

## EQUIPMENT SUMMARY SHEET

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S.No.	UNIT No.	No. Req.	DESIGNATION	OPERATING CONDITIONS		CAPACITY			HEAT TRANSFER AREA sq. m.	MAJOR DIMENSIONS (mm) D x L Shell/Jacket	M.O.C. Shell/Jacket Shell/Tubes	RATING HP	INSULATION HCl/CCI/PP	REMARKS	R
				TEMP. °C	PRESSURE kg/ sq.cm	VESSELS Lt.	PUMPS lph	BLOWERS							
01	Cy-201	18	Carbondioxide Cylinder	30	Atm.	14 kg/h	-	-	-	-	CS	-	-	Procurement by CSIR-IICT	1
02	Cy-202	4	Carbondioxide Cylinder	30	Atm.	2 kg/h	-	-	-	-	CS	-	-	Procurement by CSIR-IICT	2
03	Cr-201 a,b	2	Crystallisers	5	Atm.	400	-	-	-	700 DIA X 910/ 800 DIA X 725	SS316/CS	5.0	CCI		3
04	D-201	1	Troy Dryer	100	100 mm Hg	-	-	-	-	-	CS/SS316	-	-	No. of trays 12, Troy Cap. 10 Lit. Dimensions (lxbxn)=620x520x35	4
05	E-201	1	Vert Condenser	70	Atm.	-	-	-	2.7	200 DIA X 750	CS/SS316	-	-	No. of Tubes 14 and Tube Dia. 25 mm	5
06	Fi-201 a,b	2	Filters	10-25	Atm.	100 kg	-	-	-	-	SS 316	-	-	Pore Size 11 microns	6
07	Fi-202	1	Line Filter	25-30	Atm.	10 kgs	-	-	-	-	SS 316	-	-	Pore Size 2 microns	7
08	Fi-203 a,b	2	Nutsche Filters	5-25	Atm.	50 kg	-	-	-	-	SS 316	-	-	Pore Size 80 microns	8
09	Fi-204	1	Line Filter	25-30	Atm.	10 kgs	-	-	-	-	SS 316	-	-	Pore Size 2 microns	9
10	P-201 a,b	2	W Transfer Pumps	25-30	Atm.	-	-	-	-	-	SS 316	-	-		10
11	P-202 a,b	2	W Transfer Pumps	5-10	Atm.	-	-	-	-	-	SS 316	-	-		11
12	P-203 a,b	2	C3 Transfer Pumps	10-25	Atm.	-	-	-	-	-	SS 316	-	-		12
13	P-204 a,b	2	C3 Transfer Pumps	20-30	Atm.	-	-	-	-	-	SS 316	-	-		13
14	P-205 a,b	2	C3 Feed Metering Pumps	20-30	Atm.	-	-	-	-	-	SS 316	-	-		14
15	P-206 a,b	2	Crystalliser Feed Pumps	50-60	Atm.	-	-	-	-	-	SS 316	-	-		15
16	P-207 a,b	2	L Transfer Pumps	20-25	Atm.	-	-	-	-	-	SS 316	-	-		16
17	P-208 a,b	2	L Transfer Pumps	20-25	Atm.	-	-	-	-	-	SS 316	-	-		17
18	P-209 a,b	2	CL Transfer Pumps	20-25	Atm.	-	-	-	-	-	SS 316	-	-		18
19	P-210 a,b	2	RF transfer Pumps	20-25	Atm.	-	-	-	-	-	SS 316	-	-		19
20	R-201	1	Hydrolysis Reactor	10	Atm.	1600	-	-	-	1100 DIA X 1475/ 1200 DIA X 1180	SS316/CS	5.0	CCI	pH - 7.5 to 8.5	20

Notes : 1. VTS = Vendor to Specify

NOTES : HCl = HEAT CONSERVATIVE INSULATION ; CCl = COLD CONSERVATIVE INSULATION ; PPI = PERSONEL PROTECTION INSULATION ;

VTS = Vendor to Specify

<b>DESIGN &amp; ENGINEERING DIVISION</b> <b>CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY</b> <b>HYDERABAD - 500 007</b>													
PROJECT : Pilot Plant Facility For Bulk Chemicals													
LOCATION : -													
TITLE : <b>EQUIPMENT LIST - HYDROLYSIS AND DIMERIZATION (SECTION 200)</b>													
MR/SAK : -													
DESIGN : -													
PREPARED : -													
SCALE : -													
REFERENCES : -													
SOFT COPY REF : -													
CD/FP FOLDER : -													
VER/CHD : -													
DWG/DOC/SK No. : -													
SHEET : 1 OF 2													
REV : 0													

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				TEMP. °C	PRESSURE kg/ sq.cm	VESSELS Lt.	PUMPS lpm	BLOWERS/EXCHANGERS								
21	R-202 a,b,c	3	DP Reactor	70-75	Atm.	160	-	-	-	500 DIA X 725/ 600 DIA X 580	Shell/Jacket Shell/Tubes	SS316/CS	3.0	HCl	pH - 7.5 to 8.5	1
22	RV-201	2	Rotary Valve	25-30	Atm.	2kg/10 min	-	-	-	-	-	-	-	-	Rotary Valve to be Operated Based on pH Value (Feed Approx. 2kg in 10 Min.)	2
23	SB-201	1	C1 Storage Bin	25-30	Atm.	400 kg	-	-	-	800 DIA X 530	-	SS 316	-	-	-	3
24	SB-202	1	C2 Cake Storage Bin	10-20	Atm.	1000 kg	-	-	-	1400 DIA X 840	-	SS 316	-	-	-	4
25	SB-203	1	C3 Storage Bin	5-10	Atm.	100 kg	-	-	-	600 DIA X 200	-	SS316	-	-	-	5
26	SB-204	1	Dry C3 Storage Bin	30-40	Atm.	63 kg	-	-	-	500 DIA X 200	-	SS316	-	-	-	6
27	S-201	1	Settling Tank	25-30	Atm.	1250	-	-	-	800 DIA X 2350	-	SS316	-	-	-	7
28	ST-201	1	W Storage Tank	25-30	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	-	-	8
29	ST-202 a,b	2	C3 Collection Tanks	10-20	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	-	-	9
30	ST-203 a,b	2	C3 Feed Tanks	25-30	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	-	pH - 7.5 to 8.5	10
31	ST-204 a,b	2	DP Collection Tanks	50-70	Atm.	1250	-	-	-	1000 DIA X 1400/ 1100 DIA X 1120	-	SS316/CS	-	-	pH - 7.5 to 8.5	11
32	ST-205	1	L Collection Tank	20-25	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	-	-	12
33	ST-206 a,b	2	P Collection Tanks	20-25	Atm.	160	-	-	-	500 DIA X 725	-	SS316	-	-	-	13
34	ST-207 a,b	2	RF Collection Tanks	20-25	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	-	-	14
35	SV-201	1	WC	5	Atm.	400	-	-	-	700 DIA X 910/ 800 DIA X 725	-	SS316/CS	-	5.0	-	15
36	SV-202	1	C3 Preparation Vessel	20-25	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	5.0	pH - 7.5 to 8.5	16
37	SV-203	1	L Stirred Vessel	20-25	Atm.	1250	-	-	-	1000 DIA X 1400	-	SS316	-	5.0	pH - 7.5 to 8.5	17
38	Tryg-201	5	Troys	Amb.	Atm.	100 Lit.	-	-	-	-	-	SS316	-	-	Dimensions (lxbxh)=1000x530x180	18
39																19
40																20

Notes : 1. VTS = Vendor to Specify

NOTES : HCl = HEAT CONSERVATIVE INSULATION ; CCl = COLD CONSERVATIVE INSULATION ; PPI = PERSONEL PROTECTION INSULATION ; VTS = Vendor to Specify

<b>DESIGN &amp; ENGINEERING DIVISION</b> <b>CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY</b> <b>HYDERABAD - 500 007</b>															
PROJECT :- Pilot Plant Facility For Bulk Chemicals				LOCATION :-				CAPACITY :- 0.125 TPD							
TITLE :- <b>EQUIPMENT LIST - HYDROLYSIS AND DIMERIZATION (SECTION 200)</b>				MR/SAK :-				CLIENT :-							
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR	
SCALE		DESIGN		REFERENCES		PREPARED		SOFT COPY REF		VER/CHD		SHEET		APPROVED	
-		-		-		-		-		-		2 OF 2		REV 0	



## CRYSTALLIZER SPECIFICATION DATA SHEET

Page  
OF

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	-

GEN.				R	
	1	Unit No. : Cr-201 a,b	Dwg. No.: -	Code : ASME Sec. VIII Div. I	1
	2	Title :Crystalliser	Nos. required : Two	Type : Vertical, Cylindrical & Flanged	2
	3	Service : To Crystallise C5 Solution			3
	4	Nominal Capacity : lit. : 400 lit.			4
				5	

PROCESS DATA	OPERATION :				6	
			Batch/ Continuous	Batch Time : hrs :-	Working Hours/Day : -	7
			SHELL	JACKET	DOUBLE COIL	8
	2	Material Handled :		Water + C5	Ethylene Glycol Mix.	9
	3	Operation :		Continuous	Continuous	10
	4	Feed Quantity Total :	kg/hr	87.074	1670	11
	5	Solid/Liquid/Gas:	kg/hr	-/87.074/-	-/-/-	12
	6	Discharge Quantity Total :	kg/hr	87.074	1670	13
	7	Solid/Liquid/Gas:	kg/hr	58/81/-	-/-/-	14
	8	Operating Temp.:Nor./Max.:	°C	4	1/4	15
	9	Operating Press.:Nor./Max.:	kg/sq.cm.-g/☉	Atm.	4.0	16
	10	Density : at 25 °C	kg/cu.m.	1050	1000	17
	11	Viscosity : at 25 °C	cP	1	1	18
	12	pH :		8	-	19
13	Pressure Drop :	kg/sq.cm.	-	-	20	
14	Hazard Condition :			-	21	

INTERALS	1	Agitator Type :	Anchor	Shaft Dia :	25 mm	22	
	2		mm	Impeller Dia. : 600	No. of Impellers : One	23	
	3		mm	Height from bottom: 50	Speed : RPM : 50	24	
	4	Coil : 2 Nos.	mm	Tube Dia. : -	BWG / Sch. : -	25	
	5		mm	Pitch : -	No. of Turns : -	26	
	6		mm	Coil Helix Dia. : -	Height from bottom : -	27	
	7	Baffles :	mm	Nos. : 4 Nos.	Type : Flat	28	
	8		mm	Height : 910	Width : 25	29	
	9		mm	Thk. : -		30	
	10	Feed Arrangement :	Type : -		Dia. : -	Length : -	31
			Spray Nozzle Dia. : -		Pitch : -	Others : -	32
	11	Shaft :	Dia. : 25 mm		Length : VTS		33
12	Others :	-				34	

CONSTRUCTION	SHELL				JACKET		COIL			
	1	Temperature :	°C	Dgn: 30	Test: Amb.	Dgn: 15	Test: Amb.	Dgn:	Test:	35
	2	Pressure :	kg/sq.cm.-g/☉	Dgn: 1.2	Test: 6.0 ext.	Dgn: 4.4	Test: 6.0	Dgn:	Test:	36
	3	Diameter :	mm	14.4 ext.	I.D.: 700	O.D.: -	I.D.: 800	O.D.:	H.Dia.:	37
	4	Straight Length :	mm	910		725				38
	5	Thk. :	mm	6 MM		6 MM				39
	6	Shell Ends :	Top	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50			40
	Bottom		Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50			41	
7	Jacket end :	Bottom	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50			42	
										43

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	ISSUES / DISTRIBUTION / COPIES
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All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
<b>CLEARANCES</b>							
MR		MR	19.07.23	MR/SAK		TPK/MR/SAK	
	DESIGN		PREPARED		VER/CHD		APPROVED
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK-No.		SHEET	
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX	1 OF 3	REV 1

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**CRYSTALLIZER SPECIFICATION DATA SHEET**

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1	Unit No. : Cr-201 a,b	Title : Crystalliser					R	1
							2	
		SHELL		JACKET		COIL	3	
8	Corrosion Allowance :	-		-			4	
9	Supports :	Type: -	No.: -	Type: LEG	No.: 4 Nos.	Type:	No.:	
10	Material Of Construction	Shell : SA-240 SS 316		Jacket : CS A 285 Gr. C			6	
		Shell Ends : SA-240 SS 316		Jacket Ends : CS A 285 Gr. C			7	
		Coil : -		Supports : CS A-75/IS:226			8	
		Shaft : SA-479 SS 316		Feed Arrangement : SS 316			9	
		Agitator : SA 240 SS 316		External Bolting : CS to IS 1364			10	
		Baffle :-		Internal Bolting : SS 316			11	
		Dip Pipe : SA-312 TP 316		Gaskets : PTFE			12	
		Shell Flanges : -		Sparger : -			13	
11	Heat Treatment :	Insulation : HCl / CCl / PPI - CCl		Thk. : 100 mm (Mineral Wool)			14	
		Stress Relieving : -		Others : -			15	
12	Tests :	Hydraulic / Pneumatic :		Dye-Penetrant : -			16	
		Radiograph : -		Others : -			17	
13	Insulation :	Type : Mineral Wool		Thk. : 100 mm			18	
14	Painting / Finish :	All CS parts to be painted with two coats of red oxide primer					19	
15	Weight : kg	Empty : 360		Full of Water : 930			20	
16	Drive Details :	Motor : Electric, Flame Proof					21	
		Power Supply : 440V, 3 Ø Phase,			H.P. : 5.0		22	
		R.P.M. : Shaft RPM is 90, Motor RPM is VTS					23	
17	Shaft Seal :	Mechanical seal					24	
18	Inspection By :	IICT / CLIENT / Third Party -			Others : -		25	
							26	
							27	
							28	
							29	

**CONSTRUCTION DATA**

**NOTES**

1	** : Vendor to specify.	30
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.	31
3	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.	32
4	Rev. 1 - Quantities written in kgs.	33
		34
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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	
							ISSUES / DISTRIBUTION / COPIES										
All dimensions in mm, unless specified			<b>DO NOT SCALE</b>														
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR										
<b>CLEARANCES</b>																	
MR		MR	19.07.23	MR/SAK		TPK/MR/SAK											
DESIGN		PREPARED			VER/CHD		APPROVED										
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK-NO.		SHEET		REV 1								
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX		2 OF 3										



CRYSTALLIZER SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

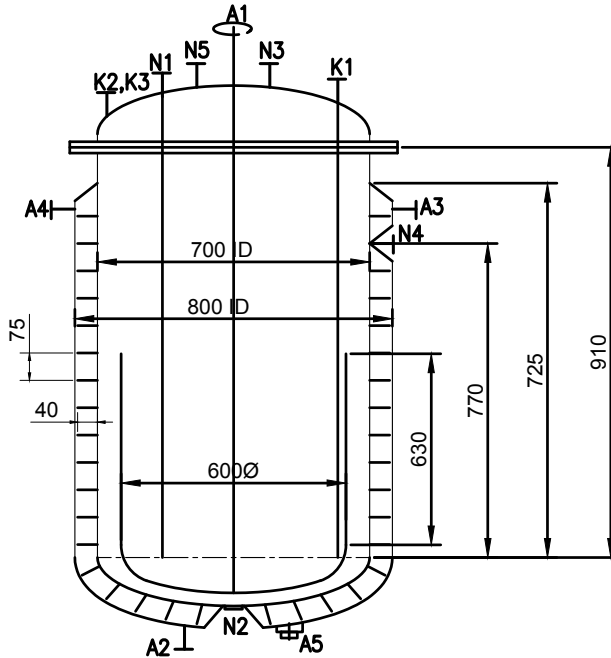
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : Cr-201 a,b

Title : Crystalliser



Impeller Details

No. of impellers = One  
Type of impeller = Anchor  
Impeller Dia. = 600 mm  
Impeller Ht. = 630 mm  
Blade Width x Thk = 630 mm x 70 mm  
Ht. from Bot. Vessel to  
Anchor = 50 mm

Spiral Jacker Details  
Baffle Pitch = 50 mm

NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from P-206 a,b	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Bottom Outlet	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Flush Bottom Valve	2
N3	Vent	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	3
N4	Overflow to Fi-203	80	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	4
N5	Spare	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	5
											6
K1	Thermowell	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	7
K2, K3	Light and Sight Glasses	100	VTS	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	8
											9
A1	Stirrer	VTS	-	-	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	10
A2	Chilled Water Inlet	50	40	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	11
A3	Chilled Water Outlet	50	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	12
A4	Jacket Vent	25	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	13
A5	Jacket Drain (Plug)	3/4"	-	-	CS	-	#3000	-	-	Plug	14
											15
											16
											17

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								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

DESIGN

PREPARED

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SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK-NO.	SHEET	REV
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HEAT EXCHANGER/ CONDENSER SPECIFICATION DATA SHEET

Page  
OF

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.	1	Unit No. : E-201	Dwg. No.:	Code : TEMA Class B/ASME Sec.VIII Div.1	R	1
	2	Title : Vent Condenser	Nos. required : Operating /Spare: 1/ -	Type : Shell & Tube / <del>Double Pipe</del>		2
	3	Service : To Condense the Water Vapours from R-202 a,b,c and back to R-202c		: <del>Horizontal</del> /Vertical		3
	4	Heat Transfer Area : per unit : sq.m.: 2.7	Connected : In Series / Parallel	: Shell/Tube Pass :		4
						5

PROCESS DATA			SHELL SIDE		TUBE SIDE		
			IN	OUT	IN	OUT	
	1	Fluid Circulated :	Cooling Water		Water		
	2	Fluid quantity, total :	960		8		
	3	Vapour, in / out :	0.0	0	8	0	
	4	Liquid :	960	960	0	8	
	5	Temperature, in/out :	32	37.21	100	40	
	4	Dew/Bubble point :	-	-	93.68/93.68	93.56/93.56	
	5	Density :	996.88	995.44	0.57	976.46	
	6	Viscosity :	0.7658	0.6888	0.0126	0.6711	
	7	Molecular wt. Vap. :	-	-	18.02	-	
	8	Molecular wt. NC :	-	-	-	-	
	9	Specific Heat :	1.0007	1.0004	0.4513	1.0805	
	10	Thermal Conductivity :	0.525	0.531	0.021	0.539	
	11	Latent Heat :	-	-	590.09	590.09	
	12	Pressure :	4.0		Atm.		
	13	Velocity :	0.07/0.2		1.64/3.28		
14	Pressure Drop allow/calc.	0.51	0.181	0.112	0.006		
15	Fouling Resistance (min):	0.0001		0.0001			
16	Heat Exchanged, Kcal/h : 5006	MTD corrected, °C : 52.66					
17	Transfer rate, service (W/sq.m <sup>2</sup> K)	35.1	Dirty : 528.2	Clean : 528.2			

CONSTRUCTION DATA			SHELL SIDE		TUBE SIDE		
	1	Temperature :	°C	Dgn. : 40	Test : Amb.	Dgn. : 150	Test : Amb.
	2	Pressure :	kg/sq.cm.-g/ø	Dgn. : 4.4	Test : 6.0	Dgn. : 1.2	Test : Full with Water
	3	Corrosion Allowance :	VTS				
	4	Shell :	mm/Sch./mm	Nom. Dia. : 200	Thk. : Sch 40s	Length : 440	
	5	Tube :	mm/Sch./mm	Nom. Dia. : 25	BWG : 16 BWG	Length : 500	
				Pitch Layout : $\Delta$ / $\square$ / $\triangleleft$ / $\diamond$ Triangular		Pitch : 31.25	Nos. : 14
	6	Bonnet/Channel :	mm	Length : Bonnet 1 / Bonnet 2 :		Thk.: Sch 40s	
	7	Tube Sheet :	mm	Type : Fixed, Sandwiched	Nom. Dia.: 230 mm	Thk.: 30 mm	
	8	Baffle :	mm	Type : 25% segmental cut		Thk. : 3 mm	No. : 3
			mm	Spacing : Central / Inlet /Outlet		115/115/115	
9	Tie Rods :	mm	Dia. : 6 mm	Total Nos.: 4	Length 1 : 345	No. : 3	
		mm			Length 2 : 230	No. : 1	
10	Spacers :	mm	Dia. : 12 mm	Total Nos.: 9	Length 1 : 115	No. : 7	
		mm	Sch.: Sch 10s	B.W.G. : -	Length 2 : 230	No. : 2	
11	Cover :	mm	Pipe Cap / Dished End : Dished		Sch. / Thk. : 3 mm / Sch 10s		

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
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All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

SAK	SAK	07.04.15	TPK/MR/SAK	SAK/MR/TPK
DESIGN	PREPARED	VER/CHD	APPROVED	
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK No.	SHEET
		CD/FP    FOLDER    FILE	DE-XXX-XXX-ED-01-05 00 XXX	1 OF 3
				REV $\triangle$

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## HEAT EXCHANGER/ CONDENSER SPECIFICATION DATA SHEET

Page  
OF

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

**CONSTRUCTION DATA**

1	Unit No. : E-201	Title : Vent Condenser	R	1
12	Pass Partition Plate : mm	Thk.: Sch 40s.	Nos. : One	2
13	Supports :	Type : Saddle	Nos. : Two	3
14	Material Of Construction	Shell : SA-53 Gr. B	Spacers : CS	4
		Tube : SA 213 TP 316	Gasket : Tube side : PTFE	5
		Tube Sheet : SA-240 SS 316	Shell side : PTFE	6
		Bonnet / Channel : CS with 3 thk. SS Lining	Supports : CS A to / IS:226	7
		Channel Flanges : CS with 3 thk. SS Lining	Internal Bolting : SS 316	8
		Tie Rods : CS	External Bolting : CS to IS 1364	9
15	Heat Treatment :	Stress Relieving : -	Others :	10
16	Tests :	Hydraulic / Pneumatic : Yes	Dye - Penetrant :	11
		Radiograph :	Others :	12
17	Insulation :	Type : HCl / GGI / PPI : Not Reqd.	Thk. : -	13
18	Weight : kg	Empty : 65	Full of Water : 75	14
19	Painting / Finish :	All CS parts to be painted with two coats of red oxide primer		15
20	Inspection By :	IICT / CLIENT / Third Party	Others :	16
				17
				18
				19
				20
				21

**NOTES**

1	** VTS : Vendor to specify.	22
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.	23
3	Shell flanges should be as per IS 4864 to 4870	24
4	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.	25
		26
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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified		<b>DO NOT SCALE</b>														
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
<b>CLEARANCES</b>																
SAK	DESIGN	SAK	PREPARED	07.04.15	TPK/MR/SAK	VER/CHD	SAK/MR/TPK									
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK-No.		SHEET									
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-05 00 XXX		2 OF 3	REV	-							

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HEAT EXCHANGER/ CONDENSER SPECIFICATION DATA SHEET

Page  
OF

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

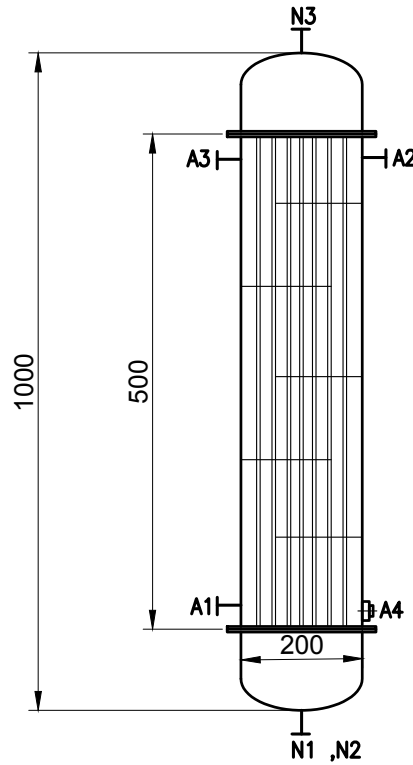
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : E-201

Title : Vent Condenser



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1,N2	Inlet from R-202c	25	40s	150	SS 316	Shell Flange	#150	SO,RF	SS 316	-	1
N3	Vent	25	40s	150	SS 316	Shell Flange	#150	SO,RF	SS 316	-	2
											3
A1	Cooling Water Inlet	50	40	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	4
A2	Cooling Water Outlet	50	40	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	5
A3	Shell Vent	25	40	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	6
A4	Shell Drain (Plug)	3/4"	-	-	CS	-	#3000	-	CS	Plug	7
											8
											9
											10
											11
											12
											13
											14
											15

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

SAK		PVSB	10.03.2014	SAK/MR		SAK/MR/TPK
DESIGN		PREPARED		VER/CHD		APPROVED
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK-NO.		SHEET
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX	3 OF 3
						REV

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**NUTSCHE FILTER SPECIFICATION DATA SHEET**

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.	Unit No. : FI-201 a,b	Dwg. No.: -	Code : ASME Sec.VIII Div 1 Edn.1995	R
1	Title : Filters	Nos. required : Two	Type : .Cylindrical / Vertical / Jacketed	1
2	Service : To Filter C2 from R-201 a,b			
3	Nominal Capacity : lit. : 100 Kgs			
4				
5				

PROCESS DATA	Fluid	C2	
1	Operating Temperature : °C	Normal : 30	Maximum : 40
2	Operating Pressure : kg/sq.cm.-g/a	Normal : 100 mm Hg	Maximum : 150 mm Hg
3	Density : at - °C kg/cu.m.	1000	
4	Hazard Condition : -		
5			

		SHELL				JACKET	
		Design	Test	Design	Test	Design	Test
1	Temperature : °C	Design : 50	Test : Amb.	Design : -	Test : -		
2	Pressure : kg/sq.cm.-g/a	Design : Full Vacuum	Test : 3.0	Design : -	Test : -		
3	Corrosion Allowance	-					
4	Diameter mm	OD : -	ID : VTS	OD : -	ID : -		
5	Straight Length mm	VTS					
6	Thickness mm	VTS					
7	Ends	Shell	Top	Type : VTS	K.R. : -	Thk.: VTS	S.F.: -
		Jacket	Bottom	Type : VTS	K.R. : 10%	Thk.: VTS	S.F.: -
			Bottom	Type : -	K.R. : -	Thk.: -	S.F.: -
8	Supports	Type : Leg				Nos. : 3	
8a	Material Of Construction	Shell : SA 240 TP 316				Heads : See Note 3	
		Supports : CS TO IS 226				Bolting : A 193 Gr BT/A 194 Gr 2H	
		Gaskets : CAF PTFE (Enveloped)				Jacket / Internals : -	
		Shell Flanges: A285 Gr.C-SS316 3 Thk lined				Other wetted parts :CS TO A285 Gr C	
9	Heat Treatment	Stress Relieving : -				Others : -	
10	Tests	Hydraulic / Pneumatic : Vaccum for Shell				Dye-Penetrant : -	
		Radiographic : 0.85				Others : -	
11	Insulation	Type : <del>CC</del> / CCI / <del>PP</del>				Thk. : VTS	
12	Painting / Finish	Two coats of red oxide primer for CS parts					
13	Weight : kg	Empty : VTS				Full of water : VTS	
14	Inspection By	IICT / Client / Third Party				Others : -	

NOTES	DESCRIPTION
1	Vendor to suggest the filter cloth material and thickness of filter cloth of 11 microns
2	Filter to work under vacuum / Pressure
3	Shell top flange MOC-CS to A 285 Gr.C with 3mm thk SS 316 Lined Bottom end SA 240 TP SS 316
4	Shell inside finished to grit 240, cleaned as per ASTM 380
5	Welding Joint efficiency to be 0.85
6	Gasket to be food grade only (Teflon)
7	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
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All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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<b>CLEARANCES</b>			
SAK / TPK / MR	DESIGN	PREPARED	VER/CHD
	SCALE	REFERENCES	APPROVED
		SOFT COPY REF	DWG/DOC/SK No.
		CD/FP FOLDER FILE	SHEET
			1 OF 2
			REV

