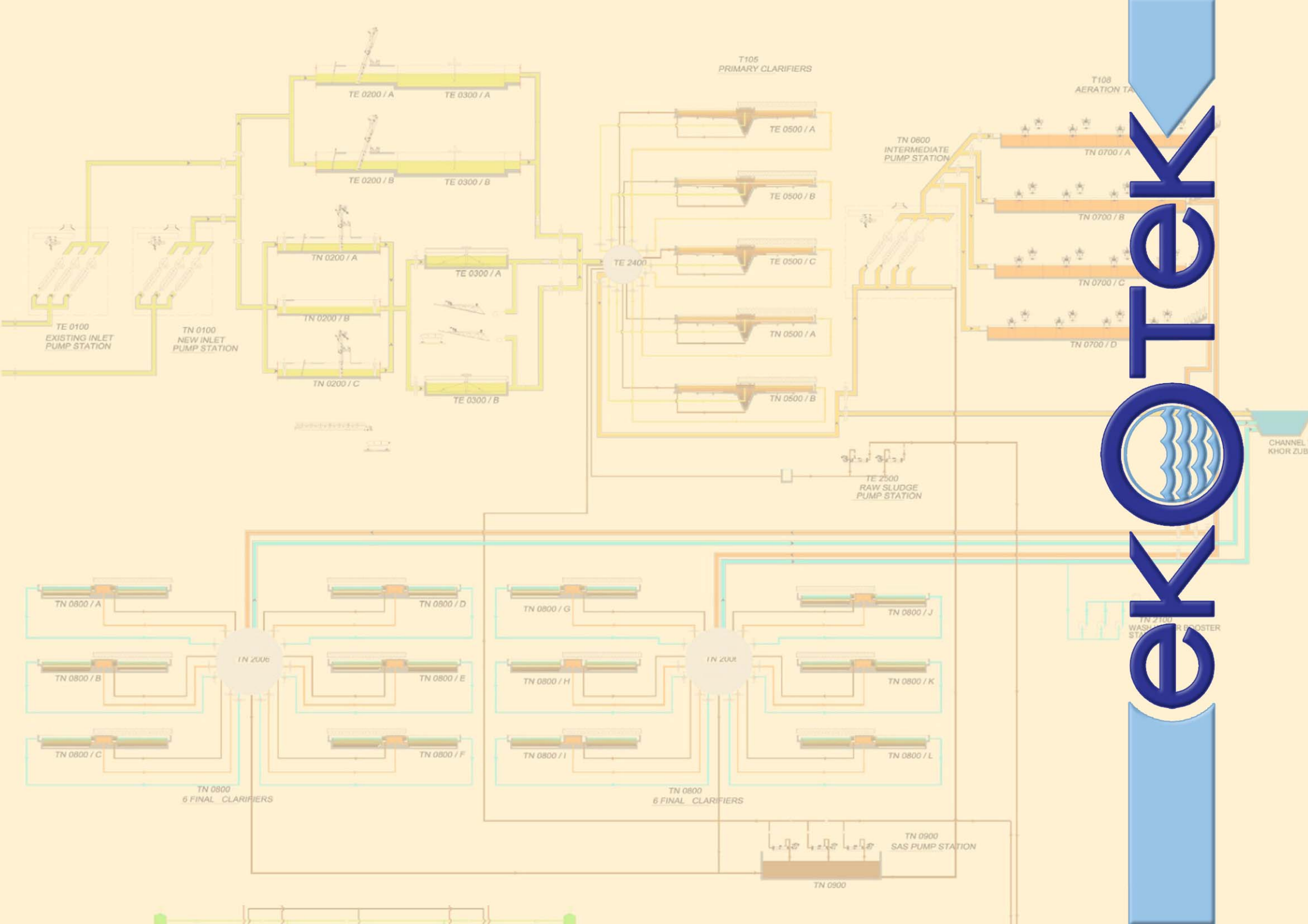
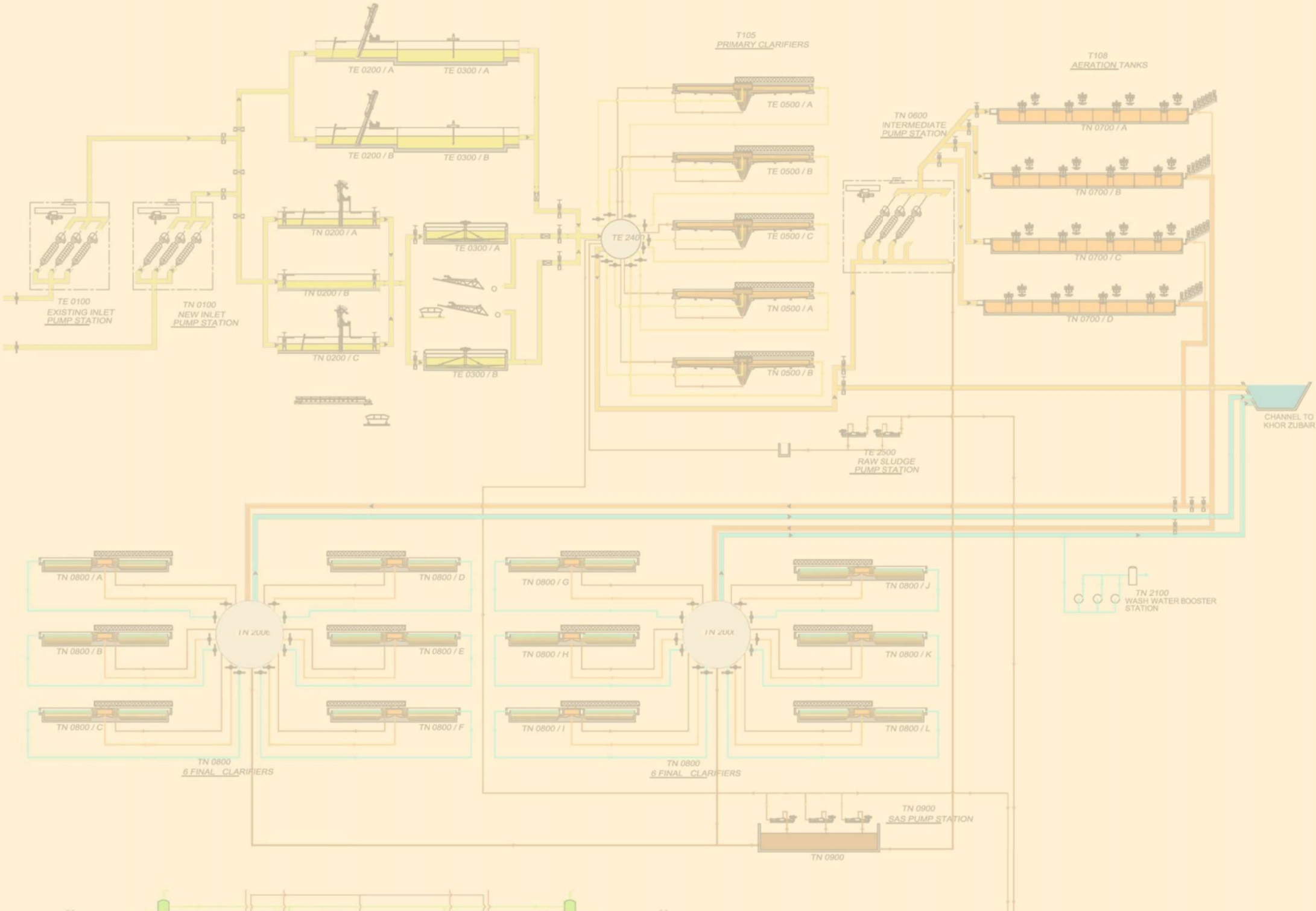

T105
PRIMARY CLARIFIERS
T108
AERATION TA
TE 0200 / A
TE 0300 / A
TE 0200 / B
TE 0300 / B
TE 0500 / A
TE 0500 / B
TE 0500 / C
TN 0500 / A
TN 0500 / B
TN 0600
INTERMEDIATE
PUMP STATION
TN 0700 / A
TN 0700 / B
TN 0700 / C
TN 0700 / D
TN 0200 / A
TN 0200 / B
TN 0200 / C
TE 0300 / A
TE 0300 / B
TE 2400
TE 0100
EXISTING INLET
PUMP STATION
TN 0100
NEW INLET
PUMP STATION
TE 2500
RAW SLUDGE
PUMP STATION
CHANNEL
KHOR ZUB
TN 0800 / A
TN 0800 / B
TN 0800 / C
TN 0800 / D
TN 0800 / E
TN 0800 / F
TN 2006
TN 0800
6 FINAL CLARIFIERS
TN 0800 / G
TN 0800 / H
TN 0800 / I
TN 0800 / J
TN 0800 / K
TN 0800 / L
TN 2008
TN 0800
6 FINAL CLARIFIERS
TN 2100
WASH
STA
TN 0900
SAS PUMP STATION
TN 0900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TE 0300 / A
TE 0200 / B
TE 0300 / B
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PUMP STATION
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NEW INLET
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TN 0200 / C
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PRIMARY CLARIFIERS
TE 0500 / A
TE 0500 / B
TE 0500 / C
TN 0500 / A
TN 0500 / B
TE 2400
TN 0600
INTERMEDIATE
PUMP STATION
T108
AERATION TANKS
TN 0700 / A
TN 0700 / B
TN 0700 / C
TN 0700 / D
CHANNEL TO
KHOR ZUBAIR
TE 2500
RAW SLUDGE
PUMP STATION
TN 0800 / A
TN 0800 / D
TN 0800 / B
TN 0800 / E
TN 0800 / C
TN 0800 / F
TN 0800
6 FINAL CLARIFIERS
TN 0800 / G
TN 0800 / J
TN 0800 / H
TN 0800 / K
TN 0800 / I
TN 0800 / L
TN 0800
6 FINAL CLARIFIERS
TN 2100
WASH WATER BOOSTER
STATION
TN 0900
SAS PUMP STATION
TN 0900

EQUIPMENT MANUFACTURING

Most of the equipment to be used in water and wastewater treatment can be manufactured in the workshops of EKOTEK and almost all of the equipment to be encountered in such plants can be supplied by EKOTEK. Additionally, package plants for water and wastewater treatment can be manufactured. Various processes are adopted, depending on the specific project (such as sequencing batch reactor, fixed growth type activated sludge, membrane biological reactors). Especially package plants for potable water treatment can be manufactured for considerably large capacities at quite compact sizes, They come out to be more economical than conventional concrete plants for medium sized communities (20000 - 30000 Population Equivalent) Such package plants are very feasible solutions for areas with difficulty of civil works construction

PRODUCTION RANGE

- Mechanically cleaned screens,
- Grit and grease removal equipment,
- Screw pumps (Archimedean pump)
- Small, purpose design pumps,
- Penstocks, adjustable overflow weirs, telescopic valves.
- Scraper bridges for circular, rectangular sedimentation tanks and sludge thickeners,
- Various types of aeration tank equipment (slow speed or high speed Vertical or horizontal shaft surface aerators, aspirator type aerators)
- Chemical preparation, mixing and dosing systems.
- Sludge dewatering equipment (belt filter, filter press)
- Low voltage switch boards and automation systems, mimic diagrams
- Pressured sand filters, pressure boosting (hydrophore) systems, activated carbon, water softening and reverse osmosis systems.

EKOFAN®

The aerator is the heart of the system in biological treatment plants. Oxygen is the most important requirement of the microorganisms which consume the organic material in water and it is thus oxygen is given into the water.

EKOFAN is one of the first few surface aerators manufactured in this country, the performance of which is tested and certified by T.S.E. (Turkish Standards Institute), and ILLER BANKASI (Bank of Provinces -government organisation in charge of infrastructure investment of municipalities)

EKOTEK manufactures various types of aerators such as:

EKOFAN V-LS : Vertical shaft, low speed,

EKOFAN V-HS : Vertical shaft, high speed,

EKOFAN H-LS : Horizontal shaft, low speed,

EKOFAN S-EJ : Submerged ejector,

EKOFAN D-EJ : Dry ejector,

EKOFAN V-LS MODELS

The basic principle of operation of the **EKOFAN V-LS**, is an impeller rotating at the surface of the water and pulverising into small droplets thus increasing the surface area in contact with air.

EKOFAN V-LS aerators operate at slightly higher speed than other similar low speed aerators. This results with a smaller torque and thus with smaller shafts, bearing and a smaller, lighter gear box.

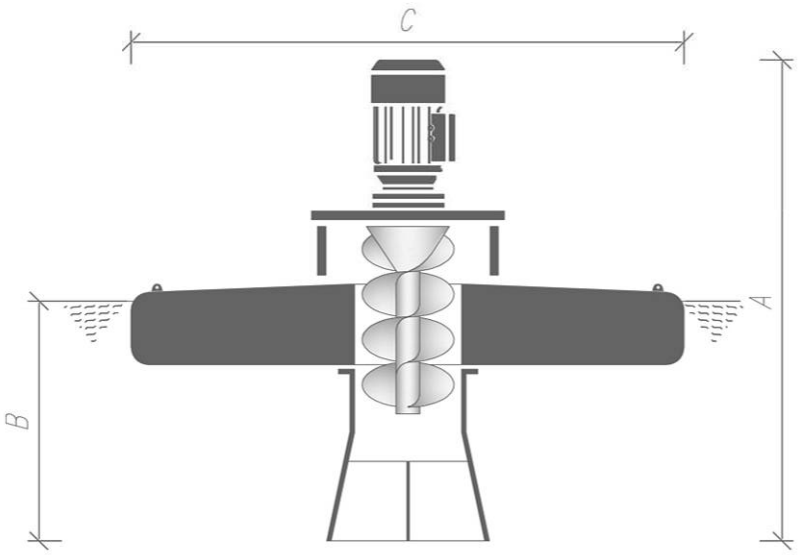
Design speed of the impeller at its periphery is kept with 3-7 m/sec. range. This speed range eliminates the break-up of activated sludge flocks. At large motor sizes electronic soft-start is used.

Model	Diameter mm	Oxygen Transfer kg/hr*	Preferred Nominal Liquid Depth mm	Motor kW
EKOFAN V-LS-0.75	450	0.6-1.5	1400-2000	0.75
EKOFAN V-LS-1.5	600	1.2-3	1600-2300	1.5
EKOFAN V-LS-3	700	2.4-6	1750-2600	3
EKOFAN V-LS-4	850	3-8	2000-2850	4
EKOFAN V-LS-5.5	900	4.5-11	2100-3000	5.5
EKOFAN V-LS-7.5	1000	6-15	2300-3250	7.5
EKOFAN V-LS-11	1100	9-22	2600-3700	11
EKOFAN V-LS-15	1200	12-30	2850-4100	15
EKOFAN V-LS-18.5	1350	15-37	3000-4300	18.5
EKOFAN V-LS-22	1400	17-44	3200-4600	22
EKOFAN V-LS-30	1600	24-60	3600-5100	30
EKOFAN V-LS-37	1700	29-74	4000-5500	37
EKOFAN V-LS-55	1900	44-110	4500-5800	55
EKOFAN V-LS-75	2150	60-150	5100-6000	75
EKOFAN V-LS-110	2350	88-220	5800-6200	110

* Under standar conditions of i) zero dissolved oxygen, ii) 760 mmHg, iii) pure water, iv) 10-20°C

37 kW EKOFAN
Aerators being manufactured in the workshop (below, being transported (left and bottom).

