kg per day.
10. Caustic	:	20-35 kg per day
11. Electricity (415 V & 50 Hz)	:	Consume- 650-700 kW

ANNEXURE II**PROCESS DESCRIPTION****LIQUEFACTION OF MALANGA SLURRY**

The malanga slurry is pumped continuously through a jet cooker, where the temperature is instantly raised to 120 °C. The retention time in the U tube is only three minutes, after which it is flashed into the liquefaction vessel at 80-90°C and the enzyme is added. The gelatinized mash from the Flash Tank is liquefied in the Final Liquefaction Tank where liquefying enzyme (alpha-amylase) is added. The liquefied mash is cooled in Mash Coolers and transferred to Fermentation section for further action.

FERMENTATION

The purpose of fermentation is to convert sugars into alcohol. Simultaneously Carbon dioxide is produced in Stoichiometric proportions and is scrubbed before being discharged. We employ closed top Fermenter with adequate external cooling system to maintain optimum fermentation temperatures. Agitators are also provided to ensure mixing and suspension of substrate in the tank. Anaerobic conditions are maintained to ensure high reaction rates and CO₂.

Typically 3 Nos. of fermenters are provided with Beer well of same capacity. Two fermenters will be taken for distillation every day. After transfer process is complete, empty fermenters will be put to CIP cycle.

Auxiliaries-

Auxiliary system comprises of dosing system for nutrient, antifoam, acid, additive as well as sterile air supply system yeast propagation and Fermentation.

Utility-

Cooling water is supplied to fermentation through combined cooling water system for distillation & fermentation.

DISTILLATION:

The columns in order of flow are: -

1. Analyser Column -
2. Aldehyde Column
3. Extraction Column
4. Rectification cum exhaust column
5. Fusel oil concentration column
6. Demethyliser Column

Fermented wash with 10-12 % v/v alcohol is preheated in fermented wash pre-heater. The preheated wash is then fed to analyzer column, to remove light impurities, dissolved gasses. Vapor from this column is sent to the bottom of the Pre-rectifier. The Spent wash from the Bottom of analyzer column is sent through a PHE to heat the incoming Fermented wash and then is taken for further treatment or recycle to fermentation section.

In Pre-rectifier column the alcohol is concentrated in the top tray and a small impure spirit cut is taken out. RS draw is taken from few trays below the top of Pre rectifier column, which is sent to purification column.

Dilution water in the ratio of 1:7 is fed to the Purifier column, which operates on the principle of inversion of relative volatility. Low boiling impurities are separated in the purifier column & bottom is sent to rectifier cum exhaust column while the top vapor draw is fed directly to Fusel oil concentration column. The Rectifier/Exhaust column concentrates the ethanol to 96% v/v. The high-grade spirit is drawn from one of the upper trays of the rectification column and fed to the Demethyliser Column. Demethyliser Column removes methanol, di-acetyls from the top and ENA draw is taken from the bottom. A small head cut is removed from the overhead stream to withdraw Impurities.

Fusel oil build up is avoided in the Rectifier cum exhaust column by withdrawing out side streams (fusel oils). These are sent to the Fusel Oil Concentration column where these fusel oils are concentrated and then sent to decanter where these streams are diluted with water and fusel oil rich

Storage

Product streams from the various sections are initially collected in respective daily receivers and then transferred to bulk storage tanks. Separate vent condenser is provided for each bulk storage tank.

Utilities

This comprises cooling tower and its system, instrument air and process air system, water treatment system and steam generation facility. Instrument Air should be dried air having dew point (-) 40°C. Process air can be filtered air. The water treatment plant consists of sand filtration followed by softening unit. The design of softening plant is dependent upon quality of raw water. Boiler capacity is arrived considering a peak load requirement.

