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Wignity
Water Dignified

Wignity, adj. - to add
dignity to the world of
water management

Dear Water Warriors,

A new beginning with “Stronger Together”, we understand the importance of something that defines the success of a Water or Wastewater Project..Components.

Components - all are perfect but if selected properly. The knowledge available with Product designers shall be channelized to Water Companies through Wignity.

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'Handyman' is dedicated to the engineers and technicians in field, often alone and at remote sites but expected to solve their day-to-day issues. We have tried to be comprehensive and cover formulas, calculations, and basics well in Version 1 of Handyman – "Waughter Volume 1 Edition 10".

In 2nd version of the Handyman, we will introduce you to Design Tools.

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- 🔗 Water Chemistry – Acid/Alkali Dose Calculator
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- 🔗 Reverse Osmosis Design

(For the RO Design Refer Waughter Vol 2 Edi 6 : Reverse Osmosis Design from Software and Pre-treatment Significance)



Water Chemistry – Acid/Alkali Dose Calculator

Water chemistry is the most important subject for you to learn before visiting a customer.

Wignity		Aktion Waughter Private Limited		AKTION WAUGHTER
C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)				
Sr No	Parameter	Unit	Value	Formula
1	pH Actual	-	6.7	Feed From Report
2	pH Required	-	6.4	Desired pH
3	M Alkalinity	mg/l as CaCO3	100	Feed From Report
4	P Alkalinity	mg/l as CaCO3	11	Check pH as Most water will have P=0
5	HCO3	mg/l as CaCO3	100	Fill Manually, Alkalinity Relationships
6	CO3	mg/l as CaCO3	0	Fill Manually, Alkalinity Relationships
7	OH	mg/l as CaCO3	0	Fill Manually, Alkalinity Relationships
8	CO2	mg/l as CO2	39.81	=E6/10^(E2-6.3)
9	Dose of NaOH/HCL	mg/l as CaCO3	-23.66	If Positive naOH, Negative HCl
10	Dose as Such Alkali	mg/l as NaOH	-18.93	
11	Dose as Such Acid	mg/l as HCl	17.75	Discard if Negative Value
Available value		Acid/Alkali Dose Calculator		
Desired				
Fill after undersatnding M, P Relation				

(01 pH Correction HCl NaOH Dosing.xls)

Key to Follow

1. Fill data from the Report
2. Fill desired value & data after understanding M, P relation

Clarifiers & Tube settler Design

Clarifiers are essential components in water treatment processes, employing gravitational forces to separate suspended solids from liquid, promoting settling and facilitating the removal of impurities.

Wignity		Aktion Waughter Private Limited		AKTION WAUGHTER
C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)				
Project	Practice	Client Data		
CLIENT CONSULTANT	ImpaKT	To Select		
Consultant	Aktion Indiaa	Design data		
EPC	ABC	Final Selection		
Sr No	Design Parameter	Abbr.	Value	Unit
A	Parameter			
A.1	Flow rate	F	215.00	m ³ /h
A.2	Suspended Solids	T	800	mg/L
A.3	Rise Rate	R	2.4	m ³ /m ² .h
A.4	Retention Time: Clarification	CRT	90	min
A.5	Retention Time: Flocculation'	FRT	20	min
A.6	Side Water Depth Excluding Free Board	H	3.5	m
A.7	Flocculator	FB	0.5	m
A.8	Retention Time: Draft Tube	DRT	2	min
A.9	Flocculator SWD	FSWD	2.2	m
A.10	Height Draft Tube	HDT	2.2	m
B	Diameter Based on Rise Rate			
B.1	Surface Area Based on Rise Rate: SAR	F/R	89.58	m ²
B.2	Water Volume Flocculation Zone: FV	F x FRT	71.67	m ³
B.3	Water Volume Draft Tube Zone: DV	F x DRT	7.17	m ³
B.4	Flocculator Area: FA	FV/FSWD	32.58	m ²
B.5	Draft Tube Area: ADT	DV/HDT	3.26	m ²
B.6	Total Surface Area: TSA	SAR+FA+ ADT	125.42	m ²
B.7	Dia of Flocculation Zone	DF	6.44	m
B.8	Dia of HRSCC	DSA	12.64	m
B.9	Dia of Draft Tube		2.04	m

(02 High Rate Solids Contact Clarifier & Tube Settler.xls)

Key to Follow

Put data and value as mentioned color code in the design tool.