EKOFAN V-HS MODELS



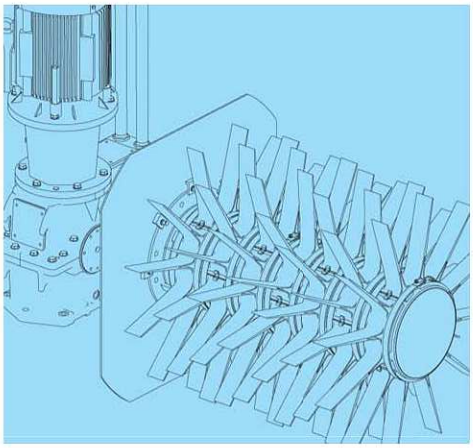
MATERIAL

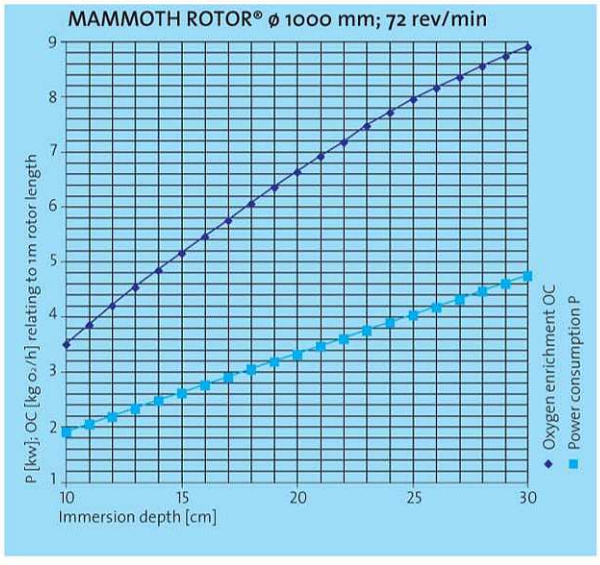
Motorhousing	:Cast Iron GG 25 Epoxy Coated
Float + Cone/Cross	:GRP or Stainless Steel AISI 304
Impeller	:Epoxy Coated Carbon Steel or Stainless Steel AISI 304

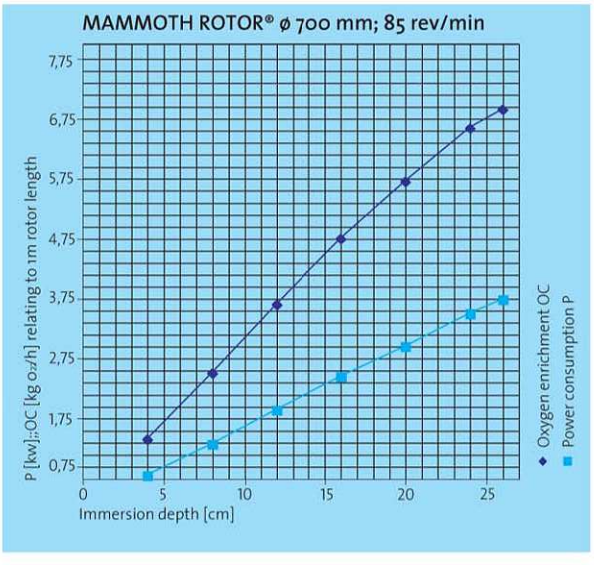
TYPE (kW)	Total Height (A)	Oxygen Transfer kg/hr*	Standart Height (B)	Float diameter (C)	Motor Power
EKOFAN V-HS-0,75	1286	0,6-1,5	890	1000	0,75
EKOFAN V-HS-1,1	1307	0,88-2,2	890	1000	1,1
EKOFAN V-HS-1,5	1364	1,2-3	925	1000	1,5
EKOFAN V-HS-2,2	1364	1,76-4,4	890	1000	2,2
EKOFAN V-HS-3	1416	2,4-6	940	1000	3
EKOFAN V-HS-4	1534	3-8	1030	1000	4
EKOFAN V-HS-5,5	1711	4,5-11	1146	1250	5,5
EKOFAN V-HS-7,5	1878	6-15	1251	1250	7,5
EKOFAN V-HS-11	2007	9-22	1296	1500	11
EKOFAN V-HS-15	2214	12-30	1431	1500	15
EKOFAN V-HS-18,5	2447	15-37	1614	2000	18,5
EKOFAN V-HS-22	2605	17-44	1764	2000	22
EKOFAN V-HS-30	2943	24-60	2031	2000	30
EKOFAN V-HS-37	2935	29-74	1966	2000	37
EKOFAN V-HS-45	3041	36-90	2066	2000	45

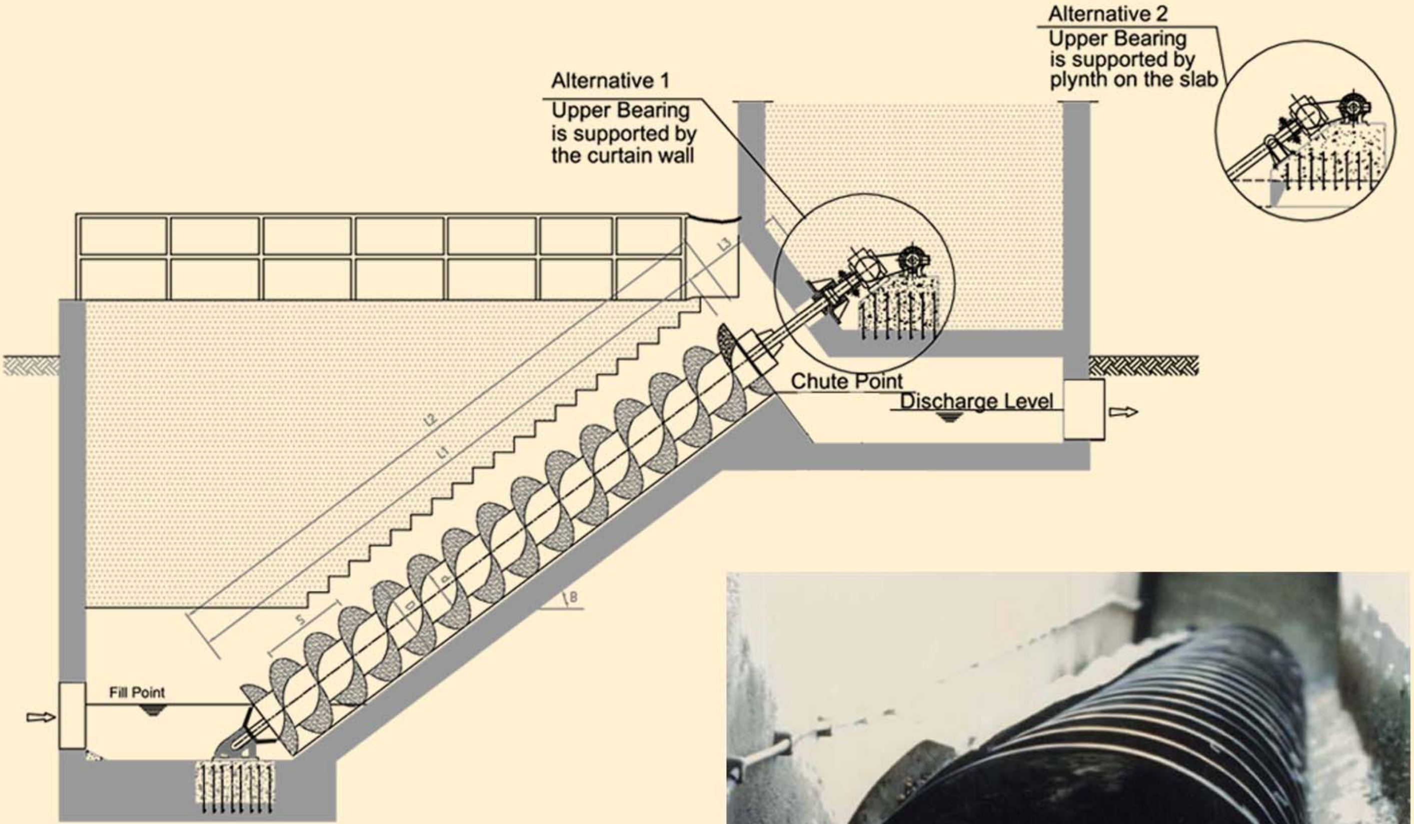
* Under standart conditions of i) zero disolved oxygen, ii) 760 mmHg, iii) pure water, iv) 10-20^{0}C

ekOFAN H-LS MODELS









NOMINAL CAPACITY OF SCREW PUMPS WITH DIFFERENT DIAMETERS AND ANGLES OF INCLINATION

Diameter (mm)	Capacity (l/sec) different angle of inclination			
	30°	33°	35°	38°
400	18 – 21	16 – 19	15 - 18	10 – 16
500	30 – 40	27 – 33	25 - 31	20 – 28
600	45 – 55	40 – 49	37 – 45	35 – 41
700	70 – 83	60 – 75	55 – 68	50 – 62
800	90 – 111	82 - 96	75 – 91	75 – 83
900	120 – 146	110 – 132	105 – 121	90 – 109
1000	165 – 192	150 – 173	135 –158	130 – 144
1200	240 –275	220 – 248	195 – 227	175 – 207
1400	350 – 422	340 – 380	300 – 347	270 – 317
1600	510 – 566	480 – 510	410 – 466	370 – 424
1800	700 – 760	620 – 684	565 – 625	510 – 570
2000	880 – 954	790 – 860	700 – 786	650 – 716
2200	1100 – 1193	977 – 1075	887 – 983	727 – 823
2300	1210 – 1312	1070 – 1182	980 – 1082	765 – 885
2400	1340 – 1475	1183 – 1327	1087 – 1215	893 – 1039
2600	1600 – 1800	1410 – 1616	1300 – 1480	1150 – 1348
2800	1925 – 2133	1705 – 1913	1550 – 1750	1378 – 1595
3000	2250 – 2465	2000 - 2210	1800 - 2020	1600 - 1842

TÜRK STANDARDLARI ENSTİTÜSÜ

MÜSTAKİLEN İMALÂTA YETERLİLİK BELGESİ

(BU BELGE ÜRÜNÜN KALİTESİNİ TEMSİL ETMEZ)

BELGE NUMARASI :

BELGENİN VERİLİŞ TARİHİ :
18.05.1994

FİRMANIN ADI ve ADRESİ :
Yenişehir-ANKARA

İMALATHANE ADRESİ :

SANAYİ SİCİL NUMARASI :

TİCARET SİCİL NUMARASI :
52920

BELGENİN KAPSAMINDAKİ MADDE VE MAMÜLLERİN MARKASI, CİNSİ ve TİPİ

650 lt/sn.ye kadar.

132 SAYILI KANUN GEREĞİNCE ve TÜRK STANDARDLARI ENSTİTÜSÜ MEVZUATI UYARINCA YAPILAN İNCELEME SONUNDA BELİRTİLEN MADDE ve MAMÜLLERİ İMALE, ADI-ADRESİ VERİLEN KURULUŞ YETERLİ GÖRÜLEREK İŞ BU BELGE VERİLMİŞTİR.

YIL VİZESİ | YIL VİZESİ | YIL VİZESİ | YIL VİZESİ | YIL VİZESİ

BELT FILTER PRESSES FOR SLUDGE DEWATERING

The dryness of the sludge (amount of dry solids in the sludge cake) depends on a variety of parameters some of which can not be predicted beforehand. Type of wastewater and the treatment process affects the dewaterability characteristics of the sludge. Some sludges have a gelatinous structure and are very difficult to dewater by belt filter press. In general extended aeration sludges are not as dewaterable as the primary and anaerobically digested sludge. The general range is:
16-18 % Dry solids for extended aeration
18-24 % Dry solids for primary and anaerobically digested sludges.
As the no. of pressing rollers increase a more dry sludge cake solids are obtained.

Enhanced features of EKOTEK presses include :

- 5distinct zones of increasing pressure

    1. Gravity drainage zone
    2. Wedge pressing zone
    3. Low pressure zone
    4. Medium pressure zone
    5. High pressure zone

- Extremely compact design and height is also kept at a minimum so that the top can be inspected without the need for an access ladder or platform.

- Some models are completely covered to prevent contact with sludge or aerosols. Glass windows on covers allow continuous inspection and covers can easily be removed for closer inspection and maintenance.

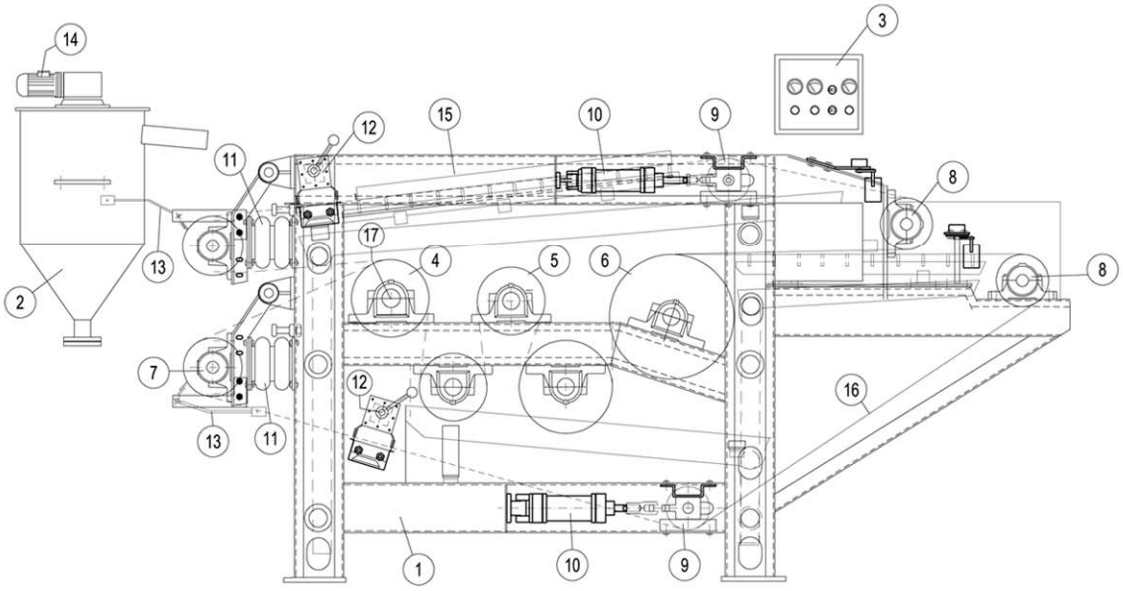
- Belt tensioning is by pneumatic actuators and air bellows as a standard, spring module options are available.

- Continuous monitoring and control of belt alignment with the help of sensors placed on both belts and pneumatic actuators.

- Heavy duty bearings and perfect seals.

- Rollers are made of rilsan coated carbon steel. Stainless steel options are available. Trays and body either stainless steel or hot dip galvanised steel.

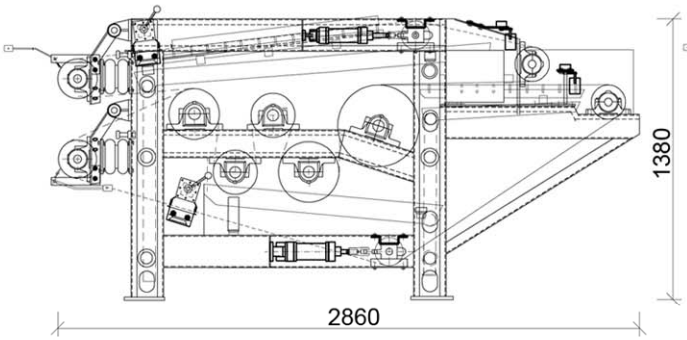
BELT FILTER PRESSES FOR SLUDGE DEWATERING



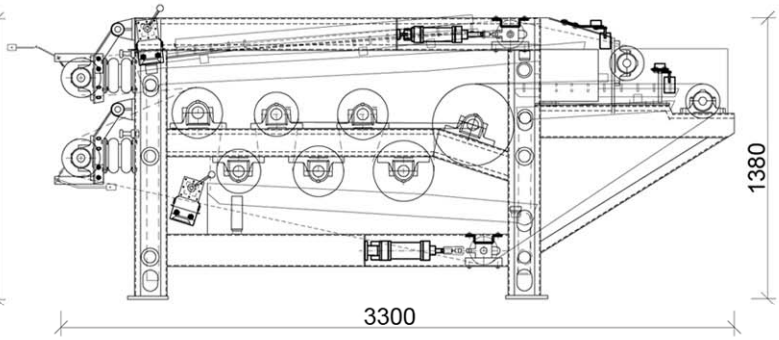
Item	Name
1	Body (Hot Dip Galv. St.)
2	Flocculation Tank (Hot Dip Galv. St.)
3	Pneumatics Control Box
4	Drive Roller (Rubber Coated Steel)
5	High Pressure Rollers (Rilsan Coated Steel)
6	Low Pressure Rollers (Perforated Galv. St.)
7	Belt Tension Rollers (Rilsan Coated Steel)
8	Direction Rollers (Rilsan Coated Steel)
9	Belt Alignment Control Rollers Rubber Coated Steel)

Item	Name
10	Pneumatic Actuators
11	Air Bellows
12	Belt Wash Nozzules
13	Doctor Blades For Cake Scraping (PVC)
14	Flocculator Drive
15	Upper Belt
16	Lower Belt
17	Belt Drive Motor + Gearbox (not shown)

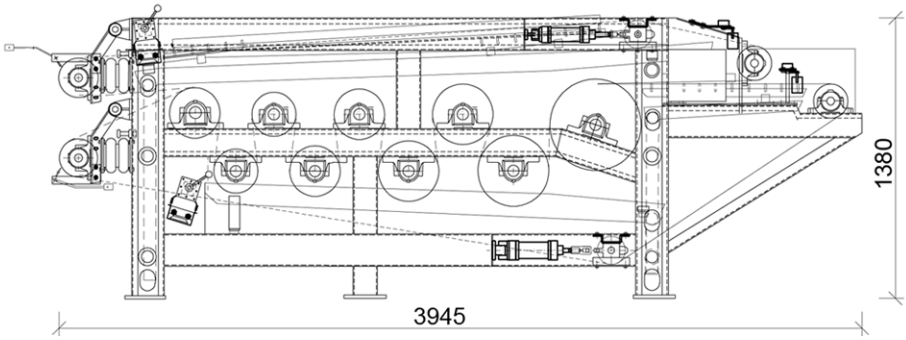
BELT FILTER PRESSES FOR SLUDGE DEWATERING



BF-S



BF-M



BF-L

EKOTEK manufactures three types of machines, small, medium and large models with increasing no. of pressing rollers. For each size different belt width combinations are available.