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**NUTSCHE FILTER SPECIFICATION DATA SHEET**

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

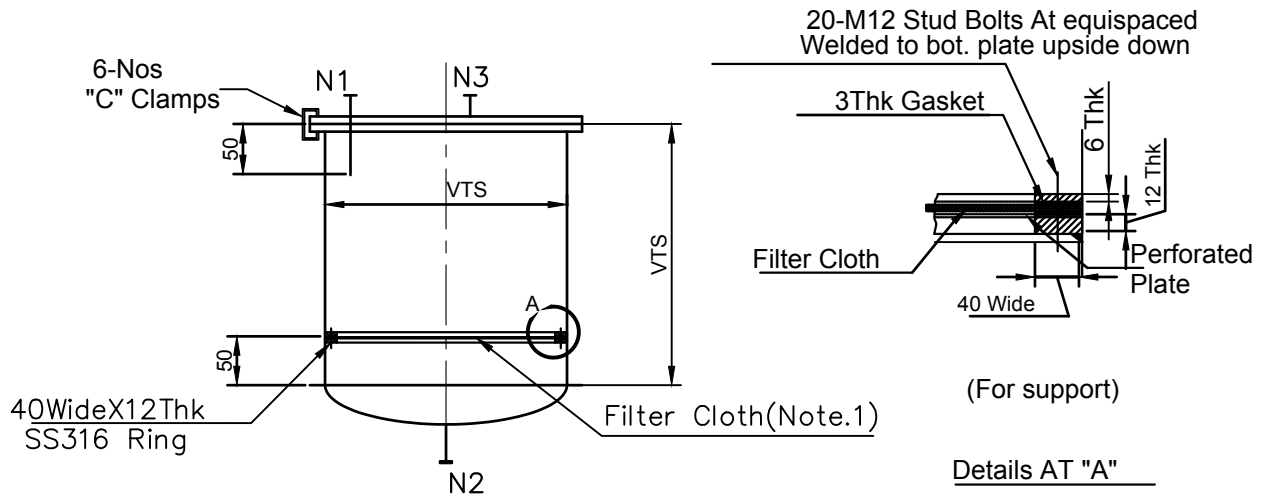
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : FI-201 a,b

Title : Filters



**NOZZLE SCHEDULE**

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.	
N1	Inlet from R-201 a,b	100	10s	150	SS316	ANSI	150#	RF/SO	SS316	
N2	Outlet to ST-202	100	10s	150	SS316	FERRULE	FITTINGS			
N3	Water Inlet	25	40s	150	SS316					

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
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All dimensions in mm, unless specified		<b>DO NOT SCALE</b>														
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MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
<b>CLEARANCES</b>							
SAK / TPK / MR						TPK / MRK	
DESIGN		PREPARED		VER/CHD		APPROVED	

SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK- <del>No.</del>	SHEET	REV -
		CD/FP	FOLDER	FILE	DE-PTBBA-175-06-11004	2 OF 2	

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**NUTSCHE FILTER SPECIFICATION DATA SHEET**

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.	Unit No. : Fi-202, Fi-204	Dwg. No.: -	Code : ASME Sec.VIII Div 1 Edn.1995	R
1	Title : Line Filters	Nos. required : Two	Type : .Cylindrical / Vertical / Jacketed	1
2	Service : To Filter C3 ST-202 a,b L from S-201 a,b			2
3	Nominal Capacity : lit. : 10 Kgs			3
4				4
				5

PROCESS DATA	Fluid	C3	R	
1	Operating Temperature : °C	Normal : 30	Maximum : 40	6
2	Operating Pressure : kg/sq.cm.-g/a	Normal : 100 mm Hg	Maximum : 150 mm Hg	7
3	Density : at - °C kg/cu.m.	1000		8
4	Hazard Condition : -			9
5				10
				11
				12

CONSTRUCTION DATA		SHELL		JACKET		R		
1	Temperature : °C	Design : 50	Test : Amb.	Design : -	Test : -	13		
2	Pressure : kg/sq.cm.-g/a	Design : Full Vacuum	Test : 3.0	Design : -	Test : -	14		
3	Corrosion Allowance	-				15		
4	Diameter mm	OD : -	ID : VTS	OD : -	ID : -	16		
5	Straight Length mm	VTS		-		17		
6	Thickness mm	VTS		-		18		
7	Ends	Shell	Top	Type : VTS	K.R. : -	Thk.: VTS	S.F.: -	19
		Jacket	Bottom	Type : VTS	K.R. : 10%	Thk.: VTS	S.F.: -	20
			Bottom	Type : -	K.R. : -	Thk.: -	S.F.: -	21
8	Supports	Type : Leg		Nos. : 3		22		
8a	Material Of Construction	Shell : SA 240 TP 316		Heads : See Note 3		23		
		Supports : CS TO IS 226		Bolting : A 193 Gr BT/A 194 Gr 2H		24		
		Gaskets : CAF PTFE (Enveloped)		Jacket / Internals : -		25		
		Shell Flanges: A285 Gr.C-SS316 3 Thk lined		Other wetted parts :CS TO A285 Gr C		26		
9	Heat Treatment	Stress Relieving : -		Others : -		27		
10	Tests	Hydraulic / Pneumatic : Vacuum for Shell		Dye-Penetrant : -		28		
		Radiographic : 0.85		Others : -		29		
11	Insulation	Type : <del>CC</del> / CCI / <del>PP</del>		Thk. : VTS		30		
12	Painting / Finish	Two coats of red oxide primer for CS parts				31		
13	Weight : kg	Empty : VTS		Full of water : VTS		32		
14	Inspection By	IICT / Client / Third Party		Others : -		33		
						34		
						35		

NOTES	DESCRIPTION	R
1	Vendor to suggest the filter cloth material and thickness of filter cloth of 2 microns	36
2	Filter to work under vacuum / Pressure	37
3	Shell top flange MOC-CS to A 285 Gr.C with 3mm thk SS 316 Lined	38
	Bottom end SA 240 TP SS 316	39
4	Shell inside finished to grit 240, cleaned as per ASTM 380	40
5	Welding Joint efficiency to be 0.85	41
6	Gasket to be food grade only (Teflon)	42
7		43

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified		<b>DO NOT SCALE</b>					
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
<b>CLEARANCES</b>							
SAK / TPK / MR						TPK / MRK	
DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK/No.		SHEET	REV <span style="border: 1px solid black; padding: 2px;">-</span>
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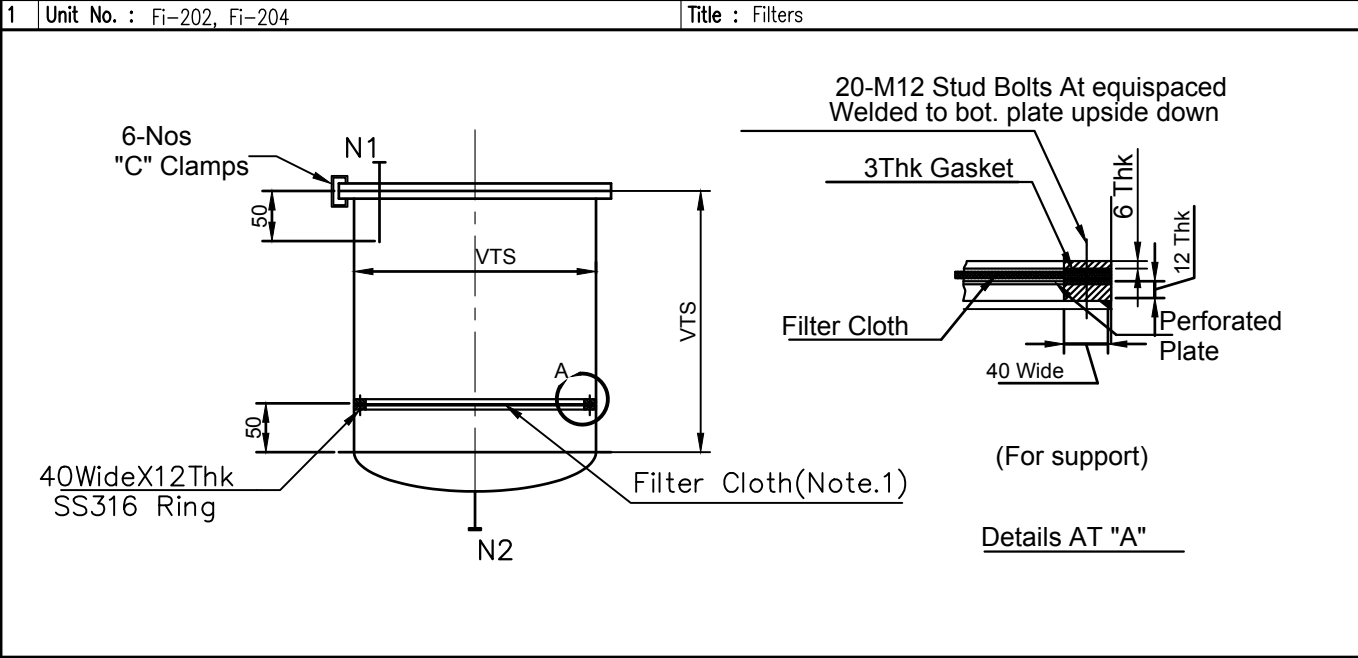
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NUTSCHE FILTER SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	-



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.	
N1	Inlet from ST-202	50	40s	150	SS316	ANSI	150#	RF/SO	SS316	
N2	Outlet to S-201 a,b	100	10s	150	SS316	FERRULE	FITTINGS			

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
<b>CLEARANCES</b>							
SAK / TPK / MR						TPK / MRK	
<b>DESIGN</b>		<b>PREPARED</b>		<b>VER/CHD</b>		<b>APPROVED</b>	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK/No.		SHEET	
		CD/FP	FOLDER	FILE	DE-PTBBA-175-06-11004	2	OF 2
						REV	-

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HYDERABAD – 500 007**



**NUTSCHE FILTER SPECIFICATION DATA SHEET**

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R		
	1	Unit No. : Fi-203 a,b	Dwg. No.: -		Code : ASME Sec.VIII Div 1 Edn.1995	1
	2	Title : Nutch Filters	Nos. required : Two		Type : .Cylindrical / Vertical / Jacketed	2
	3	Service : To Filter C3				3
	4	Nominal Capacity : lit. : 50 Kgs				4
				5		

PROCESS DATA						
	1	Fluid	C3		6	
	2	Operating Temperature : °C	Normal : 30		Maximum : 40	8
	3	Operating Pressure : kg/sq.cm.-g/a	Normal : 100 mm Hg		Maximum : 150 mm Hg	9
	4	Density : at - °C kg/cu.m.	1000			10
5	Hazard Condition : -			11		
				12		

CONSTRUCTION DATA				SHELL		JACKET				
	1	Temperature :	°C	Design : 50	Test : Amb.	Design : -	Test : -		14	
	2	Pressure :	kg/sq.cm.-g/a	Design : Full Vacuum	Test : 3.0	Design : -	Test : -		15	
	3	Corrosion Allowance		-					16	
	4	Diameter	mm	OD : -	ID : VTS	OD : -	ID : -		17	
	5	Straight Length	mm	VTS		-			18	
	6	Thickness	mm	VTS		-			19	
	7	Ends	Shell	Top	Type : VTS	K.R. : -	Thk.: VTS		S.F.: -	20
				Bottom	Type : VTS	K.R. : 10%	Thk.: VTS		S.F.: -	21
			Jacket	Bottom	Type : -	K.R. : -	Thk.: -		S.F.: -	22
	8	Supports		Type : Leg		Nos. : 3			23	
	8a	Material Of Construction		Shell : SA 240 TP 316		Heads : See Note 3			24	
				Supports : CS TO IS 226		Bolting : A 193 Gr BT/A 194 Gr 2H			25	
				Gaskets : CAF PTFE (Enveloped)		Jacket / Internals : -			26	
			Shell Flanges: A285 Gr.C-SS316 3 Thk lined		Other wetted parts :CS TO A285 Gr C		27			
9	Heat Treatment		Stress Relieving : -		Others : -		28			
10	Tests		Hydraulic / Pneumatic : Vaccum for Shell		Dye-Penetrant : -		29			
			Radiographic : 0.85		Others : -		30			
11	Insulation		Type : <del>CC</del> / CCI / <del>PP</del>		Thk. : VTS		31			
12	Painting / Finish		Two coats of red oxide primer for CS parts				32			
13	Weight :	kg	Empty : VTS		Full of water : VTS		33			
14	Inspection By		IICT / Client / Third Party		Others : -		34			
							35			

NOTES									
	1	Vendor to suggest the filter cloth material and thickness of filter cloth of 80 microns							36
	2	Filter to work under vacuum / Pressure							37
	3	Shell top flange MOC-CS to A 285 Gr.C with 3mm thk SS 316 Lined							38
		Bottom end SA 240 TP SS 316							39
	4	Shell inside finished to grit 240, cleaned as per ASTM 380							40
	5	Welding Joint efficiency to be 0.85							41
6	Gasket to be food grade only (Teflon)							42	
7								43	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified		<b>DO NOT SCALE</b>														
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
CLEARANCES																
SAK / TPK / MR	DESIGN			PREPARED			VER/CHD			APPROVED			TPK / MRK			
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK/No.			SHEET			REV					
		CD/FP	FOLDER	FILE	DE-PTBBA-175-06-11004			1 OF 2			-					

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**NUTSCHE FILTER SPECIFICATION DATA SHEET**

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

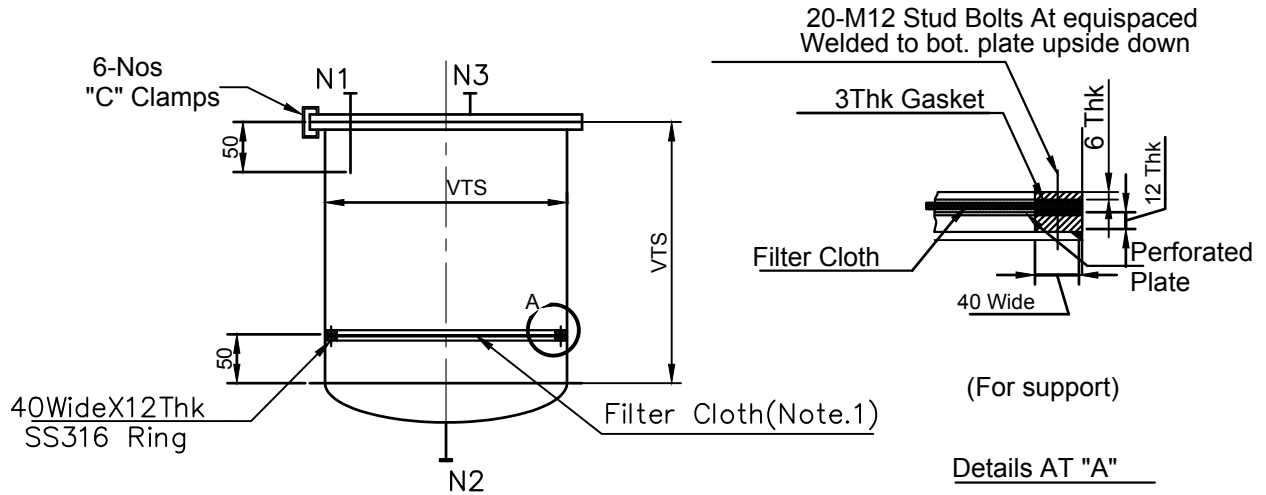
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : FI-203 a,b

Title : Filters



**NOZZLE SCHEDULE**

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.	
N1	Inlet from ST-202	80	40s	150	SS316	ANSI	150#	RF/SO	SS316	
N2	Outlet to S-201 a,b	100	10s	150	SS316	FERRULE	FITTINGS			
N3	Water Inlet	25	40s	150	SS316					

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified																<b>DO NOT SCALE</b>			
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR												
<b>CLEARANCES</b>																			
SAK / TPK / MR															TPK / MRK				
DESIGN				PREPARED				VER/CHD				APPROVED							
SCALE	REFERENCES	SOFT COPY REF				DWG/DOC/SK-NO.				SHEET									
		CD/FP	FOLDER	FILE	DE-PTBBA-175-06-11004				2 OF 2				REV	-					

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## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-201 a,b	Dwg. No. : -	Code : -	1		
	2	Title : W Transfer Pumps	Type : Centrifugal		2		
	3	Service : To Transfer W from ST-201 to R-201 a,b				3	
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4	
<b>PROCESS DATA</b>	1	Fluid Handled : W				5	
	2	Capacity : lpm	Normal : 35	Maximum : 50	Design : 50	6	
	3	Operating Temperature : °C	Normal : 25	Maximum : 30	Design : 30	7	
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8	
	5	Density at 30°C : kg/cu.m.	1000			9	
	6	Viscosity at 30 : cP	1			10	
	7	Vapour Pressure at °C : mm Hg	-			11	
	8	Nature of Fluid :	-			12	
	9	pH				13	
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avg. particle size:mic. : -	14	
	11	Dissolved Gases :	-			15	
	12	Hazard Condition :				16	
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17	
	2	Discharge Details :	Condition : Discharge to R201 a,b at Atm. Pressure			18	
			m of water	Head : 30.0 m		19	
	3	Total Discharge Pressure :	kg/sq.cm.-g/a =	3.0		20	
	4	NPSH Available :	m of W.C.	VTS		21	
	5	Material Of Construction	Casing :	SS 316		22	
			Gears :	-		23	
			Shaft :	SS 316		24	
			Bolting :	SS 316		25	
	6	Nozzles	Suction	End Connection :	Flanged	Size NB (mm) : 50	26
				Pressure Rating :	150#	Standard : ANSI, B16.5	27
			Discharge	End Connection :	Flanged	Size NB (mm) : 50	28
				Pressure Rating :	150#	Standard : ANSI, B16.5	29
	7	Drive Details :	Motor :	Electric, Flame Proof		30	
			Power Supply :	440V, 3Ø, 50 Hz		31	
			R.P.M. :	1440		32	
8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS		33		
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				34	
	2	Vendor to indicate a list of recommended spare parts.				35	
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				36	
	4	VTS : Vendor to specify.				37	
	5	Stroke length to be adjustable through flow range.				38	
	6	Pump shall operate at +/- 1% accuracy.				39	
	7	All non contact parts should be coated with corrosion acid resistant paint.				40	
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				41	

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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
ISSUES / DISTRIBUTION / COPIES																
All dimensions in mm, unless specified <b>DO NOT SCALE</b>																
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR		
CLEARANCES																
MR		-		MR		19.07.23		MR/SAK		-		TPK/MR/SAK		-		
DESIGN				PREPARED				VER/CHD				APPROVED				
SCALE	REFERENCES			SOFT COPY REF			DWG/DOC/SK No.			SHEET			REV 0			
				CD/FP	FOLDER	FILE	DE-XXX-XXX-ED			1 of 1						



## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-202 a,b	Dwg. No. : -	Code : -	1	
	2	Title : W Transfer Pumps	Type : Centrifugal		2	
	3	Service : To Transfer Chilled Water from SV-201 to Fi-201 a,b				3
	4	Normal Capacity : 900 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4
<b>PROCESS DATA</b>	1	Fluid Handled : W			5	
	2	Capacity : lpm	Normal : 10	Maximum : 15	Design : 15	6
	3	Operating Temperature : °C	Normal : 5	Maximum : 10	Design : 10	7
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C : kg/cu.m.	1000			9
	6	Viscosity at 30 : cP	1			10
	7	Vapour Pressure at °C - : mm Hg	-			11
	8	Nature of Fluid :	-			12
	9	pH				13
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avg. particle size:mic.: -	14
	11	Dissolved Gases :	-			15
	12	Hazard Condition :				16
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded		17	
	2	Discharge Details :	Condition : Discharge to Fi-201 a,b at Atm. Pressure		18	
	3	Total Discharge Pressure : kg/sq.cm.-g/a	= 3.0		19	
	4	NPSH Available : m of W.C.	VTS		20	
	5	Material Of Construction	Casing : SS 316	Seal : -	21	
			Gears : -	Gasket : PTFE	22	
			Shaft : SS 316	Others :	23	
			Bolting : SS 316	All contact parts : SS 316	24	
	6	Nozzles	Suction	End Connection : Flanged	Size NB (mm) : 25	25
				Pressure Rating : 150#	Standard : ANSI, B16.5	26
			Discharge	End Connection : Flanged	Size NB (mm) : 25	27
				Pressure Rating : 150#	Standard : ANSI, B16.5	28
	7	Drive Details :	Motor : Electric, Flame Proof	H.P. : 3.0	29	
			Power Supply : 440V, 3Ø, 50 Hz		30	
			R.P.M. : 1440		31	
	8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS	32	
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				33
	2	Vendor to indicate a list of recommended spare parts.				34
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				35
	4	VTS : Vendor to specify.				36
	5	Stroke length to be adjustable through flow range.				37
	6	Pump shall operate at +/- 1% accuracy.				38
	7	All non contact parts should be coated with corrosion acid resistant paint.				39
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				40

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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	
							ISSUES / DISTRIBUTION / COPIES										
		All dimensions in mm, unless specified		<b>DO NOT SCALE</b>													
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR			
CLEARANCES																	
MR		-		MR		19.07.23		MR/SAK		-		TPK/MR/SAK		-			
DESIGN				PREPARED				VER/CHD				APPROVED					
SCALE		REFERENCES		SOFT COPY REF			DWG/DOC/SK No.		SHEET		REV 0						
				CD/FP	FOLDER	FILE	DE-XXX-XXX-ED		1 of 1								





## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-203 a,b	Dwg. No. : -	Code : -	1		
	2	Title : C3 Transfer Pumps	Type : Centrifugal		2		
	3	Service : To Transfer Filtrate from ST-202 a,b to Fi-202			3		
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4	
<b>PROCESS DATA</b>	1	Fluid Handled :	C3			5	
	2	Capacity :	lpm	Normal : 35	Maximum : 50	Design : 50	6
	3	Operating Temperature :	°C	Normal : 20	Maximum : 30	Design : 30	7
	4	Operating Pressure :	kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C	kg/cu.m.	1000			9
	6	Viscosity at 30	cP	-			10
	7	Vapour Pressure at °C -	mm Hg	-			11
	8	Nature of Fluid :	-			12	
	9	pH				13	
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avge. particle size:mic.: -		14
	11	Dissolved Gases :	-			15	
	12	Hazard Condition :				16	
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17	
	2	Discharge Details :	Condition : Discharge to Fi-202 at Atm. Pressure			18	
	3	Total Discharge Pressure :	kg/sq.cm.-g/a	= 3.0		21	
	4	NPSH Available :	m of W.C.	VTS		22	
	5	Material Of Construction	Casing :	SS 316		23	
			Gears :	-		24	
			Shaft :	SS 316		25	
			Bolting :	SS 316		26	
	6	Nozzles	Suction	End Connection :	Flanged	Size NB (mm) : 50	27
				Pressure Rating :	150#	Standard : ANSI, B16.5	28
			Discharge	End Connection :	Flanged	Size NB (mm) : 50	29
				Pressure Rating :	150#	Standard : ANSI, B16.5	30
	7	Drive Details :	Motor :	Electric, Flame Proof		31	
			Power Supply :	440V, 3Ø, 50 Hz		32	
			R.P.M. :	1440		33	
	8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS		34	
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				35	
	2	Vendor to indicate a list of recommended spare parts.				36	
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				37	
	4	VTS : Vendor to specify.				38	
	5	Stroke length to be adjustable through flow range.				39	
	6	Pump shall operate at +/- 1% accuracy.				40	
	7	All non contact parts should be coated with corrosion acid resistant paint.				41	
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				42	
					43		
					44		
					45		
					46		

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								ISSUES / DISTRIBUTION / COPIES								
All dimensions in mm, unless specified			<b>DO NOT SCALE</b>													
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
<b>CLEARANCES</b>																
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK	-									
DESIGN			PREPARED			VER/CHD			APPROVED							
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK No.		SHEET		REV 0							
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED		1 of 1									



## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-204 a,b	Dwg. No. : -	Code : -	1	
	2	Title : C3 Transfer Pumps	Type : Centrifugal		2	
	3	Service : To Transfer Filtrate from SV-202 to ST-203 a,b				3
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4
<b>PROCESS DATA</b>	1	Fluid Handled : C3				5
	2	Capacity : lpm	Normal : 35	Maximum : 50	Design : 50	6
	3	Operating Temperature : °C	Normal : 20	Maximum : 30	Design : 30	7
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C : kg/cu.m.	1000			9
	6	Viscosity at 30 : cP	-			10
	7	Vapour Pressure at °C - : mm Hg	-			11
	8	Nature of Fluid :	-			12
	9	pH				13
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avg. particle size:mic.: -	14
	11	Dissolved Gases :	-			15
	12	Hazard Condition :				16
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17
	2	Discharge Details :	Condition : Discharge to ST-202 a,b at Atm. Pressure			18
	3	Total Discharge Pressure : kg/sq.cm.-g/a	= 3.0			19
	4	NPSH Available : m of W.C.	VTS			20
	5	Material Of Construction	Casing :	SS 316		21
			Gears :	-		22
			Shaft :	SS 316		23
			Bolting :	SS 316		24
	6	Nozzles	Suction	End Connection : Flanged	Size NB (mm) : 50	25
				Pressure Rating : 150#	Standard : ANSI, B16.5	26
			Discharge	End Connection : Flanged	Size NB (mm) : 50	27
				Pressure Rating : 150#	Standard : ANSI, B16.5	28
7	Drive Details :	Motor :	Electric, Flame Proof		29	
		Power Supply :	440V, 3Ø, 50 Hz		30	
		R.P.M. :	1440		31	
8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS	32		
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				33
	2	Vendor to indicate a list of recommended spare parts.				34
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				35
	4	VTS : Vendor to specify.				36
	5	Stroke length to be adjustable through flow range.				37
	6	Pump shall operate at +/- 1% accuracy.				38
	7	All non contact parts should be coated with corrosion acid resistant paint.				39
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				40

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified		DO NOT SCALE					
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
CLEARANCES							
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK	-
DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK No.		SHEET	REV
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED	1 of 1	0