Wignity		Aktion Waughter Private Limited		AKTION WAUGHTER
C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)				
Flow	m ³ /day	1000		
	m ³ /hr	41.667		
Vertical Ht of Tube	m	0.75		
Shape	Hex-Chevron			
Cross section size	mmxmm	120 x 44		
Settling Area	m ² /m ³	11		
Angle of Inclination	Degree	60		
Up Wards Velocity (Max 5-7)	m/hr	5		
Factor of Safety		0.75		
Plan area Reqd	m ²	11.111		

(02 High Rate Solids Contact Clarifier & Tube Settler.xls)



PureBactTM



LOOKING FOR TECHNICALLY
COMPETENT AND COMMERCIALY
SOUND PARTNERS TO WORK
WITH ACROSS THE WORLD.

Aerobic Bacteria Culture

We at Pure Water Enterprises have recently partnered up with Zytex Biotech, a 75 year old industry leading biotechnology company based out of Mumbai. Together, we are very excited to introduce our very own brand of bacteria culture offerings for ETPs and STPs, **PureBact Bacteria Culture**.

OUR COMMITMENT TO EXCELLENCE



EXPERIENCE -
More than 75 years of
Industry leadership



TRANSPARENCY -
Complete CFU count
disclosure on every pack



PROVEN & TESTED -
Thorough testing
under stringent conditions



TESTING FACILITIES -
2 state of the art lab
testing facilities for trials

OUR PRODUCT RANGE

Our PureBact Bacteria culture range of products help our customers tackle numerous challenges that they face at their ETPs and STPs.

All our products come with the CFU (Colony Forming Units) count disclosure on each packet. What you see is what you always get!

Our always available technical team will help you choose the most efficient & cost-effective product, tailored to your needs.



PureBact - 10

CFU count -
1 billion/gram
For regular maintenance &
trouble free operations



PureBact - 20

CFU count -
2 billion/gram
For fluctuating
inlet parameters



PureBact - 50

CFU count -
5 billion/gram
For challenging
BOD/COD conditions



PureBact - 100

CFU count -
10 billion/gram
For regaining control
over plant upsets



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Filter and Carbon Filter Design

At a site we see some GRP Filter and need to calculate media quantity to commission the plant. Media is available with Client, and he can give provided we tell quantity. Let's Calculate, For Sand Filter:

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)		AKTION WAUGHTER	
Pressure Sand Filter in MS					
Parameter	Symbol	Unit	Value	Source	
Flow rate	Q _s	m ³ /h	50	Customer	
Rate of Filtration, Selected	Sp.V	m ³ /h.m ²	9	Aktion	
Area of the Vessel, required	A = Q _s /Sp.V	m ²	5.56	Calculation	
Diameter of Vessel, required	Ø = (4A/π) ^{0.5}	mm	2660	Calculation	
Vessel Selected	Ø _s	mm	2800	Aktion	
Area of the Vessel, Revised	A _r = πØ _s ² /4	m ²	6.15	Calculation	
Height of Media	H	mm	550	Design for PSF	
Free Board for Expansion	Fb	%	100	Design for PSF	
HOS Required	HOS	mm	1100	Calculation	
Under Bed (Gravel, pebble above HOS)		mm	250	Design for PSF	
HOS Provided	HOS _p	mm	1500	Aktion	

(03 Sand & Carbon Filter Design.xls)

For Carbon Filter:

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)		AKTION WAUGHTER	
Activated Carbon Filter in MS					
Parameter	Symbol	Unit	Value	Source	
Flow rate	Q _s	m ³ /h	10	Customer	
Rate of Filtration, Selected	Sp.V	m ³ /h.m ²	13	Aktion	
Area of the Vessel, required	A = Q _s /Sp.V	m ²	0.769230769	Calculation	
Diameter of Vessel, required	Ø = (4A/π) ^{0.5}	mm	990	Calculation	
Vessel Selected	Ø _s	mm	1000	Aktion	
Area of the Vessel, Revised	A _r = πØ _s ² /4	m ²	0.79	Calculation	
Height of Media	H	mm	1000.0	Design for ACS	
Free Board for Expansion	Fb	%	100	Design for ACS	
HOS Required	HOS _{media}	mm	2000	Calculation	
Under Bed (Silix HOS)	HOS _{support}	mm	200	Design for ACS	
Minimum HOS Required	HOS _{min (media+support)}	mm	2200	Calculation	
HOS Provided	HOS _p	mm	2200	Aktion	
Qty of carbon (Iodine value > 950)		m ³	0.785	Calculation	
Qty of carbon (Iodine value > 950)		kg	392.5	Calculation	
Rate of back wash, Selected	Sp.V	m ³ /h.m ²	9	Aktion	
Flow Rate, Backwash	Q _{bw}	m ³ /h	7.07	Calculation	
Back Wash Duration	t	min	10.00	Design for ACS	
Back Wash Water Volume	V	m ³	1.18	Calculation	