EXTRA NEUTRAL ALCOHOL (ENA):

Sr. No.	Characteristics / Parameters	Values
1	Specific Gravity at 15.6 deg C	0.81
2	Ethanol content % v/v at 15.6 deg C	96.0
3	Miscibility with water	Miscible
4	Alkalinity	Nil
5	Acidity as Acetic Acid ppm	1.25
6	Esters as Ethyl acetate ppm	2
7	Aldehyde as Acetaldehyde ppm	0.5
8	Residue on evaporation ppm	2
9	Methanol	5 ppm
10	Fusel Oil ppm	1.5
11	Furfural	To pass test
12	Copper as Cu ppm	0.2
13	Lead as Pb ppm	Not detected
14	Permanganate reaction time (minutes)	40 min

ANNEXURE-III
SCOPE OF SUPPLY OF EQUIPMENTS

A. LIQUEFACTION SECTION:-

Sr. No.	Description	Tech specs	MOC	Qty	Remarks
1.	Slurry Preparation Tank with agitator	Cyl Shell, Top & bottom Dished Cap: 4 m ³	SS-304	1	
2.	Liquefaction Tank with agitator and motor and sparger	Cyl Shell, Top & bottom Dished Cap: 7 m ³	SS-304	1	
3.	Pump for Slurry tank	Cap: 4 m ³ /hr	Wetted parts CF8	1+1	
4.	Pump for Liquefaction Tank	Cap: 7 m ³ /hr	Wetted parts CF8	1+1	
5.	Mash Coolers	PHE	Frame MS, Plates SS 304	1+1	
6.	Jet Cooker	Cap- 6 m ³ /hr	AISI 304	1	
7.	Enzyme Dosing Tank	Standard	AISI 304	1	
8.	Piping and Valves	Standard	-	LOT	
9.	Instrumentation	Standard	-	LOT	

B. FERMENTATION SECTION:-

Sr. No.	Description	Tech specs	MOC	Qty	Remarks
1.	Pre fermenter	Cyl Shell, Conical Top & sloping bottom Cap: 10 m ³	Carbon steel	1	
2.	Pre fermenter cooler	PHE	Frame: MS Plates: SS304	1	
3.	Pre fermenter recirculation Pump with motor	Centrifugal Cap: 10 m ³ /hr	Wetted parts CF8	1	
4.	Fermenter	Cyl Shell, Conical Top & sloping bottom Cap: 150 m ³	Carbon steel	3	
5.	Beer well Tank	Cyl Shell, Conical	MS	1	

		Top & sloping bottom Cap: 150 m ³			
6.	Fermented wash cooler	PHE	Frame: MS Plates: SS304	3	
7.	Fermented wash recirculation pump	Cap: 60 m ³ /hr	Wetted parts CF8	3	
8.	CO ₂ scrubber	Std.	AISI 304	1	
9.	Air blower	Cap: 10 m ³ /hr	CI	1	
10.	Inter connecting Piping Valves	As per Std	LOT		
11.	Instrumentation	Standard	-	LOT	

C. DISTILATION SECTION:-

Sr. No.	Equipment	Technical Specs	M.O.C.	Qty
1.	Analyser Column Thickness	Dia: 900 mm 3 mm	SS 304	1
2.	Aldehyde Column Thickness	Dia: 700 mm 3 mm	SS 304	1
3.	Extractive Distillation Column Thickness	Dia: 650 mm 3 mm	SS 304	1
4.	Rectification column Thickness	Dia: 900 mm 3 mm	SS 304	1
5.	FOC Column Thickness	Dia: 450 mm 3 mm	SS 304	1
6.	Demethyliser Column Thickness	Dia: 650 mm 3 mm	SS 304	1
7.	Reboiler for Demethyliser	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	1
8.	Condenser Aldehyde – I & II	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	2
9.	Condenser Extraction – I	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	1
10.	Condenser Rectifier – I & II	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	2
11.	Condenser FOC – I	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	1
12.	Condenser Demethyliser– I & II	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	2
13.	Cooler for Fusel Oil	Type- Shell & Tube Tube-25.4 mm Shell- 3 mm	SS 304	1
14.	Cooler for ENA	Type- Shell & Tube Tube-25.4 mm	SS 304	1