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## METERING PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-205 a,b	Dwg. No.: -	Code : -	1		
	2	Title : C3 Metering Pumps	Type : Metering Pump		2		
	3	Service : To Transfer C3 from ST-203 a,b to R-202a			3		
	4	Normal Capacity : lph : 300 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4	
<b>PROCESS DATA</b>	1	Fluid Handled :	C3			5	
	2	Capacity :	lpm	Normal : 2	Maximum : 5	Design : 5	6
	3	Operating Temperature :	°C	Normal : 30	Maximum : 40	Design : 40	7
	4	Operating Pressure :	kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C	kg/cu.m.	1000			9
	6	Viscosity at 30	cP	-			10
	7	Vapour Pressure at °C -	mm Hg	-			11
	8	Nature of Fluid :	-			12	
	9	pH	-			13	
	10	Suspended Solids :	Type :	% wt / Vol. : -	Avge. particle size:mic.: -		14
	11	Dissolved Gases :	-			15	
	12	Hazard Condition :	-			16	
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17	
	2	Discharge Details :	Condition : Discharge to R-202a at Atm. Pressure			18	
	3	Total Discharge Pressure :	kg/sq.cm.-g/a	3.0			19
	4	NPSH Available :	m of W.C.	VTS			20
	5	Material Of Construction	Casing :	SS 316	Seal :	SS 316	21
			Gears :	SS 316	Gasket :	PTFE	22
			Shaft :	SS 316	Others :		23
			Bolting :	SS 316	All contact parts :	SS 316	24
	6	Nozzles	Suction	End Connection : Flanged	Size NB (mm) :	25	25
				Pressure Rating : 150#	Standard : ANSI, B 16.5		26
		Discharge	End Connection : Flanged	Size NB (mm) :	25	27	
			Pressure Rating : 150#	Standard : ANSI, B 16.5		28	
7	Drive Details :	Motor :	Electric, Flame Proof	H.P. :	3.0	29	
		Power Supply :	440V, 3Ø, 50 Hz			30	
		R.P.M. :	1440			31	
8	Seal :	Type :	Single Mechanical Seal	Seal Fluid :	VTS	32	
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				33	
	2	Vendor to indicate a list of recommended spare parts.				34	
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				35	
	4	VTS : Vendor to specify.				36	
	5	Stroke length to be adjustable through flow range.				37	
	6	Pump shall operate at +/- 1% accuracy.				38	
	7	All non contact parts should be coated with corrosion acid resistant paint.				39	
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				40	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
ISSUES / DISTRIBUTION / COPIES																

All dimensions in mm, unless specified																DO NOT SCALE	
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR			
CLEARANCES																	
SAK		-		SAK		07.04.15		TPK/MR/SAK		-		SAK/MR/TPK		-			
DESIGN				PREPARED				VER/CHD				APPROVED					
SCALE		REFERENCES		SOFT COPY REF				DWG/DOC/SK No.				SHEET		REV 0			
				CD/FP		FOLDER		FILE		DE-XXX-XXX-ED		1 of 1					

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## METERING PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-206 a,b	Dwg. No.: -	Code : -	1		
	2	Title : Crystalliser Feed Pumps	Type : Metering Pump		2		
	3	Service : To Transfer DP from ST-204 a,b to Cr-201a				3	
	4	Normal Capacity : lph : 300 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4	
<b>PROCESS DATA</b>	1	Fluid Handled : DP				5	
	2	Capacity : lpm	Normal : 2	Maximum : 5	Design : 5	6	
	3	Operating Temperature : °C	Normal : 40	Maximum : 60	Design : 60	7	
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8	
	5	Density at 30°C : kg/cu.m.	1000			9	
	6	Viscosity at 30 : cP	-			10	
	7	Vapour Pressure at °C - : mm Hg	-			11	
	8	Nature of Fluid :	-			12	
	9	pH	-			13	
	10	Suspended Solids :	Type :	% wt / Vol. : -	Avg. particle size:mic.: -	14	
	11	Dissolved Gases :				15	
	12	Hazard Condition :				16	
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17	
			-			18	
	2	Discharge Details :	Condition : Discharge to Cr-201a at Atm. Pressure			19	
		m of water	Head : 30.0 m			20	
	3	Total Discharge Pressure : kg/sq.cm.-g/a	3.0			21	
	4	NPSH Available : m of W.C.	VTS			22	
	5	Material Of Construction	Casing :	SS 316		Seal : SS 316	23
			Gears :	SS 316		Gasket : PTFE	24
			Shaft :	SS 316		Others :	25
			Bolting :	SS 316		All contact parts : SS 316	26
6	Nozzles	Suction	End Connection :	Flanged	Size NB (mm) : 50	27	
			Pressure Rating :	150#	Standard : ANSI, B 16.5	28	
		Discharge	End Connection :	Flanged	Size NB (mm) : 50	29	
			Pressure Rating :	150#	Standard : ANSI, B 16.5	30	
7	Drive Details :	Motor :	Electric, Flame Proof		H.P. : 3.0	31	
		Power Supply :	440V, 3Ø, 50 Hz			32	
		R.P.M. :	1440			33	
8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS		34		
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				35	
						36	
	2	Vendor to indicate a list of recommended spare parts.				37	
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				38	
	4	VTS : Vendor to specify.				39	
	5	Stroke length to be adjustable through flow range.				40	
	6	Pump shall operate at +/- 1% accuracy.				41	
	7	All non contact parts should be coated with corrosion acid resistant paint.				42	
8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				43		
					44		
					45		
					46		

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								ISSUES / DISTRIBUTION / COPIES								
All dimensions in mm, unless specified			<b>DO NOT SCALE</b>													
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
CLEARANCES																
SAK	-	SAK	07.04.15	TPK/MR/SAK	-	SAK/MR/TPK	-									
DESIGN			PREPARED			VER/CHD			APPROVED							
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK No.		SHEET		REV 0							
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED		1 of 1									



## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-207 a,b	Dwg. No. : -	Code : -	1	
	2	Title : L Transfer Pumps	Type : Centrifugal		2	
	3	Service : To Transfer Filtrate from SV-203 to ST-205				3
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4
<b>PROCESS DATA</b>	1	Fluid Handled : L				5
	2	Capacity : lpm	Normal : 35	Maximum : 50	Design : 50	6
	3	Operating Temperature : °C	Normal : 20	Maximum : 30	Design : 30	7
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C : kg/cu.m.	1000			9
	6	Viscosity at 30 : cP	-			10
	7	Vapour Pressure at °C : mm Hg	-			11
	8	Nature of Fluid :	-			12
	9	pH				13
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avg. particle size:mic.: -	14
	11	Dissolved Gases :	-			15
	12	Hazard Condition :				16
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17
	2	Discharge Details :	Condition : Discharge to ST-205 at Atm. Pressure			18
	3	Total Discharge Pressure : kg/sq.cm.-g/a	= 3.0			19
	4	NPSH Available : m of W.C.	VTS			20
	5	Material Of Construction	Casing : SS 316	Seal : -		21
			Gears : -	Gasket : PTFE		22
			Shaft : SS 316	Others :		23
			Bolting : SS 316	All contact parts : SS 316		24
	6	Nozzles	Suction	End Connection : Flanged	Size NB (mm) : 50	25
				Pressure Rating : 150#	Standard : ANSI, B16.5	26
			Discharge	End Connection : Flanged	Size NB (mm) : 50	27
				Pressure Rating : 150#	Standard : ANSI, B16.5	28
7	Drive Details :	Motor : Electric, Flame Proof	H.P. : 3.0		29	
		Power Supply : 440V, 3Ø, 50 Hz				30
		R.P.M. : 1440				31
8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS		32	
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				33
	2	Vendor to indicate a list of recommended spare parts.				34
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				35
	4	VTS : Vendor to specify.				36
	5	Stroke length to be adjustable through flow range.				37
	6	Pump shall operate at +/- 1% accuracy.				38
	7	All non contact parts should be coated with corrosion acid resistant paint.				39
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				40
					41	
					42	
					43	
					44	
					45	
					46	

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ISSUES / DISTRIBUTION / COPIES																
All dimensions in mm, unless specified <b>DO NOT SCALE</b>																
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR		
CLEARANCES																
MR		-		MR		19.07.23		MR/SAK		-		TPK/MR/SAK		-		
DESIGN				PREPARED				VER/CHD				APPROVED				
SCALE	REFERENCES			SOFT COPY REF			DWG/DOC/SK No.			SHEET			REV 0			
				CD/FP	FOLDER	FILE	DE-XXX-XXX-ED			1 of 1						



## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

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PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-208 a,b	Dwg. No. : -	Code : -	1		
	2	Title : L Transfer Pumps	Type : Centrifugal		2		
	3	Service : To Transfer Filtrate from ST-205 to S-201				3	
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4	
<b>PROCESS DATA</b>	1	Fluid Handled : L				5	
	2	Capacity : lpm	Normal : 35	Maximum : 50	Design : 50	6	
	3	Operating Temperature : °C	Normal : 20	Maximum : 30	Design : 30	7	
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8	
	5	Density at 30°C : kg/cu.m.	1000			9	
	6	Viscosity at 30 : cP	-			10	
	7	Vapour Pressure at °C : mm Hg	-			11	
	8	Nature of Fluid :	-			12	
	9	pH				13	
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avg. particle size:mic.: -	14	
	11	Dissolved Gases :	-			15	
	12	Hazard Condition :				16	
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17	
	2	Discharge Details :	Condition : Discharge to S-201 at Atm. Pressure			18	
			m of water	Head : 30.0 m		19	
	3	Total Discharge Pressure :	kg/sq.cm.-g/a =	3.0		20	
	4	NPSH Available :	m of W.C.	VTS		21	
	5	Material Of Construction	Casing :	SS 316	Seal :	-	22
			Gears :	-	Gasket :	PTFE	23
			Shaft :	SS 316	Others :		24
			Bolting :	SS 316	All contact parts :	SS 316	25
	6	Nozzles	Suction	End Connection :	Flanged	Size NB (mm) :	50
Pressure Rating :				150#	Standard :	ANSI, B16.5	27
Discharge			End Connection :	Flanged	Size NB (mm) :	50	28
			Pressure Rating :	150#	Standard :	ANSI, B16.5	29
7	Drive Details :	Motor :	Electric, Flame Proof	H.P. :	3.0	30	
		Power Supply :	440V, 3Ø, 50 Hz			31	
		R.P.M. :	1440			32	
8	Seal :	Type :	Single Mechanical Seal	Seal Fluid :	VTS	33	
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				34	
	2	Vendor to indicate a list of recommended spare parts.				35	
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				36	
	4	VTS : Vendor to specify.				37	
	5	Stroke length to be adjustable through flow range.				38	
	6	Pump shall operate at +/- 1% accuracy.				39	
	7	All non contact parts should be coated with corrosion acid resistant paint.				40	
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				41	
					42		
					43		
					44		
					45		
					46		

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								ISSUES / DISTRIBUTION / COPIES								
All dimensions in mm, unless specified			<b>DO NOT SCALE</b>													
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
CLEARANCES																
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK	-									
DESIGN			PREPARED			VER/CHD			APPROVED							
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK No.			SHEET				REV 0				
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED			1 of 1								



## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

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- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-209 a,b	Dwg. No. : -	Code : -	1		
	2	Title : CL Transfer Pumps	Type : Centrifugal		2		
	3	Service : To Transfer Filtrate from S-201 a,b to Fi-204				3	
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4	
<b>PROCESS DATA</b>	1	Fluid Handled :	CL			5	
	2	Capacity :	lpm	Normal : 35	Maximum : 50	Design : 50	6
	3	Operating Temperature :	°C	Normal : 20	Maximum : 30	Design : 30	7
	4	Operating Pressure :	kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C	kg/cu.m.	1000			9
	6	Viscosity at 30	cP	-			10
	7	Vapour Pressure at °C -	mm Hg	-			11
	8	Nature of Fluid :	-			12	
	9	pH				13	
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avge. particle size:mic.: -		14
	11	Dissolved Gases :	-			15	
	12	Hazard Condition :				16	
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17	
	2	Discharge Details :	Condition : Discharge to Fi-204 at Atm. Pressure			18	
	3	Total Discharge Pressure :	kg/sq.cm.-g/a	= 3.0		19	
	4	NPSH Available :	m of W.C.	VTS		20	
	5	Material Of Construction	Casing :	SS 316		21	
			Gears :	-		22	
			Shaft :	SS 316		23	
			Bolting :	SS 316		24	
	6	Nozzles	Suction	End Connection : Flanged	Size NB (mm) : 50	25	
				Pressure Rating : 150#	Standard : ANSI, B16.5	26	
			Discharge	End Connection : Flanged	Size NB (mm) : 50	27	
				Pressure Rating : 150#	Standard : ANSI, B16.5	28	
7	Drive Details :	Motor :	Electric, Flame Proof		29		
		Power Supply :	440V, 3Ø, 50 Hz		30		
		R.P.M. :	1440		31		
8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS		32		
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				33	
	2	Vendor to indicate a list of recommended spare parts.				34	
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				35	
	4	VTS : Vendor to specify.				36	
	5	Stroke length to be adjustable through flow range.				37	
	6	Pump shall operate at +/- 1% accuracy.				38	
	7	All non contact parts should be coated with corrosion acid resistant paint.				39	
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				40	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
ISSUES / DISTRIBUTION / COPIES																

All dimensions in mm, unless specified																DO NOT SCALE	
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR			
CLEARANCES																	
MR		-		MR		19.07.23		MR/SAK		-		TPK/MR/SAK		-			
DESIGN				PREPARED				VER/CHD				APPROVED					
SCALE		REFERENCES		SOFT COPY REF				DWG/DOC/SK No.				SHEET		REV 0			
				CD/FP		FOLDER		FILE		DE-XXX-XXX-ED		1 of 1					

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## CENTRIFUGAL PUMP SPECIFICATION DATA SHEET

Page  
- of -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	R

<b>GEN.</b>	1	Unit No. : P-210 a,b	Dwg. No. : -	Code : -	1	
	2	Title : RF Transfer Pumps	Type : Centrifugal		2	
	3	Service : To Transfer Filtrate from ST-207 a,b to R-201a				3
	4	Normal Capacity : 3000 LPH	Nos. required (Total) : 2	Working : 1	Stand By : 1	4
<b>PROCESS DATA</b>	1	Fluid Handled : Filtrate				5
	2	Capacity : lpm	Normal : 35	Maximum : 50	Design : 50	6
	3	Operating Temperature : °C	Normal : 20	Maximum : 30	Design : 30	7
	4	Operating Pressure : kg/sq.cm.-g/a	Suction : Atm.	Discharge : 3.0		8
	5	Density at 30°C : kg/cu.m.	1000			9
	6	Viscosity at 30 : cP	-			10
	7	Vapour Pressure at °C - : mm Hg	-			11
	8	Nature of Fluid :	-			12
	9	pH				13
	10	Suspended Solids :	Type : -	% wt / Vol. : -	Avg. particle size:mic.: -	14
	11	Dissolved Gases :	-			15
	12	Hazard Condition :				16
<b>CONSTRUCTION DATA</b>	1	Suction Details :	Condition : Flooded			17
	2	Discharge Details :	Condition : Discharge to R-201a at Atm. Pressure			18
	3	Total Discharge Pressure : kg/sq.cm.-g/a	= 3.0			19
	4	NPSH Available : m of W.C.	VTS			20
	5	Material Of Construction	Casing : SS 316	Seal : -		21
			Gears : -	Gasket : PTFE		22
			Shaft : SS 316	Others :		23
			Bolting : SS 316	All contact parts : SS 316		24
	6	Nozzles	Suction	End Connection : Flanged	Size NB (mm) : 50	25
				Pressure Rating : 150#	Standard : ANSI, B16.5	26
			Discharge	End Connection : Flanged	Size NB (mm) : 50	27
				Pressure Rating : 150#	Standard : ANSI, B16.5	28
7	Drive Details :	Motor : Electric, Flame Proof	H.P. : 3.0		29	
		Power Supply : 440V, 3Ø, 50 Hz			30	
		R.P.M. : 1440			31	
8	Seal :	Type : Single Mechanical Seal	Seal Fluid : VTS		32	
<b>NOTES</b>	1	Vendor shall supply 2 sets of all relevant catalogues, performance curves, dimensioned drawings and maintenance manuals and shall guarantee mechanical performance.				33
	2	Vendor to indicate a list of recommended spare parts.				34
	3	Scope of supply shall include Pump, Motor, coupling & guard common base plate and foundation details.				35
	4	VTS : Vendor to specify.				36
	5	Stroke length to be adjustable through flow range.				37
	6	Pump shall operate at +/- 1% accuracy.				38
	7	All non contact parts should be coated with corrosion acid resistant paint.				39
	8	Vendor shall indicate whether the suction conditions meet NPSH requirements.				40

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All dimensions in mm, unless specified <b>DO NOT SCALE</b>																
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR		
CLEARANCES																
MR		-		MR		19.07.23		MR/SAK		-		TPK/MR/SAK		-		
DESIGN				PREPARED				VER/CHD				APPROVED				
SCALE		REFERENCES		SOFT COPY REF				DWG/DOC/SK No.				SHEET		REV		
				CD/FP		FOLDER		FILE		DE-XXX-XXX-ED				1 of 1		0





REACTOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.	1	Unit No. : R-201	Dwg. No.: -	Code : ASME Sec. VIII Div. I	R	1	
	2	Title : Hydrolysis Reactors	Nos. required : One	Type : Vertical, Cylindrical & Flanged		2	
	3	Service : To Carry out Hydrolysis Reaction					3
	4	Nominal Capacity : lit. : 1600 lit.					4
						5	

PROCESS DATA	1	OPERATION :	Batch / <del>Continuous</del>	Batch Time : hrs :12 hrs	Working Hours/Day : -	6
			SHELL	JACKET	DOUBLE COIL	7
	2	Material Handled :	W, C1+CO2	Chilled Water		8
	3	Operation :	Batch	Batch		9
	4	Feed Quantity Total :	kg	1407	10480	10
	5	Solid/Liquid/Gas:	kg	295/1072/40	-/10480/-	11
	6	Discharge Quantity Total :	kg	1407	10480	12
	7	Solid/Liquid/Gas:	kg	-/581/24	-/10480/-	13
	8	Operating Temp.:Nor./Max.:	°C	10	7/10	14
	9	Operating Press.:Nor./Max.:	kg/sq.cm.-g/¢	Atm.	3.0	15
	10	Density : at 30 °C	kg/cu.m.	1169	1000	16
	11	Viscosity : at 25 °C	cP	-	1	17
	12	pH :		-	-	18
	13	Pressure Drop :	kg/sq.cm.	-	-	19
14	Hazard Condition :		-	-	20	
						21

INTERALS	1	Agitator Type :	Anchor/Flat Blade	Shaft Dia : 50 mm	22		
	2		Impeller Dia. : 1000	No. of Impellers : One	23		
	3		Height from bottom: 50	Speed : RPM : 50	24		
	4	Coil : 2 Nos.	mm	Tube Dia. : -	BWG / Sch. : -	25	
	5		mm	Pitch : -	No. of Turns : -	26	
	6		mm	Coil Helix Dia. : -	Height from bottom : -	27	
	7	Baffles :	mm	Nos. : -	Type : -	28	
	8		mm	Height : -	Width : -	29	
	9		mm	Thk. : -		30	
	10	Feed Arrangement :		Type : -	Dia. : -	Length : -	31
				Spray Nozzle Dia. : -	Pitch : -	Others : -	32
	11	Shaft :		Dia. : 50 mm	Length : VTS		33
12	Others :		-			34	

CONSTRUCTION			SHELL		JACKET		COIL		35	
	1	Temperature :	°C	Dgn: 50	Test: Amb.	Dgn: 40	Test: Amb.	Dgn:	Test:	36
	2	Pressure :	kg/sq.cm.-g/¢	Dgn: 1.1/3.3(Ext.)	Test: 4.5 ext.	Dgn: 3.3	Test: 4.5	Dgn:	Test:	37
	3	Diameter :	mm	O.D.: -	I.D.: 1100	O.D.: -	I.D.: 1200	O.D.:	H.Dia.:	38
	4	Straight Length :	mm	1475		1180				39
	5	Thk. :	mm	6 MM		6 MM				40
	6	Shell Ends :	Top	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50			41
		Bottom	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50			42	
7	Jacket end :	Bottom	Type : -	Thk. : 6 MM	K.R. : -	SF : -			43	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

MR	MR	19.07.23	MR/SAK	TPK/MR/SAK
DESIGN	PREPARED	VER/CHD	APPROVED	
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK- <del>No.</del>	SHEET
		CD/FP	FOLDER	FILE
			DE-XXX-XXX-ED-01-07 00 XXX	1 OF 3
				REV 1

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## REACTOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals	PROJECT CODE : -
CLIENT : -	CAPACITY : 0.125 TPD
LOCATION : -	-

1	Unit No. : R-201	Title : Hydrolysis Reactors	R	1
				2
		SHELL	JACKET	COIL
8	Corrosion Allowance :	-	-	-
9	Supports :	Type: - No.: -	Type: LEG No.: 4 Nos.	Type: No.:
10	Material Of Construction	Shell : SA-240 SS 316	Jacket : CS A 285 Gr. C	
		Shell Ends : SA-240 SS 316	Jacket Ends : CS A 285 Gr. C	
		Coil : -	Supports : CS A-75/IS:226	
		Shaft : SA-479 SS 316	Feed Arrangement : SS 316	
		Agitator : SA-240 SS 316	External Bolting : CS to IS 1364	
		Baffle : SS 316	Internal Bolting : SS 316	
		Dip Pipe : SA-312 TP 316	Gaskets : PTFE	
		Shell Flanges : CS A 285 Gr. C with 3 thk. SS316 lining	Sparger : -	
11	Heat Treatment :	Stress Relieving : -	Others : -	
12	Tests :	Hydraulic / Pneumatic : Yes	Dye-Penetrant : -	
		Radiograph : -	Others : -	
13	Insulation :	Type : -	Thk. : -	
14	Painting / Finish :	All CS parts to be painted with two coats of red oxide primer		
15	Weight : kg	Empty : 865	Full of Water : 3000	
16	Drive Details :	Motor : Electric, Flame Proof		
		Power Supply : 440V, 3 Ø Phase,	H.P. : 5.0	
		R.P.M. : Shaft RPM is 300, Motor RPM is VTS		
17	Shaft Seal :	Mechanical seal		
18	Inspection By :	IICT / CLIENT / Third Party -	Others : -	
				26
				27
				28
				29

1	** : Vendor to specify.	30
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.	31
3	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.	32
4	MSGSL – MS Glass Lined	33
5	Rev. 1 – Quantities written in kgs.	34
		35
		36
		37
		38
		39
		40
		41
		42
		43

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	ISSUES / DISTRIBUTION / COPIES			
All dimensions in mm, unless specified		<b>DO NOT SCALE</b>																		
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR													
<b>CLEARANCES</b>																				
MR	MR	19.07.23	MR/SAK	TPK/MR/SAK																
DESIGN		PREPARED		VER/CHD		APPROVED														
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK- <del>No.</del>			SHEET												
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX			2 OF 3		REV 1										

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REACTOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : R-201

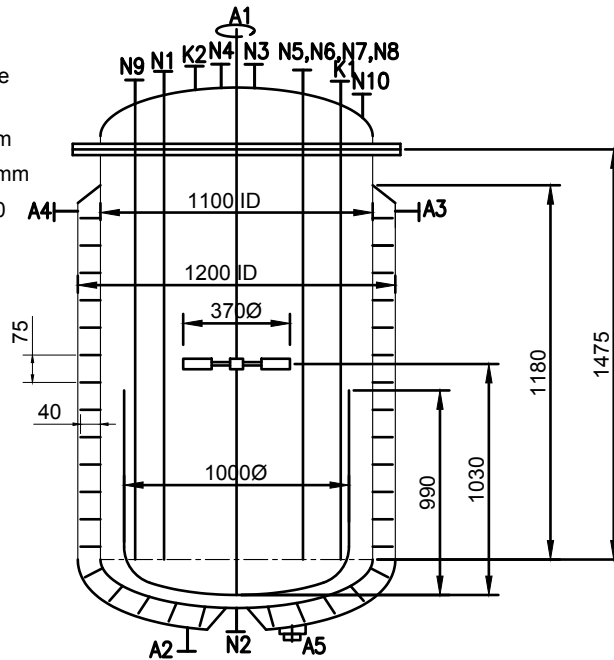
Title : Hydrolysis Reactors

Top Impeller Details

No. of impellers = One  
Type = Flat Blade  
Impeller Dia = 370 mm  
Ht. from Bot. = 1030 mm  
Blade L x W = 90 x 70

Spiral Jacker Details

Baffle Pitch = 50 mm



Bottom Impeller Details

No. of impellers = One  
Type of impeller = Anchor  
Impeller Dia. = 1000 mm  
Impeller Ht. = 990 mm  
Blade Width x Thk = 110 mm x 10 mm  
Ht. from Bot. Vessel to Anchor = 50 mm

NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet for W	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Bottom Outlet	100	10s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Flush Bottom Valve	2
N3	Vent	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	3
N4	Inlet from SB-201	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Hopper	4
N5-N8	CO2 Inlet	15	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg Four Sides	5
N9	Inlet for RF from P-210 a,b	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	6
N10	Spare	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	7
											8
K1	Thermowell	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	9
K2	pH Indicator	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	10
K3	Level Transmitter	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316		11
A1	Stirrer	VTS	-	-	-	-	-	-	-	-	12
A2	Chilled Water Inlet	100	10	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	13
A3	Chilled Water Outlet	100	10	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	14
A4	Jacket Vent	25	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	15
A5	Jacket Drain (Plug)	3/4"	-	-	CS	-	#3000	-	-	Plug	16
											17

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
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All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK-NO.		SHEET	
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX		3 OF 3
							REV -

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# REACTOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R
1	Unit No. : R-202 a,b,c	Dwg. No.: -	Code : ASME Sec. VIII Div. I	1
2	Title : DP Reactors	Nos. required : Three	Type : Vertical, Cylindrical & Flanged	2
3	Service : To Carry out DP Reaction			3
4	Nominal Capacity : lit. : 160 lit.			4
				5

PROCESS DATA		Batch / Continuous	Batch Time : hrs :-	Working Hours/Day : -	
1	OPERATION :	SHELL	JACKET	DOUBLE COIL	6
2	Material Handled :	C3	Steam		7
3	Operation :	Continuous	Continuous		8
4	Feed Quantity Total : kg/hr	87	16		9
5	Solid/Liquid/Gas: kg/hr	-/87/-	-/-/-		10
6	Discharge Quantity Total : kg/hr	87	16		11
7	Solid/Liquid/Gas: kg/hr	-/87/-	-/-/-		12
8	Operating Temp.:Nor./Max.: °C	70/75	80/90		13
9	Operating Press.:Nor./Max.: kg/sq.cm.-g/¢	Atm.	3.0		14
10	Density : at 30 °C kg/cu.m.	1057	1000		15
11	Viscosity : at 25 °C cP	1	1		16
12	pH :	8.1	-		17
13	Pressure Drop : kg/sq.cm.	-	-		18
14	Hazard Condition :	-	-		19
					20
					21

INTERALS						
1	Agitator Type :	Pitched Blade Turbine		Shaft Dia : 25 mm		22
2		mm	Impeller Dia. : 170	No. of Impellers : One		23
3		mm	Height from bottom: 170	Speed : RPM : 550		24
4	Coil : 2 Nos.	mm	Tube Dia. : -	BWG / Sch. : -		25
5		mm	Pitch : -	No. of Turns : -		26
6		mm	Coil Helix Dia. : -	Height from bottom : -		27
7	Baffles :	mm	Nos. : 4 Nos.	Type : Flat		28
8		mm	Height : 725	Width : 50		29
9		mm	Thk. : 10			30
10	Feed Arrangement :	Type : -		Dia. : -	Length : -	31
		Spray Nozzle Dia. : -		Pitch : -	Others : -	32
11	Shaft :	Dia. : 25 mm		Length : VTS		33
12	Others :	-				34

CONSTRUCTION		SHELL		JACKET		COIL		
1	Temperature : °C	Dgn: 80	Test: Amb.	Dgn: 40	Test: Amb.	Dgn:	Test:	35
2	Pressure : kg/sq.cm.-g/¢	Dgn: 1.1/3.3(Ext.)	Test: 4.5 ext.	Dgn: 3.3	Test: 4.5	Dgn:	Test:	36
3	Diameter : mm	O.D.: -	I.D.: 500	O.D.: -	I.D.: 600	O.D.:	H.Dia.:	37
4	Straight Length : mm	725		580		-		38
5	Thk. : mm	6 MM		6 MM				39
6	Shell Ends :	Top	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50		40
		Bottom	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50		41
7	Jacket end :	Bottom	Type : -	Thk. : 6 MM	K.R. : -	SF : -		42
								43