KEY FOR TYPE CODES

example BF-M / 80 - 5

Type
- BF-S
- BF-M
- BF-L

Belt width (cm)
- 80
- 100
- 120
- 150
- 200
- 250

no of pressing rollers.
- 5
- 7
- 9

The first step in wastewater treatment is the removal or reduction of coarse solids. The usual procedure is to pass the untreated wastewater through **screens.** A screen is a device with openings generally of uniform size and the screening element may consist of paralel bars, rods or wires, grating, wire mesh, or perforated plate and the opening, may be of any shape but generally are circular or rectangular slots. The material removed by screens are called screenings. Depending upon the quality and characteristics of screenings sometimes compactors are used to drain the excess water and to reduce the volume of screenings.
In the past, the term coarse screen was used in wastewater sector for screen openings larger than 25mm and fine screen for smaller openings. However in the recent years screens with openings larger than 10mm are considered as coarse screens.
EKOTEK manufactures a broad range of screen types as deseribed below. Reference codes for various types are given by the type key below.

TYPE KEY FOR MECHANICALLY CLEANED SCREENS.

Example CHAIN / 15 / 40-60-300

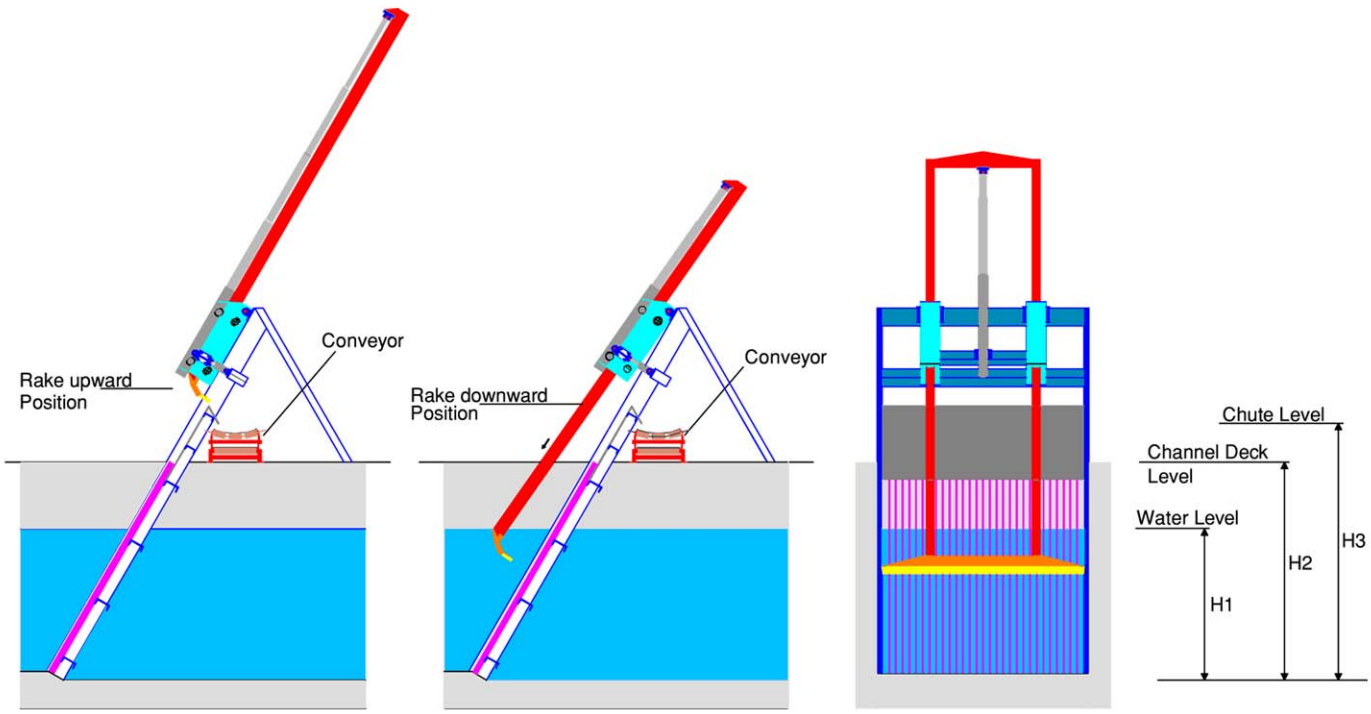
Type
- BOOM
- CHAIN
- ESCA
- CABLE
- DRUM
- STEP
- ARC

Maximum Free Passage (mm)
2 ⋮ 80

Channel Width (cm)
20 ⋮ 250

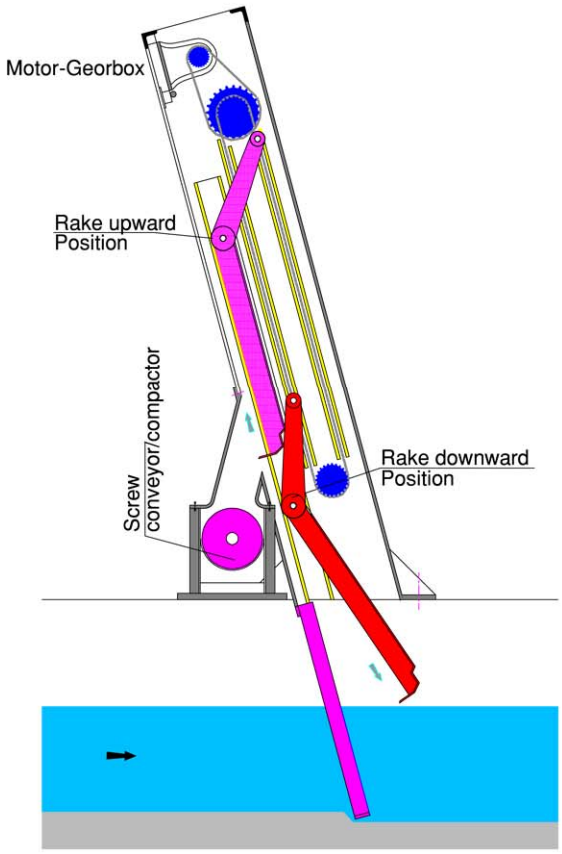
Chute Height (cm)
50 ⋮ 700

Maximum Water Depth (cm)
10 ⋮ 250



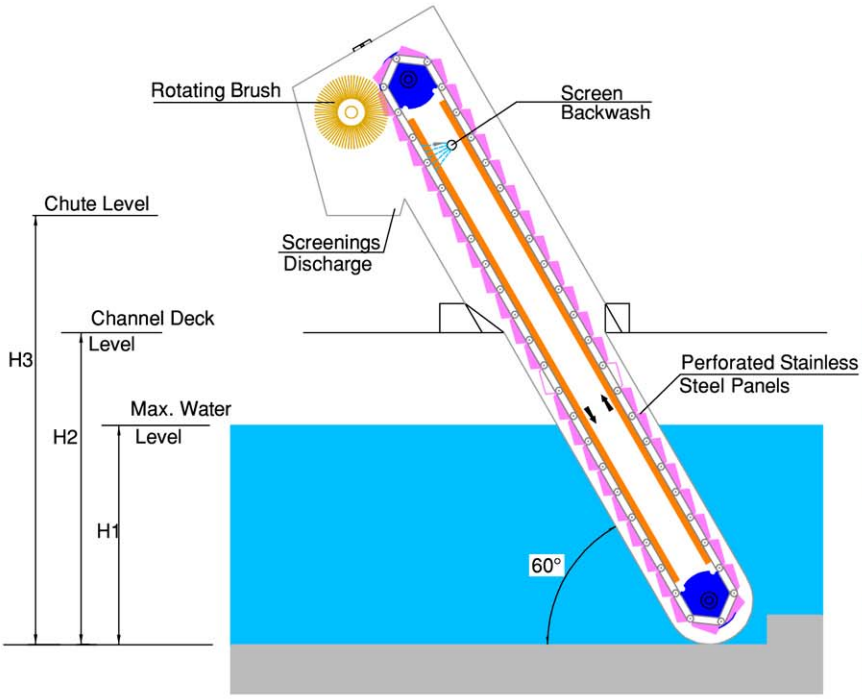
BOOM TYPE

The rake is mounted on a boom which is made of steel beams. This beam structure travels up and down along the bearing system which is mounted above the water level. These movements are done by hydraulic pistons. Suitable for deep and wide channels. Bar spacing is not very fine (>60 mm). When the rake is at the uppermost position it becomes a tall structure, therefore must not be used in closed areas with low ceiling.



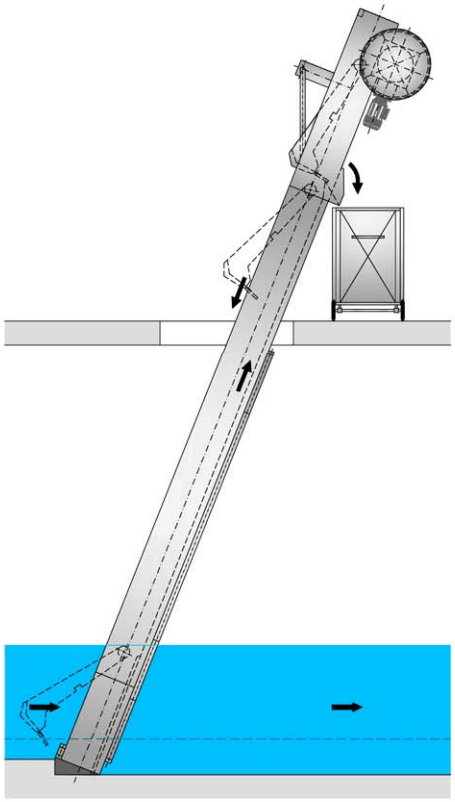
CHAIN TYPE

The two sorts of movement (upward-downward, towards-away from the screen) of the raking arm is made by the movement of the endless chain continuously in the same direction. Therefore no limit switches and reverse operations are required.There are no mechanisms below water level. All the mechanisms being above the water level causes a rather long raking arm. This results with a relatively tall structure. This type is suitable for not very deep channels.



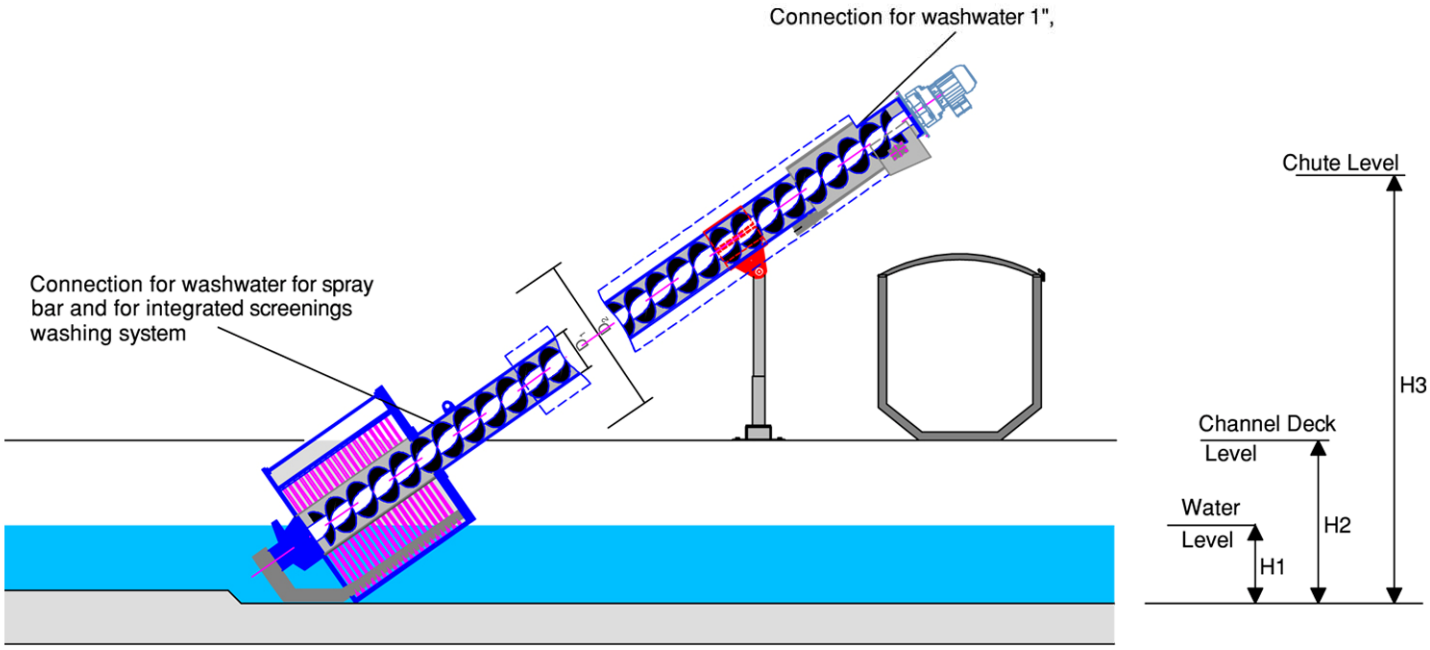
ESCALATOR TYPE

It is made of perforated panels which form an escalator (step) screen. There exists a chain gear and bearing at the bottom (below water level). The gear is made of stainless steel or some type of plastic material such as nylon 6. Bearing is water lubricated type and made of teflon or nylon 6 type material. The panels and conveying chain is made of stainless steel. The advantage of this type is that it can be used in very deep channels and also the panels can be made with very fine perforations.



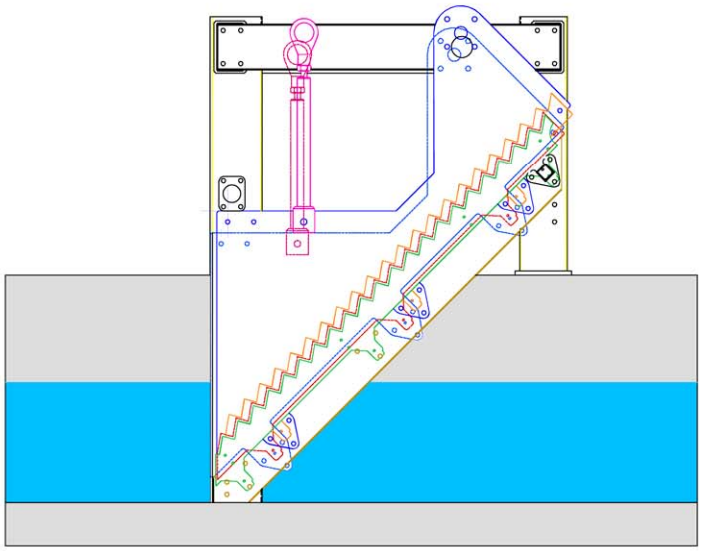
CABLE OPERATED TYPE

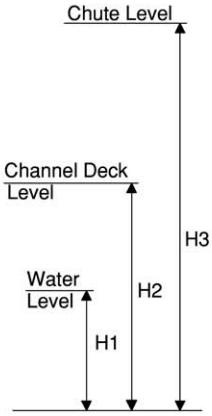
This type of screen is ideal for deep channels. The upward and downward motion of the rake is provided by means of a single motor + gearbox and a stainless steel cable wound on a drum. The rake carriage has a special lever form and with the help of some mechanisms and guide rails the rake is kept away from the screen during downward motion and it is kept close to the bars during upward motion. The upward and downward motions are arranged by limit switches.



DRUM TYPE

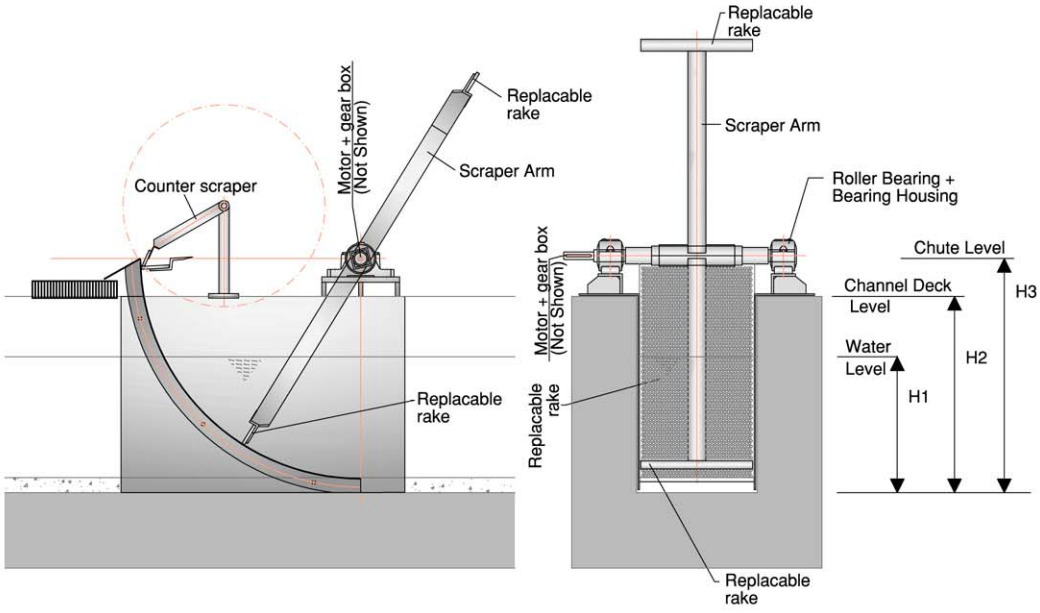
Both the raking mechanism and the screw conveyor are driven by the same shaft. Therefore a single drive unit is used for both purposes. Due to the circular geometry of the screen bars, there is more precision in the spacing of the bars, thus finer screens can be manufactured. Suitable for not very deep and wide channels.