		Shell- 3 mm		
15.	Feed tank	Capacity- 1 m3	SS 304	1
16.	Fusel oil decanter	Capacity- 1 m3	SS 304	1
17.	Cooling tower	Type- Induced Draft Qty-01	MOC- FRP	1
18.	Cooling water Supply pumps with motor	Type- Centrifugal Capacity-100 m ³ /hr Head- 35 meter	MOC-CI	1+1
19.	Extraction bottom pump with motor	Type- Centrifugal Capacity-3 m ³ /hr Head- 25 meter	MOC-Contact part SS-304	1+1
20.	FOC feed pump with motor	Type- Centrifugal Capacity-0.5 m ³ /hr Head- 25 meter	MOC-Contact part SS-304	1+1
21.	Piping & valves	Lot	-	-
22.	Electrical MCC panel	Type- Non compartmental	MOC-CRCA	1
23.	Instrument Panel	Type- Non compartmental	MOC-CRCA	1
24.	Flow meters. Temp Indicators, pressure gauges	Lot	-	-

D. TANK FORM:-

Sr. No.	Description	MOC and Qty	Remarks
1.	Daily ENA Receiver	Capacity – 15 M3 MS – 2 No Thk- 6 mm	
2.	Daily IS Receiver	Capacity – 1 M3 MS – 1 No Thk- 6 mm	
3.	BULK ENA Storage	Capacity – 100 M3 MS – 1 No Thk- 6 mm	
4.	BULK IS Storage	Capacity – 10 M3 MS – 1 No Thk- 6 mm	
5.	BULK Fusel oil Storage	Capacity – 10 M3 MS – 1 No Thk- 6 mm	
6.	Pumps with motor & Issue with Flow meter	Lot	

E. BOILER & WATER TREATMENT PLANT:-

Sr. No.	Description	MOC and Qty	Remarks
1.	Boiler for Plant	IBR- 1 No Capacity- 8 Tons per Pressure – 10.54 kg/cm ² (g) Temp- 186 Deg C	

		Fuel- Natural Gas Or Furnace Oil Scope- Water Feed tank 3 m ³ , Boiler package 8 TPH, Chimney,	
2.	Water Treatment plant	Capacity- For Filtration Unit- 15 m ³ /hr For Softener Unit – 15 m ³ /hr For DM water Unit- 3 m ³ /hr All storage tanks for water in RCC client scope.	

F. STRUCTURAL BUILDINGS:-

Sr. No.	Description	MOC and Qty	Remarks
1.	1. Starch Processing Building 2. Fermentation Building 3. Distillation & Evaporation Building	Roof Type Side open- MS Roof Type Side open- MS	

G. EVAPORATION SECTION

Sr. No.	Description	Tech. Data	Qty
1	Calendria (Falling film Evaporator)	Type: Tubular Heat Exchanger Vertical	3 Nos
		MOC - Tube- AISI 304 Shell -AISI 304	
		Thickness- Tube - 1.2 mm Thk Shell - AISI - 3 mm Thk	
2	Vapour Liquid Separator	Type - Cylindrical/Vertical	3 Nos
		MOC - AISI 304	
		Thickness- 3 mm Thk	
3	Surface Condenser	Type: Tubular Heat Exchanger Vertical	1 No
		MOC - Tube- AISI 304 Shell - AISI 304	
		Thickness- Tube - 1.2 mm Thk	
4	Circulation cum Transfer pump with motor	Type -Centrifugal type	3 No
		Flow - Later	
		Head - 15 MLC	
		MOC- Wetted parts in AISI-304 With double mechanical seal	
5	Vacuum Pump with Motor	Type -Water ring vacuum pump	1 No
		Flow - 100 m ³ /hr	
		MOC - Cast Iron with gland packing	

6	Process Condensate pump with motor	Type- Centrifugal	1 No.
7	Instrumentation	Pressure Gauges	1 Lot
		Temp Gauges	
		Level Gauges	
		Glass Tube Flow Meters	
		RTD	
8	Piping	Internal piping -AISI-304 Sch-5	1 Lot
		Water piping- Carbon Steel	
9	Flow transmitter	MOC: as per vendor std.	1 No
10	Manual operated Valves	40 NB and below - Ball Valve	1 Lot
		50 NB and above - Butterfly Valve	

H. DDGS DRYER SECTION

Sr. No.	Description	Tech. Data	Qty
1	Dryer	Type: Horizontal type long conveying Dryer	1 No
		MOC - Tube- AISI-304 Shell -CS with SS Cladding	
		TEFC electric motor with drive train of pulleys, 'V' belt, gear box, flexible coupling and pinion	
2	Feed screw with drive	Type: Single screw with continuous spiral flight	1 No
		MOC – Stainless Steel	
3	Cyclone separator with Accessories	Type: Tangential entry	1 No
		MOC – Stainless Steel	
4	ID fan with Accessories for dryer vapour	Type: Centrifugal	1 No
		MOC – Stainless Steel Impeller and casing - CS Shaft - EN8	