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8

All dimensions in mm, unless specified																<b>DO NOT SCALE</b>	
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MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES																
MR		MR	19.07.23	MR/SAK		TPK/MR/SAK										
DESIGN				PREPARED				VER/CHD				APPROVED				
SCALE	REFERENCES	SOFT COPY REF				DWG/DOC/SK- <del>No.</del>				SHEET						
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX				1 OF 3				REV 1			

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REACTOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1	Unit No. : R-202 a, b,c	Title : DP Reactors					R	1
		SHELL		JACKET		COIL	2	
8	Corrosion Allowance :	-		-			3	
9	Supports :	Type: -	No.: -	Type: LEG	No.: 4 Nos.	Type:	No.:	
	Material Of Construction	Shell : SA-240 SS 316		Jacket : CS A 285 Gr. C			4	
		Shell Ends : SA-240 SS 316		Jacket Ends : CS A 285 Gr. C			5	
		Coil : -		Supports : CS A-75/IS:226			6	
		Shaft : SA-479 SS 316		Feed Arrangement : SS 316			7	
		Agitator : SA-240 SS 316		External Bolting : CS to IS 1364			8	
		Baffle : SS 316		Internal Bolting : SS 316			9	
		Dip Pipe : SA-312 TP 316		Gaskets : PTFE			10	
		Shell Flanges : CS A 285 Gr. C with 3 thk. SS316 lining		Sparger : -			11	
11	Heat Treatment :	Stress Relieving : -		Others : -			12	
12	Tests :	Hydraulic / Pneumatic : Yes		Dye-Penetrant : -			13	
		Radiograph : -		Others : -			14	
13	Insulation :	Type : -		Thk. : -			15	
14	Painting / Finish :	All CS parts to be painted with two coats of red oxide primer						16
15	Weight : kg	Empty : 210		Full of Water : 450			17	
16	Drive Details :	Motor : Electric, Flame Proof						18
		Power Supply : 440V, 3 Ø Phase,		H.P. : 3.0			19	
		R.P.M. : Shaft RPM is 550, Motor RPM is VTS						20
17	Shaft Seal :	Mechanical seal						21
18	Inspection By :	IICT / CLIENT / Third Party -		Others : -			22	
								23
								24
								25
								26
								27
								28
								29

1	** : Vendor to specify.	30
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.	31
3	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.	32
4	MSGSL - MS Glass Lined	33
5	Rev. 1 - Quantities written in kgs.	34
		35
		36
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		41
		42
		43

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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	
All dimensions in mm, unless specified							<b>DO NOT SCALE</b>										
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR										
<b>CLEARANCES</b>																	
MR	MR	19.07.23	MR/SAK	TPK/MR/SAK													
DESIGN		PREPARED		VER/CHD				APPROVED									
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK- <del>No.</del>				SHEET				REV 1				
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX				2 OF 3								



# REACTOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : R-202 a,b,c

Title : DP Reactors

### Impeller Details

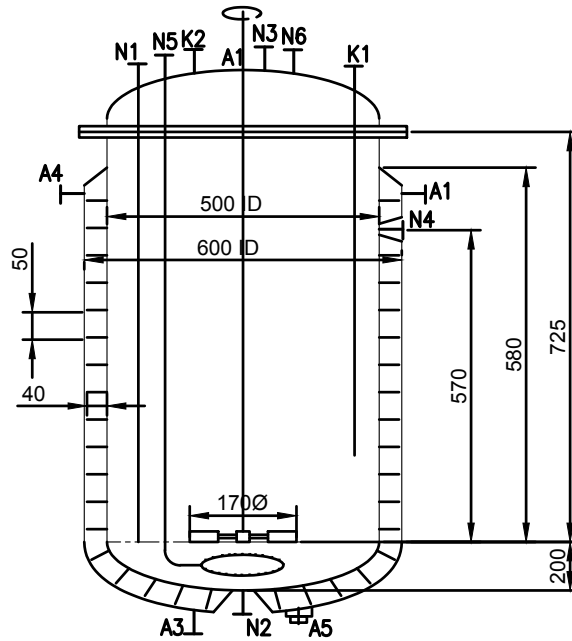
No. of impellers = One  
Type = Pitched Blade  
Impeller Dia = 170 mm  
Ht. from Bot. = 170 mm  
Blade L x W = 40 x 35

### Spiral Jacket

Spiral Baffle Pitch = 50 mm

### Sparger Details

Sparger Dia = 260 mm  
HT. from Bot. = 125 mm  
Sparger Pipe Dia = 25NB  
Hole size = 0.5 Ø mm  
No. of Holes = 140 Nos.  
Dist between Holes = 3 mm



### NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from P-205 a,b	50	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	Dipleg	1
N2	Bottom Outlet	50	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	Flush Bottom Valve	2
N3	Vent	25	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	-	3
N4	Overflow to ST-204 a,b	50	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	-	4
N5	CO2 Inlet	15	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	Sparger	5
N6	Spare	25	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	-	6
											7
K1	Thermowell	20	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	Dipleg	8
K2	pH Indicator	20	40s	150	SS316	ANSI, B16.5	#150	SO,RF	SS316	-	9
											10
A1	Stirrer	VTS	-	-	-	-	-	-	-	-	11
A2	Steam Inlet	50	40	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	12
A3	Condensate Outlet	50	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	Plug	13
A4	Jacket Vent	25	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	14
A5	Jacket Drain (Plug)	3/4"	-	-	CS	-	#3000	-	-	-	15
											16
											17
											18
											19

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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### CLEARANCES

SAK	PVSB	13.12.13	SAK/MR	SAK/MR/TPK
DESIGN	PREPARED	VER/CHD	APPROVED	
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK No.	SHEET
		CD/FP FOLDER FILE	DE-XXX-XXX-ED-01-07 00 XXX	3 OF 3
				REV -

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S-101

**INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY**  
**HYDERABAD – 500 007**



## SEPARATOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.						R	
1	Unit No. : S-201 a,b	Dwg. No.:	Code : ASME Sec. VIII Div. I			1	
2	Title : Settling Tanks	Nos. required : Two	Type : Vertical, Cylindrical			2	
3	Service : To settle material from Mixture					3	
4	Nominal Capacity : lit. : 1250 lit.					4	
						5	
						6	
<b>PROCESS DATA</b>							
1	Fluid	Mixture				7	
2	Operating Temperature : °C	Normal : 25	Maximum : 30			8	
3	Operating Pressure : kg/sq.cm.-g/ø	Normal : Atm.	Maximum : 1.1			9	
4	Density : at 30 °C kg/cu.m.	1050				10	
5	Hazard Condition : -					11	
						12	
						13	
<b>CONSTRUCTION DATA</b>							
1	Temperature : °C	Design : 40	Test : Amb.			14	
2	Pressure : kg/sq.cm.-g/ø	Design : 1.1	Test : Full with Water			15	
3	Corrosion Allowance					16	
4	Shell	ØD/ID : 800 mm		St. Length : 2350 mm		17	
		Thk. : 6 MM				18	
5	Ends	Top	Type : Dish, Torispherical	KR : 10%	Thk. : 6 MM	SF : 50 mm	19
		Bottom	Type : Dish, Torispherical	KR : 10%	Thk. : 6 MM	SF : 50 mm	20
6	Supports					21	
		Type : Leg		Nos. : 4 Nos.			
7	Material Of Construction	Shell : SA 240 SS 316		Heads : SA 240 SS 316		22	
		Supports : CS to IS 226		Internal Bolting : SS 316		23	
		Gaskets : PTFE		External Bolting : CS to IS 1364		24	
		Shell Flanges : -		Jacket / Internals : SS 316		25	
		Nozzles : SS 316		Other wetted parts : SS 316		26	
		Flanges : -		Others : -		27	
8	Heat Treatment					28	
		Stress Relieving : -		Others : -			
9	Tests					29	
		Hydraulic / Pneumatic : Yes		Dye-Penetrant : -			
		Radiographic : -		Others : -		30	
10	Insulation					31	
		Type : HCl / CCl / PPI -		Thk. : -			
11	Painting / Finish					32	
		All CS parts to be painted with two coats of red oxide primer					
12	Weight : kg	Empty : 465		Full of water : 1760		33	
13	Inspection By					34	
		IICT / Client / Third Party -		Others : -			
	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.					35	
1	All dimensions are in mm					36	
2	VTS - Vendor to specify.					37	
3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.					38	
4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.					39	
5	Nozzle orientation and support height shall be provided by vendor					40	
6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.					41	
7	Suitable stiffeners to be provided for all the nozzles.					42	
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.					43	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	ISSUES / DISTRIBUTION / COPIES													
							DATE	TR. No.	1	2	3	4	5	6	7	8				

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR

PRCS ENGR

INST ENGR

ELECT ENGR

CIVIL ENGR

CLIENT

CONSULTANT

CONTRACTOR

### CLEARANCES

MR

-

MR

19.07.23

MR/SAK

-

TPK/MR/SAK

DESIGN

PREPARED

VER/CHD

APPROVED

SCALE

REFERENCES

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DWG/DOC/SK/No.

SHEET

CD/FP FOLDER FILE

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1 OF 2

REV

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# SEPARATOR SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

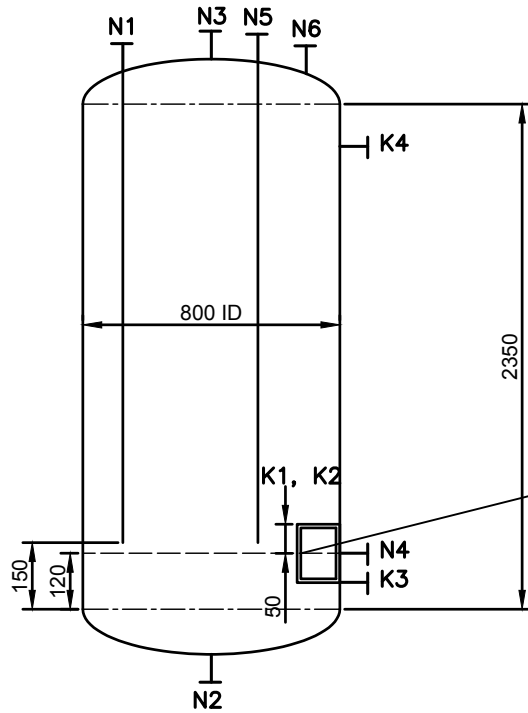
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : S-201 a,b

Title : Settling Tanks



Interface Ht. from BTL = 120 mm  
Dipleg from BTL = 150 mm  
BTL - Bottom Tangent Line

Light and Sight Glass Dimensions  
(l x b) 100 mm x 100 mm

## NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from P-208 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Bottom Outlet to ST-206 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Side Outlet to P-209 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	4
N5	Inlet from P-201 a,b	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	5
N6	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	6
K1,K2	Light and Sight Glass	100 x 100	-	-	SS 316	-	-	-	-	-	8
K3	Level Guage	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K4	Level Guage	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	10
											11
											12

- NOTES**
- 9 Lifting lugs, earthing boss(SS316) and name plate are to be provided.
  - 10 Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.
  - 11 Dished ends shall conform to IS 4179.

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

### CLEARANCES

MR    -    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK No.	SHEET	REV
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STORAGE BIN SPECIFICATION DATA SHEET

Page  
1 OF 2

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R
1	Unit No. : SB-201	Dwg. No.:	Code : ASME Sec. VIII Div. I	1
2	Title : C1 Storage Bin	Nos. required : One	Type : Vertical, Cylindrical	2
3	Service : To Store C1			3
4	Nominal Capacity : Kg/h. : 25 Kg/hr	Nominal Capacity : Kg. : 300 Kg (12 h Capacity)		4
				5

PROCESS DATA				
1	Fluid	C1		6
2	Operating Temperature : °C	Normal : 30	Maximum : 40	7
3	Operating Pressure : kg/sq.cm.-g/a	Normal : Atm.	Maximum : 1.1	8
4	Density : at 20°C kg/L	1.1		9
5	Hazard Condition :			10
				11
				12

CONSTRUCTION DATA				
1	Temperature : °C	Design : 50	Test : Amb.	13
2	Pressure : kg/sq.cm.-g/a	Design : 1.1	Test : Full with Water	14
3	Corrosion Allowance	-		15
4	Shell	Ø/D : 800 mm	St. Length : 530 mm	16
		Thk. : 4 MM		17
5	Ends	Top Type : Dish, Flat	Thk. : 4 MM	18
		Bottom Type : Dish, Conical	Thk. : 4 MM	19
6	Supports	Type : LUG	Nos. : 4 Nos.	20
7	Material Of Construction	Shell : SA 240 SS 316	Heads : SA 240 SS 316	21
		Supports : CS to IS 226	Bolting : SS 316	22
		Gaskets : PTFE	Jacket / Internals CS to IS 1364	23
		Shell Flanges : -	Other wetted parts : SS 316	24
8	Heat Treatment	Stress Relieving : SS 316	Others : SS 316	25
9	Tests	Hydraulic / Pneumatic : Yes	Dye-Penetrant :	26
		Radiographic : -	Others : -	27
10	Insulation	Type : HCl / CCl / PPI -	Thk. : -	28
11	Painting / Finish	All CS parts to be painted with two coats of red oxide primer		29
12	Weight : kg	Empty : 160	Full of water : 560	30
13	Inspection By	IICT / Client / Third Party	Others :	31
				32
				33
				34

NOTES				
1	Nozzles marked "spare" shall be provided with matching blind flange, gaskets, bolts, nuts and washers.			35
2	All other nozzles shall be provided with companion flange, gaskets, bolts, nuts and washers and shall be suitably blanked off before despatch.			36
3	All nozzles - Top, Side and Bottom shall be 150 mm in length unless otherwise specified.			37
4	Diple shall be provided with suitable support.			38
5	3mm antisiphon holes shall be provided to the dipleg pipe at top.			39
6	Dished end heights shall conform to IS 4179.			40
7	Nozzles orientation shall be provided after pipe routing is finalised.			41
8	Vendor shall provide detailed fabrication drawing for approval from IICT and shall guarantee mechanical performance of the equipment.			42
				43

1	E	For Engineering																		
0	C	Preliminary																		
S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	ISSUES / DISTRIBUTION / COPIES			

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

MR	04.08.2015	SAK/BS	04.08.2015		SAK/MR/TPK	04.08.2015
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DESIGN

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# INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY

HYDERABAD - 500 007



## STORAGE BIN SPECIFICATION DATA SHEET

Page  
2 OF 2

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

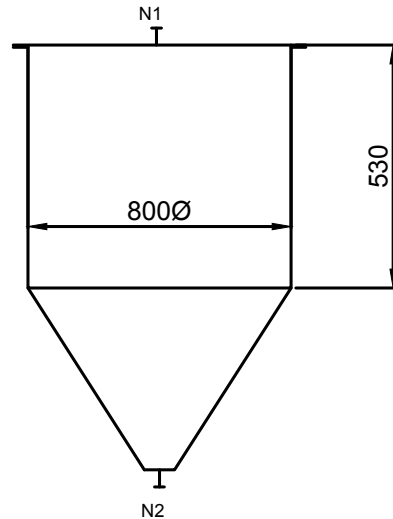
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : SB-201

Title : C1 Storage Bin



All Dimensions are in mm

### NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet	800	10s	100	Note 10	ANSI B16.5	150#	SO/RF	Note 11	Blind Flange with 5mm Thk.	
N2	Outlet	250	10s	150	Note 10	ANSI B16.5	150#	SO/RF	Note 11		

NOTES	DESCRIPTION										
9	Lifting lugs, Nameplate and Earthing boss shall be provided conforming to good engineering practices.										
10	MOC : SA312 TP 316										
11	Flanges 50 mm NB and below shall be of SA182 F 316 and above 50 mm NB shall be IS:2062 Gr.A plus 3 mm thick SA240 Gr. 316 liner.										

1	E	For Engineering												
0	C	Preliminary												

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified DO NOT SCALE

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

MR	04.08.2015	SAK/BS	04.08.2015	SAK/MR/TPK	04.08.2015
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DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/CHK No.		SHEET	
		CD/FP	FOLDER	FILE	DE-SP-172-06-11009		2 OF 2
							REV 0

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STORAGE BIN SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R	
	1	Unit No. : SB-202	Dwg. No.:		Code : ASME Sec. VIII Div. I
	2	Title : C2 Cake Storage Bin	Nos. required : One		Type : Vertical, Cylindrical
	3	Service : To Store C2 Cake			
	4	Nominal Capacity : Kg/h. : 52.5 Kg/hr	Nominal Capacity : Kg. : 630 Kg (12 h Capacity)		

PROCESS DATA					
	1	Fluid	C2		
	2	Operating Temperature : °C	Normal : 30		Maximum : 40
	3	Operating Pressure : kg/sq.cm.-g/a	Normal : Atm.		Maximum : 1.1
	4	Density : at 20°C kg/L	1.1		
5	Hazard Condition :				

CONSTRUCTION DATA					
	1	Temperature : °C	Design : 50		Test : Amb.
	2	Pressure : kg/sq.cm.-g/a	Design : 1.1		Test : Full with Water
	3	Corrosion Allowance	-		
	4	Shell	ØD/ID : 1000 mm		St. Length : 500 mm
			Thk. : 4 MM		
	5	Top	Type : Dish, Flat		Thk. : 4 MM
		Bottom	Type : Dish, Conical		Thk. : 4 MM
	6	Supports	Type : LUG		Nos. : 4 Nos.
	7	Material Of Construction	Shell : SA 240 SS 316		Heads : SA 240 SS 316
			Supports : CS to IS 226		Bolting : SS 316
			Gaskets : PTFE		Jacket / Internals CS to IS 1364
			Shell Flanges : -		Other wetted parts :SS 316
8	Heat Treatment	Stress Relieving : SS 316	Others : SS 316		
9	Tests	Hydraulic / Pneumatic : Yes	Dye-Penetrant :		
		Radiographic : -	Others : -		
10	Insulation	Type : HCl / CCl / PPI -	Thk. : -		
11	Painting / Finish	All CS parts to be painted with two coats of red oxide primer			
12	Weight : kg	Empty : 230	Full of water : 860		
13	Inspection By	IICT / Client / Third Party	Others :		

NOTES				
	1	Nozzles marked "spare" shall be provided with matching blind flange, gaskets, bolts, nuts and washers.		
	2	All other nozzles shall be provided with companion flange, gaskets, bolts, nuts and washers and shall be suitably blanked off before despatch.		
	3	All nozzles - Top, Side and Bottom shall be 150 mm in length unless otherwise specified.		
	4	Dipleg shall be provided with suitable support.		
	5	3mm antisiphon holes shall be provided to the dipleg pipe at top.		
	6	Dished end heights shall conform to IS 4179.		
	7	Nozzles orientation shall be provided after pipe routing is finalised.		
8	Vendor shall provide detailed fabrication drawing for approval from IICT and shall guarantee mechanical performance of the equipment.			

1	E	For Engineering																	
0	C	Preliminary																	
S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	ISSUES / DISTRIBUTION / COPIES		

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

MR	04.08.2015	SAK/BS	04.08.2015		SAK/MR/TPK	04.08.2015
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DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK No.		SHEET	
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STORAGE BIN SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

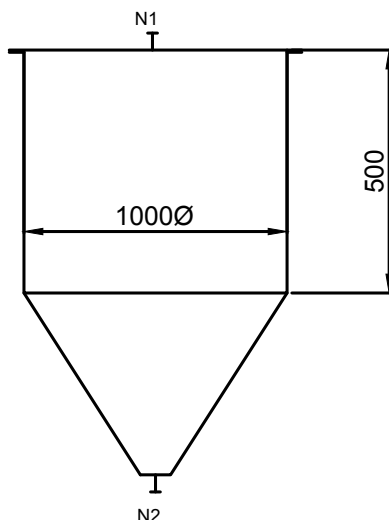
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : SB-202

Title : C2 Cake Storage Bin



All Dimensions are in mm

NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet	1000	10s	100	Note 10	ANSI B16.5	150#	SO/RF	Note 11	Blind Flange with 5mm Thk.	
N2	Outlet	250	10s	150	Note 10	ANSI B16.5	150#	SO/RF	Note 11		

NO.	DESCRIPTION
9	Lifting lugs, Nameplate and Earthing boss shall be provided conforming to good engineering practices.
10	MOC : SA312 TP 316
11	Flanges 50 mm NB and below shall be of SA182 F 316 and above 50 mm NB shall be IS:2062 Gr.A plus 3 mm thick SA240 Gr. 316 liner.

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
1	E	For Engineering														
0	C	Preliminary														

ISSUES / DISTRIBUTION / COPIES

All dimensions in mm, unless specified DO NOT SCALE

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR

CLEARANCES

MR	04.08.2015	SAK/BS	04.08.2015	SAK/MR/TPK	04.08.2015

DESIGN	PREPARED	VER/CHD	APPROVED

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STORAGE BIN SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R	
	1	Unit No. : SB-203	Dwg. No.:		Code : ASME Sec. VIII Div. I
	2	Title : C5 Storage Bin	Nos. required : One		Type : Vertical, Cylindrical
	3	Service : To Store C5			
	4	Nominal Capacity : Kg/h. : 6 Kg/hr	Nominal Capacity : Kg. : 72 Kg (12 h Capacity)		

PROCESS DATA					
	1	Fluid	C5		
	2	Operating Temperature : °C	Normal : 30		Maximum : 40
	3	Operating Pressure : kg/sq.cm.-g/a	Normal : Atm.		Maximum : 1.1
	4	Density : at 20°C kg/L	1.1		
5	Hazard Condition :				

CONSTRUCTION DATA					
	1	Temperature : °C	Design : 50		Test : Amb.
	2	Pressure : kg/sq.cm.-g/a	Design : 1.1		Test : Full with Water
	3	Corrosion Allowance	-		
	4	Shell	ØD/ID : 600 mm		St. Length : 200 mm
			Thk. : 4 MM		
	5	Top	Type : Dish, Flat		Thk. : 4 MM
		Bottom	Type : Dish, Conical		Thk. : 4 MM
	6	Supports	Type : LUG		Nos. : 4 Nos.
	7	Material Of Construction	Shell : SA 240 SS 316		Heads : SA 240 SS 316
			Supports : CS to IS 226		Bolting : SS 316
			Gaskets : PTFE		Jacket / Internals CS to IS 1364
			Shell Flanges : -		Other wetted parts :SS 316
8	Heat Treatment	Stress Relieving : SS 316	Others : SS 316		
9	Tests	Hydraulic / Pneumatic : Yes	Dye-Penetrant :		
		Radiographic : -	Others : -		
10	Insulation	Type : HCl / CCl / PPI -	Thk. : -		
11	Painting / Finish	All CS parts to be painted with two coats of red oxide primer			
12	Weight : kg	Empty : 75	Full of water : 175		
13	Inspection By	IICT / Client / Third Party	Others :		

NOTES				
	1	Nozzles marked "spare" shall be provided with matching blind flange, gaskets, bolts, nuts and washers.		
	2	All other nozzles shall be provided with companion flange, gaskets, bolts, nuts and washers and shall be suitably blanked off before despatch.		
	3	All nozzles - Top, Side and Bottom shall be 150 mm in length unless otherwise specified.		
	4	Dipleg shall be provided with suitable support.		
	5	3mm antisiphon holes shall be provided to the dipleg pipe at top.		
	6	Dished end heights shall conform to IS 4179.		
	7	Nozzles orientation shall be provided after pipe routing is finalised.		
8	Vendor shall provide detailed fabrication drawing for approval from IICT and shall guarantee mechanical performance of the equipment.			

1	E	For Engineering																	
0	C	Preliminary																	
S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	ISSUES / DISTRIBUTION / COPIES		

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

MR	04.08.2015	SAK/BS	04.08.2015		SAK/MR/TPK	04.08.2015
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DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK No.		SHEET	
-	-	CD/FP	FOLDER	FILE	DE-SP-172-06-11009	1 OF 2	REV 0

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# STORAGE BIN SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

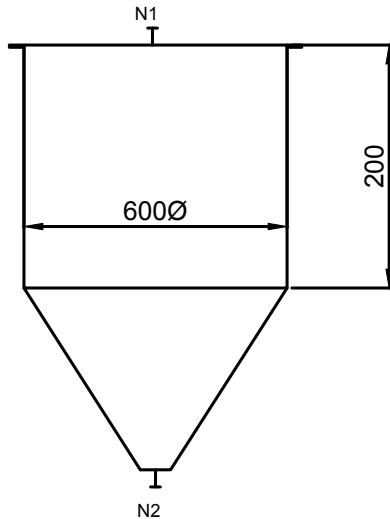
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : SB-203

Title : C5 Storage Bin



All Dimensions are in mm

### NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet	600	10s	100	Note 10	ANSI B16.5	150#	SO/RF	Note 11	Blind Flange with 5mm Thk.	
N2	Outlet	250	10s	150	Note 10	ANSI B16.5	150#	SO/RF	Note 11		

9	Lifting lugs, Nameplate and Earthing boss shall be provided conforming to good engineering practices.	10
10	MOC : SA312 TP 316	11
11	Flanges 50 mm NB and below shall be of SA182 F 316 and above 50 mm NB shall be IS:2062 Gr.A plus 3 mm thick SA240 Gr. 316 liner.	12
		13
		14
		15

1	E	For Engineering																	
0	C	Preliminary																	
S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	ISSUES / DISTRIBUTION / COPIES		

All dimensions in mm, unless specified DO NOT SCALE

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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MR	04.08.2015	SAK/BS	04.08.2015			SAK/MR/TPK	04.08.2015	
DESIGN		PREPARED		VER/CHD		APPROVED		
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/CHK No.		SHEET	REV 0
		CD/FP	FOLDER	FILE	DE-SP-172-06-11009		2 OF 2	

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STORAGE BIN SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

GEN.	1	Unit No. : SB-204	Dwg. No.:	Code : ASME Sec. VIII Div. I			R	1	
	2	Title : Dry C5 Storage Bin	Nos. required : One	Type : Vertical, Cylindrical				2	
	3	Service : To Store Dry C5						3	
	4	Nominal Capacity : Kg/h. : 8 Kg/hr	Nominal Capacity : Kg. : 63 Kg (8 h Capacity)					4	
PROCESS DATA	1	Fluid	C5					6	
	2	Operating Temperature : °C	Normal : 30	Maximum : 40				7	
	3	Operating Pressure : kg/sq.cm.-g/a	Normal : Atm.	Maximum : 1.1				8	
	4	Density : at 20°C kg/L	1.1					9	
	5	Hazard Condition :						10	
CONSTRUCTION DATA	1	Temperature : °C	Design : 50	Test : Amb.				14	
	2	Pressure : kg/sq.cm.-g/a	Design : 1.1	Test : Full with Water				15	
	3	Corrosion Allowance	-					16	
	4	Shell	ØD/ID : 500 mm		St. Length : 200 mm			17	
			Thk. : 4 MM					18	
	5	Ends	Top	Type : Dish, Flat	Thk. : 4 MM			19	
		Bottom	Type : Dish, Conical	Thk. : 4 MM			20		
	6	Supports	Type : LUG		Nos. : 4 Nos.			21	
	7	Material Of Construction	Shell : SA 240 SS 316		Heads : SA 240 SS 316			22	
			Supports : CS to IS 226		Bolting : SS 316			23	
			Gaskets : PTFE		Jacket / Internals CS to IS 1364			24	
	8	Heat Treatment	Shell Flanges : -		Other wetted parts :SS 316			25	
			Stress Relieving : SS 316		Others : SS 316			26	
9	Tests	Hydraulic / Pneumatic : Yes		Dye-Penetrant :			27		
		Radiographic : -		Others : -			28		
10	Insulation	Type : HCl / CCl / PPI -		Thk. : -			29		
11	Painting / Finish	All CS parts to be painted with two coats of red oxide primer						30	
12	Weight : kg	Empty : 55		Full of water :120			31		
13	Inspection By	IICT / Client / Third Party		Others :			32		
NOTES	1	Nozzles marked "spare" shall be provided with matching blind flange, gaskets, bolts, nuts and washers.							35
	2	All other nozzles shall be provided with companion flange, gaskets, bolts, nuts and washers and shall be suitably blanked off before despatch.							36
	3	All nozzles – Top, Side and Bottom shall be 150 mm in length unless otherwise specified.							37
	4	Diplep shall be provided with suitable support.							38
	5	3mm antisiphon holes shall be provided to the dipleg pipe at top.							39
	6	Dished end heights shall conform to IS 4179.							40
	7	Nozzles orientation shall be provided after pipe routing is finalised.							41
	8	Vendor shall provide detailed fabrication drawing for approval from IICT and shall guarantee mechanical performance of the equipment.							42
1	E	For Engineering							
0	C	Preliminary							
S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	
							1	2	
							3	4	
							5	6	
							7	8	
							ISSUES / DISTRIBUTION / COPIES		
All dimensions in mm, unless specified			<b>DO NOT SCALE</b>						
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR		
<b>CLEARANCES</b>									
MR	04.08.2015	SAK/BS	04.08.2015			SAK/MR/TPK	04.08.2015		
DESIGN			PREPARED		VER/CHD		APPROVED		
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SH No.		SHEET		
-	-	CD/FP	FOLDER	FILE	DE-SP-172-06-11009		1 OF 2		
							REV	0	

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STORAGE BIN SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

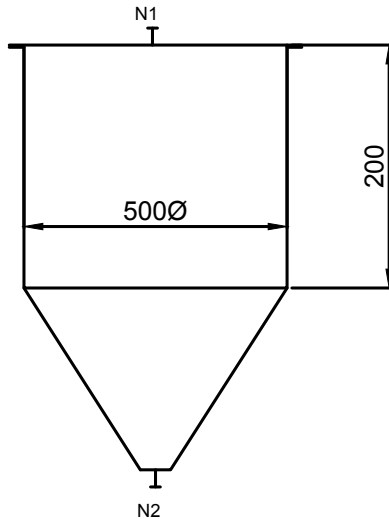
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : SB-204

Title : Dry C5 Storage Bin



All Dimensions are in mm

NOZZLE SCHEDULE

Table with columns: NOZZLE MARK, SERVICE, NOZZLE DETAILS (SIZE NB, Sch., Length, M.O.C.), FLANGE DETAILS (STANDARD, RATING, TYPE, M.O.C.), REMARKS, R. Includes entries for N1 (Inlet) and N2 (Outlet).