STEP SCREEN TYPE

The screen is made of two sets of step shaped lamella. One set is fixed and the other set made of every other lamella is movable. With a crank system mounted above water level, every other lamella makes a crank motion with respect to the fixed set of lamella, thus moving the debris one step up at each cycle. The debris falls into a chute after the uppermost step. Lamella plates are made of stainless steel whereas the supporting structure can either be stainless steel or hot dip galvanised steel. This type of screen can be used in deep channels with no problem and the slot width can be as low as 2 mm.



ARC TYPE SCREENS

The screen bars are in the form of an arc of a circle. In stead of bars a perforated plate can be used if small bar spacing is required. A rotating arm with replacable rakes scrapes the screen. With the help of a counter scraper the screenings are discharged on the chute.

Sedimentation is used for the removal of grit, suspended solids in primary settling basins, biological floc removal in the activated sludge settling basin and chemical floc removal when the chemical coagulation process is used.

Sedimentation is also used for solids concentration in sludge thickeners. In most cases the primary purpose is to produce a clarified effluent, but it is also necessary to produce sludge with a solids concentration that can be handled and treated easily.

Almost all treatment plants use mechanically cleaned sedimentation tanks of standardized circular or rectangular design. The selection of the type of sedimentation unit for a given application is governed by the size of the installation, by rules and regulations of local control authorities, by local site conditions and by the experience and judgment of the engineer.

SCRAPERS FOR GRIT CHAMBERS, SEDIMENTATION and THICKENER TANKS

Standard material of scrapers is epoxy coated mild steel above water level and hot-dip galvanized mild steel at below water level (excluding the chain and flight type which is made of various special materials.) Walkways are hot-dip galvanized open mesh type grating.

Depending on the span of the bridge either standard steel sections, or special sections obtained by folding steel plates can be used. When the height of the special section exceeds half of the handrail height (large span bridges) solid wall type (or "Castello Beam" type) bridges are used.

Generally available types of scrapers and code no.s are summarized in the table below.

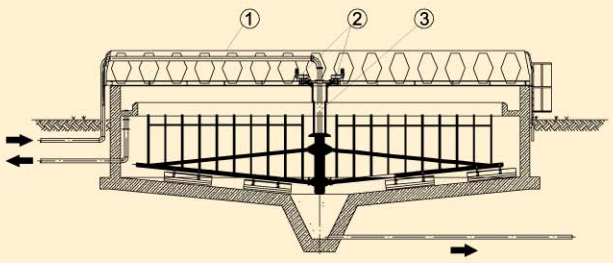
RECTANGULAR TANKS (R)

	TRAVELLING BRIDGE TYPE (RB)		CHAIN-AND-FLIGHT TYPE (RC)	
	SUCTION TYPE (V)	SCRAPING TYPE (S)	SUCTION TYPE (V)	SCRAPING TYPE (S)
SEDIMENTATION TANKS (S)	S-RB-V	S-RB-S	-	S-RC-S
GRAVITY THICKENERS (T)	-	T-RB-S	-	-
GRIT & GREASE REMOVAL (G)	G-RB-V	G-RB-S	-	G-RC-S

CIRCULAR TANKS (C)

	PERIPHERAL DRIVE (CP)		CENTRAL DRIVE			
			CENTRALLY SUPPORTED BRIDGE (CCS)		FULL SPAN BRIDGE (CCF)	
	SUCTION TYPE (V)	SCRAPING TYPE (S)	SUCTION TYPE (V)	SCRAPING TYPE (S)	SUCTION / VACUUM TYPE (V)	SCRAPING TYPE (S)
SEDIMENTATION TANKS (S)	S-CP-V	S-CP-S	S-CCS-V	S-CCS-S	S-CCF-V	S-CCF-S
GRAVITY THICKENERS (T)	-	T-CP-S	-	T-CCS-S	-	T-CCF-S
GRIT & GREASE REMOVAL (G)	G-CP-V	G-CP-S	-	G-CCS-S	-	G-CCF-S

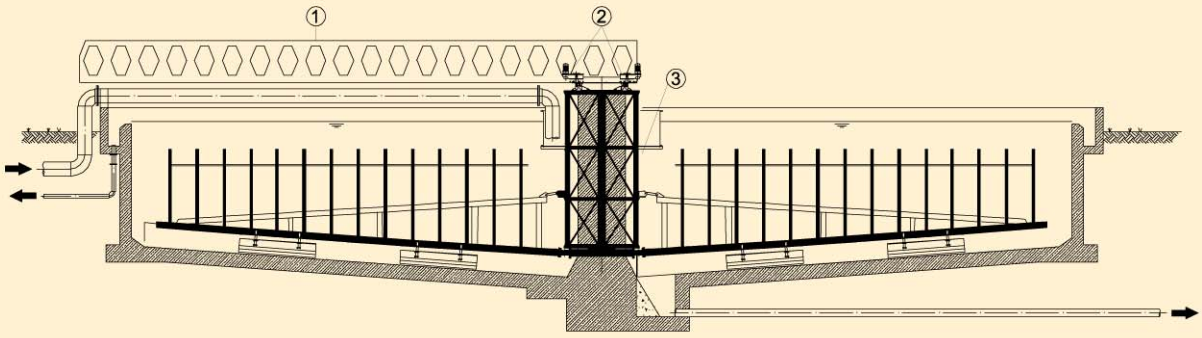
S	Sedimentation	**CP**	Circular Tank, Peripheral Drive
T	Gravity Thickener	**CCS**	Circular Tank, Central Drive, Supported Bridge
G	Grit & Grease Removal	**CCF**	Circular Tank, Central Drive, Full Span Bridge
RB	Rectangular Tank, With Bridge	**V**	Vacuum Or Suction (With A Pump Or Syphon) Type
RC	Rectangular Tank, With Chain and Flight	**S**	Bottom Scrapers



T-CCF-S

CCF-TYPES (Circular Tanks With Central Drive on Full Span Bridges)

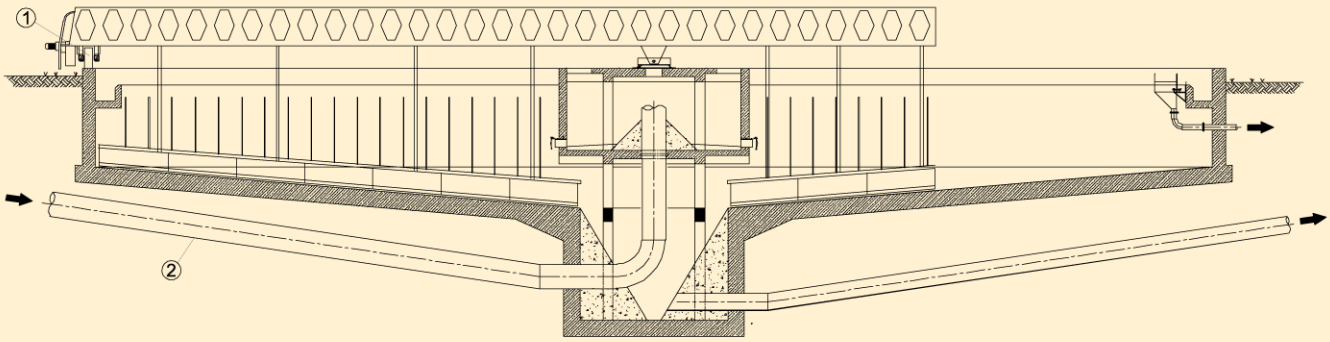
- Full span bridge for service and support of mechanisms. (1)
- Central drive mechanism supported by the bridge. (2) Drive mechanism is heavy and complicated.
- Bridge structure is heavy and costly since it takes all vertical and torsional loads.
- Torque transmitted by a circular shaft pipe. (3)
- Not very suitable for large diameter (large span) tanks.



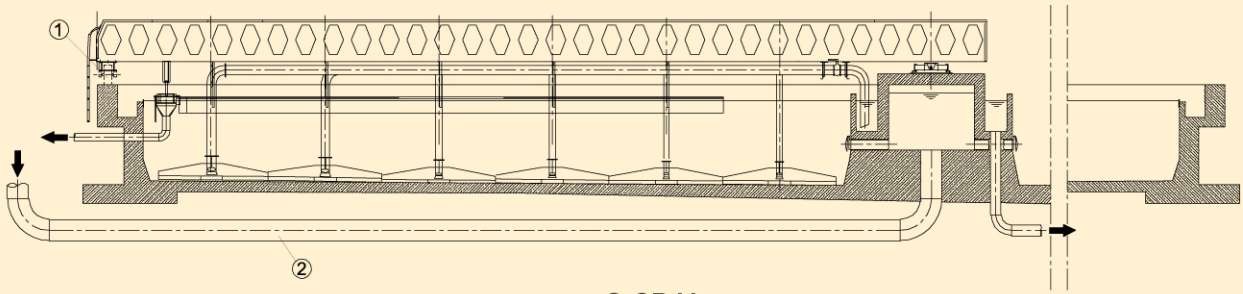
T-CCS-S

CCS-TYPES (Circular Tanks With Central Drive on Centrally Supported Bridge)

- Steel service bridge of half span (1)
- Central drive mechanism supported on central column (2) Drive mechanism is heavy and complicated.
- Bridge structure not very heavy because not much vertical load imposed on it.
- Torque transmitted by a cage type shaft (3)



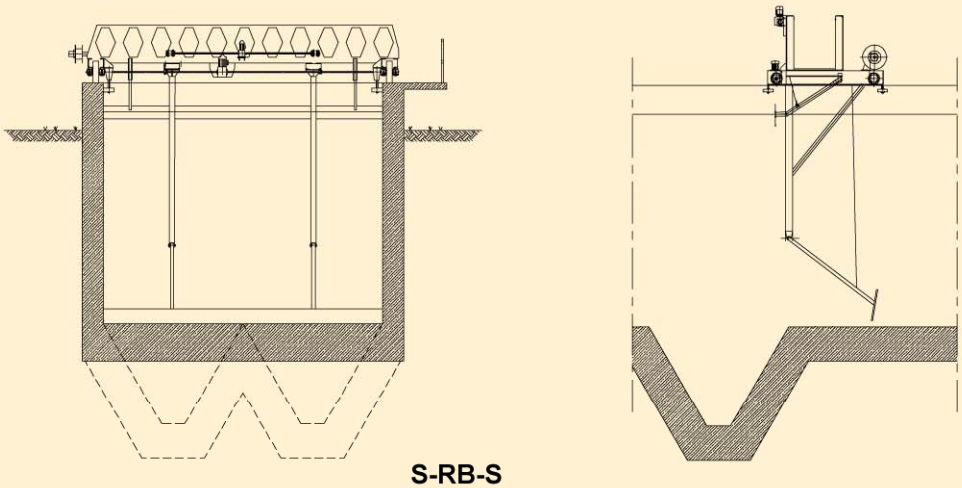
T-CP-S



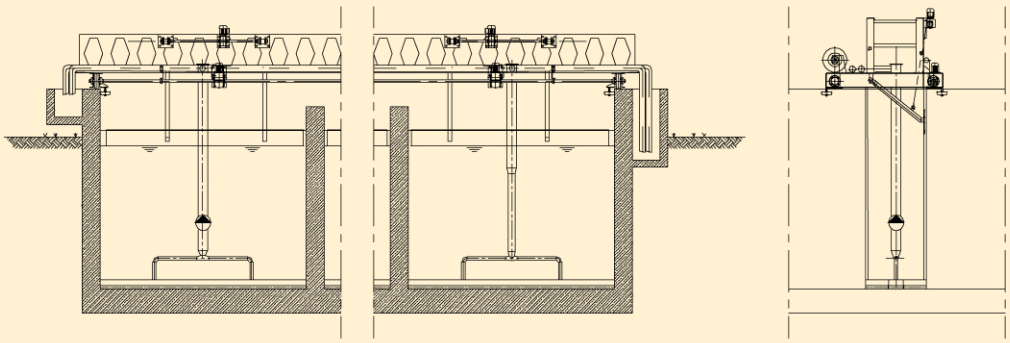
S-CP-V

CP-TYPES (Circular Tanks With Peripheral Drive)

- Circular tanks occupy more space than rectangular tanks.
- Suitable for large sized tanks.
- Simple operation and control.
- Does not have parts permanently immersed in water.
- Drive gear is light and simple. (1)
- Inlet pipe must be laid under tank bottom. (2)



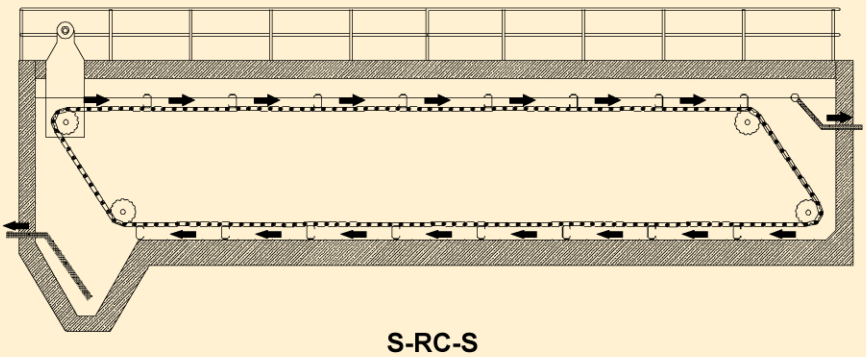
S-RB-S



S-RB-V

RB-TYPES (Rectangular Tanks With Bridge Type Scrapers)

- Suitable for compact plants, occupies less space.
- One or more of them can be put together with common walls.
- Not very suitable for medium and large final clarifiers because removal of sludge depended on travel cycle. This can be overcome by using suction types.
- Requires more controls and automation.
- Does not have parts permanently immersed in water.



S-RC-S

RC-TYPES (Rectangular Tanks With Chain Drive Type Scrapers)

- Suitable for compact plants, occupies less space.
- One or more of them can be put together with common walls.
- Suitable also for medium sized final clarifiers as the increased no. of flights help rapid removal of sludge.
- Automation and control level is not high.
- Some rotating parts are permanently immersed in water and the tank has to be drained in case of repair.

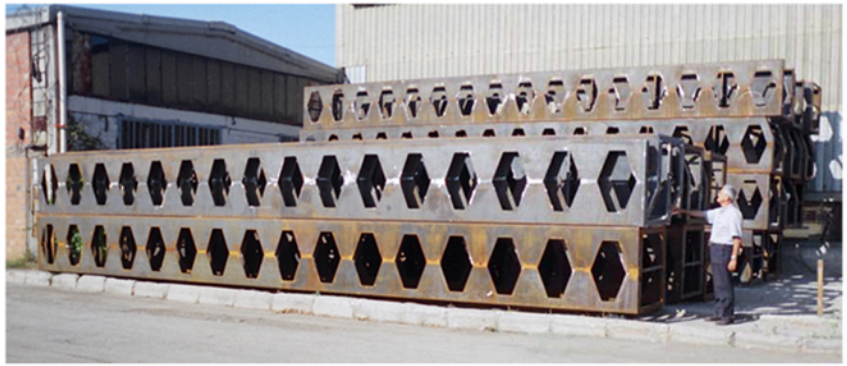
SCRAPERS FOR GRIT CHAMBERS, SEDIMENTATION and THICKENER TANKS

S-RC-S

S-RB-V

S-CP-V

S-CP-S

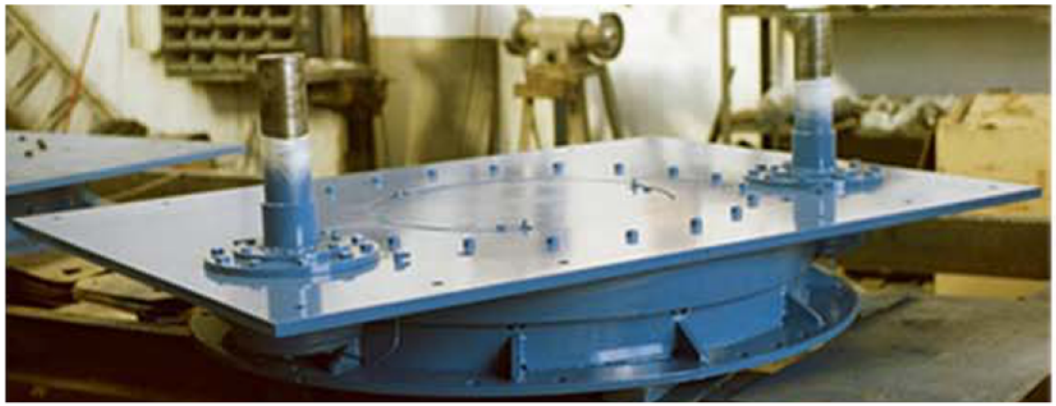


Large span bridges made of folded steel plates in the form of “Castello Beams” ready for hot dip galvanizing.

Hot dip galvanized bridge, pipes, and fittings during transport.

Scraper bridge during erection.

SCRAPERS FOR GRIT CHAMBERS, SEDIMENTATION and THICKENER TANKS



Thickener arms and central drive bearing for a thickener.