I. EQUIPMENT LIST FOR DECANTATION SECTION

Sr. No.	Description	Tech. Data	MOC	Qty	Remarks
1	Decanter	Capacity: 5 m ³ /hr	MS frame and SS Vessel	1	
2	Thin Slop Holding Tank	Cap: 40 m ³	MS	1	Site Fabrication
3	Thin Slop Transfer Pump	Cap: 5 m ³ /hr	CF 8	1 + 1	
4	Piping, valves, fittings and Insulation	Lot	-	Lot	
5	Instrumentation for entire Decantation	Lot	-	Lot	

ANNEXURE-IV BATTERY LIMITS

Sr. No.	Title	Description
1.	Starch Slurry	At the inlet of Tank
2.	Raw Water	At water treatment unit inlet
3.	Vents & drains	At the out let flange of respective vent and drain point of equipment / piping
4.	Electricity	At the MCC electric panel
5.	Spent wash	At outlet of analyser column
6.	Spent lees & washing water	At outlet of columns & Cleaning Equipment
7.	Chemicals nutrients, enzymes & yeast	At respective Inlets and Tanks
8.	ENA/IS	At tanks

ANNEXURE-V EXCLUSIONS	
1.	Dismantling of any existing structure, demolishing existing building, levelling of plot for civil construction. Contour Plan and trial pits for soil data.
2.	Landscaping, construction of any internal roads, storm water drains, main drains fencing, gate, watchman's cabin, etc.
3.	Molasses bulk storage tank and accessories. With weigh Bridge for Tanks.
4.	Water storage tank overground / underground and water pumps and piping facility upto the Battery Limits, water softening plant, it's pumps and it's piping upto the battery limits.
5.	All electrical including MCC incomer cables, lighting, etc. upto the Battery Limits.
6.	Office equipment, furniture, and plant communication equipment
7.	All legal and statutory approvals including Applications and License fees to various statutory Government Authorities for obtaining various clearances permissions, No Objection Certificates, Work Permits for our Engineers/Technicians, etc
8.	Raw materials required for the commissioning, testing of various samples during commissioning and all laboratory equipments.
9.	Actual installation of the plant and required manpower, tools tackles consumables for installation.
10.	Accommodation, lodging, boarding for IBHA Engineers / Supervisors. A furnished site office with communication facility and computer.
11.	Crane, forklifts, any other installation machinery, electric power, water etc. required during Installation.
12.	Receipt safe unloading, storing of the equipment at site before commencement of erection.
13.	Any other item / activity not specifically mentioned in our scope of work & equipment list
14.	Effluent treatment plant for Spentwash & Spent lees from plant.
15.	Laboratory equipment, work shop equipment,
16.	Fire fighting Equipments and related accessories, piping and all.
17.	Plant lightning
18.	DG sets for emergency use and its fuel storage. Transformers (if any) and synchronisation & distribution system.
19.	Expenses associated with Owner's representative, Third Party Witness, and Inspectors.
20.	Lubricants for Test Run and Production and their transfer up to the respective Battery Limits.
21.	Security of plant and machinery.
22.	Any other item / activity not specifically mentioned in our scope of work and equipment list.