(03 Sand & Carbon Filter Design.xls)

STD GRP vessels are as here under:

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)		AKTION WAUGHTER	
Sl No	Model	Tank OC	Tank IC	Design	Material
1	10000	10000	10000	10000	10000
2	10000	10000	10000	10000	10000
3	10000	10000	10000	10000	10000
4	10000	10000	10000	10000	10000
5	10000	10000	10000	10000	10000
6	10000	10000	10000	10000	10000
7	10000	10000	10000	10000	10000
8	10000	10000	10000	10000	10000
9	10000	10000	10000	10000	10000
10	10000	10000	10000	10000	10000
11	10000	10000	10000	10000	10000
12	10000	10000	10000	10000	10000
13	10000	10000	10000	10000	10000
14	10000	10000	10000	10000	10000
15	10000	10000	10000	10000	10000
16	10000	10000	10000	10000	10000

(03 Sand & Carbon Filter Design.xls)

So be aware that use Tank HOS and not over all HOS while designing.

Ion – Exchange Resin

Resins are Key to Demineralization; Resins are classified based on the type of functional group they contain and their % of cross-linkages. Refer “Handyman – Vol 1 Edi 10.”

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)		AKTION WAUGHTER	
User Requirement					
Client		ABC Limited			
Consultants		Aktion Waughter			
Parameter	Symbol	Unit	Formula	Value	
Scheme Selected				CDA_MB	
Out between regenerateaion - DM Plant	OBR _{DM}	m ³ /h	Input	1000	
Operating Cycle	O _p	h	Input	24	
No of Regn /day for DM	Reg _{DM}	Nos	Input	1	
MB Regn Frequency	Reg _{MB}	d	Input	7	
Regeneration Time DM	R _T	h	Input	4	
Working Time	W _T	h	= O _p - R _T	20	
OBR for Mixed Bed, if Provided	OBR _{MB}	m ³	= OBR _{DM} * Reg _{MB}	7000	
Plant Flow Rate	Q	m ³ /h	= OBR _{DM} / O _T	50	

(04 IX Resin CDA Design.xls) : 01 Input

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)		AKTION WAUGHTER		
Raw Water Analysis					Chemical Dose, mg/l	
					20	7
Sl No	Parameter	Unit	As CaCO ₃	Corr. Alum	Corr. Lime	
1	Calcium mg/l	mg/l	50.00	50.0	62.5	
2	Magnesium	mg/l	22.00	22.0	22.0	
3	Total Hardness	mg/l	72.00	72.0	84.5	
4	Temp Hardness	mg/l	72.00	72.0	73.5	
5	Permanent Hardness	mg/l	0.00	0.0	11.0	
6	Na+K	mg/l	79.00	79.0	79.0	
7	Total Cation	mg/l	151.00	151.0	163.5	
8	Chloride	mg/l	40.00	40.0	40.0	
9	Sulphate	mg/l	30.00	39.0	39.0	
10	Nitrate	mg/l	10.00	10.0	10.0	
11	Fluoride	mg/l	1.00	1.0	1.0	
12	Total EMA	mg/l	81.00	90.0	90.0	
13	M-Alkalinity	mg/l	70.00	61.0	73.5	
14	P-Alkalinity	mg/l	0.00	0.0	0.0	
15	Total Anion	mg/l	151.00	151.0	163.5	
16	Silica Reactive,	mg/l	25.00	25.0	25.0	

(04 IX Resin CDA Design.xls) : 02 Raw Water

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)		AKTION WAUGHTER	
End Point Ionic Slip					
Exchanger	What's Typical Slip from Exchanger	Unit	CCR Regen		
SAC	Na (1-2)	mg/l	2		
Degasser	Alkalinity (5-8)	mg/l	6		
SBA	Silica (0.1 - 0.5)	mg/l	0.2		
MB Cation	Na (0.1 - 0.3)	mg/l	0.1		
MB Anion	Silica (0.01 - 0.05)	mg/l	0.02		