NOTES section with 3 entries: 9. Lifting lugs, Nameplate and Earthing boss shall be provided conforming to good engineering practices. 10. MOC : SA312 TP 316. 11. Flanges 50 mm NB and below shall be of SA182 F 316 and above 50 mm NB shall be IS:2062 Gr.A plus 3 mm thick SA240 Gr. 316 liner.

Revision table with columns: S.No., STATUS, DESCRIPTION, BY, CHD, APD, DATE, and a grid for ISSUES / DISTRIBUTION / COPIES.

All dimensions in mm, unless specified DO NOT SCALE

Table for CLEARANCES with columns for MECH ENGR, PRCS ENGR, INST ENGR, ELECT ENGR, CIVIL ENGR, CLIENT, CONSULTANT, CONTRACTOR.

Table for DESIGN, PREPARED, VER/CHD, APPROVED, SCALE, REFERENCES, SOFT COPY REF, SHEET, and REV.

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R	
	1	Unit No. : ST-201	Dwg. No.:		Code : ASME Sec. VIII Div. I
	2	Title : W Storage tank	Nos. required : One		Type : Vertical, Cylindrical
	3	Service : To Store Distilled Water for Hydrolysis Reaction			
	4	Nominal Capacity : lit. : 1250 lit.			
				5	

PROCESS DATA					
	1	Fluid			Distilled Water
	2	Operating Temperature : °C	Normal : 30		Maximum : 50
	3	Operating Pressure : kg/sq.cm.-g/¢	Normal : Atm.		Maximum : 1.1
	4	Density : at 30 °C kg/cu.m.	1000		
5	Hazard Condition : -				
				6	

CONSTRUCTION DATA					
	1	Temperature : °C	Design : 60		Test : Amb.
	2	Pressure : kg/sq.cm.-g/¢	Design : 1.2		Test : Full with Water
	3	Corrosion Allowance			
	4	Shell	ØD/ID : 1000 mm		
			St. Length : 1400 mm		
	5	Ends	Top		Type : Dish, Torispherical
		Bottom	Type : Dish, Torispherical		KR : 10% Thk. : 6 MM SF : 50 mm
	7	Material Of Construction	Type : LEG		
			Nos. : 4 Nos.		
			Shell : SA 240 SS 316		
			Heads : SA 240 SS 316		
			Supports : CS to IS 226		
Internal Bolting : SS 316					
8	Heat Treatment	Gaskets : PTFE			
		External Bolting : CS to IS 1364			
		Shell Flanges : -			
		Jacket / Internals : SS 316			
		Nozzles : SS 316			
		Other wetted parts : SS 316			
9	Tests	Flanges : -			
		Others : -			
10	Insulation	Stress Relieving : -			
		Others : -			
11	Painting / Finish	Hydraulic / Pneumatic : Yes			
		Dye-Penetrant : -			
12	Weight : kg	Radiographic : -			
		Others : -			
13	Inspection By	Type : HCl / CCl / PPI -			
		Thk. : -			
All CS parts to be painted with two coats of red oxide primer					
Empty : 425		Full of water : 1750			
Others : -					

NOTES				
	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.			
	1	All dimensions are in mm		
	2	VTS - Vendor to specify.		
	3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.		
	4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.		
	5	Nozzle orientation and support height shall be provided by vendor		
	6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.		
	7	Suitable stiffeners to be provided for all the nozzles.		
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.			

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
ISSUES / DISTRIBUTION / COPIES																

All dimensions in mm, unless specified		<b>DO NOT SCALE</b>														
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									

CLEARANCES																
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK										

DESIGN			PREPARED			VER/CHD			APPROVED					
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK/No.			SHEET		REV				
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX			1 OF 2		-				

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

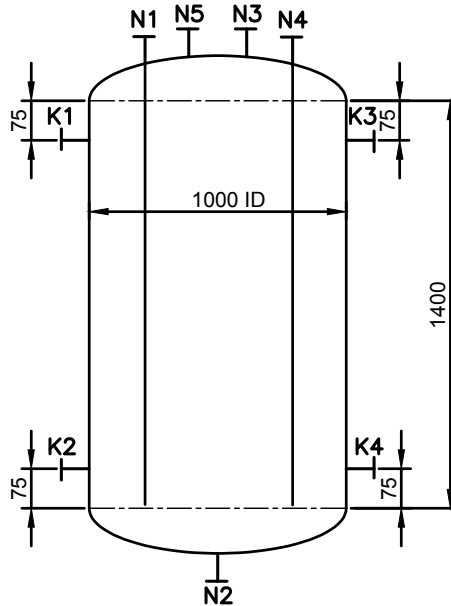
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : ST-201

Title : W Storage tank



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from Tankfarm	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-201a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	5
											6
K1	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	7
K2	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K3	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K4	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	10
											11
											12

NOTES		
9	Lifting lugs, earthing boss(SS 316) and name plate are to be provided.	13
10	Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.	14
11	Dished ends shall conform to IS 4179.	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

MR    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			ENC/DOC/SK-No.	SHEET	REV
		CD/FP	FOLDER	FILE			
					DE-XXX-XXX-ED-01-01 00    XXX	2 OF 2	-

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## STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.						R
1	Unit No. : ST-202 a,b	Dwg. No.:	Code : ASME Sec. VIII Div. I			1
2	Title : C3 Collection Tanks	Nos. required : Two	Type : Vertical, Cylindrical			2
3	Service : To Collect the C3					3
4	Nominal Capacity : lit. : 1250 lit.					4
						5
						6
<b>PROCESS DATA</b>						
1	Fluid	C3				7
2	Operating Temperature : °C	Normal : 10	Maximum : 30			8
3	Operating Pressure : kg/sq.cm.-g/ø	Normal : Atm.	Maximum : 1.1			9
4	Density : at 30 °C kg/cu.m.	1051				10
5	Hazard Condition : -	-				11
						12
						13
<b>CONSTRUCTION DATA</b>						
1	Temperature : °C	Design : 50	Test : Amb.			14
2	Pressure : kg/sq.cm.-g/ø	Design : 1.2	Test : Full with Water			15
3	Corrosion Allowance					16
4	Shell	ØD/ID : 1000 mm		St. Length : 1400 mm		17
		Thk. : 6 MM				18
5	Ends	Top	Type : Dish, Torispherical	KR : 10% Thk. : 6 MM SF : 50 mm		19
		Bottom	Type : Dish, Torispherical	KR : 10% Thk. : 6 MM SF : 50 mm		20
6	Supports	Type : LEG		Nos. : 4 Nos.		21
		Shell : SA 240 SS 316		Heads : SA 240 SS 316		22
		Supports : CS to IS 226		Internal Bolting : SS 316		23
		Gaskets : PTFE		External Bolting : CS to IS 1364		24
		Shell Flanges : -		Jacket / Internals : SS 316		25
		Nozzles : SS 316		Other wetted parts : SS 316		26
		Flanges : -		Others : -		27
8	Heat Treatment	Stress Relieving : -		Others : -		28
9	Tests	Hydraulic / Pneumatic : Yes		Dye-Penetrant : -		29
		Radiographic : -		Others : -		30
10	Insulation	Type : HCl / CCl / PPI -		Thk. : -		31
11	Painting / Finish	All CS parts to be painted with two coats of red oxide primer				32
12	Weight : kg	Empty : 425		Full of water : 1750		33
13	Inspection By	IICT / Client / Third Party -		Others : -		34
	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.					35
<b>NOTES</b>						
1	All dimensions are in mm					36
2	VTS - Vendor to specify.					37
3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.					38
4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.					39
5	Nozzle orientation and support height shall be provided by vendor					40
6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.					41
7	Suitable stiffeners to be provided for all the nozzles.					42
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.					43

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									
All dimensions in mm, unless specified																
<b>DO NOT SCALE</b>																
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
<b>CLEARANCES</b>																
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK										
DESIGN			PREPARED			VER/CHD			APPROVED							
SCALE	REFERENCES		SOFT COPY REF			DWG/DOC/SK/No.			SHEET			REV				
			CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX			1 OF 2			-				

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

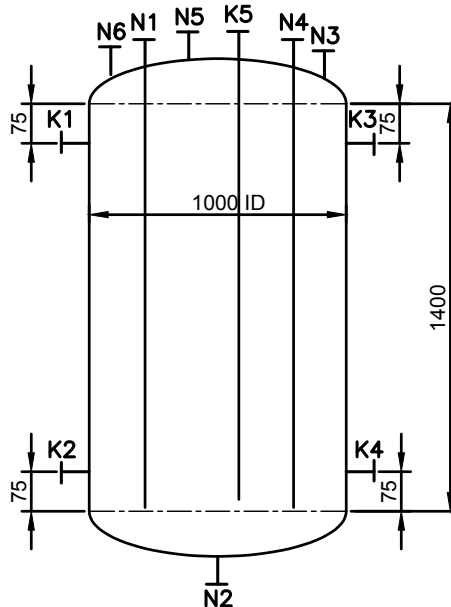
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : ST-202 a,b

Title : C3 Collection Tanks



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from Fi-201	100	10s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-203 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	Recirculation from P-204 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	5
N6	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	6
K1	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K2	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K3	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	10
K4	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	11
K5	pH Indicator	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	12

NOTES		
9	Lifting lugs, earthing boss(SS 316) and name plate are to be provided.	13
10	Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.	14
11	Dished ends shall conform to IS 4179.	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

MR    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			ENC/DOC/SK-No.	SHEET	REV
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX	2 OF 2	-

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.				R
1	Unit No. : ST-203 a,b	Dwg. No.:	Code : ASME Sec. VIII Div. I	1
2	Title : C3 Feed Tanks	Nos. required : Two	Type : Vertical, Cylindrical	2
3	Service : To Collect the C3			3
4	Nominal Capacity : lit. : 1250 lit.			4
				5

PROCESS DATA				
1	Fluid	C3		6
2	Operating Temperature : °C	Normal : 10	Maximum : 30	7
3	Operating Pressure : kg/sq.cm.-g/¢	Normal : Atm.	Maximum : 1.1	8
4	Density : at 30 °C kg/cu.m.	1051		9
5	Hazard Condition : -			10
				11
				12

CONSTRUCTION DATA				
1	Temperature : °C	Design : 50	Test : Amb.	13
2	Pressure : kg/sq.cm.-g/¢	Design : 1.2	Test : Full with Water	14
3	Corrosion Allowance			15
4	Shell	ØD/ID : 1000 mm	St. Length : 1400 mm	16
		Thk. : 6 MM		17
5	Ends	Top	Type : Dish, Torispherical	18
		Bottom	Type : Dish, Torispherical	19
			KR : 10% Thk. : 6 MM SF : 50 mm	20
6	Supports	Type : LEG	Nos. : 4 Nos.	21
		Shell : SA 240 SS 316	Heads : SA 240 SS 316	22
		Supports : CS to IS 226	Internal Bolting : SS 316	23
		Gaskets : PTFE	External Bolting : CS to IS 1364	24
		Shell Flanges : NA	Jacket / Internals : SS 316	25
		Nozzles : SS 316	Other wetted parts : SS 316	26
		Flanges : -	Others : -	27
8	Heat Treatment	Stress Relieving : -		28
		Hydraulic / Pneumatic : Yes		29
9	Tests	Radiographic : -		30
		Others : -		31
10	Insulation	Type : HCI / CCI / PPI -	Thk. : -	32
11	Painting / Finish	All CS parts to be painted with two coats of red oxide primer		33
12	Weight : kg	Empty : 425	Full of water : 1750	34
13	Inspection By	IICT / Client / Third Party -	Others : -	35

NOTES				
	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.			36
1	All dimensions are in mm			37
2	VTS - Vendor to specify.			38
3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.			39
4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.			40
5	Nozzle orientation and support height shall be provided by vendor			41
6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.			42
7	Suitable stiffeners to be provided for all the nozzles.			43
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.			

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR

CLEARANCES							
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK	
DESIGN		PREPARED		VER/CHD		APPROVED	
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK/No.		SHEET	REV
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX	1 OF 2	-

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : ST-203 a,b

Title : C3 Collection Tanks

Sparger Details

Sparger Dia = 530 mm

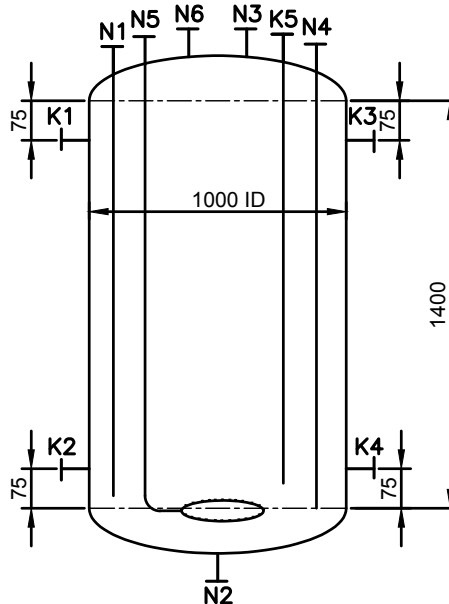
HT. from Bot. = 250 mm

Sparger Pipe Dia = 15NB

Hole size = 0.5 Ø mm

No. of Holes = 10 Nos.

Dist between Holes = 60 mm



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from SV-202	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-205 a	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	CO2 Inlet	15	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Sparger	5
N6	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	6
											7
K1	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K2	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K3	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	10
K4	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	11
K5	pH Indicator	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	12

NOTES		
9	Lifting lugs, earthing boss(SS 316) and name plate are to be provided.	13
10	Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.	14
11	Dished ends shall conform to IS 4179.	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

MR    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			ENC/DOC/SK-No.	SHEET	REV
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX	2 OF 2	-

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## STORAGE TANK(JACKETED) SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

- -

GEN.	Unit No. : ST-204 a,b	Dwg. No.: -	Code : ASME Sec. VIII Div. I	R
1	Title : DP Collection Tanks	Nos. required : Two	Type : Vertical, Cylindrical	1
2	Service : To Collect DP Solution from R-202c			
3	Nominal Capacity : lit. : 1250 lit.			
4				
5				

PROCESS DATA	Fluid	Shell : DP Solution	Jacket : Cooling Water
1	Operating Temperature : °C	Normal : 30    Maximum : 35	Normal : 20    Maximum : 30
2	Operating Pressure : kg/sq.cm.-g/¢	Normal : Atm.    Maximum : 1.1	Normal : 2.0    Maximum : 3.0
3	Density : at 30 °C kg/cu.m.	1050	
4	Hazard Condition : -		
5			

CONSTRUCTION DATA	SHELL	JACKET	
1	Temperature : °C	Design : 40    Test : Amb.	
2	Pressure : kg/sq.cm.-g/¢	Design : 1.2/3.3 ext    Test : 4.5 ext	
3	Corrosion Allowance	-	
4	Diameter	OD :-    ID : 1000	
5	Straight Length	1400    1120	
6	Thickness	VTS	
7	Ends	Top    Type : Dish, Torrispherical    K.R. : 10%    Thk.: 6 MM    S.F.: 50 mm	
	Shell	Bottom    Type : Dish, Torrispherical    K.R. : 10%    Thk.: 6 MM    S.F.: 50 mm	
	Jacket	Bottom    Type : Dish, Torrispherical    K.R. : 10%    Thk.: 6 MM    S.F.: 50 mm	
8	Supports	Type : VTS    Nos. : -	
7	Material Of Construction	Shell : SA 240 SS 316    Heads : SA 240 SS 316	
		Jacket Shell : CS A 285 Gr. C    Jacket Head : CS A 285 Gr. C	
		Supports : CS to IS 226    Internal/External Bolting : SS 316/CS	
		Gaskets : PTFE    Jacket / Internals : CS/SS 316	
		Shell Flanges : -    Other wetted parts : SS 316	
9	Heat Treatment	Stress Relieving : -    Others : -	
10	Tests	Hydraulic / Pneumatic : YES    Dye-Penetrant : -	
		Radiographic : -    Others : -	
11	Insulation	Type : HCl / CCl / PPI    Thk. : -	
12	Painting / Finish	All CS parts to be painted with two coats of red oxide primer	
13	Weight : kg	Empty : 760    Full of water : 2415	
14	Inspection By	IICT / Client / Third Party    Others : -	

NOTES	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.
1	All dimensions are in mm
2	VTS - Vendor to specify.
3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.
4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.
5	Nozzle orientation and support height shall be provided by vendor
6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.
7	Suitable stiffeners to be provided for all the nozzles.
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8

All dimensions in mm, unless specified		<b>DO NOT SCALE</b>	
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR
CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
<b>CLEARANCES</b>			
MR	-	MR	19.07.23
DESIGN	PREPARED	MR/SAK	-
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK/No.
		CD/FP    FOLDER    FILE	DE-XXX-XXX-ED-01-06 00 XXX
			SHEET
			1 OF 2
			REV -

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

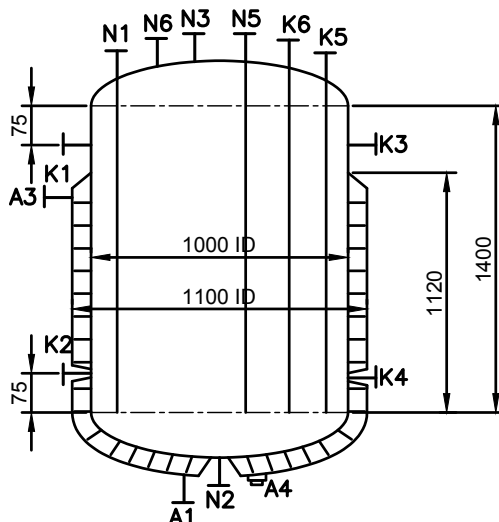
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : ST-204 a,b

Title : DP Collection Tanks



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from R-202c	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-206 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	5
K1	Level Gauge	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	6
K2	Level Gauge	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	7
K3	Level Transmitter	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K4	Level Transmitter	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K5	Temperature Indicator	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	10
K6	pH Indicator	20	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	11
A1	Cooling Water Inlet	25	10	100	CS	ANSI,B16.5	#150	SO,RF	CS		12
A2	Cooling Water Outlet	25	10	100	CS	ANSI,B16.5	#150	SO,RF	CS		13
A3	Jacket Vent	25	40	100	CS	ANSI,B16.5	#150	SO,RF	CS		14
A4	Jacket Drain (Plug)	3/4"	-	-	CS	-	#3000	-	-		15
9	Lifting lugs, earthing boss(SS316) and name plate are to be provided.										16
10	Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.										
11	Dished ends shall conform to IS 4179.										

STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
-----------	-----------	-----------	------------	------------	--------	------------	------------

MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK
DESIGN		PREPARED		VER/CHD		APPROVED
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK-No.		SHEET
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX	2 OF 2
						REV

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## STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

	GEN.	DESCRIPTION		R													
	1	Unit No. : ST-205	Dwg. No.:	Code : ASME Sec. VIII Div. I	1												
	2	Title : L Collection Tank	Nos. required : One	Type : Vertical, Cylindrical	2												
	3	Service : To Collect L Filtrate from SV-202			3												
	4	Nominal Capacity : lit. : 1250 lit.			4												
					5												
					6												
	1	Fluid	L Filtrate		7												
	2	Operating Temperature : °C	Normal : 25	Maximum : 30	8												
	3	Operating Pressure : kg/sq.cm.-g/¢	Normal : Atm.	Maximum : 1.1	9												
	4	Density : at 30 °C kg/cu.m.	1055		10												
	5	Hazard Condition : -	-		11												
					12												
					13												
	1	Temperature : °C	Design : 40	Test : Amb.	14												
	2	Pressure : kg/sq.cm.-g/¢	Design : 1.2	Test : Full with Water	15												
	3	Corrosion Allowance			16												
	4	Shell	ØD/ID : 1000 mm	St. Length : 1400 mm	17												
			Thk. : 6 MM		18												
	5	Ends	Top	Type : Dish, Torispherical	KR : 10% Thk. : 6 MM SF : 50 mm	19											
			Bottom	Type : Dish, Torispherical	KR : 10% Thk. : 6 MM SF : 50 mm	20											
	6	Supports			Type : LEG	Nos. : 4 Nos.	21										
			Shell : SA 240 SS 316	Heads : SA 240 SS 316		22											
			Supports : CS to IS 226	Internal Bolting : SS 316		23											
			Gaskets : PTFE	External Bolting : CS to IS 1364		24											
			Shell Flanges : NA	Jacket / Internals : SS 316		25											
			Nozzles : SS 316	Other wetted parts : SS 316		26											
			Flanges : -	Others : -		27											
	8	Heat Treatment			Stress Relieving : -	Others : -	28										
			Hydraulic / Pneumatic : Yes	Dye-Penetrant : -		29											
	9	Tests			Radiographic : -	Others : -	30										
	10	Insulation			Type : HCl / CCl / PPI -	Thk. : -	31										
	11	Painting / Finish			All CS parts to be painted with two coats of red oxide primer		32										
	12	Weight : kg	Empty : 425	Full of water : 1750		33											
	13	Inspection By			IICT / Client / Third Party -	Others : -	34										
		Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.				35											
	1	All dimensions are in mm				36											
	2	VTS - Vendor to specify.				37											
	3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.				38											
	4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.				39											
	5	Nozzle orientation and support height shall be provided by vendor				40											
	6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.				41											
	7	Suitable stiffeners to be provided for all the nozzles.				42											
	8	Dimensions are based on IS 4179. Vendor to specify the equivalent.				43											
S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	
									ISSUES / DISTRIBUTION / COPIES								
		All dimensions in mm, unless specified		<b>DO NOT SCALE</b>													
		MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR								
		<b>CLEARANCES</b>															
		MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK									
		DESIGN			PREPARED			VER/CHD			APPROVED						
		SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK/No.			SHEET			REV				
				CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX			1 OF 2			-				

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

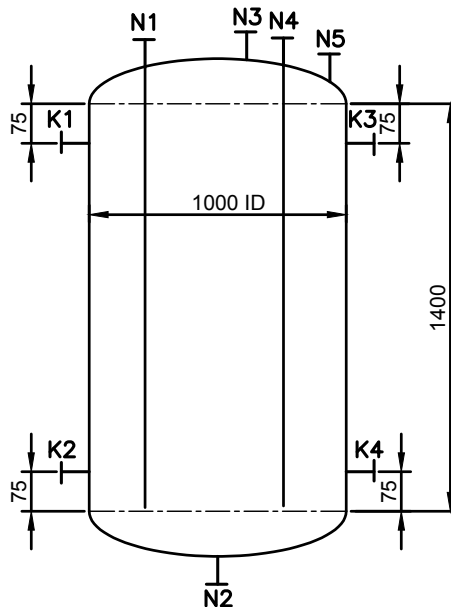
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : ST-205

Title : L Collection Tank



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from P-207 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Bottom Outlet to P-208 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	5
											6
K1	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	7
K2	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K3	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K4	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	10
											11
											12

NOTES		
9	Lifting lugs, earthing boss(SS 316) and name plate are to be provided.	13
10	Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.	14
11	Dished ends shall conform to IS 4179.	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

MR    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			ENC/DOC/SK-No.	SHEET	REV
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX	2 OF 2	-

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STORAGE SPECIFICATION DATA SHEET

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.					R
1	Unit No. : ST-206 a,b	Dwg. No.:	Code : ASME Sec. VIII Div. I		1
2	Title : P Collection Tanks	Nos. required : One	Type : Vertical, Cylindrical		2
3	Service : To Collect the P Material				3
4	Nominal Capacity : lit. : 160 lit.				4
					5
					6
1	Fluid	P Material			7
2	Operating Temperature : °C	Normal : 25	Maximum : 30		8
3	Operating Pressure : kg/sq.cm.-g/¢	Normal : Atm.	Maximum : 1.1		9
4	Density : at 30 °C kg/cu.m.	1000			10
5	Hazard Condition : -				11
					12
					13
1	Temperature : °C	Design : 40	Test : Amb.		14
2	Pressure : kg/sq.cm.-g/¢	Design : 1.2	Test : Full with Water		15
3	Corrosion Allowance				16
4	Shell	ØD/ID : 500 mm	St. Length : 725 mm		17
		Thk. : 6 MM			18
5	Ends	Top	Type : Dish, Torispherical	KR : 10% Thk. : 6 MM SF : 50 mm	19
		Bottom	Type : Dish, Torispherical	KR : 10% Thk. : 6 MM SF : 50 mm	20
6	Supports				21
		Type : LEG	Nos. : 4 Nos.		22
		Shell : SA 240 SS 316	Heads : SA 240 SS 316		23
		Supports : CS to IS 226	Internal Bolting : SS 316		24
		Gaskets : PTFE	External Bolting : CS to IS 1364		25
		Shell Flanges : -	Jacket / Internals : SS 316		26
		Nozzles : SS 316	Other wetted parts : SS 316		27
		Flanges : -	Others : -		28
8	Heat Treatment				29
		Stress Relieving : -	Others : -		30
9	Tests				31
		Hydraulic / Pneumatic : Yes	Dye-Penetrant : -		32
		Radiographic : -	Others : -		33
10	Insulation				34
		Type : HCI / CCI / PPI -	Thk. : -		35
11	Painting / Finish				36
		All CS parts to be painted with two coats of red oxide primer			37
12	Weight : kg	Empty : 110	Full of water : 280		38
13	Inspection By				39
		IICT / Client / Third Party -	Others : -		40
	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.				41
1	All dimensions are in mm				42
2	VTS - Vendor to specify.				43
3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.				44
4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.				45
5	Nozzle orientation and support height shall be provided by vendor				46
6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.				47
7	Suitable stiffeners to be provided for all the nozzles.				48
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.				49