Steel wheels before and after galvanizing and fitting with polyurathane tires.

Suction type bottom scrapers ready for hot dip galvanizing.

The main application of penstocks is the control of flow and isolation of fluids in water and wastewater treatment plant, irrigation works, power plants , etc. According to place of aplication they are classified in two broad categories.

* Wall mounted types,
* Channel mounted types.

According to the thrust transmission type they are classified as:

* Rising stem,
* None rising stem.

According to the type of sealing material they are classified as:

* Metal-to-metal seals,
* Rubber seals.

Materials of construction can be cast iron, hot dip galvanized steel, epoxy coated steel or stainless steel.

TYPE KEY FOR PENSTOCKS

Example C / RS / 40x60 / 50-500

Type
C (Channel)
W (Wall)

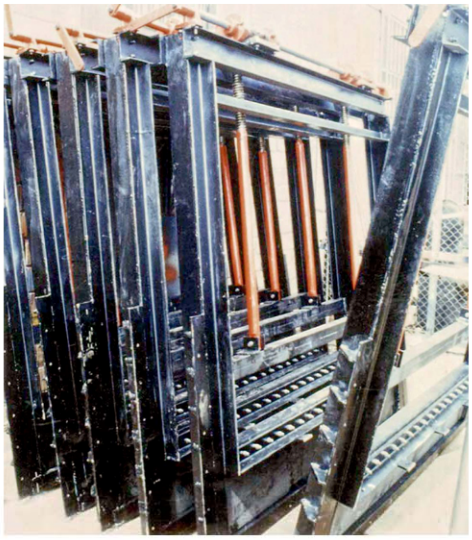
Spindle
RS (Rising Spidle)
NS (Non-rising Spindle)

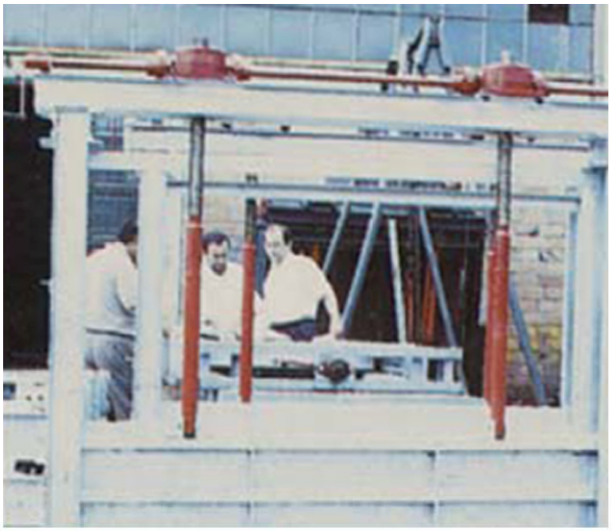
Size of Gate (b x h) cm

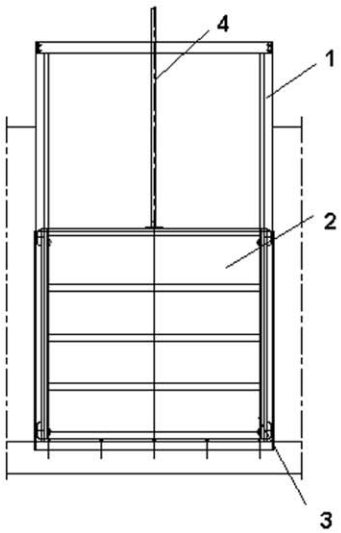
Maximum Water Depth (cm)

Height of Operation Platform (cm)

Metal-to-metal seals are not much preferred because they are not as successful as the rubber seals agains leakage. Cast iron types are not very common due to large no of moulds to be kept in stock for different types. Standart material for EKOTEK penstocks is stainless steel AISI 304.







Structural Data

1. Frame

It is the carrier of the system. Channel mounted penstocks are designed with full frame and the frame is manufactured from mild steel or stainless steel profile.

2. The door

Door is designed with flat surface and runs in slide rails up and down. It is made of mild steel or stainless steel material.

3. Seal

P, V and double lip rubber seals are used as sealing element and sealing is applied on 3 sides of channel penstocks. The standart seals material is EPDM, options available on request.

Complete water tightness can not be guarantied for fabricated penstocks and they have leakage rates depending on pressure sides. Estimated leakage rate is 0,4 litres/min/m.

4. Spindle

Our standart for gates is rising spindle type, but non-rising spindle type gate is also available. Up to approximately 1500 mm width, one single spindle is used; for greater widths the double spindle model is generally used.

Replacing or maintenance of diffusers at the bottom of aeration tanks is always a problem. Most of the time tanks must be emptied or sometimes divers with special clothing must be used in large tanks.

With this simple apparatus, designed and manufactured by EKOTEK, diffusers can easily be taken out of the tanks.

Specific equipment for solid waste handling and composting can be manifactured in the workshop of EKOTEK.

- Shredding equipment (Above)
- Bridge cranes with clampshell (Below)

Specific equipment for solid waste handling and composting can be manifactured in the workshop of EKOTEK.

- Belt conveyors and step conveyors (Above)
- Rotary drums for aerobic composting (Below)

EKO PAK

Package Plants are pre-engineered and manufactured units that are transportable to site ready for use. Small compact treatment plants made of in-situ concrete are not considered as package plants. However, for the installation of a package plant some minor civil works such as a concrete pad for foundation or a collection pit for pumps etc. are generally needed.

Package treatment plants manufactured by EKOTEK can be classified into the following categories:

- **Continuous Flow Systems:**

Raw water or wastewater enters continuously by gravity or by pumping to the treatment unit and leaves the system simultaneously as it is treated.

- **Batch systems (SBR-Sequencing Batch Reactors):**

Operate on the fill-treat-and decant principle. Multiple modules can be used for increasing the capacity. In this case, either multiple equipment or several automatic valves must be used to provide the required sequencing. If a single module is used, then a balancing tank is necessary to store the water during decant mode.

Depending upon the concentration and nature of the impurities to be treated and the required quality of the effluent, combinations of biological treatment methods and/or physicochemical treatment methods can be used.

Biological Treatment Plants are mainly for wastewater with impurities in organic character. Domestic (municipal) wastewaters and industrial wastewaters from food and beverage industries, poultries, slaughterhouses etc are in this category.

In biological treatment the dissolved impurities are consumed by a mass of microorganisms under controlled conditions.

Physicochemical Treatment Plants are for potable water, service water, or industrial wastewaters. Basic rules of physics and chemistry are employed.

BIOLOGICAL PACKAGE TREATMENT PLANTS

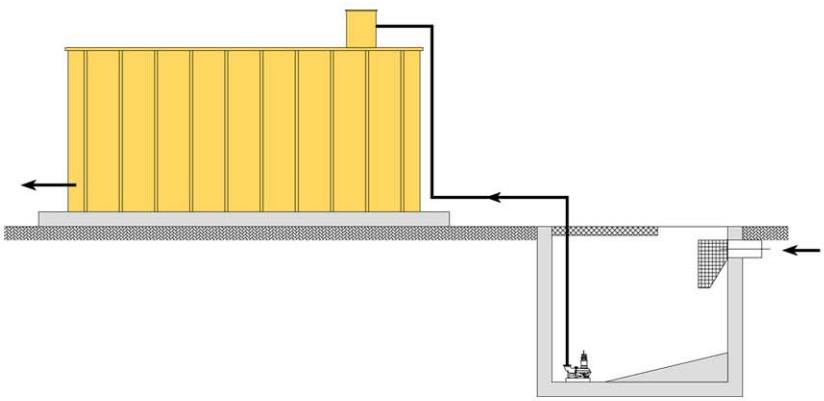
Biological treatment is something that allready happens by itself in nature. By the treatment technology it is accelerated under controlled conditions.

Depending upon the size of the plant and the strength of the wastewater and the required effluent quality, single stage or double stage treatment can be used. When large capacities or high treatment efficiencies are required classical package plants which operate on single processes such as SBR or extented aeration activated sludge are not adequate to provide the required effluent quality in a reasonable volume. For such cases combined processes (or double stage processes) are used. This means the wastewater undergoes a biological pretreatment first and then the treated effluent is treated again in the second stage biological treatment.

EKOTEK employs double stage biological treatment when the capacities exceed 800 PE or when required effluent quality is below 10 mg/l.
The philosophy behind using multiple stage treatment depends on the fact that first 50-60% of the pollutants can be removed easily and economically in a shorter time and small volume. Therefore, to treat the remaining 40-50% pollutants requires a relatively smaller volume. For example, a single-stage treatment plant with 95% efficiency is not as economical as a double stage plant with 60% efficiency + 87.5% efficiency which adds up to 95% overall efficiency.

Various package plant configurations from selected cases are enclosed below.
- SBR
- Continuous Flow Systems:
  - Conventional,
  - Aerated submerged filter,
  - MBR,

ABOVE GROUND INSTALLATION



Batch type (fill and draw) process is used. The main advantage of this process is that it is not affected from peak flows that occur during the day. Therefore no balancing tank is required.Wastewater entering the inlet section passes through screens. Floatable objects like grease etc. are kept at the inlet chamber. Then by a submersible pump the wastewater is conveyed to the biological reaction section. The organic pollutants are consumed by the microorganisms and thus water is purified. The oxygen required by microorganisms during this process is supplied by blowing air to the bottom of the tank. (Figure 1)

BELOW GROUND INSTALLATION

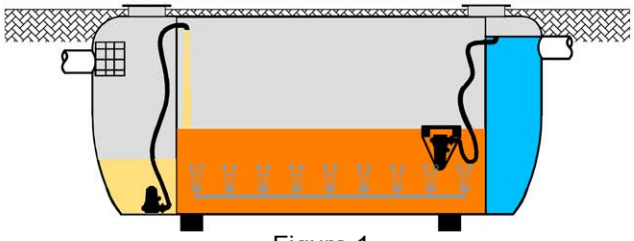


Figure 1

Aeration continues until the biological reactor gets completely full. (Figure 2)

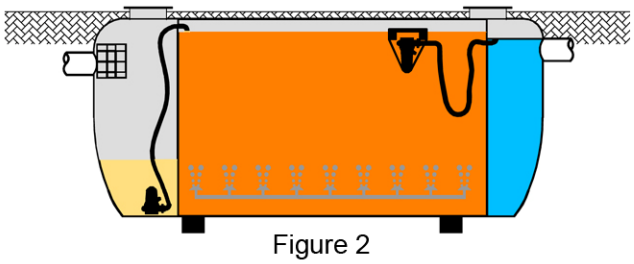


Figure 2

Aeration and inlet feed is stopped for a while to let the microorganisms settle to the bottom of the tank. At this stage the wastewater which comes to the plant is kept at the inlet section. (Figure 3)

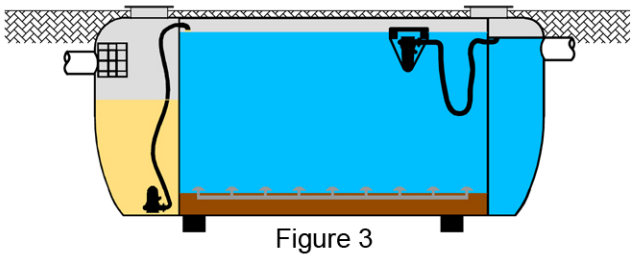


Figure 3

Clarified water is decanted by a float mounted submersible pump. At this stage chlorine (hypochloride solution) is injected to kill pathogenic microorganisms. Filling cycle starts again. Settling and decanting period is adjusted by level switcihes and a timer on the control panel. (Figure 4)

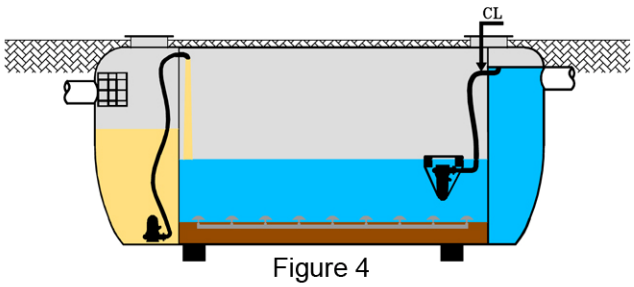
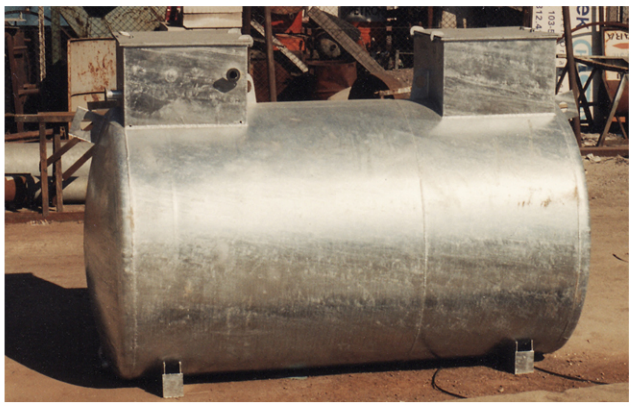


Figure 4

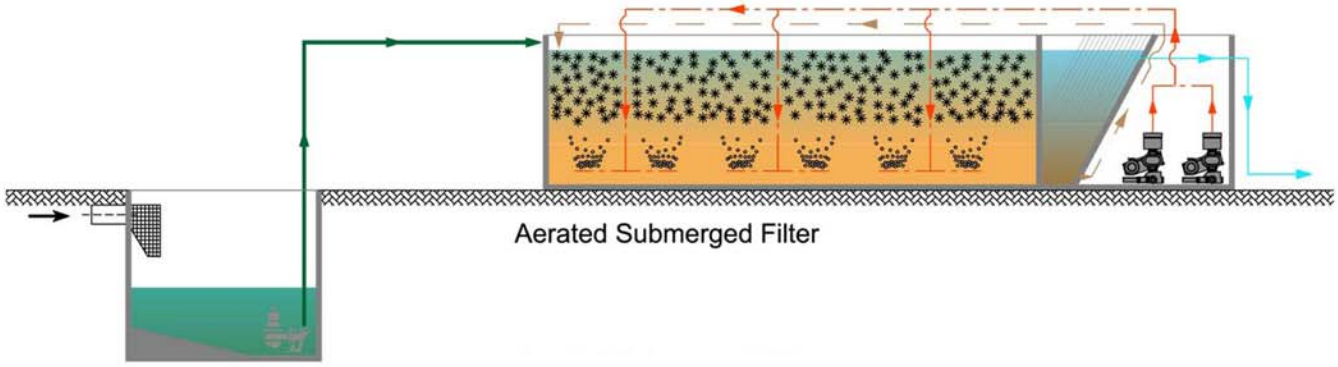
ekOMİNİ
ECONOMY IN WASTEWATER TREATMENT

**PACKAGE TREATMENT PLANTS
FOR SMALL ISOLATED COMMUNITIES**

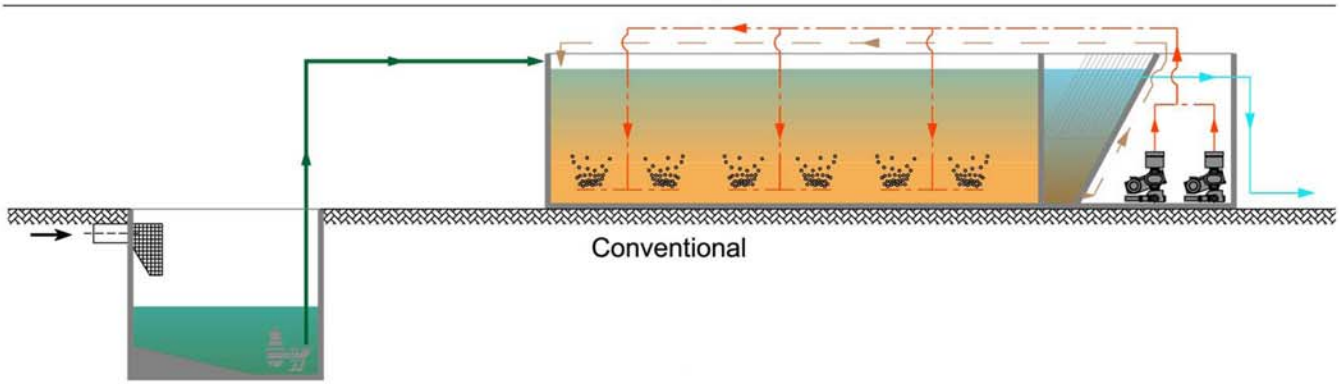


BIOLOGICAL PACKAGE TREATMENT PLANTS

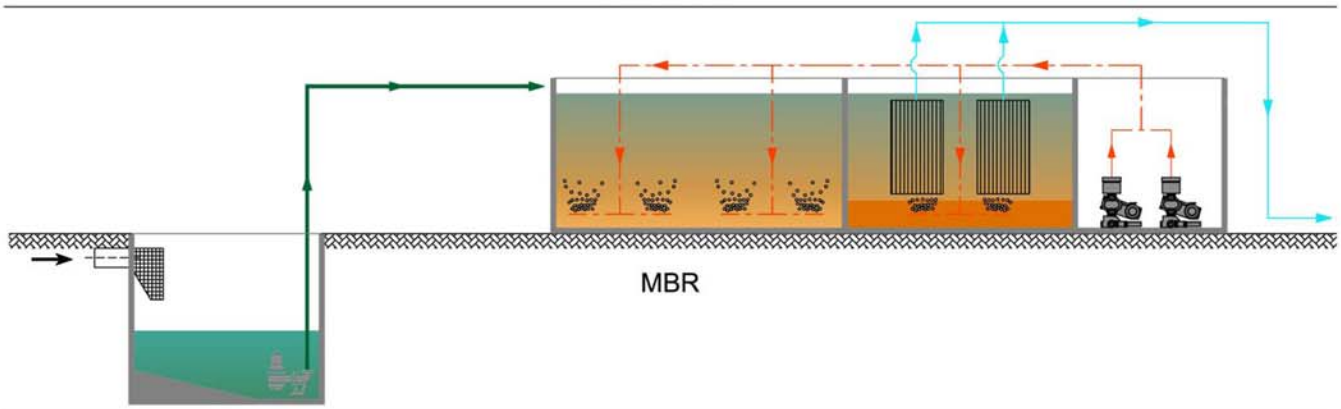
CONTINUOUS FLOW TYPE PACKAGE PLANTS



Aerated Submerged Filter



Conventional



MBR

Basic rules of physics and chemistry are used to remove the pollution from water. For example:

All particles suspended in a fluid of lower density tend to settle under the influence of gravity. This physical effect is used to remove suspended solids from wastewater or other water supplies by storage in large reservoirs or by passing the water trough settling tanks of various designs.