(04 IX Resin CDA Design.xls) : 03 Treated Water Quality Data

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)					
Process Calculation for DM Plant							
Production Data							
Sl No	Description	Unit	MB Cation	MB Anion	SBA	SAC	
1	Regeneration Mode		Co	Co	CCR	CCR	
2	Chemical for Regeneration		HCl	NaOH	NaOH	HCl	
3	Type of Resin - IONION Brand		225H	FFIP	FFIP	225H	
4	Temperature	Deg C	25	25	25	25	
5	Flow rate (Avg)	m3/h	50	50	50	50	
6	Working Hrs	h	140	140	20	20	
7	Out Between Rgeneration, nett	m3	7000	7000	1000	1000	
8	Waste Water for Self	m3	14.23	14.23	21.98	12.96	
9	Waste Water for Upstream	m3	153.84	153.84	0.00	0.00	
10	Waste Water for Down Stream	m3	0.00	0.00	5.01	63.36	
11	Gross Output BR, Gross	m3	7168.07	7168.07	1026.99	1076	

(04 IX Resin CDA Design.xls) : 04 Process Calculations

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)					
Mixed Bed Regeneration(Sequential)							
Sl No	Operation	Basis	Flow m3/h	Time(min)	Volume m3	Water Source	
1	Middle Coll. Flush, 9m/h	9	13.85	5.00	1.15	DM	
2	Backwash, 9m/h	9	13.85	5.00	1.15	DM	
3	Bed settlement			5.00			
4	Acid injection (1.5-5%)	w/v	6.92	10.00	1.15	DM	
4	Down flow, 1.5 m/h	1.5	2.31	10.00	0.38	DM	
5	Acid rinse, 2 BV	2	6.15	15.00	1.54	DM	
5	Downflow, 1.5m/h	1.5	2.31	15.00	0.58	DM	
6	Alkali injection	w/v	4.62	15.00	1.15	DM	
6	Upflow	4.5	6.92	15.00	1.73	DM	
7	Alkali Rinse	4	9.23	20.00	3.08	DM	
7	Upflow	4.5	6.92	20.00	2.31	DM	
8	Drain Down			10.00			
9	Air Mix	2.0 m3/min/m2	184.63	10.00			
10	Final Rinse (10-30 min)	Service flow	50.00	25.00	20.83	SBA	
11	Check Acid	> 4.5	4.50				
12	Check Alkali	> 3.0	3.00				
13	Total	< 120 min		120.00	20.83	SBA	
					14.23	MB	
Rinse Time depends upon Final quality (10 Min., 1 MicroS/Cm, 30 min 0.2 micro Siemes)							

(04 IX Resin CDA Design.xls) : 05 Mixed bed Regeneration

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)					
SBA Regeneration							
Sl No	Operation	Basis	Flow m3/h	Time(min)	Volume m3	Water source	
1	Backwash, 3m/h	3	11.40	5.00	0.95	DG	
2	Middle Coll. Flush, 3 m/h	3	11.40	5.00	0.95	DG	
3	Alkali Pre Inject, 5/6 of Inj	5/6 of Inj	14.45	5.00	1.20	MB	
3	Down Flow, 5/6 of DF	5/6 of DF	14.45	5.00	1.20	DG	
4	Alkali injection, 4.5 - 18 m/h	4.5-18 m/h	17.34	25.00	7.23	MB	
4	Down Flow, inj flow	inj flow	17.34	25.00	7.23	DG	
5	Slow Rinse (2.5 BV)	5/6 of Inj	14.45	56.25	13.55	MB	
5	Down Flow	5/6 of DF	14.45	56.25	13.55	DG	
6	Final Rinse	Ser Flow	50.00	15.00	12.50	DG	
	Total			111.25	36.38	on SAC	
					21.98	on MB/SBA	
	Check Alkali Injection	4.5-18 m/h	4.56				