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
All dimensions in mm, unless specified																
<b>DO NOT SCALE</b>																
CLEARANCES																
MR	-	MR	19.07.23	MR/SAK	-	TPK/MR/SAK										
DESIGN			PREPARED			VER/CHD			APPROVED							
SCALE	REFERENCES		SOFT COPY REF			DWG/DOC/SK/No.			SHEET				REV			
			CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-01 00 XXX			1 OF 2				-			

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

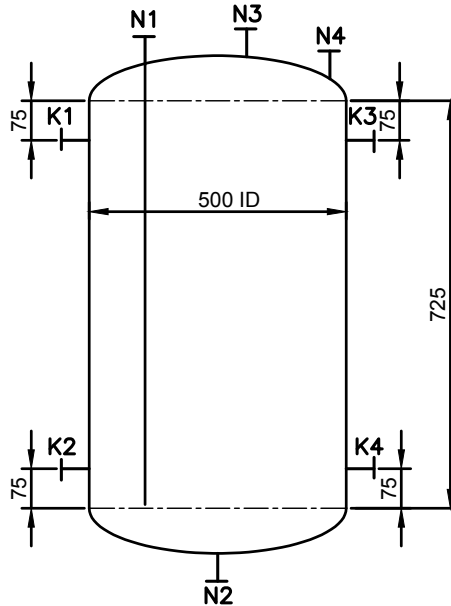
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : ST-206 a,b

Title : P Collection Tanks



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from S-201	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to ETP	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	4
											5
K1	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	6
K2	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	7
K3	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K4	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
											10
											11
											12

NOTES		
9	Lifting lugs, earthing boss(SS 316) and name plate are to be provided.	13
10	Dip leg to be provided with 3Ø antisiphon holes and suitable supporting arrangement.	14
11	Dished ends shall conform to IS 4179.	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

MR    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			ENC/DOC/SK-No.	SHEET	REV
		CD/FP	FOLDER	FILE			
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## STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.							R												
1	Unit No. : ST-207 a,b	Dwg. No.:	Code : ASME Sec. VIII Div. I				1												
2	Title : RF Collection Tanks	Nos. required : Two	Type : Vertical, Cylindrical				2												
3	Service : To Collect the RF Material						3												
4	Nominal Capacity : lit. : 1250 lit.						4												
							5												
							6												
<b>PROCESS DATA</b>																			
1	Fluid	C5 Solution						7											
2	Operating Temperature : °C	Normal : 25		Maximum : 30			8												
3	Operating Pressure : kg/sq.cm.-g/¢	Normal : Atm.		Maximum : 1.1			9												
4	Density : at 30 °C kg/cu.m.	1000						10											
5	Hazard Condition : -							11											
							12												
							13												
<b>CONSTRUCTION DATA</b>																			
1	Temperature : °C	Design : 40		Test : Amb.			14												
2	Pressure : kg/sq.cm.-g/¢	Design : 1.2		Test : Full with Water			15												
3	Corrosion Allowance						16												
4	Shell	ØD/ID : 1000 mm			St. Length : 1400 mm		17												
		Thk. : 6 MM					18												
5	Ends	Top	Type : Dish, Torispherical		KR : 10%	Thk. : 6 MM	SF : 50 mm	19											
		Bottom	Type : Dish, Torispherical		KR : 10%	Thk. : 6 MM	SF : 50 mm	20											
6	Supports						21												
			Type : LEG		Nos. : 4 Nos.														
			Shell : SA 240 SS 316		Heads : SA 240 SS 316														
			Supports : CS to IS 226		Internal Bolting : SS 316														
			Gaskets : PTFE		External Bolting : CS to IS 1364														
			Shell Flanges : -		Jacket / Internals : SS 316														
			Nozzles : SS 316		Other wetted parts : SS 316														
			Flanges : -		Others : -														
8	Heat Treatment						28												
			Stress Relieving : -		Others : -														
9	Tests						29												
			Hydraulic / Pneumatic : Yes		Dye-Penetrant : -														
			Radiographic : -		Others : -														
10	Insulation						31												
			Type : HCI / CCI / PPI -		Thk. : -														
11	Painting / Finish						32												
	All CS parts to be painted with two coats of red oxide primer																		
12	Weight : kg		Empty : 425		Full of water : 1750		33												
13	Inspection By						34												
			IICT / Client / Third Party -		Others : -														
	Refer Document # DE- 000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.						35												
1	All dimensions are in mm						36												
2	VTS - Vendor to specify.						37												
3	Nozzles shall be provided with companion flange, gaskets, nuts, and washers shall be suitably blanked off before dispatch.						38												
4	All nozzle - top, side and bottom shall be 150 mm in length unless otherwise specified.						39												
5	Nozzle orientation and support height shall be provided by vendor						40												
6	Vendor shall provide detailed drawing for approval from M/s Vinati Organics Ltd. and shall guarantee the mechanical performance.						41												
7	Suitable stiffeners to be provided for all the nozzles.						42												
8	Dimensions are based on IS 4179. Vendor to specify the equivalent.						43												
<b>NOTES</b>																			
S.No.	STATUS		DESCRIPTION			BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
											ISSUES / DISTRIBUTION / COPIES								
All dimensions in mm, unless specified											<b>DO NOT SCALE</b>								
MECH ENGR		PRCS ENGR		INST ENGR		ELECT ENGR		CIVIL ENGR		CLIENT		CONSULTANT		CONTRACTOR					
<b>CLEARANCES</b>																			
MR		-		MR		19.07.23		MR/SAK		-		TPK/MR/SAK							
DESIGN				PREPARED				VER/CHD				APPROVED							
SCALE		REFERENCES		SOFT COPY REF				DWG/DOC/SK/No.				SHEET				REV <span style="border: 1px solid black; padding: 2px;">-</span>			
				CD/FP		FOLDER		FILE		DE-XXX-XXX-ED-01-01 00 XXX				1 OF 2					

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STORAGE SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

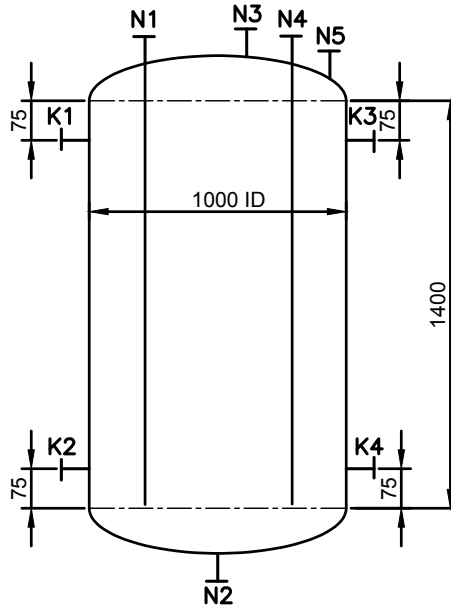
CAPACITY : 0.125 TPD

LOCATION : -

-

1 Unit No. : ST-207 a,b

Title : RF Collection Tanks



NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from Fi-204	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-210 a,b	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	Spare	25	40s	150	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	5
											6
K1	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	7
K2	Level Gauge	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	8
K3	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	9
K4	Level Transmitter	20	40s	100	SS 316	ANSI,B16.5	#150	SO,RF	SS 316	-	10
											11
											12

NOTES		
9	Lifting lugs, earthing boss(SS 316) and name plate are to be provided.	13
10	Dip leg to be provided with 3ø antisiphon holes and suitable supporting arrangement.	14
11	Dished ends shall conform to IS 4179.	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

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MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

CLEARANCES

MR    MR    19.07.23    MR/SAK    -    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

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## STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

<b>GEN.</b>	1	Unit No. : SV-201	Dwg. No.: -	Code : ASME Sec. VIII Div. I	R	1
	2	Title : Chilled W	Nos. required : One	Type : Vertical, Cylindrical & Flanged		2
	3	Service : To Cool W upto 5°C				3
	4	Nominal Capacity : lit. : 400 lit.				4
						5

<b>PROCESS DATA</b>	1	OPERATION :	Batch / Continuous	Batch Time : hrs :12	Working Hours/Day : 24	6
			SHELL	JACKET	DOUBLE COIL	7
	2	Material Handled :	Water, Distilled Water	Ethylene Glycol Mixture		8
	3	Operation :	Batch	Batch		9
	4	Feed Quantity Total : kg	300	1610		10
	5	Solid/Liquid/Gas: kg	-/300/-	-/1610/-		11
	6	Discharge Quantity Total : kg	300	1610		12
	7	Solid/Liquid/Gas: kg	-/-/-	-/-/-		13
	8	Operating Temp.:Nor./Max.: °C	5	1/4		14
	9	Operating Press.:Nor./Max.: kg/sq.cm.-g/¢	Atm.	4.0		15
	10	Density : at 25 °C kg/cu.m.	1000	1000		16
	11	Viscosity : at 25 °C cP	1	1		17
	12	pH :	-	-		18
	13	Pressure Drop : kg/sq.cm.	-	-		19
14	Hazard Condition :	-	-		20	
						21

<b>INTERALS</b>	1	Agitator Type :	Pitched Blade Turbine	Shaft Dia : 25 mm	22	
	2		Impeller Dia. : 240	No. of Impellers : One	23	
	3		Height from bottom: 240	Speed : RPM : 400	24	
	4	Coil : 2 Nos.	Tube Dia. : -	BWG / Sch. : -	25	
	5		Pitch : -	No. of Turns : -	26	
	6		Coil Helix Dia. : -	Height from bottom : -	27	
	7	Baffles :	Nos. : 4 Nos.	Type : Flat	28	
	8		Height : 910	Width : 50	29	
	9		Thk. : 10		30	
	10	Feed Arrangement :	Type : -	Dia. : -	Length : -	31
			Spray Nozzle Dia. : -	Pitch : -	Others : -	32
	11	Shaft :	Dia. : 25 mm	Length : VTS		33
12	Others :	-			34	

<b>CONSTRUCTION</b>			SHELL	JACKET	COIL	
	1	Temperature : °C	Dgn: 30 Test: Amb.	Dgn: 30 Test: Amb.	Dgn: Test:	36
	2	Pressure : kg/sq.cm.-g/¢	Dgn: 1.1 Test: Full with Water	Dgn: 4.5 Test: 6.0	Dgn: Test:	37
	3	Diameter : mm	O.D.: - I.D.: 700	O.D.: - I.D.: 800	O.D.: H.Dia.:	38
	4	Straight Length : mm	910	725	-	39
	5	Thk. : mm	6 MM	-		40
	6	Shell Ends :	Top Type : Tori. Thk. : 6 MM K.R. : 10% SF : 50			41
		Bottom Type : Tori. Thk. : 6 MM K.R. : 10% SF : 50			42	
7	Jacket end :	Bottom Type : Tori. Thk. : 6 MM K.R. : 10% SF : 50			43	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
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MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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**CLEARANCES**

MR	MR	19.07.23	MR/SAK	TPK/MR/SAK
DESIGN	PREPARED	VER/CHD	APPROVED	
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK- <del>No.</del>	SHEET
		CD/FP FOLDER FILE	DE-XXX-XXX-ED-01-07 00 XXX	1 OF 3
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STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
OF

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1	Unit No. : SV-201	Title : Chilled W				R	1	
							2	
		SHELL	JACKET	COIL			3	
8	Corrosion Allowance :	-	-				4	
9	Supports :	Type: LEG	No.: 4 Nos.	Type: -	No.: -	Type:	No.:	
	Material Of Construction	Shell : SA-240 SS 316		Jacket : CS A 285 Gr. C			6	
		Shell Ends : SA-240 SS 316		Jacket Ends : CS A 285 Gr. C			7	
		Coil : -		Supports : CS A-75/IS:226			8	
		Shaft : SA-479 SS 316		Feed Arrangement : SS 316			9	
		Agitator : SA 240 SS 316		External Bolting : CS to IS 1364			10	
		Baffle : SS 316		Internal Bolting : SS 316			11	
		Dip Pipe : SA-312 TP 316		Gaskets : PTFE			12	
		Shell Flanges : CS A 285 Gr. C with 3 thk. SS 316 lining		Sparger : -			13	
11	Heat Treatment :	Stress Relieving : -		Others : -			15	
12	Tests :	Hydraulic / Pneumatic : Yes		Dye-Penetrant : -			16	
		Radiograph : -		Others : -			17	
13	Insulation :	Type : -		Thk. : -			18	
14	Painting / Finish :	All CS parts to be painted with two coats of red oxide primer						19
15	Weight : kg	Empty : 360		Full of Water : 930			20	
16	Drive Details :	Motor : Electric, Flame Proof		Power Supply : 440V, 3 Ø Phase,		H.P. : 5.0	22	
		R.P.M. : Shaft RPM is 300, Motor RPM is		VTS			23	
17	Shaft Seal :	Mechanical seal						24
18	Inspection By :	IICT / CLIENT / Third Party -		Others : -			25	
								26
								27
								28
								29

1	** : Vendor to specify.	30
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.	31
3	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.	32
4	Rev. 1 - Quantities written in kgs.	33
		34
		35
		36
		37
		38
		39
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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									
All dimensions in mm, unless specified		<b>DO NOT SCALE</b>														
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR									
<b>CLEARANCES</b>																
MR	MR	19.07.23	MR/SAK	TPK/MR/SAK												
DESIGN		PREPARED		VER/CHD		APPROVED										
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK-No.			SHEET			REV 1					
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX			2 OF 3								





STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
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PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

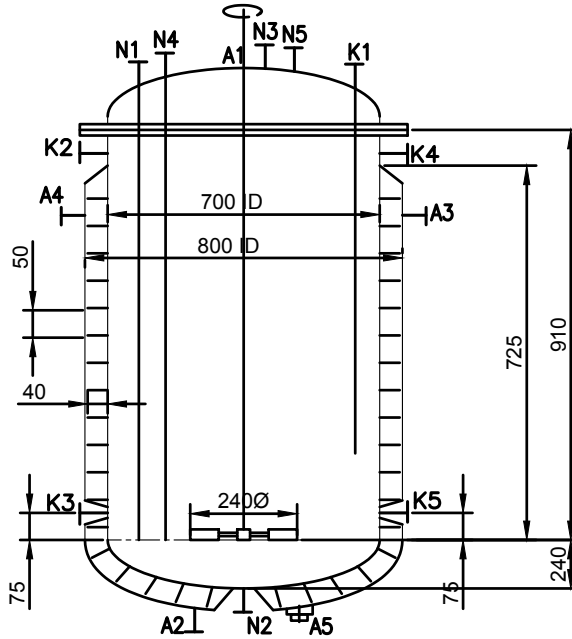
CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

1 Unit No. : SV-201

Title : Chilled W



Impeller Details

Type : Pitched Blade  
No. Of Impeller : One  
Impeller Dia : 240 mm  
Bt. of Impeller : 240 mm  
Blade L X W = 60 mm x 45 mm

NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from P-201 a,b	50	10s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-202 a,b	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	Spare	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	5
											6
K1	Thermowell	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	7
K2	Level Gauge	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	8
K3	Level Gauge	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	9
K4	Level Transmitter	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	10
K5	Level Transmitter	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	11
											12
A1	Stirrer	VTS	-	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	13
A2	Ethylene Glycol Inlet	50	40	150	CS	ANSI, B16.5	#150	SO,RF	CS	-	14
A3	Ethylene Glycol Outlet	50	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	15
A4	Jacket Vent	25	40	100	CS	ANSI, B16.5	#150	SO,RF	CS	-	16
A5	Jacket Drain (Plug)	3/4"	-	-	CS	-	#3000	-	-	Plug	17
											18
											19

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.							
								1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES							

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR PRCS ENGR INST ENGR ELECT ENGR CIVIL ENGR CLIENT CONSULTANT CONTRACTOR

CLEARANCES

MR DESIGN MR 19.07.23 MR/SAK TPK/MR/SAK APPROVED

SCALE REFERENCES SOFT COPY REF DWG/DOC/SK No. SHEET

CD/FP FOLDER FILE DE-XXX-XXX-ED-01-07 00 XXX 3 OF 3 REV 1

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## STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.	Unit No. : SV-202	Dwg. No.: -	Code : ASME Sec. VIII Div. I	R
1	Title : C3 Preparation Vessel	Nos. required : One	Type : Vertical, Cylindrical & Flanged	1
2	Service : To Adjust pH of C3			2
3	Nominal Capacity : lit. : 1250 lit.			3
4				4
5				5

PROCESS DATA	OPERATION :	Batch / Continuous	Batch Time : hrs :8	Working Hours/Day : 24
1		SHELL	JACKET	DOUBLE COIL
2	Material Handled :	C3	-	-
3	Operation :	Batch	-	-
4	Feed Quantity Total : kg	1052	-	-
5	Solid/Liquid/Gas: kg	1052/-/-	-	-
6	Discharge Quantity Total : kg	1052	-	-
7	Solid/Liquid/Gas: kg	-/-/-	-	-
8	Operating Temp.:Nor./Max.: °C	30	-	-
9	Operating Press.:Nor./Max.: kg/sq.cm.-g/¢	Atm.	-	-
10	Density : at 25 °C kg/cu.m.	1000	-	-
11	Viscosity : at 25 °C cP	1	-	-
12	pH :	8.0	-	-
13	Pressure Drop : kg/sq.cm.	-	-	-
14	Hazard Condition :	-	-	-

INTERALS	Agitator Type :	Pitched Blade Turbine	Shaft Dia : 25 mm
1		Impeller Dia. : 330	No. of Impellers : One
2	mm	Height from bottom: 330	Speed : RPM : 300
3	mm	Tube Dia. : -	BWG / Sch. : -
4	Coil : 2 Nos. mm	Pitch : -	No. of Turns : -
5	mm	Coil Helix Dia. : -	Height from bottom : -
6	mm	Nos. : 4 Nos.	Type : Flat
7	Baffles : mm	Height : 1400	Width : 100
8	mm	Thk. : 10	
9	mm	Type : -	Dia. : - Length : -
10	Feed Arrangement :	Spray Nozzle Dia. : -	Pitch : - Others : -
11	Shaft :	Dia. : 25 mm	Length : VTS
12	Others :	-	

CONSTRUCTION	Temperature : °C	Dgn: 50	Test: Amb.	Dgn: -	Test: -	Dgn: -	Test: -
1	Pressure : kg/sq.cm.-g/¢	Dgn: 1.1	Test: Full with Water	Dgn: -	Test: -	Dgn: -	Test: -
2	Diameter : mm	O.D.: -	I.D.: 1000	O.D.: -	I.D.: -	O.D.: -	H.Dia.: -
3	Straight Length : mm	1400		-		-	
4	Thk. : mm	6 MM		-		-	
5	Shell Ends :	Top	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50	
6		Bottom	Type : Tori.	Thk. : 6 MM	K.R. : 10%	SF : 50	
7	Jacket end :	Bottom	Type : -	Thk. : -	K.R. : -	SF : -	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
ISSUES / DISTRIBUTION / COPIES																

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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**CLEARANCES**

<b>MR</b>		<b>MR</b>	<b>19.07.23</b>	<b>MR/SAK</b>		<b>TPK/MR/SAK</b>
DESIGN		PREPARED		VER/CHD		APPROVED
SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK- <del>No.</del>	SHEET
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX	1 OF 3
						REV 1

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STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1	Unit No. : SV-202	Title : C3 Preparation Vessel				R	1	
							2	
		SHELL	JACKET	COIL			3	
8	Corrosion Allowance :	-	-				4	
9	Supports :	Type: LEG	No.: 4 Nos.	Type: -	No.: -	Type:	No.:	
	Material Of Construction	Shell : SA-240 SS 316		Jacket :-			6	
		Shell Ends : SA-240 SS 316		Jacket Ends : -			7	
		Coil : -		Supports : CS A-75/IS:226			8	
		Shaft : SA-479 SS 316		Feed Arrangement : SS 316			9	
		Agitator : SA 240 SS 316		External Bolting : CS to IS 1364			10	
		Baffle : SS 316		Internal Bolting : SS 316			11	
		Dip Pipe : SA-312 TP 316		Gaskets : PTFE			12	
		Shell Flanges ;CS A 285 Gr. C with 3 thk. SS 316 lining		Sparger : -			13	
11	Heat Treatment :	Stress Relieving : -		Others : -			15	
12	Tests :	Hydraulic / Pneumatic : Yes		Dye-Penetrant : -			16	
		Radiograph : -		Others : -			17	
13	Insulation :	Type : -		Thk. : -			18	
14	Painting / Finish :	All CS parts to be painted with two coats of red oxide primer						19
15	Weight : kg	Empty : 425		Full of Water : 1750			20	
16	Drive Details :	Motor : Electric, Flame Proof						21
		Power Supply : 440V, 3 Ø Phase,		H.P. : 5.0			22	
		R.P.M. : Shaft RPM is 300, Motor RPM is VTS						23
17	Shaft Seal :	Mechanical seal						24
18	Inspection By :	IICT / CLIENT / Third Party -		Others : -			25	
								26
								27
								28
								29

1	** : Vendor to specify.	30
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.	31
3	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.	32
4	Rev. 1 - Quantities written in kgs.	33
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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	
All dimensions in mm, unless specified							<b>DO NOT SCALE</b>										
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR	CLEARANCES									
MR	MR	19.07.23	MR/SAK	TPK/MR/SAK													
DESIGN	PREPARED	VER/CHD	APPROVED														
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK-No.		SHEET		REV 1									
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX		2 OF 3										



# STIRRED VESSEL SPECIFICATION DATA SHEET

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PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

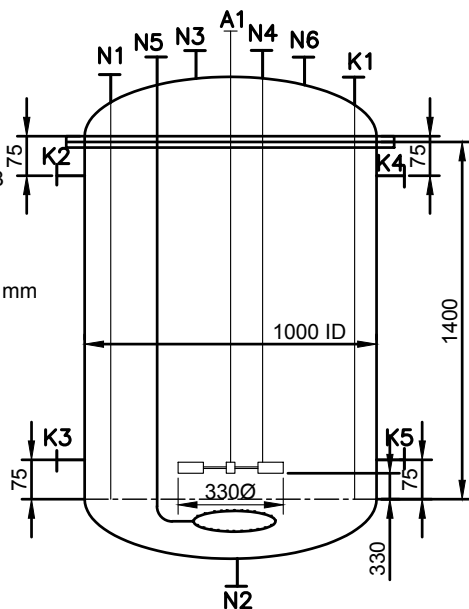
-

1 Unit No. : SV-202

Title : C3 Preparation Vessel

### Sparger Details

Sparger Dia = 530 mm  
HT. from Bot. = 250 mm  
Sparger Pipe Dia = 15NB  
Hole size = 0.5 Ø mm  
No. of Holes = 10 Nos.  
Dist between Holes = 60 mm



### Impeller Details

Type : Pitched Blade  
No. Of Impeller : One  
Impeller Dia : 330 mm  
Ht. of Impeller : 330 mm  
Blade L X W = 85 mm x 65 mm

### NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from Fi-202	100	10s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-204 a,b	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	CO2 Inlet	15	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Sparger	5
N6	Spare	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	6
											7
K1	pH Indicator	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	8
K2	Level Gauge	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	9
K3	Level Gauge	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	10
K4	Level Transmitter	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	11
K5	Level Transmitter	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	12
											13
A1	Stirrer	VTS	-	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	14
											15
											16
											17
											18
											19

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

### CLEARANCES

MR    MR    19.07.23    MR/SAK    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK No.	SHEET	REV
		CD/FP	FOLDER	FILE		3 OF 3	1
					DE-XXX-XXX-ED-01-07 00 XXX		

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STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

GEN.	1	Unit No. : SV-203	Dwg. No.: -	Code : ASME Sec. VIII Div. I	R	1
	2	Title : L Stirred Vessel	Nos. required : One	Type : Vertical, Cylindrical & Flanged		2
	3	Service : To Adjust pH of L				3
	4	Nominal Capacity : lit. : 1250 lit.				4
						5

PROCESS DATA	1	OPERATION :	Batch / Continuous	Batch Time : hrs :8	Working Hours/Day : 24	6
			SHELL	JACKET	DOUBLE COIL	7
	2	Material Handled :	Water	-	-	8
	3	Operation :	Batch	-	-	9
	4	Feed Quantity Total : kg	1060	-	-	10
	5	Solid/Liquid/Gas: kg	-/1058/2	-	-	11
	6	Discharge Quantity Total : kg	1060	-	-	12
	7	Solid/Liquid/Gas: kg	-/-/-	-	-	13
	8	Operating Temp.:Nor./Max.: °C	30	-	-	14
	9	Operating Press.:Nor./Max.: kg/sq.cm.-g/¢	Atm.	-	-	15
	10	Density : at 25 °C kg/cu.m.	1000	-	-	16
	11	Viscosity : at 25 °C cP	1	-	-	17
	12	pH :	8.0	-	-	18
	13	Pressure Drop : kg/sq.cm.	-	-	-	19
14	Hazard Condition :	-	-	-	20	
						21

INTERALS	1	Agitator Type :	Pitched Blade Turbine	Shaft Dia : 25 mm	22	
	2	mm	Impeller Dia. : 330	No. of Impellers : One	23	
	3	mm	Height from bottom: 330	Speed : RPM : 300	24	
	4	Coil : 2 Nos. mm	Tube Dia. : -	BWG / Sch. : -	25	
	5	mm	Pitch : -	No. of Turns : -	26	
	6	mm	Coil Helix Dia. : -	Height from bottom : -	27	
	7	Baffles : mm	Nos. : 4 Nos.	Type : Flat	28	
	8	mm	Height : 1400	Width : 100	29	
	9	mm	Thk. : 10		30	
	10	Feed Arrangement :	Type : -	Dia. : -	Length : -	31
			Spray Nozzle Dia. : -	Pitch : -	Others : -	32
	11	Shaft :	Dia. : 25 mm	Length : VTS		33
12	Others :	-			34	
						35

CONSTRUCTION			SHELL	JACKET	COIL	
	1	Temperature : °C	Dgn: 50 Test: Amb.	Dgn: - Test: -	Dgn: Test:	36
	2	Pressure : kg/sq.cm.-g/¢	Dgn: 1.1 Test: Full with Water	Dgn: - Test: -	Dgn: Test:	37
	3	Diameter : mm	O.D.: - I.D.: 1000	O.D.: - I.D.: -	O.D.: H.Dia.:	38
	4	Straight Length : mm	1400	-	-	39
	5	Thk. : mm	6 MM	-		40
	6	Shell Ends :	Top Type : Tori. Thk. : 6 MM K.R. : 10% SF : 50			41
		Bottom Type : Tori. Thk. : 6 MM K.R. : 10% SF : 50			42	
7	Jacket end :	Bottom Type : - Thk. : - K.R. : - SF : -			43	

