

WABIO Technologie GmbH -R&D Center Neukirchen-

Sitz: D-08459 Neukirchen/Pleisse

Project: MSW, sewage sludge+ straw, Tarragona Biogas Mora la Nova

Equipment List (Version 17.2M. Biogas)

			Vendor	Qty	Buy-In Price in Euro
Item	Description				
1.	Input storage/Grind Station I+II				
1.1.	Input storage 1 for 2.900 m³ MSE+ sewage sludge, covered storage RCC		local	1	
1.1.1.	Input storage 1, roof, steel construction (25 m L, 20 m W, 5,0 m H)		local	1	
1.2.	Input storage 2 for 1200 m³ Straw, covered storage RCC		local	1	
1.2.1.	Input storage 2 roof, steel construction (11,25 m L, 20 m W, 5,0 m H)		local	1	
1.3.	Buffering and dosing station, 160 m³		local/import	3	
1.4.	Conveyor		local	2	
1.5.	QZ		MEWA	4	
1.6.	Rotacut		VOGELANG	2	
1.7.	Plurymaxx		WOPEREIS	4	
1.7.1.	Plurymaxx spare set		WOPEREIS	4	
2.	Suspension Station				
2.1.	Submerged special stirrers-Fitted in Biosuspension Tank (BST) (1 nos + 1 red)		PAULMICHL	4	
2.2.	BST in RCC by Customer 500 m³ filling volume		local	2	
2.3.	Process water tank in RCC, 1000 m³		local	1	
2.4.	Biosuspension Transfer Pump 50 m³/hr at 2,5 bar		NETZSCH	4	
2.5.	Bio-Acid Tank coating Epoxy		local lining	2	
2.6.	Bio-Acid Dosing Pump 2 m³/hr and 2 bar		any	2	
3.	Hydrolysis Station				
3.1.	Hyrolysis Reactor 1 in SS, 750 m³ volume 11 m D * 8,25 m H (approx 22 tons SS)		local/chinese	2	
3.2.	Hyrolysis Reactor 2 in SS, 750 m³ volume 11 m D * 8,25 m H (approx 22 tons SS)		local/chinese	2	
3.3.	Heatingsystem for Hydrolysis Tank			4	
3.4.	Air Ventilators + air Distribution system 150 m³/hr with Air Pressure at 1,5 bar		BECKER or local	4	
3.5.	Agitator-top		PAULMICHL	4	
4.	Main -fermenter station				
4.1.	Hydrolysate pump station with Feed Metering Pumps (50 m³/hr at 2,5 bar)		NETZSCH	2	
4.2.	Main Fermenter 1 (Steel Shell and Internals), 6.000 m³, 23m x 23 m, appx. 380 tons construction steel		local	1	
4.3.	Main Fermenter 2 (Steel Shell and Internals), 6.000 m³, 23m x 23 m, appx. 380 tons construction steel		local	1	
4.4.	Steel Structurals Supports for Mechanical Equipment		local	2	
4.4.	Heating Tubes of Fermenter CS - U-profile-limpets apx. 8 tons weight		local	2	
4.5.	Submerged Stirrer for Main Fermenters, 2.000 m³/hr, 3 nos each Fermenter		PAULMICHL	6	
4.6.	Insulation/paint primer		Rach - local	2	
4.7.	Gas Regulating Valves in SS (DUNGS)		DUNGS	2	
4.8.	Controlling instruments		BINDER	1	
4.9.	Video Station		MAX MÜLLER	2	
5.	Post Fermentation Station				