Suspended solids of small particle size as well as colloidal substances cannot be removed by settlement without a preliminary coagulation and flocculation to increase the effective particle size. Suspended constituents with a density below that of water float to the surface. A combination of both settling and floating is also possible.

The dimensions of the separation systems depend on a number of factors, such as the quantity of water which has to be treated, shape and size of the particles, the difference in density between solids and water, water temperature, turbulance and the effluent standards.

The removal of settling and floated substances requires special equipment, such as scraper mechanisms, pumps, etc.

Containerized compact plants for physico-chemical treatment of various types of water and wastewaters employ one of the following processes or a combination of various of them

-coagulation / flocculation

-sedimentation

-flotation

-filtration

-adsorption (activated carbon)

-ion exchange (softening)

-separation by membranes

-microfiltration

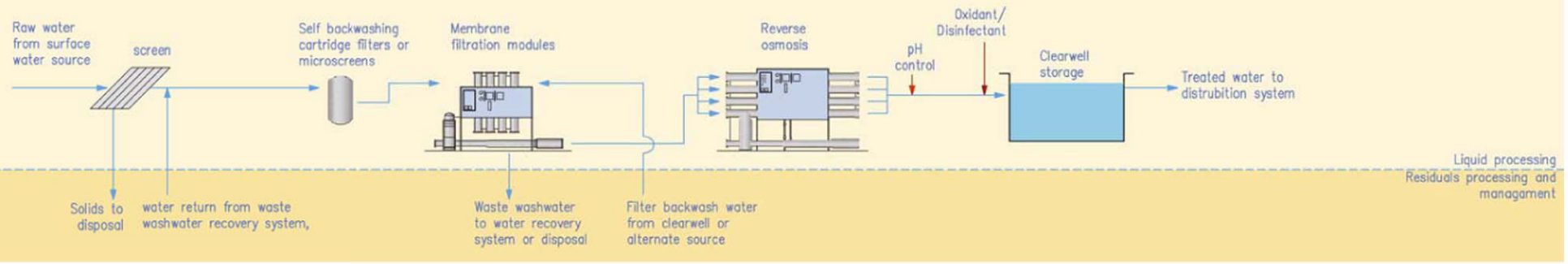
-ultrafiltration

-nanofiltration / reverse osmosis

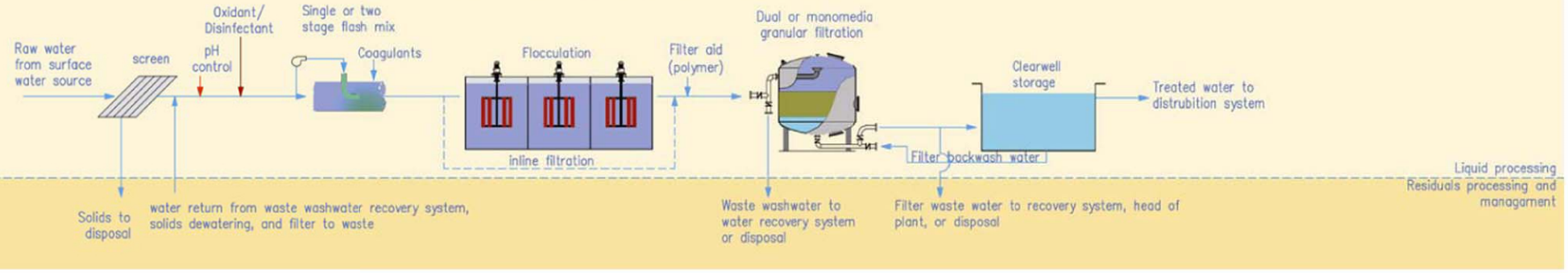
ALTERNATIVE / COMBINATIONS OF PHYSICO-CHEMICAL PROCESSES

Depending on the characteristics of the water to be treated and the required effluent quality, different combinations of the physico–chemical processes mentioned in the previous page, can be made. Biological treatment is explained elsewhere, therefore it is not mentioned here. But quite often it is used in conjuction with these physico–chemical units.

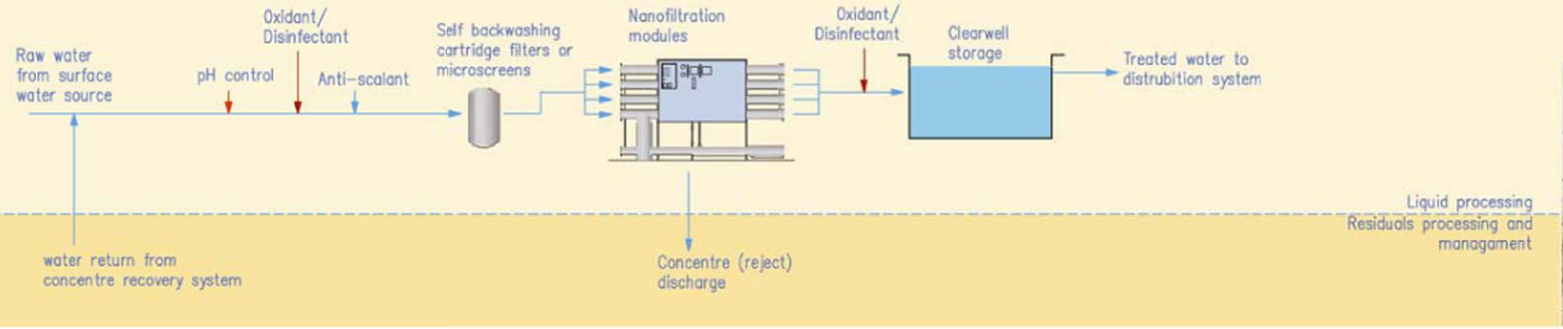
1. TYPICAL PROCESS TRAIN FOR TREATMENT OF SURFACE WATER BY REVERSE OSMOSIS



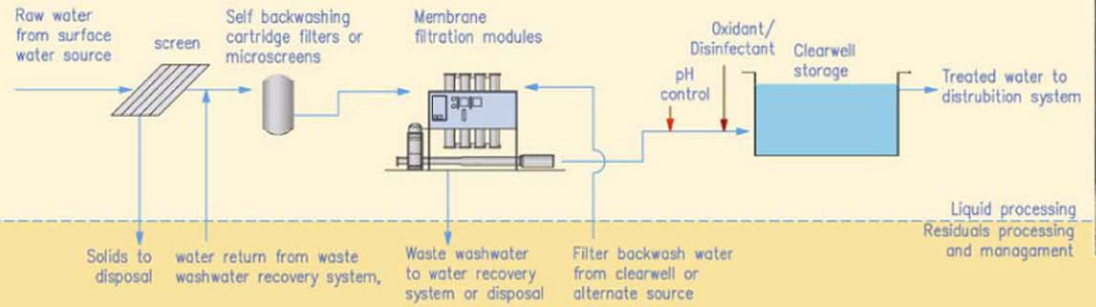
2. TYPICAL PROCESS TRAIN FOR TREATMENT OF SURFACE WATER BY DIRECT AND IN–LINE FILTRATION



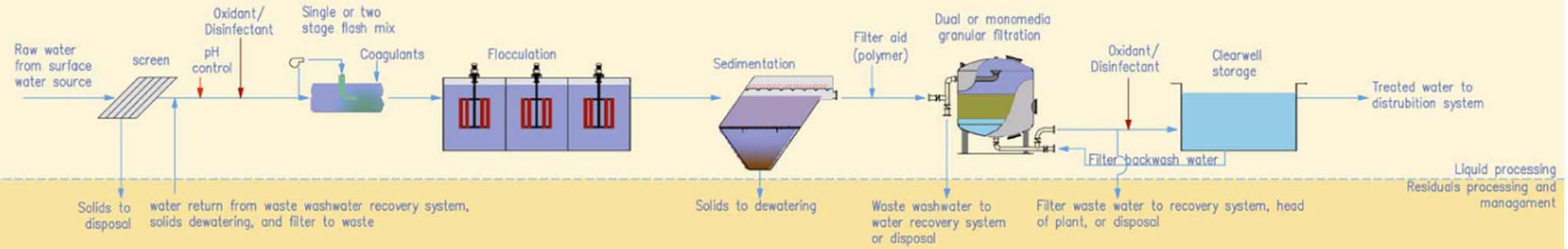
3. TYPICAL PROCESS TRAIN FOR TREATMENT OF GROUNDWATER WITH NANOFILTRATION SOFTENING PROCESS



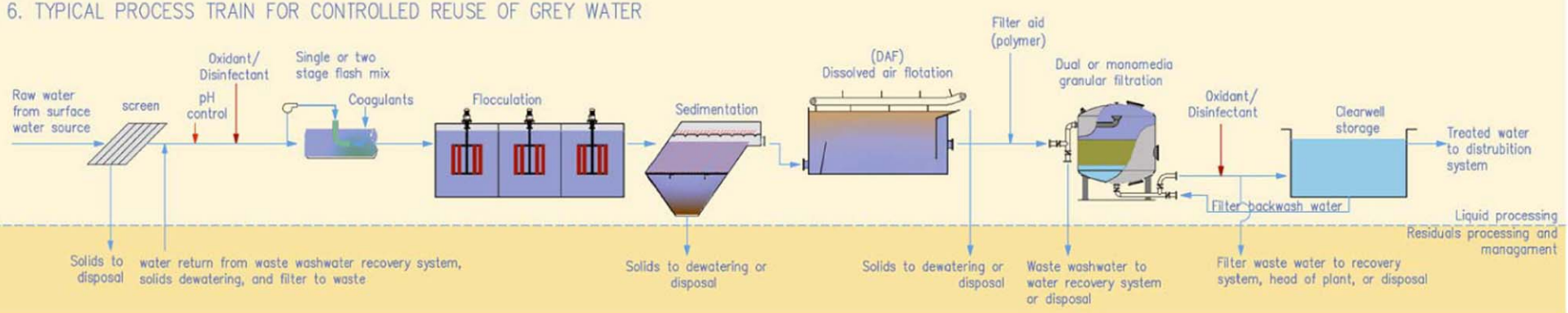
4. TYPICAL PROCESS TRAIN FOR TREATMENT OF SURFACE WATER BY MEMBRANE FILTRATION



5. TYPICAL PROCESS TRAIN FOR REMOVAL OF TURBIDITY AND COLOR FROM SURFACE WATER



6. TYPICAL PROCESS TRAIN FOR CONTROLLED REUSE OF GREY WATER



Coagulation is the destabilization of colloidal particles brought about by the addition of a chemical reagent known as a coagulant.

Flocculation is the agglomeration of destabilzed particles into microfloc and later into bulky floccules which can be settled called floc. The introduction of another reagent called a flocculant or a flocculant aid may promote the formation of the floc.

In containerized compact plants EKOTEK most of the time employs vertical shaft, paddle type flocculators. Vertical shaft paddles are preferred to horizontal shaft types because they do not have any bearing below the water surface, and maintenance can easily be done without emptying the tank. Slow speed, large diameter propeller type flocculators are also used from time to time . There are also available pipeflocculators which are plug flow reactors.

The pipe flocculator is a plugflow reactor in which processes such as coagulation, flocculation, demulsification, precipitation and pH control can take place under highly controlled and well defined conditions.

The above mentioned processes take place under turbulent flow conditions. At the chemical injection points the pipe diameter is adapted to ensure instantaneous mixing of chemicals and wastewater. Through the cross-section of a pipe the mixing intensity is virtually homogeneous. Reaction time is determined by the pipelength and flowrate and based on the exact requirements, no excess is required. In the plugflow reactor the process can be influenced at any time as opposed to tankreactors, where only one condition per tank can be maintained. Generally speaking a pipe flocculator is used where a coagulant, a flocculant and optionally a chemical for pH correction are dosed in sequence for the removal of turbidity and/or COD or precipitants.

The use of a pipeflocculator in combination with a flotation system can give COD removals of up to 95%.

VERTICAL SHAFT PADDLE TYPE FLOCCULATOR

EKOTEK has a wide experience in chemical treatment, particularly in the use and selection of coagulants and flocculants in combination with pipe flocculators.

Specific details and characteristics

- High quality and durable materials like HDPE pipes, AISI304 supports are standard.
- No shortcircuiting and hardly any backmixing.
- No retention time distribution.
- Homogeneous mixing thoroughout the cross section.
- Completely predictable and controlled mixing environment.
- No moving parts.
- No additional energy source.
- All required process conditions and chemical additions in a single unit.
- Uniform floc growth.
- Small space requirements.
- Exchangeable mixing pieces.

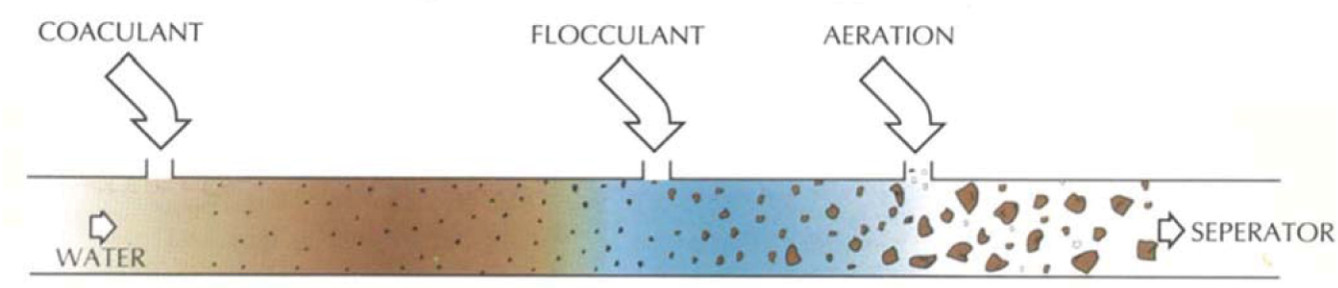
PIPE FLOCCULATOR

Available models

- Standard units are available upto a flow of 400m^3/hr.
- Customized units for special applications.

EKOTEK engineers can perform onsite tests to determine;

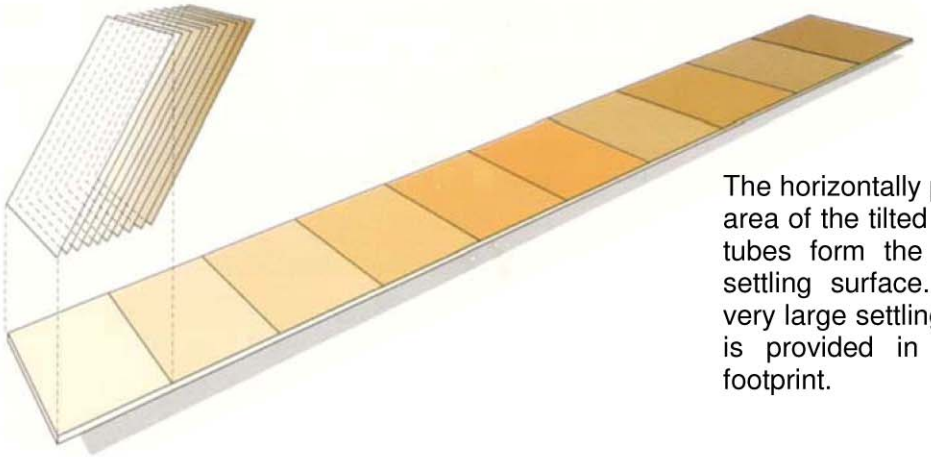
- Process parameters for coagulation
- Flocculation – separation.
- Chemical and additive requirements.
- Maximum achievable reductions in pollution load.