(04 IX Resin CDA Design.xls) : 06 SBA Regeneration



Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)					
SAC Regeneration							
Sl No	Operation	Basis	Flow m3/h	Time(min)	Volume m3	Water source	
1	Backwash	9	18.09	5.00	1.51	Fill	
2	Middle Coll. Flush	9	18.09	5.00	1.51	Fill	
3	Acid Pre Inject	5/6 of InJ	7.85	5.00	0.65	DG	
3	Down Flow	5/6 of DF	7.85	5.00	0.65	Fill	
4	Acid injection	4.5-18 m/h	9.42	30.00	4.71	DG	
4	Down Flow	inj flow	9.42	30.00	4.71	Fill	
5	Slow Rinse (2.5 BV)	5/6 of InJ	7.85	58.07	7.60	DG	
5	Down Flow	5/6 of DF	7.85	58.07	7.60	Fill	
6	Final Rinse	Ser Flow	50.00	15.00	12.50	Fill	
	Total			118.07	28.48	Fill	
					12.96	DG (SAC)	
	Check Acid Injection	4.5-18 m/h	4.69		12.96	DG (SAC)	

(04 IX Resin CDA Design.xls) : 07 SAC Regeneration

Softener Design

Water hardness decreases the life of our equipment so it's necessary to reduce the hardness of water feed, done with a piece of equipment known as a water softener, where the ion exchange process occurs.

Wignity		Aktion Waughter Private Limited C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 9558555227)					
IX Softener Design							
Parameter	Unit	Value	Remark				
Streams	Nos	1	Enter Manually				
Flow	m3/h	14	Enter Manually				
Operating Hrs.	h	20	Enter Manually				
Ionic Load (Total Hardness)	mg/l as CaCO3	360	Auto				
lutput Between Successive Regeneration	m3	280	Auto				
Work done	kg as CaCO3	100.8	Auto				
Regeneration Water	m3	8.57	Auto				
Gross OBR	m3	288.57	Auto				
Gross Work Done	kg as CaCO3	103.89	Auto				
Sodium (Na)	mg/l as CaCO3	100.00	Enter Manually				
Total Cation	mg/l as CaCO4	460.00	Auto				
Na/TC Ratio	%	22	Auto				
Regeneration level (100%)	kg/m3	160	From Graph				
Exchange capacity (as CaCO3)	kg/m3	68	From Graph				
Na/TC correction Factor 1 upto 23%	-	1	From Graph				
CF for Hardness 1 upto 500 mg/l	-	1	From Graph				
General CF	-	0.9	Standard				
Design Exchange Capacity	kg as CaCO3/m3	61.20	Auto				
Effective Resin Volume	m3	1.697	Auto				
Buffer Resin volume (mm)	m3	0.000	Not Applicable				
Total Resin volume	m3	1.697	Auto				
Diameter of IX Column	m	1.200	Enter Manually				
Unit Cross-sectional area	m2	1.130	Auto				
Total Resin bed Depth/Filter media	mm	1.502	Check < 2 m				
Free board required	%	50%	Auto				
HOS	m	2.25	Auto				
Heigh Selected - enter Manually	m	2500	Enter Manually				
Surface flowrate	m3/h.m2	12.385	Limit 4 -40				
Specific flowrate	BV/h	8.248	Limit 4 -40				
Chemical per regeneration (100%)	kg	271.60					

(05 IX Resin Softener Co Flow.xls)

Ultra Filtration Design with BOQ - GRAFiL

Ultra Filtration is a separation process using membranes with pore sizes in the range of 0.1 to 0.001 micron.