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
								ISSUES / DISTRIBUTION / COPIES								

All dimensions in mm, unless specified **DO NOT SCALE**

MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
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CLEARANCES

MR	MR	19.07.23	MR/SAK	TPK/MR/SAK
DESIGN	PREPARED	VER/CHD	APPROVED	
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK- <del>No.</del>	SHEET
		CD/FP FOLDER FILE	DE-XXX-XXX-ED-01-07 00 XXX	1 OF 3
				REV 1

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STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

LOCATION : -

-

1	Unit No. : SV-203	Title : L Stirred Vessel				R	1
							2
		SHELL	JACKET	COIL			3
8	Corrosion Allowance :	-	-				4
9	Supports :	Type: LEG No.: 4 Nos.	Type: - No.: -	Type: No.:			5
10	Material Of Construction	Shell : SA-240 SS 316	Jacket :-				6
		Shell Ends : SA-240 SS 316	Jacket Ends : -				7
		Coil : -	Supports : CS A-75/IS:226				8
		Shaft : SA-479 SS 316	Feed Arrangement : SS 316				9
		Agitator : SA 240 SS 316	External Bolting : CS to IS 1364				10
		Baffle : SS 316	Internal Bolting : SS 316				11
		Dip Pipe : SA-312 TP 316	Gaskets : PTFE				12
		Shell Flanges : CS A 285 Gr. C with 3 thk. SS 316 lining	Sparger : -				13
11	Heat Treatment :	Insulation : HCl / CCl / PPI - -	Others : -			14	
12	Tests :	Stress Relieving : -	Others : -			15	
13	Insulation :	Hydraulic / Pneumatic : Yes	Dye-Penetrant : -			16	
14	Painting / Finish :	Radiograph : -	Others : -			17	
15	Weight : kg	Type : -	Thk. : -			18	
16	Drive Details :	All CS parts to be painted with two coats of red oxide primer					19
		Empty : 425	Full of Water : 1750			20	
		Motor : Electric, Flame Proof				21	
		Power Supply : 440V, 3 Ø Phase,	H.P. : 5.0			22	
		R.P.M. : Shaft RPM is 300, Motor RPM is VTS				23	
17	Shaft Seal :	Mechanical seal					24
18	Inspection By :	IICT / CLIENT / Third Party -	Others : -			25	
						26	
						27	
						28	
						29	

1	** : Vendor to specify.		30
2	Refer Document # DE-000-000-GE-11-10 00 001 and DE-000-000-GE-11-10 00 002 for GENERAL NOTES.		31
3	Fabrication drawing to be submitted to M/s Vinati Organics Ltd. for approval.		32
4	Rev. 1 - Quantities written in kgs.		33
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S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8	
All dimensions in mm, unless specified							<b>DO NOT SCALE</b>										
MECH ENGR	PRCS ENGR	INST ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR	CLEARANCES									
MR	MR	19.07.23	MR/SAK	TPK/MR/SAK													
DESIGN	PREPARED	VER/CHD	APPROVED														
SCALE	REFERENCES	SOFT COPY REF		DWG/DOC/SK-No.		SHEET		REV 1									
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX		2 OF 3										



# STIRRED VESSEL SPECIFICATION DATA SHEET

Page  
- OF -

PROJECT : Pilot Plant Facility For Bulk Chemicals

PROJECT CODE : -

CLIENT : -

CAPACITY : 0.125 TPD

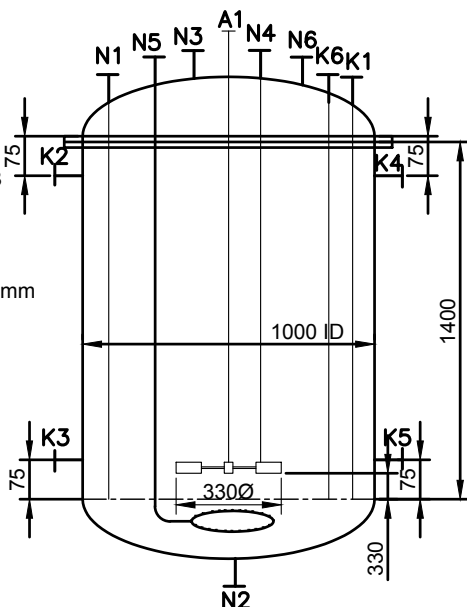
LOCATION : -

1 Unit No. : SV-203

Title : L Stirred Vessel

### Sparger Details

Sparger Dia = 530 mm  
HT. from Bot. = 250 mm  
Sparger Pipe Dia = 15NB  
Hole size = 0.5 Ø mm  
No. of Holes = 10 Nos.  
Dist between Holes = 60 mm



### Impeller Details

Type : Pitched Blade  
No. Of Impeller : One  
Impeller Dia : 330 mm  
Ht. of Impeller : 330 mm  
Blade L X W = 85 mm x 65 mm

### NOZZLE SCHEDULE

NOZZLE MARK	SERVICE	NOZZLE DETAILS				FLANGE DETAILS				REMARKS	R
		SIZE NB(mm)	Sch.	Length mm	M.O.C.	STANDARD	RATING	TYPE	M.O.C.		
N1	Inlet from Fi-203	100	10s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	1
N2	Outlet to P-207 a,b	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	2
N3	Vent	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	3
N4	Recirculation	50	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	4
N5	CO2 Inlet	15	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Sparger	5
N6	Spare	25	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	6
											7
K1	Thermowell	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	8
K2	Level Gauge	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	9
K3	Level Gauge	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	10
K4	Level Transmitter	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	11
K5	Level Transmitter	20	40s	100	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	12
K6	pH Indicator	20	40s	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	Dipleg	13
											14
A1	Stirrer	VTS	-	150	SS 316	ANSI, B16.5	#150	SO,RF	SS 316	-	15
											16
											17
											18
											19

S.No.	STATUS	DESCRIPTION	BY	CHD	APD	DATE	DATE	TR. No.	1	2	3	4	5	6	7	8
							ISSUES / DISTRIBUTION / COPIES									

All dimensions in mm, unless specified

**DO NOT SCALE**

MECH ENGR    PRCS ENGR    INST ENGR    ELECT ENGR    CIVIL ENGR    CLIENT    CONSULTANT    CONTRACTOR

### CLEARANCES

MR    MR    19.07.23    MR/SAK    TPK/MR/SAK

DESIGN    PREPARED    VER/CHD    APPROVED

SCALE	REFERENCES	SOFT COPY REF			DWG/DOC/SK No.	SHEET	REV
		CD/FP	FOLDER	FILE	DE-XXX-XXX-ED-01-07 00 XXX	3 OF 3	1

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Project: DCDA  
 Client:  
 Location:  
 Unit: Section-200A

# Instrument Index

Prepared By: GSS      Checked By: KK &      Approved By:

Date:  
 Doc. No.: DE-DCDA-XXX-XX-XXX  
 Revision No.: Rev. 0



S.No	Tag No.	Equipment Name	Service	Location	Range	Units	Description	Type	Remarks
1	TE-201	SV-201	SV-201 Temp	SV-201	0-100	deg. C	Temp. elemnt	RTD	
	TI-201	SV-201	Temp. Indicator	SV-201		deg. C	Indicator	Ctrl. Panel	
2	TE-202	SV-201	SV-201 EG-Mix Return LineTemp	SV-201	-10 to 50	deg. C	Temp. elemnt	RTD	
	TI-202	SV-201	Temp. Indicator	SV-201		deg. C	Indicator	Ctrl. Panel	
3	TE-203	R-201	R-201 CHW Supply Temp.	R-201	-10 to 50	deg. C	Temp. element	RTD	
	TI-203	R-201	Temp. Indicator	R-201		deg. C	Indicator	Ctrl. Panel	
4	TE-204	R-201	R-201 CHW Return Temp.	R-201	-10 to 50	deg. C	Temp. element	RTD	
	TI-204	R-201	Temp. Indicator	R-201		deg. C	Indicator	Ctrl. Panel	
5	TE-205	R-201	R-201 Temp.	R-201	0-150	deg. C	Temp. element	RTD	
	TIC-205	R-201	R-201 Temp. Indicating Controller	R-201		deg. C	Temp. Ind. Controller	Ctrl. Panel	
	TCV-205	R-201	R-201 jacket Temp. controlling valve at CHW Supply	R-201	0-100	%	Temp. Controlling Valve	pneumatic	
1	PG-201 a,b	ST-201	Pump P-201 a,b Outlet pressure	P-201 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
2	PG-202 a,b	SV-201	Pump P-202 a,b Outlet pressure	P-202 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
3	PG-203	R-201	R-201 CHW Supply Line Pressure	R-201 CHWS	0-6	Bar	Pressure Gauge	Bourdon	
4	PG-204 a,b	ST-202 a,b	Pump P-203 a,b Outlet pressure	P-203 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
5	PG-205 a,b	CY-201	CY-201 Header Pressure	CY-201 Header	0-6	Bar	Pressure Gauge	Bourdon	
6	PG-206 a,b	SV-202	Pump-204 a,b Outlet Pressure	P-204 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
7	PG-207 a,b	ST-203 a,b	Pump-205 a,b Outlet Pressure	P-205 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
1	PSV-201	SV-201	SV-201 Jacket pressure safety valve	SV-201 Jacket	0-6	Bar	Pressure safety valve	Spring Loaded	
2	PSV-202	R-201	R-201 Jacket pressure safety valve	R-201 Jacket	0-6	Bar	Pressure safety valve	Spring Loaded	
1	LG-201	ST-201	ST-201 level	ST-201	*1400	mm	Level Gauge	Glass Tube	*Note-1
2	LG-202	SV-201	SV-201 level	SV-201	*910	mm	Level Gauge	Glass Tube	*Note-1
3	LG-204 a,b	ST-202 a,b	ST-202 a,b Level	ST-202 a,b	*1400	mm	Level Gauge	Glass Tube	*Note-1
4	LG-205	SV-202	SV-202 Level	SV-202	*1400	mm	Level Gauge	Glass Tube	*Note-1
5	LG-206 a,b	ST-203 a,b	ST-203 a,b Level	ST-203 a,b	*1400	mm	Level Gauge	Glass Tube	*Note-1
1	LT-201	ST-201	ST-201 Level Transmitter	ST-201	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-201	ST-201	ST-201 Level Indicator	ST-201			Indicator	Ctrl. Panel	
2	LT-202	SV-201	SV-201 Level Transmitter	SV-201	*910	mm	Level Transmitter	Electronic	*Note-1
	LI-202	SV-201	SV-201 Level Indicator	SV-201			Indicator	Ctrl. Panel	





Project: DCDA  
 Client:  
 Location:  
 Unit: Section-200A

# Instrument Index

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Date:  
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 Revision No.: Rev. 0



S.No	Tag No.	Equipment Name	Service	Location	Range	Units	Description	Type	Remarks
3	LT-203	R-201	R-201 Level Transmitter	R-201	*725	mm	Level Transmitter	Electronic	*Note-1
	LI-203	R-201	R-201 Level Indicator	R-201			Indicator	Ctrl. Panel	
4	LT-204 a,b	ST-202 a,b	ST-202 a,b Level Transmitter	ST-202 a,b	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-204 a,b	ST-202 a,b	ST-202 a,b Level Indicator	ST-202 a,b			Indicator	Ctrl. Panel	
5	LT-205	SV-202	SV-202 Level Transmitter	SV-202	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-205	SV-202	SV-202 Level Indicator	SV-202			Indicator	Ctrl. Panel	
6	LT-206 a,b	ST-203 a,b	ST-203 a,b Level Transmitter	ST-203 a,b	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-206 a,b	ST-203 a,b	ST-203 a,b Level Indicator	ST-203 a,b			Indicator	Ctrl. Panel	
1	FT-201	CY-201	Flow Transmitter in Co2 to R-201 a,b Line	CY-201 Header	0-50	Kg/Hr	Mass flow transmitter		
	FIC-201	CY-201	Flow Indicating Controller for CY-201	CY-201 Header		Kg/Hr	flow Ind. controller	Ctrl. Panel	
	FCV-201	CY-201	Co2 Flow Control Valve to R-201 a,b	CY-201 Header	0 - 100	%	Control Valve	pneumatic	
2	FT-202	CY-201	Flow Transmitter in Co2 to SV-202 & ST-203 a,b Line	CY-201 Header	0-50	Kg/Hr	Mass flow transmitter		
	FIC-202	CY-201	Flow Indicating Controller for CY-201	CY-201 Header		Kg/Hr	flow Ind. controller	Ctrl. Panel	
	FCV-202	CY-201	Co2 Flow Control Valve to SV-202 & ST-203 a,b	CY-201 Header	0 - 100	%	Control Valve	pneumatic	
3	FT-203	ST-203 a,b	Flow Transmitter for Filtrate to R-202a Line	P-205 a,b	0-500	Kg/Hr	Mass flow transmitter		
	FIC-203	ST-203 a,b	Flow Indicating Controller for P-205 a,b Outlet Line	P-205 a,b		Kg/Hr	flow Ind. controller	Ctrl. Panel	
	FCV-203	ST-203 a,b	Filtrate Flow Control Valve to R-202a	P-205 a,b	0 - 100	%	Control Valve	pneumatic	
1	VFD-201	SV-201	SV-201 RPM controller	SV-201	0-100	%	Variable freq. Drive	Electronic	*Note-2
2	VFD-202	R-201	R-201 RPM controller	R-201	0-100	%	Variable freq. Drive	Electronic	*Note-2
3	VFD-203	SV-202	SV-202 RPM controller	SV-202	0-100	%	Variable freq. Drive	Electronic	*Note-2
1	pHE-201	R-201	R-201 pH Element/Sensor	R-201	1-14		pH Element/Sensor		
	pHI-201	R-201	R-201 pH Indicating Controller	R-201	1-14		pH ind. Controller	Ctrl. Panel	
2	pHE-202 a,b	ST-202 a,b	ST-202 a,b pH Element/Sensor	ST-202 a,b	1-14		pH Element/Sensor		
	pHI-202 a,b	ST-202 a,b	ST-202 a,b pH indicator		1-14		pH indicator	Ctrl. Panel	
3	pHE-203	SV-202	SV-202 pH Element/Sensor	SV-202	1-14		pH Element/Sensor		
	pHI-203	SV-202	SV-202 pH indicator	SV-202	1-14		pH indicator	Ctrl. Panel	
4	pHE-204 a,b	ST-203 a,b	ST-203 a,b pH Element/Sensor	ST-203 a,b	1-14		pH Element/Sensor		
	pHI-204 a,b	ST-203 a,b	ST-203 a,b pH indicator		1-14		pH indicator	Ctrl. Panel	



Project: DCDA  
Client:  
Location:  
Unit: Section-200A

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Prepared By: GSS      Checked By: KK &      Approved By:

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S.No	Tag No.	Equipment Name	Service	Location	Range	Units	Description	Type	Remarks
1	P-201 a,b	ST-201	Transfer Pump	ST-201	100	LPM	Transfer Pump		
2	P-202a,b	SV-201	Transfer Pump	SV-201	50	LPM	Transfer Pump		
3	P-203 a,b	ST-202a,b	Transfer Pump	ST-202 a,b	100	LPM	Transfer Pump		
4	P-204 a,b	SV-202	Transfer Pump	SV-202	100	LPM	Transfer Pump		
5	P-205 a,b	ST-203a,b	Metering Pump	ST-203 a,b	50	LPM	Metering Pump		

\*Note-1: Vendor has To be verified with equipment fabrication drawing.

\*Note-2: Required RPM Display at Control Panel for VFDs.



Project: DCDA  
 Client:  
 Location:  
 Unit: Section-200B

# Instrument Index

Prepared By: GSS      Checked By: KK &      Approved By:

Date:  
 Doc. No.: DE-DCDA-XXX-XX-XXX  
 Revision No.: Rev. 0



S.No	Tag No.	Equipment Name	Service	Location	Range	Units	Description	Type	Remarks
1	TE-206 a,b,c	R-202 a,b,c	R-202 a,b,c Stream to R-202a,b,c Jacket Temp.	R-202 a,b,c	0-250	deg. C	Temp. element	RTD	
	TI-206 a,b,c	R-202 a,b,c	Temp. Indicator	R-202 a,b,c		deg. C	Indicator	Ctrl. Panel	
2	TE-207 a,b,c	R-202 a,b,c	R-202 a,b,c Temp.	R-202 a,b,c	0-150	deg. C	Temp. element	RTD	
	TIC-207 a,b,c	R-202 a,b,c	R-202 a,b,c Temp. Indicating Controller	R-202 a,b,c		deg. C	Temp. Ind. Controller	Ctrl. Panel	
	TCV-207 a,b,c	R-202 a,b,c	R-202 a,b,c Jacket Temp. controlling valve at Steam Supply	R-202 a,b,c	0-100	%	Temp. Controlling Valve	pneumatic	
3	TE-208 a,b	ST-204 a,b	ST-204 a,b Cooling Water Return Temp	ST-204 a,b CWR	0-100	deg. C	Temp. elemnt	RTD	
	TI-208 a,b	ST-204 a,b	Temp. Indicator	ST-204 a,b		deg. C	Indicator	Ctrl. Panel	
4	TE-209 a,b	ST-204 a,b	ST-204 a,b Temp	ST-204 a,b	0-100	deg. C	Temp. elemnt	RTD	
	TI-209 a,b	ST-204 a,b	Temp. Indicator	ST-204 a,b		deg. C	Indicator	Ctrl. Panel	
5	TE-210 a,b	Cr-201 a,b	Cr-201 a,b EG-Mix Supply Temp.	Cr-201 a,b EG-Mix	-10-50	deg. C	Temp. element	RTD	
	TI-210 a,b	Cr-201 a,b	Temp. Indicator	Cr-201 a,b		deg. C	Indicator	Ctrl. Panel	
6	TE-211 a,b	Cr-201 a,b	Cr-201 a,b Temp.	Cr-201 a,b	0 - 50	deg. C	Temp. element	RTD	
	TIC-211 a,b	Cr-201 a,b	Cr-201 a,b Temp. indicating controller	Cr-201 a,b		deg. C	Temp. Ind. Controller	Ctrl. Panel	
	TCV-211 a,b	Cr-201 a,b	Cr-201 a,b EG-Mix Supply Temp. controlling valve	Cr-201 a,b		%	Temp. Controlling Valve	pneumatic	
7	TE-212 a,b	Cr-201 a,b	Cr-201 a,b EG-Mix Return Temp.	Cr-201 a,b EG-Mix	-10-50	deg. C	Temp. element	RTD	
	TI-212 a,b	Cr-201 a,b	Temp. Indicator	Cr-201 a,b		deg. C	Indicator	Ctrl. Panel	
8	TE-213	E-201	E-201 CW Return Temp.	E-201	0-50	deg. C	Temp. element	RTD	
	TI-213	E-201	Temp. Indicator	E-201		deg. C	Indicator	Ctrl. Panel	
1	PG-208 a	CY-202	CY-Header to R-202 a,b,c Line Pressure	CY-202 Header	0-6	Bar	Pressure Gauge	Bourdon	
2	PG-208 b	CY-202	CY-Header to SV-202 Line Pressure	CY-202 Header	0-6	Bar	Pressure Gauge	Bourdon	
3	PG-209 a,b,c	R-202 a,b,c	R-202 a,b,c Steam Inlet Pressure	R-202 a,b,c	0-6	Bar	Pressure Gauge	Bourdon	
4	PG-210 a,b	ST-204 a,b	Pump P-206 a,b Outlet pressure	P-206 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
5	PG-211 a,b	Cr-201 a,b	Cr-201 a,b EG-Mix Supply to Jacket Pressure	Cr-201 a,b EG-Mix	0-6	Bar	Pressure Gauge	Bourdon	
6	PG-212 a,b	SV-203	Pump P-207 a,b Outlet pressure	P-207 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
7	PG-213 a,b	ST-205	Pump P-208 a,b Outlet pressure	P-208 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
8	PG-214 a,b	S-201 a,b	Pump P-209 a,b Outlet pressure	P-209 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
9	PG-215 a,b	ST-207 a,b	Pump P-210 a,b Outlet Pressure	P-210 a,b Outlet	0-6	Bar	Pressure Gauge	Diaphragm	
10	PG-216	E-201	CW Supply to E-201 Line Pressure	E-201	0-6	Bar	Pressure Gauge	Bourdon	
1	PSV-203 a,b,c	R-202 a,b,c	R-202 a,b,c Jacket pressure safety valve	R-202 a,b,c Jacket	0-6	Bar	Pressure safety valve	Spring Loaded	
2	PSV-204 a,b	ST-204 a,b	ST-204 a,b Jacket pressure safety valve	ST-204 a,b Jacket	0-6	Bar	Pressure safety valve	Spring Loaded	



Project: DCDA  
 Client:  
 Location:  
 Unit: Section-200B

# Instrument Index

Prepared By: GSS      Checked By: KK &      Approved By:

Date:  
 Doc. No.: DE-DCDA-XXX-XX-XXX  
 Revision No.: Rev. 0



S.No	Tag No.	Equipment Name	Service	Location	Range	Units	Description	Type	Remarks
3	PSV-205 a,b	Cr-201 a,b	Cr-201 a,b Jacket pressure safety valve	Cr-201 a,b Jacket	0-6	Bar	Pressure safety valve	Spring Loaded	
1	LG-207 a,b	ST-204 a,b	ST-204 a,b Level	ST-204 a,b	*1400	mm	Level Gauge	Glass Tube	*Note-1
2	LG-208	SV-203	SV-203 Level	SV-203	*1400	mm	Level Gauge	Glass Tube	*Note-1
3	LG-209	ST-205	ST-205 Level	ST-205	*1400	mm	Level Gauge	Glass Tube	*Note-1
4	LG-210 a,b	ST-206 a,b	ST-206 a,b Level	ST-206 a,b	*725	mm	Level Gauge	Glass Tube	*Note-1
5	LG-211 a,b	ST-207 a,b	ST-207 a,b Level	ST-207 a,b	*1400	mm	Level Gauge	Glass Tube	*Note-1
6	LG-212 a,b	S-201 a,b	S-201 a,b Level	S-201 a,b	*2350	mm	Level Gauge	Glass Tube	*Note-1
1	LT-207 a,b	ST-204 a,b	ST-204 a,b Level Transmitter	ST-204 a,b	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-207 a,b	ST-204 a,b	ST-204 a,b Level Indicator	ST-204 a,b			Indicator	Ctrl. Panel	
2	LT-208	SV-203	SV-203 Level Transmitter	SV-203	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-208	SV-203	SV-203 Level Indicator	SV-203			Indicator	Ctrl. Panel	
3	LT-209	ST-205	ST-205 Level Transmitter	ST-205	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-209	ST-205	ST-205 Level Indicator	ST-205			Indicator	Ctrl. Panel	
4	LT-210 a,b	ST-206 a,b	ST-206 a,b Level Transmitter	ST-206 a,b	*725	mm	Level Transmitter	Electronic	*Note-1
	LI-210 a,b	ST-206 a,b	ST-206 a,b Level Indicator	ST-206 a,b			Indicator	Ctrl. Panel	
5	LT-211 a,b	ST-207 a,b	ST-207 a,b Level Transmitter	ST-207 a,b	*1400	mm	Level Transmitter	Electronic	*Note-1
	LI-211 a,b	ST-207 a,b	ST-207 a,b Level Indicator	ST-207 a,b			Indicator	Ctrl. Panel	
1	FT-204	CY-202	Flow Transmitter in Co2 to R-202 a,b,c Line	CY-202 Header	0-50	Kg/Hr	Mass flow transmitter		
	FIC-204	CY-202	Flow Indicating Controller for CY-202	CY-202 Header		Kg/Hr	flow Ind. controller	Ctrl. Panel	
	FCV-204	CY-202	Co2 Flow Control Valve to R-202 a,b,c	CY-202 Header	0 - 100	%	Control Valve	pneumatic	
2	FT-205	CY-202	Flow Transmitter in Co2 to SV-203 Line	CY-202 Header	0-50	Kg/Hr	Mass flow transmitter		
	FIC-205	CY-202	Flow Indicating Controller for CY-202	CY-202 Header		Kg/Hr	flow Ind. controller	Ctrl. Panel	
	FCV-205	CY-202	Co2 Flow Control Valve to SV-203	CY-202 Header	0 - 100	%	Control Valve	pneumatic	
3	FT-206	ST-204 a,b	Flow Transmitter for P-206 a,b to Cr-201a Line	P-206 a,b	0-500	Kg/Hr	Mass flow transmitter		
	FIC-206	ST-204 a,b	Flow Indicating Controller for P-206 a,b Outlet Line	P-206 a,b		Kg/Hr	flow Ind. controller	Ctrl. Panel	
	FCV-206	ST-204 a,b	Filtrate Flow Control Valve to Cr-201 a	P-206 a,b	0 - 100	%	Control Valve	pneumatic	
1	VFD-204 a,b c	R-202 a,b c	R-202 a,b c RPM Controller	R-202 a,b c	0-100	%	Variable freq. Drive	Electronic	*Note-2
2	VFD-206	SV-203	SV-203 RPM controller	SV-203	0-100	%	Variable freq. Drive	Electronic	*Note-2
1	pHE-205 a,b,c	R-202 a,b,c	R-202 a,b,c pH Element/Sensor	R-202 a,b,c	1-14		pH Element/Sensor		



Project: DCDA  
Client:  
Location:  
Unit: Section-200B

# Instrument Index

Prepared By: GSS      Checked By: KK &      Approved By:

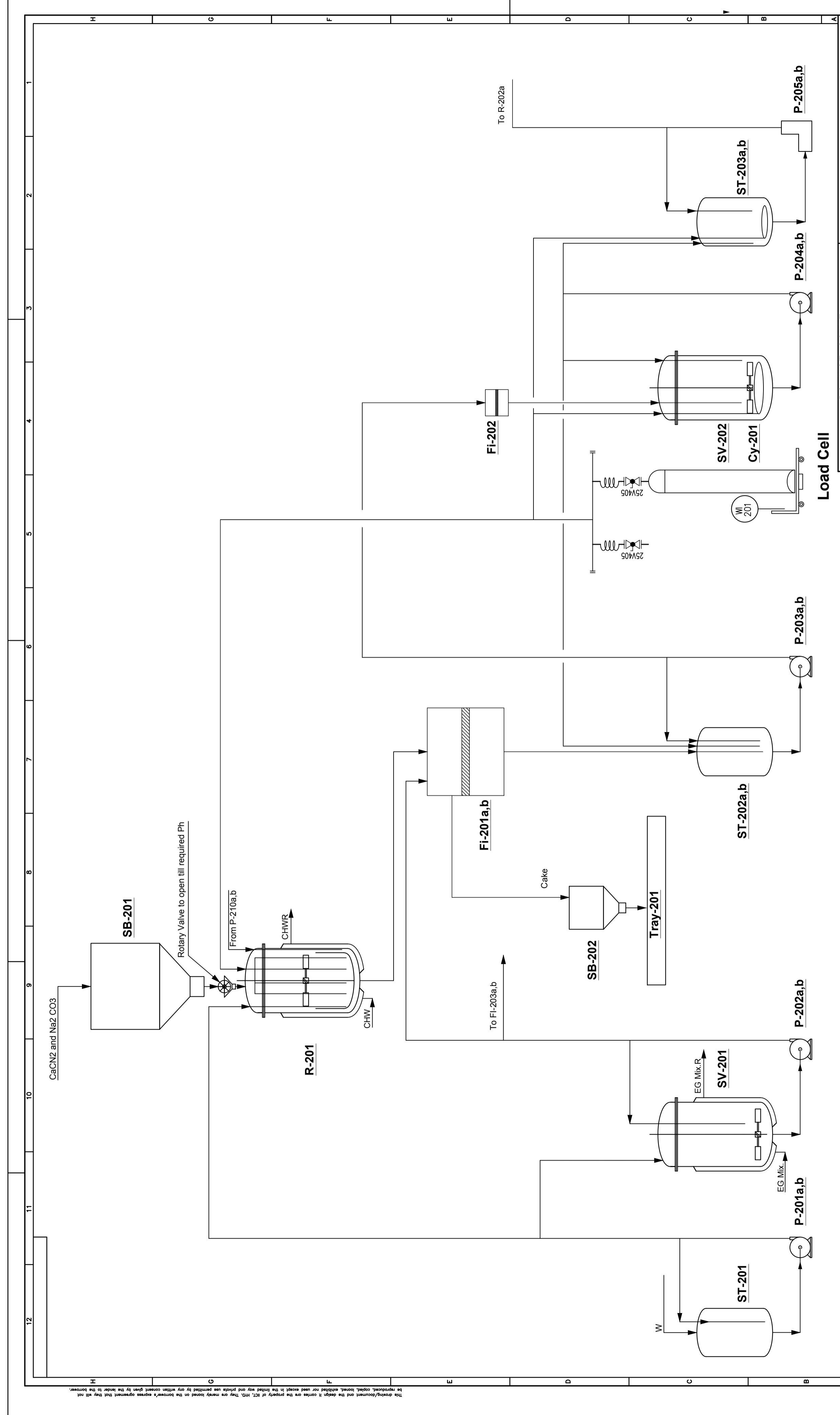
Date:  
Doc. No.: DE-DCDA-XXX-XX-XXX  
Revision No.: Rev. 0



S.No	Tag No.	Equipment Name	Service	Location	Range	Units	Description	Type	Remarks
	pHI-205 a,b,c	R-202 a,b,c	R-202 a,b,c pH indicator	R-202 a,b,c	1-14		pH indicator	Ctrl. Panel	
2	pHE-206 a,b	ST-204 a,b	ST-204 a,b pH Element/Sensor	ST-204 a,b	1-14		pH Element/Sensor		
	pHI-206 a,b	ST-204 a,b	ST-204 a,b pH indicator	ST-204 a,b	1-14		pH indicator	Ctrl. Panel	
3	pHE-207	SV-203	SV-203 pH Element/Sensor	SV-203	1-14		pH Element/Sensor		
	pHI-207	SV-203	SV-203 pH indicator	SV-203	1-14		pH indicator	Ctrl. Panel	
1	P-206 a,b	ST-204 a,b	Metering Pump	ST-204 a,b	50	LPM	Metering Pump		
2	P-207a,b	SV-203	Transfer Pump	SV-203	100	LPM	Transfer Pump		
3	P-208 a,b	ST-205	Transfer Pump	ST-205	100	LPM	Transfer Pump		
4	P-209 a,b	ST-206 a,b	Transfer Pump	ST-206 a,b	100	LPM	Transfer Pump		
5	P-210 a,b	ST-207a,b	Transfer Pump	ST-207a,b	100	LPM	Transfer Pump		

\*Note-1: Vendor has to be verified with equipment fabrication drawing.