PRINCIPLE OF PIPE FLOCCULATOR

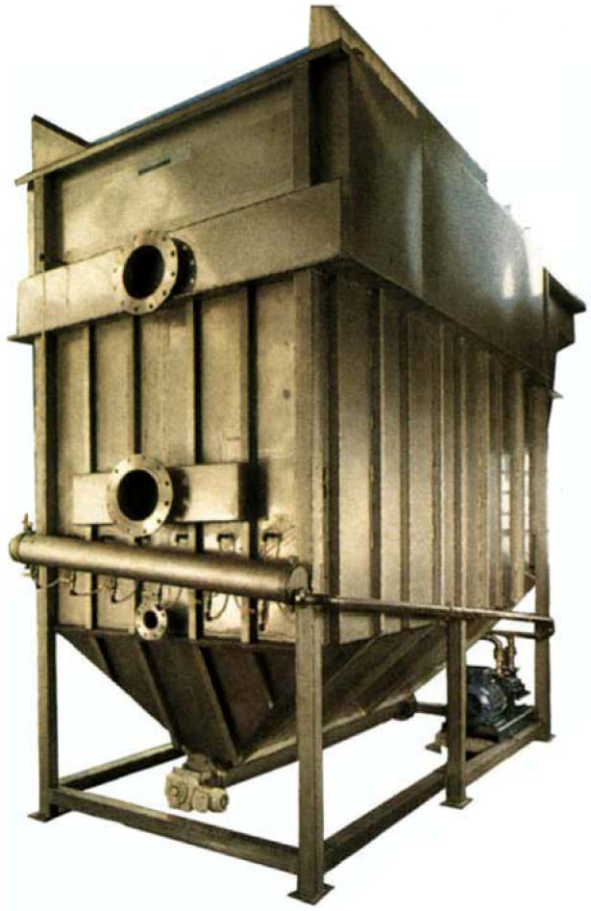
SEDIMENTATION UNITS

For compact settling plants , EKOTEK manufactures lamella type separators. The introduction of lamella separators for the removal of suspended solids has been a significant improvement with regard to the compactness of the sedimentation process. They are made up of inclined plates or bundles of smallplastic tubes. The tecnology is based on the theory that settling depends on the settling surface area rather than detention time. Although they are used predominantly in water-treatment, they are also used in wastewater treatment for primary, secondary and tertiary sedimentation. In primary sedimentation applications, however, fine screening should be provided ahead of the settling operation to prevent plugging of the plates or tubes.
To be self-cleaning, plate or tube settlers are set at an angle between 45 and 60° above the horizontal. Nominal spacing between plates is 50mm.(2in), with an inclined length of 1 to 2m.(3 to 6 ft).
EKOTEK product line consists of a broad range of lamella separation systems that can be widely used in the field of the removal of oils and fats, suspended solids and other constituents. Surface skimming devices and auger type bottom screws can be installed for the discharge of the removed substances.
A chemical pre-conditioning of the water may be employed in order to improve the settling velocity of fine particles and to remove colloidal substances.

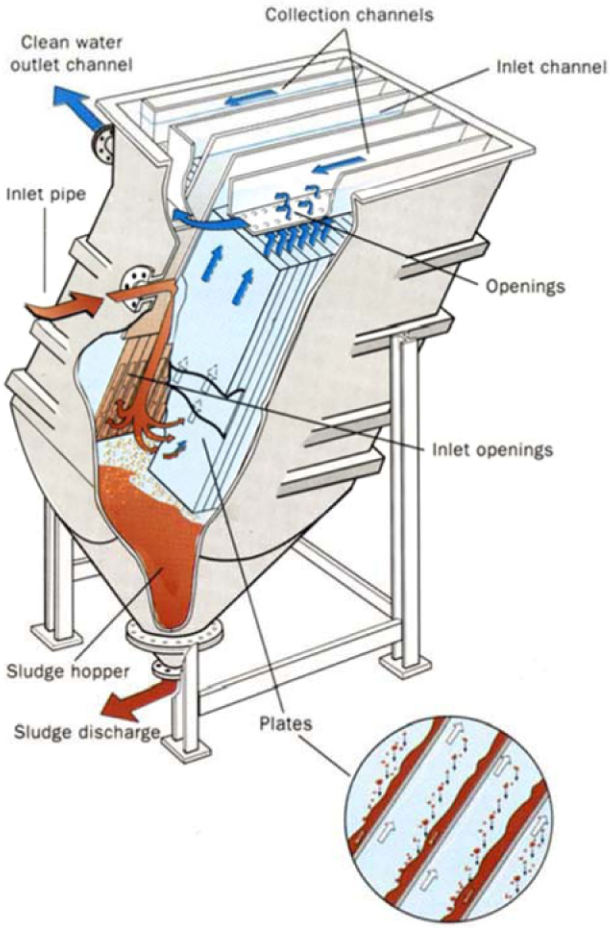


The horizontally projected area of the tilted plates or tubes form the effective settling surface. Thus a very large settling surface is provided in a small footprint.

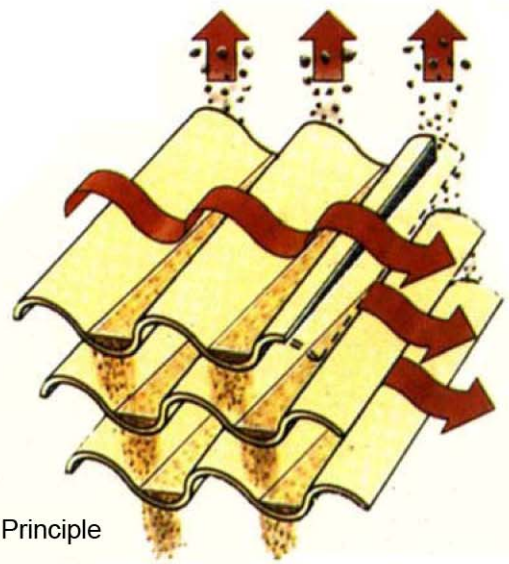
Inclined settling systems manufactured by EKOTEK are generally constructed for use in one of three ways with respect to the direction of liquid flow relative to the direction of particle sediment:
(1) countercurrent, (2) cocurrent, and (3) cross-flow. Depending on the job characteristics, the wastewater and the effluent requirements proper selection is made by EKOTEK.



Lamella Separator



Counter Current Principle



Cross Flow Principle

DISSOLVED AIR FLOTATION (DAF) UNITS

ekotek™ product line offers a large variety of dissolved air flotation systems. Dissolved air flotation is a useful tool for solving difficult waste water treatment problems and the separation of sludges. The process is also employed for the supply of drinking utilizing surface water as a source. Flotation consists of attaching fine air bubbles to suspended material, causing a net reduction of specific gravity.

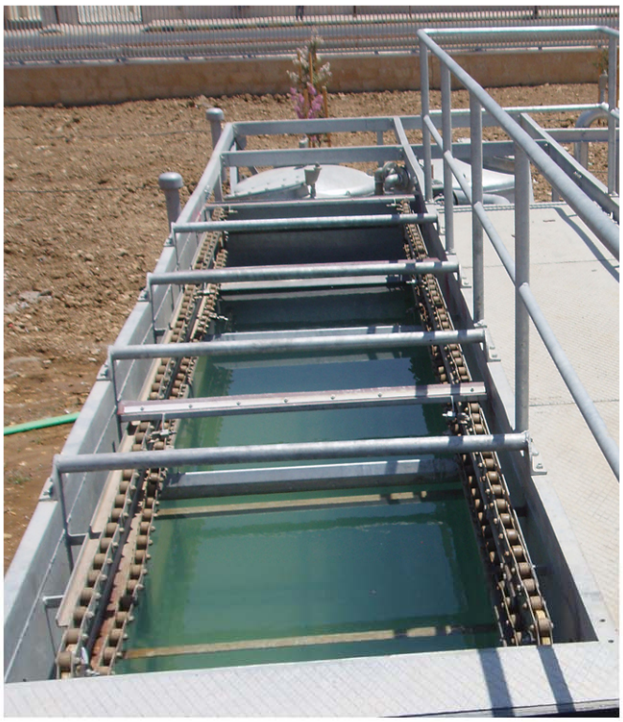
The micronsize bubbles are produced by dissolving air into the wastewater at elevated pressures followed by subsequent release to atmospheric pressure. When the pressure is reduced to atmospheric conditions, the dissolved air, present in excess of saturation, is released as extremely fine bubbles attaching to the suspended solids.

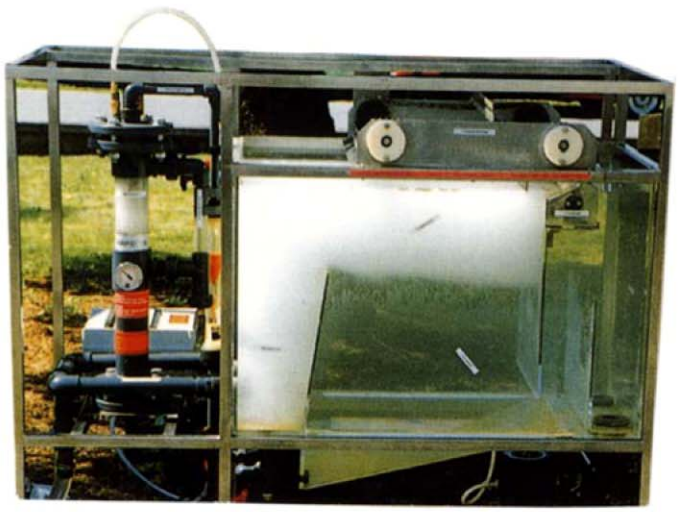
The suspended solids/air particles are floated to the top of the dissolved air flotation cell and are removed by a skimming or scraper device.

To effect flotation a recycle presurization system is sometimes used.

A part of the treated effluent is recycled and air is dissolved in the stream at an elevated pressure and mixed with the effluent just downstream of the pressure release device. In the small plants the entire flow is pressurized. In large plants only 10-15% presurized recycle is adopted.

In order to improve the efficiency of the flotation process as well as to remove colloidal substances flocculation may be integrated as a pretreatment. Also pH control may be applied for the formation of insoluble particles such as heavy metals.

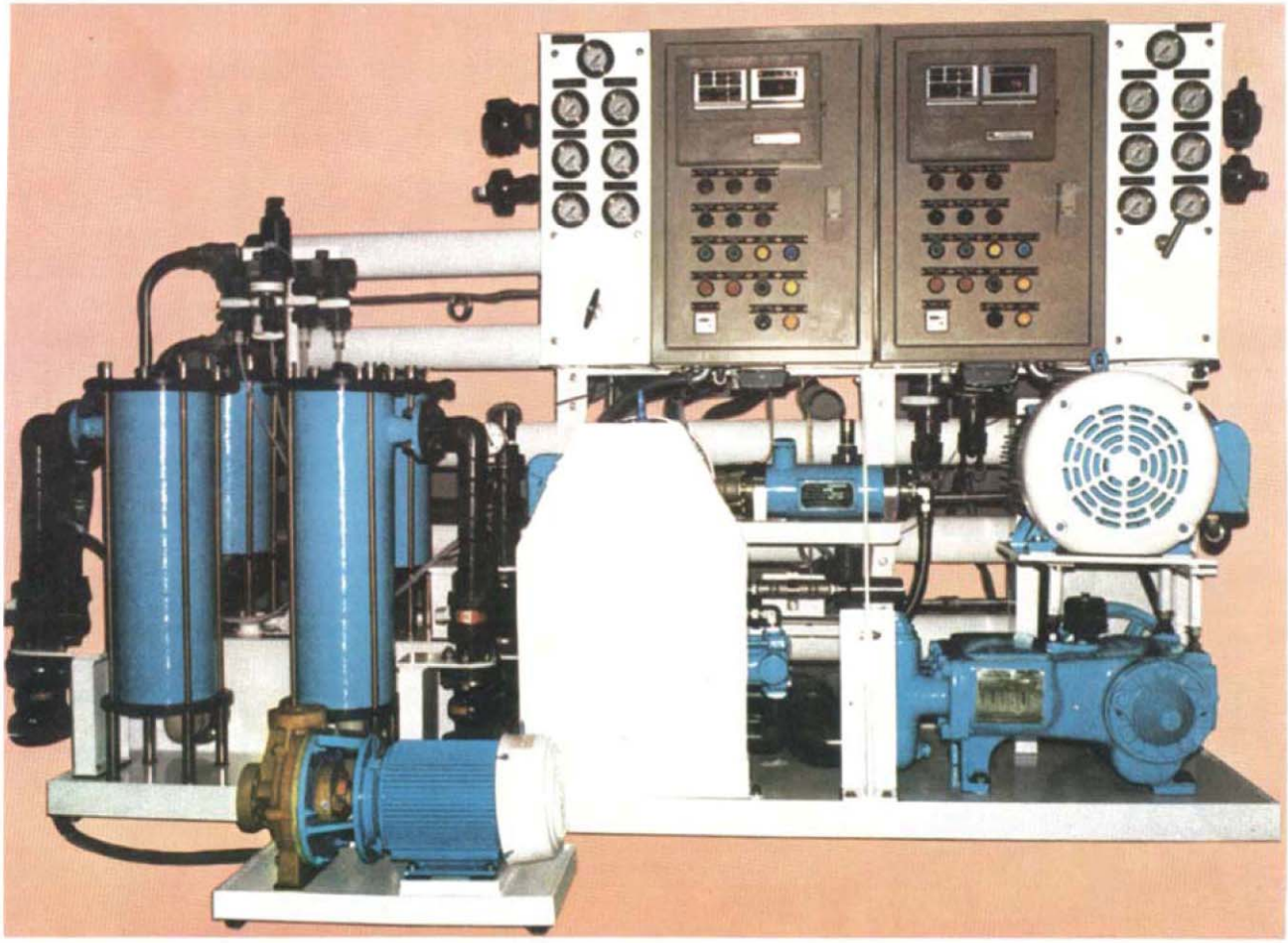


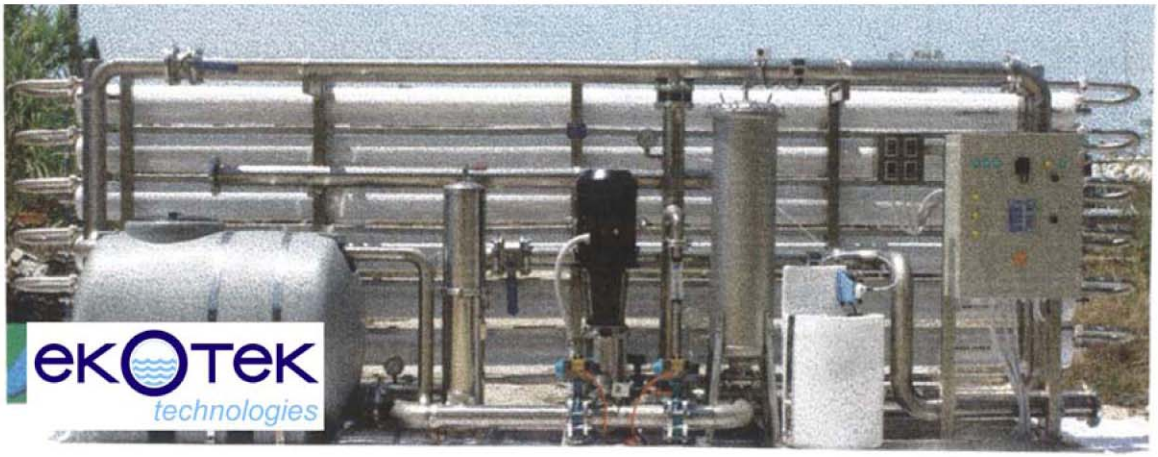


PACKAGE PLANTS for WATER & WASTEWATER TREATMENT

PHYSICO CHEMICAL TREATMENT SYSTEMS

MEMBRANE PROCESSES & REVERSE OSMOSIS

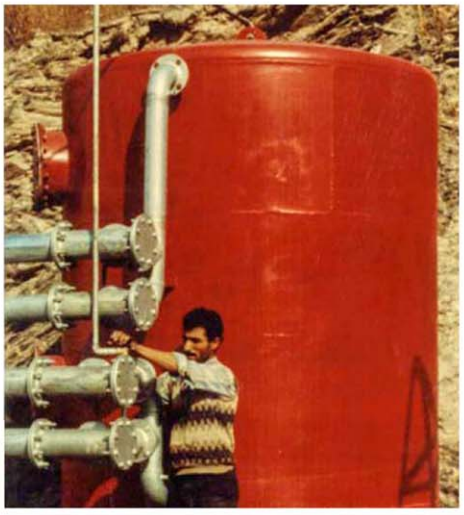




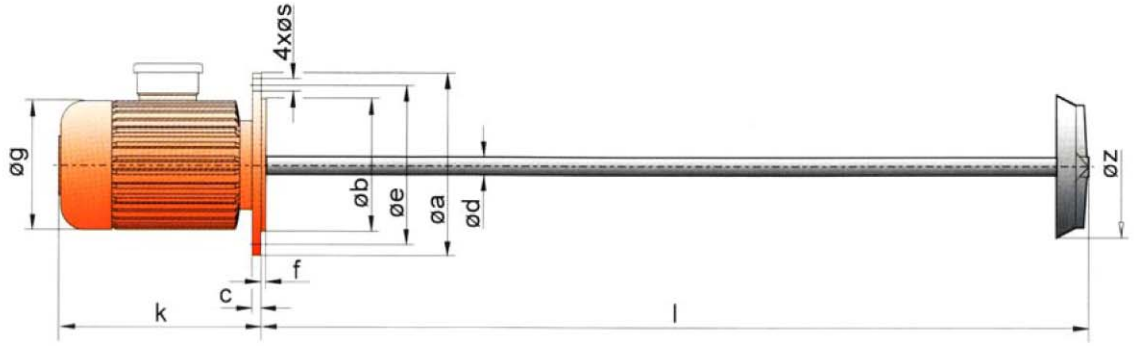
GRANULAR MEDIA FILTRATION UNITS

For compact units, pressurized tanks are used instead of atmospheric tanks. Depending on the nature of water and required filtrate quality, typical pressure ratings and surface loadings are 2 to 4bars and 5 to 40m/hr. EKOTEK generally adopts 5 to 15m/hr filtration rates for polishing of treated wastewaters, 10m/hr for potable waters and 20 to 40m/hr for s wimming pool water.
Similarly depth of media also varies with respect to the purpose aimed. EKOTEK products are generally designed in the range of 50 to 100cm for swimming pools and treated waswter and 85 to 120cm.for potable water.
The filter tanks are made of carbon steel as a standard and stainless steel options are available for special cases. Carbon steel tanks are hot dip galvanized as a standard up to 1400mm. diameter. Optionally suitable decorative paint can be applied on the outside.Tanks larger than 1400mm diameter are sand blasted and epoxy coated as a standard. Optionally can be made hot dip galvanized in the form of smaller pieces bolted together after galvanizing. For large capacities horizontal filters can be supplied. Filter nozzles are made of polypropylene. Standard nozzles are for water backwash type filters. Water + air backwashed filters are equipped with special nozzles.