ANNEXURE VI: MAKES OF BOUGHTOUT ITEMS

1.	Centrifugal Process Pump	:	Entity/Investa/IPP / Equiv.
2.	Centrifugal Pump (Water)	:	Kirloskar / Mather & Platt / Entity
3.	Metering Pump	:	Positive / Noble / Minimax / Equiv.
4.	Gear Pump	:	Johnson / Tushaco / Rover / Prakash/ Bhide / Equiv.
5.	Mechanical Seal	:	Hi fab/Maruti/ Equiv.
6.	Blower, Vacuum pump	:	Joyam / PPI / Vindivak / TMVT / Equiv.
7.	PHE	:	Tranter / AlfaLaval / GEA
8.	Cooling Tower	:	Himgiri / Matangi/Inductokool/Siddhant
9.	Air Compressor	:	Elgi / Chicago / Kirloskar / Atlas Copco / Kaeser
10.	Instrument cable	:	Polycab / Technoflex / Equiv.
11.	Control Valve	:	Dembla / RK Control / Darling Muesco / Samson
12.	Rotameter	:	Eureka / Fitzer / Scientific Device
13.	Mass Flowmeter	:	Electronet/ Scientific Device
14.	Magnetic Flowmeter	:	Electronet / Scientific Device
15.	Vortex Flowmeter	:	Electronet / Scientific Device
16.	DPT / PT	:	Honeywell/ Equi
17.	TT	:	Shri / Radix / Equi
18.	Pressure Gauges	:	H-Guru / General Instru. / Expert / Radix / Equiv.
19.	Weighing System	:	Nova / Endel / Midas / Avery
20.	Electric Motor	:	Alstom / Crompton Greaves / Kirloskar / Bharat Bijlee
21.	Ball Valve	:	Flowchem / Cosco / Sagar/ Equiv.
22.	Butterfly Valve	:	Del valve / Crane / Sagar/ Marck /Aira /Equiv.
23.	Gate / Globe Valve	:	Bajaj/ BDK / Sagar / Fouress / Equiv
24.	Steam Trap	:	Pennant / Spirex / Equiv.

ANNEXURE-VII PRICE SCHEDULE	
Description	The Price for Equipments as per Scope of Supply, subject to the Battery Limits, Exclusions, Terms and Conditions at our Ex works
<ul style="list-style-type: none"> • Liquefaction Section • Fermentation Section • Distillation Section WASH to ENA • Storage tank for alcohol • Boiler • Water treatment plant • Structure Shed buildings • Yard Piping for plant & accessories • Electrical & Cabling for whole plant • Lab Equipment 	1.86 Million USD
Additional Scope as per discussion <ul style="list-style-type: none"> • Decantation section • Evaporation Section • DDGS Dryer Section • CO2 plant for 6 Ton per day capacity • Additional cost for boiler • Transformer 1 MW from 33 KV to 440 V • Anhydrous Ethanol plant 99.8% V/V • DG for backup; capacity 500 KW 	1.81 Million USD
All kind of site activities including Erection and installation of all equipment	Client Scope
Supervision and Commissioning of Plant 2-3 Skilled persons for 3-4 months (Excluding air fare with visa fees, lodging & boarding with food expenses)	86 000 USD
Packing and Forwarding in full, Ex-our Works	3 % Extra
Transit Insurance	Client Scope
Freight	Client Scope
NOTE: Standard Terms & Conditions of Sale are attached along with offer which is binding on both the parties.	
For IBHA SYSTEMS PVT. LTD	
Yogesh Kamble (Managing Director)	

ANNEXURE-VIII PAYMENT TERMS**1.0 For all Equipments :-**

50% advance along with LOI/PO.

50% Irrevocable LC.

A) Supply of Plant and Machinery:

After signing of techno-commercially clear contract and after receipt of the stipulated first advance, the various equipment in IBHA scope will be ready for dispatch within 5-6 months. The delivery schedule is subject to the timely release of all the payments and completion of various responsibilities of Client like various statutory clearance / permissions and infrastructural requirements.

B) Installation of plant and Machinery CLIENT SCOPE

The estimated time for installation would be done within 3-3.5 Months after the equipment have reached on site, completion of various responsibilities of the clients and provided all the necessary arrangements in clients scope as required for installation are made.

3.0 Deliveries are subject to :

- a) Force Majeure.
- b) Payments due to us being released on time as per our terms of payment.
- c) Customer's scope of work being co-ordinated and completed as per initial schedule mutually agreed.

Taxes & Duties applicable at the time of dispatch.