UF Design Software		Unit		UF Feed (Max)		Limits	
Run Date	13-Sep-23						
Name of Project	UF STP						
Customer	VruSri Training						
Consultant	AC						
Runout Revision No	Ver 03.1						
GRAFiL UF Software Prepared By	SSr						
GRAFiL UF Software Version	SSr	Release	Sep-23				
Feed Design Details							
UF Feed Parameters		Unit	UF Feed (Max)	Limits			
Turbidity		NTU	100	300			
TSS		mg/l	49	50			
Max pH			7.5	10.5			
COD		mg/l	Nil	Not Allowed			
Oil & Grease		mg/l	5	50			
Temperature		°C	30	40			
Cl2 (continuous) Typical		mg/l	0.5	1			
Input Water Requirement		Unit	Enter Design Parameters Here	Remarks: DO not Design Further if "NOT ALLOWED"			
Down Stream Operating Hours		h	24	24			
Down Stream Feed water Requirement		m ³ /h	10	10			
UF Operating Hours		hrs	24	24			
B/W Tank Retention Time (min)		min	15	15			
Select UF Feed Water Category:							
Category of UF Feed Water		Cat Code	Attention				
Water Type with Pre-treatment & Cross Flow		6	Please select your water Type by entering correct No in Cell B29 Cat Code.				
1. Bore Water - Dead End		1					
2. Surface Water - Dead End		2					
3. Surface Water- Cross Flow With Pre Media Filter		3					
4. Surface Water- Cross Flow Without Pre Media Filter		4					
5. Treated Sewage Cross Flow Without Pre Media Filter or		5					
6. Treated Sewage Cross Flow With Pre Media Filter		6	e.g. If your water Type is "6. Treated Sewage Cross Flow With Pre Media Filter" select code as 6				
7. Treated Effluent Cross Flow Without Pre Media Filter		7					
8. Treated Effluent Cross Flow With Pre Media Filter		8					
9. Treated Eff CF with Solvent Without Pre Media Filter		9					
10. Treated Eff CF With solvents with Pre Media Filter		5					
11. Sea water Cross Flow Without Filter		9					
12. Sea Water Cross Flow with Filter		5					

(06 UF Design GRAFiL Membrane.xls)

Key to Follow

1. Input Data Sheet
2. Output Sheet
3. Design Sheet
4. BOQ



Ultra Filtration – GRAFiL : BOQ

Through the UF Software, you just need to fill Input Sheet and you will get complete design with detail BOQ.

Sr No	Type	ID	Item	MOC	Unit	Qty	Specification
1	Mechanical	GRAFiL Membrane Model	GRAFiL Module				GRAFiL 8000
2	Mechanical	No of Modules	GRAFiL Module		Nos.	1	Set
3	Electro Mech	Pump	UF Feed Pump	SS 316	m ³ /h	1	14
4	Electro Mech	Motor	Motor	Standard	kg/Cm2	1	2
5	Electro Mech	Pump	UF Backwash Pump	SS 316	m ³ /h	1	17
6	Electro Mech	Motor	Motor	Standard	kg/Cm2	1	15
7	Electro Mech	Pump	UF CIP Pump	SS 316	m ³ /h	1	15
8	Electro Mech	Motor	UF CIP Motor	Standard	kg/Cm2	1	15.0
9	UF Valves Process	UF Inlet	Auto Ball Valve	UPVC	NB	1	50
10	UF Valves Process	UF Outlet	Auto Ball Valve	UPVC	NB	1	50
11	UF Valves Process	UF B/W Inlet	Auto Ball Valve	UPVC	NB	1	80
12	UF Valves Process	B/W Out	Auto Ball Valve	UPVC	NB	1	80
13	UF Valves Process	UP/W Pump Discharge	Manual Ball Valve	UPVC	NB	1	100
14	UF Valves Process	Cross Flow Out	Manual Ball Valve	UPVC	NB	1	50
15	UF Valves Process	CIP In	Manual Ball Valve	UPVC	NB	1	50
16	UF Valves Process	CIP Out	Manual Ball Valve	UPVC	NB	1	50
17	UF Valves Process	Isolation	Manual Ball Valve	UPVC	NB	8	50
18	Instrument	UF Feed Pump Discharge	Pressure Gauge	SS Bourdon	kg/Cm2	1	100 mm Dial
19	Instrument	UF B/W Pump Discharge	Pressure Gauge	SS Bourdon	kg/Cm2	1	100 mm Dial
20	Instrument	UP/W Pump Discharge	Pressure Gauge	SS Bourdon	kg/Cm2	1	100 mm Dial
21	Instrument	UF Inlet & Outlet	Process Transmitter	Vendor Data		2	0-5 kg/cm ²
22	Instrument	UF Inlet & Outlet	Flow Transmitter	Vendor Data	m ³ /h	2	30
23	Instrument	B/W Inlet	Flow Indicator	Vendor Data	NA	1	52
24	Instrument	UF Feed Tank & UP/WST Tank	Low Level Switch	Vendor Data	NA	2	NA
25	Instrument	UF Feed Tank & UP/WST Tank	High Level Switch	Vendor Data	NA	2	NA
26	Mechanical	Tank	UF Feed Tank	HDPE	T	1	As Per Client
27	UF Valves Process	UF Feed Tank Drain	Manual Ball Valve	UPVC	NB	1	50
28	UF Valves Process	UF Feed Pump Suction	Manual Ball Valve	UPVC	NB	1	80
29	UF Valves Process	Manual Ball Valve	UF Feed Pump Discharge	UPVC	NB	1	50
30	UF Valves Process	Non Return Valve	UF Feed Pump Discharge	UPVC	NB	1	50
31	UF Valves Process	Sampling (3-Way Gauge cock)	UF Feed Pump Discharge	UPVC	NB	1	15
32	Mechanical	Tank	UP/WST Tank	HDPE	m ³	1	3
33	UF Valves Process	Manual Ball Valve	UP/WST Tank Drain	UPVC	NB	1	80
34	UF Valves Process	Manual Ball Valve	UF B/W Pump Discharge	UPVC	NB	1	100
35	UF Valves Process	Manual Ball Valve	UF B/W Pump Discharge	UPVC	NB	1	80
36	UF Valves Process	Non Return Valve	UF B/W Pump Discharge	UPVC	NB	1	80
37	UF Valves Process	Sampling (3-Way Gauge cock)	UF B/W Pump Discharge	UPVC	NB	1	15
38	Mechanical	Tank	CIP Tank	HDPE	T	1	586
39	UF Valves Process	Manual Ball Valve	CIP Tank Drain	UPVC	NB	1	50
40	UF Valves Process	Manual Ball Valve	CIP Pump Suction	UPVC	NB	1	80
41	UF Valves Process	Manual Ball Valve	CIP Pump Discharge	UPVC	NB	1	80
42	UF Valves Process	Non Return Valve	CIP Pump Discharge	UPVC	NB	1	15
43	UF Valves Process	Sampling (3-Way Gauge cock)	CIP Pump Discharge	UPVC	NB	1	15
44	Mechanical	Filter	Sublet Filter	SEPVIC		1	100 micron
45	Mechanical	Misc IC Pipework	IC Pipework	Lot	NA	1	NA
46	Mechanical	Skid	Skid	Lot	NA	1	NA
47	Electrical	Power Panel with PLC		Lot	NA	1	NA
48	Electrical	Electrical Cable		Lot	NA	1	NA
49	Electrical	Cable Tray		Lot	NA	1	NA
50	Electrical	Instrument Cable		Lot	NA	1	NA
UF CEB - Add-on Sewer Items							
51	Mechanical	Pump	HCl Dosing	PP Teflon	lph	1	61.6
52	Mechanical	Pump	NaOH Dosing	PP	lph	1	61.6
53	Mechanical	Pump	NaOCl Dosing	PP	lph	1	108
54	Mechanical	CEB Chemical Tank	HCl Dosing	HDPE	T	1	100
55	Mechanical	CEB Chemical Tank	NaOH Dosing	HDPE	T	1	250
56	Mechanical	CEB Chemical Tank	NaOCl Dosing	HDPE	T	1	1200