5.1.	Post fermenter tank 1, 4.600 m ³ , D=30 m, H=8 m, - RCC		local	2
5.2.	Post fermenter tank 2, 4.600 m ³ , D=30 m, H=8 m, - RCC		local	2
5.3.	Post fermenter (steel and internals)		local	4
5.4.	Submerged Stirrer for Post Fermenters, 2.000 m ³ /hr, 3 nos each Fermenter		LJM DENMARK	12
5.5.	Insulation		RACH or local	4
5.6.	Controlling Instruments		BINDER	1
5.7.	Monitoring System - Video station		MAX MÜLLER	4
6.	Fermentation residue station			
6.1.	fermentation residue pump (100 m ³ /hr at 1,5 bar		NETZSCH	4
6.2.	Fermentation Residue Tank 1, 4.600 m ³ , D=30 m, H=8 m, - RCC		local	1
6.3.	Fermentation Residue Tank 2, 4.600 m ³ , D=30 m, H=8 m, - RCC		local	1
6.4.	Fermentation Residue Stirrer installed in RCC TANK, 2 nos each tank		LJM DENMARK	4
6.5.	Fermentation Residue Dosing Pumps in SS 25		NETZSCH	4
6.6.	Dewatering Screw Press for Fermentation Residues for 7,5 m ³ /hr (4 nos + 2 red)		FAN AUSTRIA	6
6.6.1.	Steel platforms for screw press 8 m height		local	2
6.7.	Bio-Filtrate Storage tank 1 in RCC - 750 m ³ -Size Ø 11 m x 8,25 m height; apx. 8 t equipm.		local	1
6.8.	Bio-Filtrate Storage tank 2 in RCC - 750 m ³ -Size Ø 11 m x 8,25 m height; apx. 8 t equipm.		local	1
6.9.	Submerged stirrers for above 6.6.		LJM DENMARK	2
6.10.	Fermentation residue drying station, 2,0 t Steam/h		REGENIS	0
6.11.	Dry product separation station, 2 t/h		local	0
6.12.	Fertilizer storage, RCC 45 m L, 20 m W, 4 m H		local	1
6.13.	non biogen waste box, RCC, 12 m L, 6 m W, 3 m H		local	1
6.14.	Fertilizer storage roof, steel construction (45 m L, 20 m W, 7,0 m H) * 230,- €/m ² .		local	1
7.	Inhibitor-Extraction Station, total			
7.1.	Bio-Filtrate Pump to Inhibitor extraction stations, 25 m ³ /hr		KSB AG/Netzsch	4
7.2.	Inhibitor extraction station 1 for 6 m ³ /hr		local	1
7.3.	Inhibitor extraction station 2 for 7,5 m ³ /hr		local	1
7.4.	NS liquid fertiler tank, 100 m ³ PVS/PE		local	2
7.5.	Waste Water Sump /processwater pump station 25 m ³ /h at 1,5 bar		KSB or local	2
8.	Gas-handling station			
8.1.	Raw gas donut shape double membrane storage, 1,100 m ³		TECON/SLPP	6
8.2.	Gas radial blowers for (650 m ³ /hr, 50 mbar)		MEIDINGER	2
8.3.	Gas Desulfurization station, complete for 1.200 m ³ /hr		TS-Anlagenbau	2
8.4.	Condensate tank, 1.200 m ³ , -Size Ø 30 m x 2,0 m height, RCC		local	2
8.5.	Cleangas double membrane storage, 6.000 m ³		TECON/SLPP	2
8.6.	Purification station 2.500 m ³ /h (Raw gas)		SLLP	0
8.7.	Controlling instruments		BINDER	1
8.8.	Gas drying station für 2.400 m ³ /hr		APROVIS	1
8.9.	Gas compressing station für 1.200 m ³ /hr, 200 mbar, 2 nos +1 red.		MEIDINGER	3
8.10.	Condensate Pump 10 m ³ /h at 1,5 bar			2
8.11.	Flare station 12,5 MW th.		C-DEG	1
9.	Interconnecting Piping & Instruments		local	1
	Gas Piping			
	Slurry Piping			
	Water Piping			
	Steam Piping			
	Slurry Valves			
	Water Valves			
	Steam valves			

	Measuring Instruments				
	Pipe collektor, 1.000 m²		local	1	
10.	Biogas separation and liquefaction equipment				
10.1.	Equipment for biogas separation and liquefaction of methane-CH ₄ and CO ₂		ZORG	1	
11.	Electricals		local	1	
11.1.	50 kW Generator Set - emergenci		local	1	
11.2.	PROFIBUS SYSTEM			1	
	internal Distribution Equipment				
12.	M.C.C. panels For each Sation above		div	1	
	Cables from Panel to each motor				
	Earthing materials				
13.	Automation Control Valves Including Field Measurement and Transmitters with PLC		div	1	
	EXW with seaworthy Packing Insurance				
14.	WABIO Supervision for technology implementation per 12 months regular construction time			1	
	WABIO Engineering, basic +detailed (as far as necessary) + civil			1	
	License fee			1	
	Commissioning (last 3 months)			1	
	Supply Bacteria culture			1	
	Travel Cost flat for 15 months			1	
	Subtotal (FOB)				
15.	RCC & Civil				
			m³		
	Catchment area not reinforced simple area concrete layer		5.129		
	Reinforced concrete for fundaments		2.696		
	Reinforced concrete for tanks:		2.749		
	RCC & Civil total				
16.	Estimated Cost of Local Erection of Equipment/ Piping/ etc.				
17.	Total price estimate				

Exclusions

ALL INPUTS OTHER THAN ABOVE MENTIONED

WATER SUPPLY SOURCE

ALL LOCAL STATUTORY PERMISSIONS

LABORATORY

PLANT OFFICE

ACCESS ROAD/RAMP

SOIL PREPARATION

FREIGHT TO CUSTOMER

TRANSFORMERS/GRID CONNECTION

LIGHTNING PROTECTION/LIGHTING/FENCING

Boarding/Lodging/Visa/office availability/internet/tel/fax to be provided by customer