ANNEXURE-IX TERMS AND CONDITIONS

1	<p>GUARANTEE: We shall demonstrate a single performance guarantee run of the rated capacity as defined in the basis of design for the agreed single product. This trial run shall be for a cumulative period of 72 hours, after completion of erection and testing. This is subject to availability of uninterrupted raw materials, utilities, plant operators and workers. The tolerance in capacity is $\pm 10\%$.</p>
2	The order will not be binding on us unless accepted in writing by authorized officials of the SUPPLIER.
3	The SUPPLIER reserves the right to modify, alter the specifications and designs of the equipment with our constant aim to improve the same.
4	Responsibility for safety and storage of equipment at site will be with the Customers'. Customer to provide safe storage godown with security for the storage of our material.
5	<p>FORCE MAJEURE: In the event of any force Majeure circumstances affecting the ability of either party to perform in accordance with this contract for extended periods of time exceeding 3 week, the parties hereto shall meet and jointly decide the future course of action. Force Majeure shall include but not be restricted to Acts of God or enemy, action of the government in its sovereign capacity, floods, fires, earthquakes, explosions, accident, epidemics, civil commotion's, riots etc. including factors beyond SUPPLIER's reasonable control.</p>
6	The SUPPLIER shall have a general lien on the equipment supplied by us as well as the work carried out till the final payments due to us, are released in full. No part of the work carried out by the SUPPLIER will be put to commercial use without the SUPPLIER's permission.
7	The CUSTOMER shall provide suitable accommodation free of cost at site, for SUPPLIER's Engineers / Supervisors & Staff who would be deputed for the supervision of erection & commissioning.
8	Following facilities are also to be made available by the CUSTOMER, free of cost :-a) Workshop facilities for minor modifications, machining and fabrication for the equipment, if required.b) Furnished site office with communication facility for the SUPPLIER's site Engineer(s)/Senior Staff.c) Lodging, Boarding and food facilities for our engineers, technicians. d) Necessary medical first aids facilities. e) All the necessary local conveyance required for our engineers and technicians.

9	Submission of Engineering documentation package is not to be considered as transfer of know-how on a general basis. Any data, information, designs, drawings, process know-how and other such documentation pertaining to design, manufacture, operation and maintenance of the plant and machinery, which SUPPLIER may discuss and/or elaborate and/or handover to CUSTOMER or their Consultants or officials from time to time, are of proprietary nature and are to be kept confidential by CUSTOMER or their consultants.
10	CUSTOMER or their consultants shall neither disclose such data, information, designs, drawings, process know-how, and other such documentation to any third party nor use it for any other purpose other than its intended use, without the written permission from SUPPLIER.
11	CONSEQUENTIAL DAMAGES: Neither party shall at anytime be liable to the other for any loss of profits and any similar indirect damages, however, described, incurred or suffered by either party in respect of the project.
12	WARRANTY : The liability in respect of any mechanical defect in or failure of equipment supplied and commissioned by us is limited to making good by replacement or repairs, defects which under proper use appear therein, provided the equipment is operated and maintained in accordance with our instructions, and arise totally from proved faulty design, materials or workmanship, within a period of 12 months from the date of commissioning of the equipment or 18 months from the date of last invoiced dispatch, whichever is earlier, at the termination of which period all liability on our part will cease.
	The warranty does not cover the following conditions :
a	Any replacement/repairs required to be made under the provisions of the above warranty will be carried out at our option either at site or at our works. In the later case you will arrange to promptly return to us the parts which require repair.
b	After repairs/replacement, the period of warranty for the entire equipment including replaced/repared parts will limit itself to the un-expired portion of the total warranty period.
c	In respect of the equipment where dispatch after readiness is delayed due to specific instructions or lack of instructions from the CUSTOMER, the warranty will be limited to 18 months from the date or readiness for dispatch of equipment as notified by the SUPPLIER
d	Any other party on the SUPPLIER's equipment during the warranty period unless authorised by the SUPPLIER in writing, will carry out no repairs or replacement.
e	The warranty period does not cover the following:- i. Normal wears and tear. ii. Damages/defects arising out of mal-operation of the plant by the PURCHASER.

13	CHANGE IN WORK / LAW : If there is any change in the scope and / or nature of work during the execution of this project because of change in local Government's ruling / regulations / order an adjustment in terms including, but not limited to prices, deliveries etc. shall be negotiated.
14	Other Terms & Conditions will be subject to mutual discussions & confirmation thereafter, in writing by the SUPPLIER.
16	VALIDITY OF OFFER: Our offer is valid strictly for 20 days from the date of the covering letter.