LSI Calculation

LSI is the measure of Scaling Potential of the water.

Wignity		Aktion Waughter Private Limited		AKTION WAUGHTER	
		C-1305, Rajyash Rise, New Vasna, Nr. Vishala Circle, Ahmedabad - 380051 (+91 955855227)			
Langlier Saturation & Ryznar Stability Index Calculation Sheet					
Input your number in the Yellow Boxes					
Reject Water RO 1	Temperature °C	25	°C	Celcius	*A*
	pH	7.5			Derived
	Calcium Hardness	651	ppm		
	Total Alkalinity	1435	ppm		
	TDS	6341	ppm		
$p(Ca^{++}) = 2.19$ $p(Alk) = 1.54$ $A = 1.99$ $B = 0.77$ $C = 0.00$					
$pHs = 6.49$ Langlier Index = 1.01 (Scale Forming) Ryznar Index = 5.48 (Scale Forming)					
				0	2.60
				2	2.55
				4	2.50
				6	2.44
				8	2.39
				10	2.34
				12	2.29
				14	2.24
				16	2.19
				18	2.15
				20	2.10
				22	2.05
				24	2.00
				26	1.95
				30	1.88
				40	1.70

(07 Langlier Saturation Index Calculation.xls)

STRONGER
Together

Strength in Unity

Collaborative Excellence in Water Treatment



Join us in embracing the "Stronger Together"
This initiative aims to unite us all in our efforts, emphasizing collaboration, support, and synergy within our community.

Let's join hands and make a difference together!