Neukirchen, 29.01.2024

WABIO Technologie GmbH

-R&D Center Neukirchen-

Sitz: D-08459 Neukirchen/Pleiße

Project: MSW, sewage sludge + straw- Tarragona Biogas Mora la Nova

Quantitativ Precalculation of Concrete Work (17,2M Biogas)

Item	Description	Qty	Main Sizing					Weight with $\delta = 2,4$ t	Concret- volume m ³
			$\varnothing$ m	H m	L m	W m	Wall- thick m		
	<u>RCC-Construction: at Site by Customer</u>								
1.	Plain flat simple concrete								
1.1.	Catchment Room	1	0	1,8	200	90	0,25	10.800	4.500
1.2.	Input storage for MSW/Sewage sludge	1	0	11	25	20	0,30	360	150
1.3.	Input storage for Straw	1	0	11	11,3	20	0,30	162	68
1.4.	Compost storage (70 % DS)	1	0	11	20	20	0,30	288	120
1.5.	Bottom waste box	1	0	3	12	6	0,30	52	22
1.6.	NPKS Fertilizer (30 % DS) storage	1	0	11	45	20	0,30	648	270
1.7.	Total plain flat simple concrete							12.310	5.129
2.	Reinforced foundation concrete								
2.1.	Dosing and buffering station	3	0	4	25	4	0,30	216	90
2.2.	Biosuspensions Tank, 500 m ³	2	16	4	0	0	0,30	289	121
2.3.	Hydrolysis Station 1, SS, 750 m ³	2	11	8,25	0	0	0,00	0	0
2.4.	Hydrolysis Station 2, SS, 750 m ³	2	11	8,25	0	0	0,00	0	0
2.5.	WABIO-Fermenter 1, 6.000 m ³	1	24	23	0	0	0,50	543	226
2.6.	WABIO-Fermenter 2, 6.000 m ³	1	24	23	0	0	0,50	543	226
2.7.	Post Fermenter station 1, 4.600 m ³	2	31	8	0	0	0,35	1.267	528
2.8.	Post Fermenter station 2, 6.000 m ³	2	31	8	0	0	0,35	1.267	528
2.9.	Desulphurization,	2	5	18	0	0	0,60	57	24
2.10.	Fermentation Residue Tank 1, 4.600 m ³	1	31	8	0	0	0,35	634	264
2.11.	Fermentation Residue Tank 2, 4.600 m ³	1	31	8	0	0	0,35	634	264
2.12.	Clean gas/condensate storage, 6.000 m ³	2	31	2	0	0	0,20	724	302
2.13.	NPKS fertilizer tank 100 m ³	1	3,6	11	0	0	0,00	0	0
2.14.	Gas Emergency Torch	1	5	10	0	0	0,40	19	8
2.15.	Inhibitor-Extraction Station 1	0	0	11	10	8	0,00	0	0
2.16.	Inhibitor-Extraction Station 2	0	0	11	12	10	0,00	0	0
2.17.	Processwater tank,	1	15	6	0	0	0,25	106	44
2.13.	Foundation plate	5	0	0	12	4	0,30	173	72
2.14.	Total reinforced foundation concrete							6.471	2.696
3.	Reinforced concrete tanks (wall/ceiling)								
3.1.	Wall of Biowaste-Input storage	1	0	6	25	20	0,35	454	189
3.2.	Wall of straw-Input storage	1	0	4	15	20	0,35	454	98
3.3.	Suspension Tank, 500 m ³	2	15	4	0	0	0,25	446	186
3.4.	Bioacid Tank, 50 m ³	2	4	4	0	0	0,20	24	10
3.5.	Post Fermenter station 1, 4.600 m ³	2	30	8	0	0	0,30	1.104	460
3.6.	Post Fermenter station 2, 4.600 m ³	2	30	8	0	0	0,30	1.104	460
3.7.	Fermentation Residue Tank 1, 4.600 m ³	1	30	8	0	0	0,30	552	230
3.8.	Fermentation Residue Tank 2, 4.600 m ³	1	30	8	0	0	0,30	552	230

3.9.	Biofiltrate Tank 1, 750 m ³	1	11	8,25	0	0	0,25	232	97
3.10.	Biofiltrate Tank 2, 750 m ³	1	11	8,25	0	0	0,25	232	97
3.11.	NPKS fertilizer tank, 300 m ³	0	0	0	0	0	0,30	0	0
3.12.	Condensate tank/Cleangas storage	2	30	2	0	0	0,30	276	115
3.13.	Processwater tank,	1	15	6	0	0	0,25	174	72
3.14.	Wall of compost storage	1	0	6	20	20	0,30	346	144
3.15.	Wall of fertilizer storage	1	0	4	45	20	0,30	374	156
3.16.	Wall of Waste-box	1	0	3	12	6	0,30	78	32
3.17.	Wall of the Catchment Room	1	0	1,2	200	90	0,25	418	174
3.12.	Summary of Reinforced Concret Tanks							6.816	2.749

Neukirchen, d. 01.29.2024