\*Note-2: Required RPM Display at Control Panel for VFDs.



**DO NOT SCALE**

**DESIGN & ENGINEERING DIVISION**  
**CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY**  
 PROJECT : Pilot Plant Facility For Bulk Chemicals  
 CLIENT : In-House  
 LOCATION : ICT Hyderabad  
 CAPACITY : 125 Kg/Day

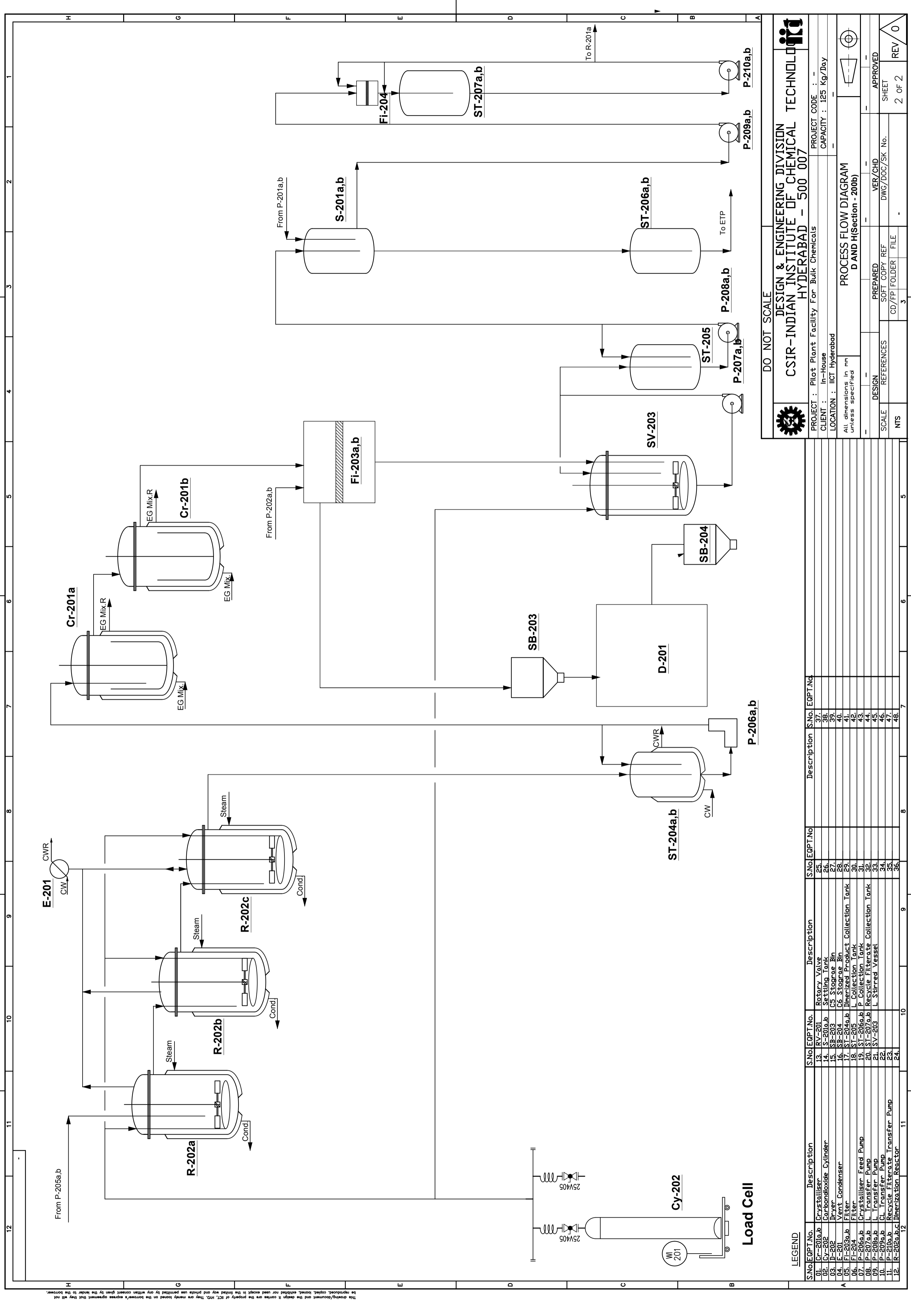
**PROCESS FLOW DIAGRAM**  
**D AND H (Section - 200a)**

SCALE	DESIGN	PREPARED	VER./CHD
MS	REFERENCES	CD/PPT FOLDER	FILE
NTS		3	

APPROVED  
 SHEET 1 OF 2  
 REV 0

**LEGEND**

S.No	EQPT.No.	Description	S.No	EQPT.No.	Description
01	Cr-201a	Carbon dioxide Cylinder	25	SB-203	Storage Bin
02	Cr-201b	Carbon dioxide Cylinder	26	ST-203a,b	Collection Tank
03	Fi-201a,b	Filter	27	SV-201	Separator
04	P-201a,b	Transfer Pump	28	SV-202	Separator
05	P-202a,b	Transfer Pump	29	Tray-201	Tray
06	P-203a,b	Transfer Pump	30	Tray-201	Tray
07	P-204a,b	Transfer Pump	31	Tray-201	Tray
08	P-205a,b	Transfer Pump	32	Tray-201	Tray
09	R-201	Hydrolysis Reactor	33	Tray-201	Tray
10	SB-201	CS Storage Bin	34	Tray-201	Tray
11	SB-202	CS Storage Bin	35	Tray-201	Tray
12	ST-201	W Storage Tank	36	Tray-201	Tray



**DO NOT SCALE**

**DESIGN & ENGINEERING DIVISION**  
**CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY**  
 PROJECT : Pilot Plant Facility For Bulk Chemicals  
 CLIENT : In-House  
 LOCATION : ICT Hyderabad  
 CAPACITY : 125 Kg/Day

**PROCESS FLOW DIAGRAM**  
**D AND H (Section - 200b)**

SCALE	DESIGN	PREPARED	VER./CHD
MS	REFERENCES	CD/PPT FOLDER	FILE
NTS		3	

APPROVED  
 SHEET 2 OF 2  
 REV 0

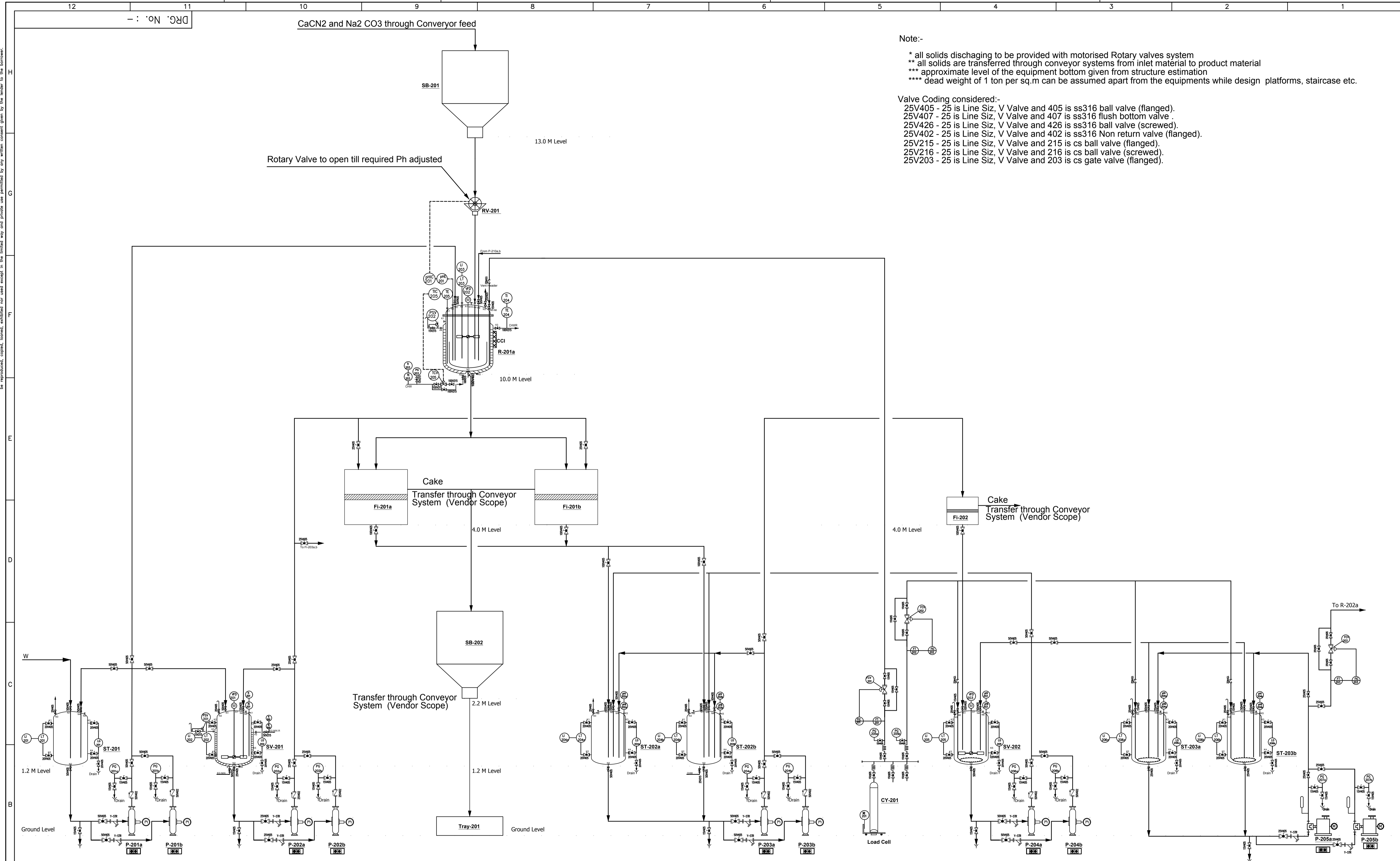
**LEGEND**

S.No	EQPT.No.	Description	S.No	EQPT.No.	Description
01	Cr-201a	Carbon dioxide Cylinder	25	SB-203	Storage Bin
02	Cr-201b	Carbon dioxide Cylinder	26	ST-203a,b	Collection Tank
03	Fi-201a,b	Filter	27	SV-201	Separator
04	P-201a,b	Transfer Pump	28	SV-202	Separator
05	P-202a,b	Transfer Pump	29	Tray-201	Tray
06	P-203a,b	Transfer Pump	30	Tray-201	Tray
07	P-204a,b	Transfer Pump	31	Tray-201	Tray
08	P-205a,b	Transfer Pump	32	Tray-201	Tray
09	P-206a,b	Transfer Pump	33	Tray-201	Tray
10	P-207a,b	Transfer Pump	34	Tray-201	Tray
11	R-202a	Hydrolysis Reactor	35	Tray-201	Tray
12	R-202b	Hydrolysis Reactor	36	Tray-201	Tray

Note:-

- \* all solids discharging to be provided with motorised Rotary valves system
  - \*\* all solids are transferred through conveyer systems from inlet material to product material
  - \*\*\* approximate level of the equipment bottom given from structure estimation
  - \*\*\*\* dead weight of 1 ton per sq.m can be assumed apart from the equipments while design platforms, staircase etc.
- Valve Coding considered:-
- 25V405 - 25 is Line Siz, V Valve and 405 is ss316 ball valve (flanged).
  - 25V407 - 25 is Line Siz, V Valve and 407 is ss316 flush bottom valve.
  - 25V426 - 25 is Line Siz, V Valve and 426 is ss316 ball valve (screwed).
  - 25V402 - 25 is Line Siz, V Valve and 402 is ss316 Non return valve (flanged).
  - 25V215 - 25 is Line Siz, V Valve and 215 is cs ball valve (flanged).
  - 25V216 - 25 is Line Siz, V Valve and 216 is cs ball valve (screwed).
  - 25V203 - 25 is Line Siz, V Valve and 203 is cs gate valve (flanged).

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	Start/Stop Push Button Station
	RELIEF VALVE
	Relief Valve
	INSTRUMENT
	Temp. Indicator
	Instrument
	VALVE
	Valve Specification
	Nominal Size in Inch

	Process Line
	CHW & CW
	Instrument Air line
	Hot Oil
	Electrical line
	ITEM LEGEND LINE
	WC Supply
	WC Return
	Instrument Air
	Cooling Water Supply
	Cooling Water Return
	Floor Drain
	Process
	INSULATION
	HCI Heat Conservative Insulation
	CCI Cold Conservative Insulation
	VFD Variable Frequency Drive

INSTRUMENTS	
FC	Flow Controller
FI	Flow Indicator
FT	Flow Transmitter
FQI	Flow Quantity Indicator
FQAH	Flow Quantity Alarm High
LG	Level Gauge
LT	Level Transmitter
LUC	Level Indicating Controller
LAL	Low Level Alarm
IHAL	High Level Alarm
PIC	Pressure Indicating Controller
PAH	Pressure Alarm High
PG	Pressure Gauge
PI	Pressure Indicator
PT	Pressure Transmitter
TE	Temperature Element
TI	Temperature Indicator
TG	Temperature Gauge
TIC	Temperature Indicating Controller
WI	Weight Indicator
WT	Weight Transmitter
WIC	Weight Indicating Controller
SFI	Side Flow Indicator
VFD	Variable Frequency Drive

PIPING SYMBOLS (VALVES)	
	BALL VALVE (SCREWED)
	BALL VALVE (FLANGED)
	FLUSH BOTTOM VALVE (FLANGED)
	GLOBE VALVE (SCREWED)
	GLOBE VALVE (FLANGED)
	NEEDLE VALVE (SCREWED)
	NEEDLE VALVE (FLANGED)
	NON RETURN VALVE (SCREWED)
	NON RETURN VALVE (FLANGED)
	STRAINER (SCREWED)
	STRAINER (FLANGED)
	PRESSURE SAFETY VALVE (SCREWED)
	PRESSURE SAFETY VALVE (FLANGED)

CONTROL VALVES	
	CONTROL VALVE (FLANGED)
	LCV LEVEL CONTROL VALVE
	PCV PRESSURE CONTROL VALVE
	TCV TEMP. CONTROL VALVE
	HAND CONTROL VALVE
	ON/OFF VALVE

INSTRUMENT SYMBOL	
	PANEL MOUNTED
	LOCAL MOUNTED
	CONVERTOR
	DRAIN FUNNEL
	INSULATION

LEGEND			
S.No./Equipment No.	Description	S.No./Equipment No.	Description
01. Cy-201	Carbondioxide Cylinder	14. ST-203a,b	C3 Feed Tank
02. FI-201a,b	Filter	15. SV-201	WC Vessel
03. FI-202	Filter	16. SV-202	C3 Preparation Vessel
04. P-201a,b	W Transfer Pump	17. Tray-201	Tray
05. P-202a,b	WC Transfer Pump		
06. P-203a,b	C3 Transfer Pump		
07. P-204a,b	C3 Transfer Pump		
08. P-205a,b	C3 Feed Metering Pump		
09. R-201	Hydrolysis Reactor		
10. SB-201	C1 Stograe Bin		
11. SB-202	C2 Cake Stograe Bin		
12. ST-201	W Storage Tank		
13. ST-202a,b	C3 Collection Tank		

**DO NOT SCALE**

**DESIGN & ENGINEERING DIVISION**  
**CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY**  
**HYDERABAD - 500 007**

PROJECT : Pilot Plant Facility For Bulk Chemicals  
 CLIENT : In-House  
 LOCATION : IICT Hyderabad

PROJECT CODE :-  
 CAPACITY : 125 Kg/Day

**P & I DIAGRAM**  
 D AND H (Section - 200a)

DESIGN	PREPARED	VER/CHD	APPROVED
SCALE	REFERENCES	SOFT COPY REF	DWG/DOC/SK No.
NTS		CD/FP FOLDER	FILE

SHEET 1 of 2 REV 0

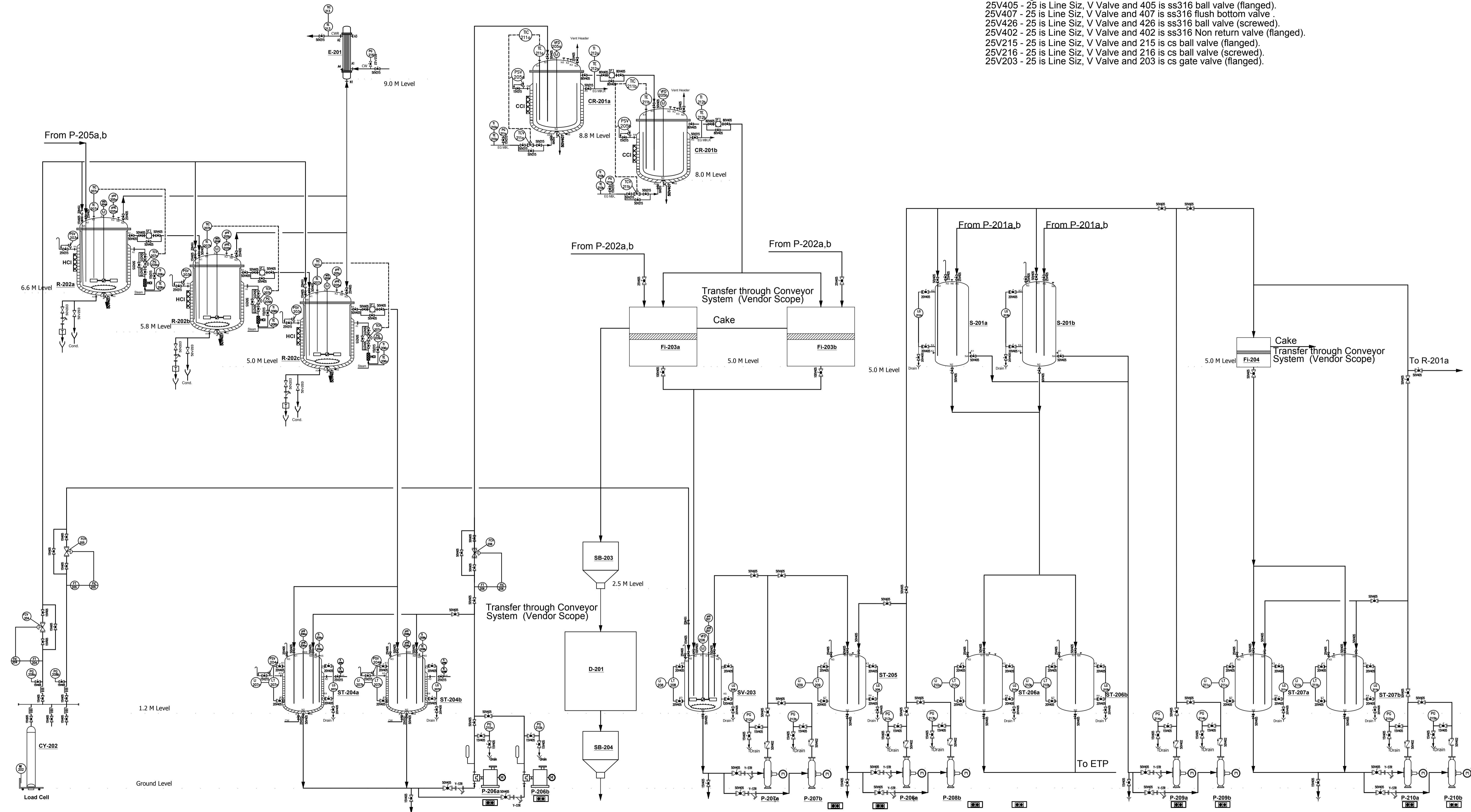
Note:-

- \* all solids discharging to be provided with motorised Rotary valves system
- \*\* all solids are transferred through conveyor systems from inlet material to product material
- \*\*\* approximate level of the equipment bottom given from structure estimation
- \*\*\*\* dead weight of 1 ton per sq.m can be assumed apart from the equipments while design platforms, staircase etc.

Valve Coding considered:-

- 25V405 - 25 is Line Siz, V Valve and 405 is ss316 ball valve (flanged).
- 25V407 - 25 is Line Siz, V Valve and 407 is ss316 flush bottom valve .
- 25V426 - 25 is Line Siz, V Valve and 426 is ss316 ball valve (screwed).
- 25V402 - 25 is Line Siz, V Valve and 402 is ss316 Non return valve (flanged).
- 25V215 - 25 is Line Siz, V Valve and 215 is cs ball valve (flanged).
- 25V216 - 25 is Line Siz, V Valve and 216 is cs ball valve (screwed).
- 25V203 - 25 is Line Siz, V Valve and 203 is cs gate valve (flanged).

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INSTRUMENTS		PIPING SYMBOLS (VALVES)		CONTROL VALVES		INSTRUMENT SYMBOL		LEGEND	
FC Flow Controller	FI Flow Indicator	1 BALL VALVE (SCREWED)	2 BALL VALVE (FLANGED)	CONTROL VALVE (FLANGED)	PANEL MOUNTED	S.No. Equipment No.	Description	S.No. Equipment No.	Description
FT Flow Transmitter	FQI Flow Quantity Indicator	FLUSH BOTTOM VALVE (FLANGED)	FOOT VALVE / ROTARY VALVE	LCV LEVEL CONTROL VALVE	LOCAL MOUNTED	01. Cr-201a,b	Crystalliser	14. S-201a,b	Settling Tank
FOAH Flow Quantity Alarm High	LT Level Transmitter	GLOBE VALVE (SCREWED)	GLOBE VALVE (FLANGED)	PCV PRESSURE CONTROL VALVE	CONVERTOR	02. Cy-202	Carbon dioxide Cylinder	15. SB-203	CS Stograe Bin
LG Level Gauge	LAL Low Level Alarm	NEEDLE VALVE (SCREWED)	NEEDLE VALVE (FLANGED)	TCV TEMP. CONTROL VALVE	DRAIN FUNNEL	03. D-202	Dryer	16. SB-204	C6 Stograe Bin
LIC Level Indicating Controller	HAL High Level Alarm	NON RETURN VALVE (SCREWED)	NON RETURN VALVE (FLANGED)	HAND CONTROL VALVE	INSULATION	04. E-201	Vent Condenser	17. ST-204a,b	Dimerized Product Collection Tank
PAH Pressure Alarm High	PG Pressure Gauge	STRAINER (SCREWED)	STRAINER (FLANGED)	ON/OFF VALVE		05. Fi-203a,b	Filter	18. ST-205	L Collection Tank
PI Pressure Indicator	PT Pressure Transmitter	PRESSURE SAFETY VALVE (SCREWED)	PRESSURE SAFETY VALVE (FLANGED)			06. Fi-204	Filter	19. ST-206a,b	P Collection Tank
TE Temperature Element	TI Temperature Indicator					07. P-206a,b	Crystalliser Feed Pump	20. ST-207a,b	Recycle Filterate Collection Tank
TG Temperature Gauge	TIC Temperature Indicating Controller					08. P-207a,b	L Transfer Pump	21. SV-203	L Stirred Vessel
WI Weight Indicator	WT Weight Transmitter					09. P-208a,b	L Transfer Pump		
WIC Weight Indicating Controller	SFI Side Flow Indicator					10. P-209a,b	CL Transfer Pump		
VFD Variable Frequency Drive						11. P-210a,b	Recycle Filterate Transfer Pump		
						12. R-202a,b,c	Dimerization Reactor		
						13. RV-201	Rotary Valve		

MECH ENGR	PRCS ENGR	ELECT ENGR	CIVIL ENGR	CLIENT	CONSULTANT	CONTRACTOR
CLEARANCES						

DO NOT SCALE		DESIGN & ENGINEERING DIVISION		CSIR-INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY		HYDERABAD - 500 007	
PROJECT : Pilot Plant Facility For Bulk Chemicals		CLIENT : In-House		LOCATION : IICET Hyderabad		PROJECT CODE :- CAPACITY : 125 Kg/Day	
P & I DIAGRAM				D AND H (Section - 200b)			
SCALE		DESIGN		PREPARED		VER/CHD	
NTS		REFERENCES		SOFT COPY REF		DWG/DOC/SK No.	
				CD/FP FOLDER		FILE	
						APPROVED	
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						1 of 2	
						REV 0	