GRANULAR MEDIA FILTRATION UNITS



EKOM – MIXER



Typ DFH	kW	min^{-1}	Øa	Øb	c	Øe	f	Øg	k	4 x Øs	Ød	l	Øz	kg
4/5	0,25	1390	160	110	10	130	3,5	138	212	9	30	1800	100	15
4/6	0,37	1380	160	110	10	130	3,5	138	212	9	30		110	16
4/7	0,55	1380	160	110	12	130	3,5	156	233	11	30		120	19
4/8	0,75	1395	160	110	12	130	3,5	156	233	11	30		130	20
4/9	1,1	1400	160	110	12	130	3,5	176	250	11	30		140	27
4/10	1,5	1410	160	110	12	130	3,5	176	275	11	30		150	31
4/10	1,5	1400	250	180	12	215	3,5	176	275	14	40	2000	150	41
4/11	2,2	1410	250	180	16	215	4	198	306	14	40		160	43
4/12	3,0	1410	250	180	16	215	4	198	306	14	40		170	49
4/13	4,0	1420	250	180	16	215	4	220	322	14	40		180	60
4/14	5,5	1460	250	180	16	215	4	260	368	14	40		190	79
4/15	7,5	1450	250	180	16	215	4	260	406	14	40		200	90
4/16	9,2	1460	250	180	16	215	4	260	406	14	40		210	95
4/17	11	1460	350	250	20	300	5	315	476	18	50	2200	220	154
4/18	15	1460	350	250	20	300	5	315	520	18	50		230	175
6/4	0,18	910	160	110	10	130	3,5	138	212	9	30	1800	120	15
6/5	0,25	920	160	110	12	130	3,5	156	233	9	30		130	16
6/6	0,37	920	160	110	12	130	3,5	156	233	9	30		140	19
6/7	0,55	915	160	110	12	130	3,5	156	233	9	30		160	21
6/8	0,75	910	160	110	12	130	3,5	176	250	11	30		170	27
6/9	1,1	910	160	110	12	130	3,5	176	275	11	30		180	31
6/9	1,1	910	250	180	12	215	3,5	176	275	11	40	2000	180	49
6/10	1,5	950	250	180	16	215	4	198	306	14	40		190	50
6/11	2,2	950	250	180	16	215	4	220	322	14	40		200	60
6/12	3,0	945	250	180	16	215	4	260	368	14	40		220	80
6/13	4,0	960	250	180	16	215	4	260	406	14	40		230	91
6/14	5,5	945	250	180	16	215	4	260	406	14	40		250	98
6/15	7,5	965	350	250	20	300	5	315	476	18	50	2200	260	155
6/17	11,0	965	350	250	20	300	5	315	520	18	50		280	177
8/4	0,18	675	160	110	10	130	4	138	212	9	30	1800	150	16
8/6	0,37	670	160	110	12	130	4	156	233	11	30		180	21
8/7	0,55	670	160	110	12	130	4	176	275	11	30		190	32
8/8	0,75	690	250	180	16	215	4	198	306	14	40	2000	200	44
8/9	1,1	690	250	180	16	215	4	198	306	14	40		220	50
8/10	1,5	705	250	180	16	215	4	220	322	14	40		230	61
8/11	2,2	710	250	180	16	215	4	260	368	14	40		250	81
8/12	3,0	720	250	180	16	215	4	260	406	14	40		260	92
8/13	4,0	715	250	180	16	215	4	260	406	14	40		280	99
8/14	5,5	720	350	250	20	300	5	315	476	18	50	2200	290	157
8/15	7,5	720	350	250	20	300	5	315	520	18	50		310	178

***EKOM – Mixer Typ* DFH**

Application

In water treatment and the chemical, pharmaceutical and drinks industries the ***EKOM- Mixer* DFH** High Speed series is especially suitable for intensive mixing and dissolving operations. The mixer is mounted either on a flange fixed on a transverse girder, a flange fixed onto the container itself, a wall-suspension device or on a tripod. If built in laterally below the liquid level or installed in pressure or vacuum containers, an appropriate mixer-shaft seal becomes necessary.

Drive

In this series of ***EKOM- Mixers*** the performance and revolutions of the threephase motors are adjusted to suit therequired mixing task. The motors are of the safety goup type IP 54 and are fitted with a hollow shaft and reinforced bearings.

Mixer shaft

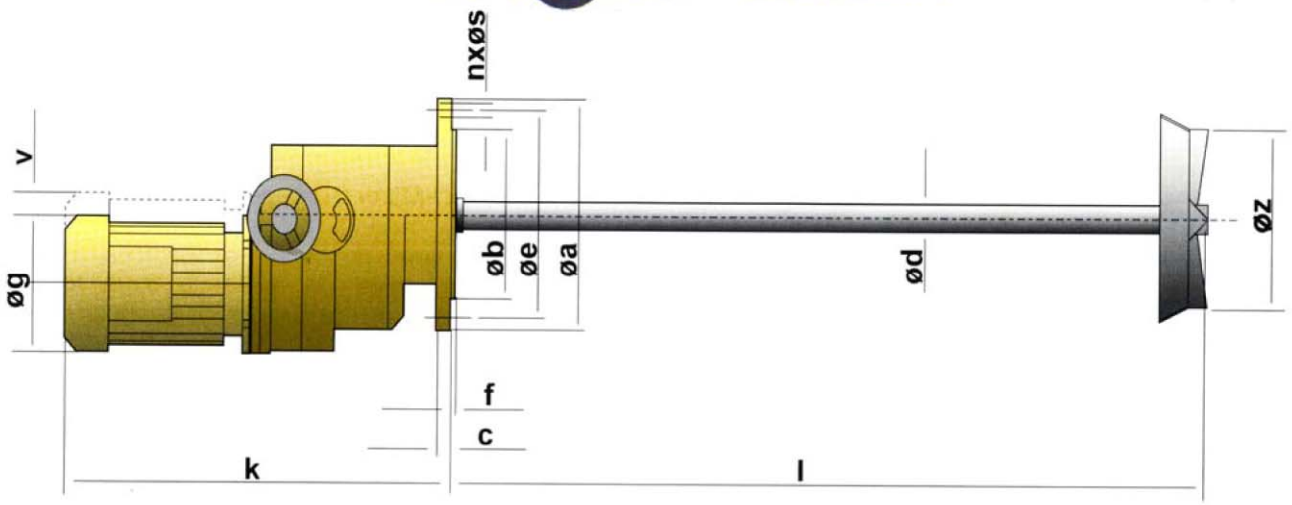
The mixer shaft is fixed install into the gears which guarantees a perfect fit and the best possible rotation.

EKOM- Mixer shafts are calculated and designed in accordance with critical bending speeds which ensure optimum rotation.
The material of the shaft is selected to suit the purpose of the operation.
We can deliver shafts in St 37, 1.4571 (V4A), Hastelloy etc. as well as rubber-or plastic-coated.

Mixing impeller

In mixing technology not all basic tasks can be performed by the same mixing impeller. The choice of impeller is based on the type of mixing medium and the required task.
EKOM- Mixer offers you an extensive range of different mixing instruments to suit every mixing process and medium.
We shall be happy to provide you with our special brochure on request.

EKOM – MIXER



Typ SD	kW	n_1 min^{-1}	n_2 min^{-1}	øa	øb	c	øe	f	øg	v	k	nxø	ød	l	øz	kg
5/36			91 - 639	200	130		165				517	4x11			170	32
5/31	0,25		149 - 1040	200	130		165				517	4x11			120	31
5/31			260 - 1820	160	110		130				497	4x9			90	27
6/36		1500	91 - 639	200	130		165				517	4x11			180	34
6/31	0,37		149 - 1040	200	130		165		140	43	517	4x11			140	34
6/31			260 - 1820	160	110		130				457	4x9			100	28
6/33			520 - 3640	160	110		130				457	4x9			60	27
7/36		3000	95 - 662	200	130		165				517	4x11			190	36
7/31	0,55		145 - 1014	200	130		165				517	4x11			150	36
7/31		1500	260 - 1820	160	110		130	3,5	160	53	510	4x9	30	1400	100	30
7/33		3000	520 - 3640	160	110		130		140	43	457	4x9			70	28
8/36			91 - 639	200	130		165				571	4x11			210	37
8/31	0,75	1500	149 - 1040	200	130		165				571	4x11			160	36
8/31			260 - 1820	160	110	12	130				510	4x9			110	31
8/33			520 - 3640	160	110		130				510	4x9			70	30
9/36			95 - 662						160	53					220	37
9/31	1,1	3000	145 - 1014	200	130		165				571	4x11			170	37
9/31			250 - 1750												120	37
9/33			520 - 3640	160	110		130				510	4x9			80	31
10/4		1500	99 - 496	250	180		215	4			625	4x14			290	63
10/4	1,5	3000	338 - 1690	250	180		215	4	180	55	600	4x14			130	48
10/4		3000	700 - 3500	200	130		165	3,5			536	4x11			90	46
11/4		1500	99 - 496	250	180		215	4	200	71	676	4x14			310	65
11/4	2,2	3000	338 - 1690	250	180		215	4	180	55	625	4x14			150	65
11/4		3000	700 - 3500	200	130		165	3,5	180	55	561	4x11			90	48
12/4		1500	99 - 496	250	180		215	4			676		40	1700	330	90
12/4	3,0	3000	338 - 1690	250	180		215	4	200	71	676				160	82
12/4		3000	700 - 3500	200	130		165	3,5			612				100	73
13/4		1500	98 - 488	300	230	14	265				784				350	125
13/4	4,0	1500	350 - 1750	250	180	12	215		220	79	702	4x14			160	108
13/4		3000	700 - 3500	250	180	12	215				702				110	103
14/5	5,5		121 - 605	300	230	14	265	4		98	838				330	156
14/5	5,5		350 - 1750	250	180	12	215			98	759				170	148
15/5	7,5		135 - 677	300	230	14	265			109	971				330	213
15/5	7,5		360 - 1800	300	230	14	265		260	109	862				180	185
16/5	9,2	1500	132 - 662	450	350		400				1025	8x18	50	1800	350	260
16/5	9,2		360 - 1800	350	250	18	300	5		132	908	4x18			190	220
17/5	11,0		132 - 662	450	350		400		310		1095	8x18			360	300
17/5	11,0		360 - 1800	350	250		300		310		978	4x18			200	260

***EKOM – Mixer Typ* SD**

Application

The ***EKOM-Mixer*** **SD** series is recommended for various mixing processes with varying viscosities and container dimensions. The mixer is mounted on a flange fixed to a transverse girder, a flange fixed onto the container, or independently of the container, on a wall-suspension device a tripod.

A mixer shaft seal becomes necessary, if the mixer is to be installed into either pressure or vacuum containers or if built in laterally below the liquid level.

Drive

The variable speed gear unit and motor are joined by a conecting flange to form a compact drive system.

Apart from moisture-proof two-pole and four-pole three-phase motors of safety group type IP 54, explosion-proof motors can also be supplied. The speed variation is based on the transfer of power by friction between the friction cone and the friction ring.

Eventual replacement of the friction ring can be made quickly and easily by virtue of the simple design. The revolutions can be adjusted both by the handwheel and the electric speed control mechanism.

Mixer shaft

The mixer shaft is bolted directly into the gear shaft which is housed in a reinforced bearing section. Locking surfaces ensure a precise fit and optimum rotation. The material of the mixer shaft is selected to suit the purpose of the operation. We can deliver shafts in St 37, 1.4571 (V4A), Hastelloy etc. as well as rubber-or plastic-coated.

Mixing impeller

In mixing technology not all basic tasks can be performed by the same mixing impeller. The choice of impeller is based on the type of mixing medium and the required task.

EKOM- Mixer offers you an extensive range of different mixing instruments to suit every mixing process and medium.

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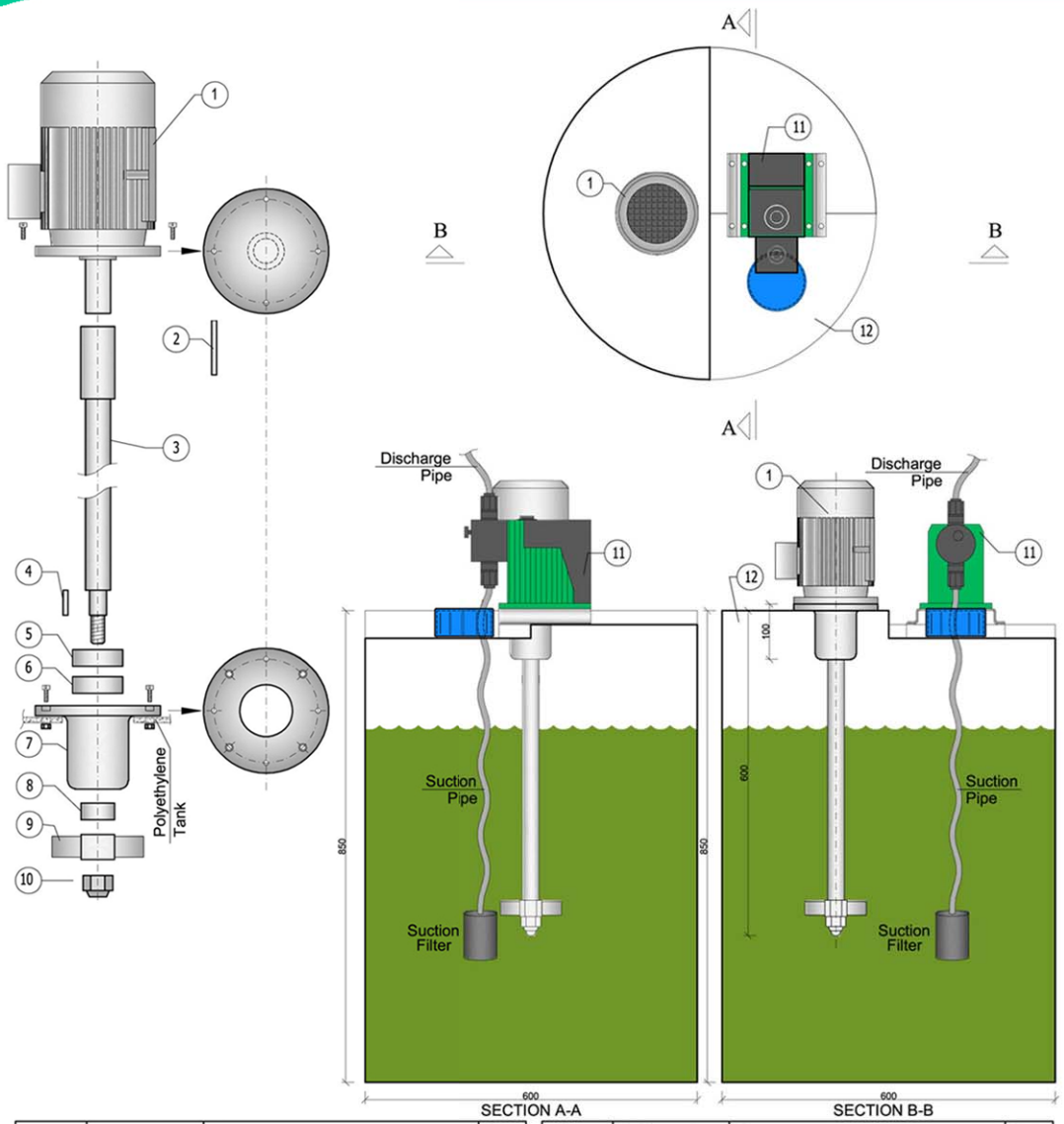
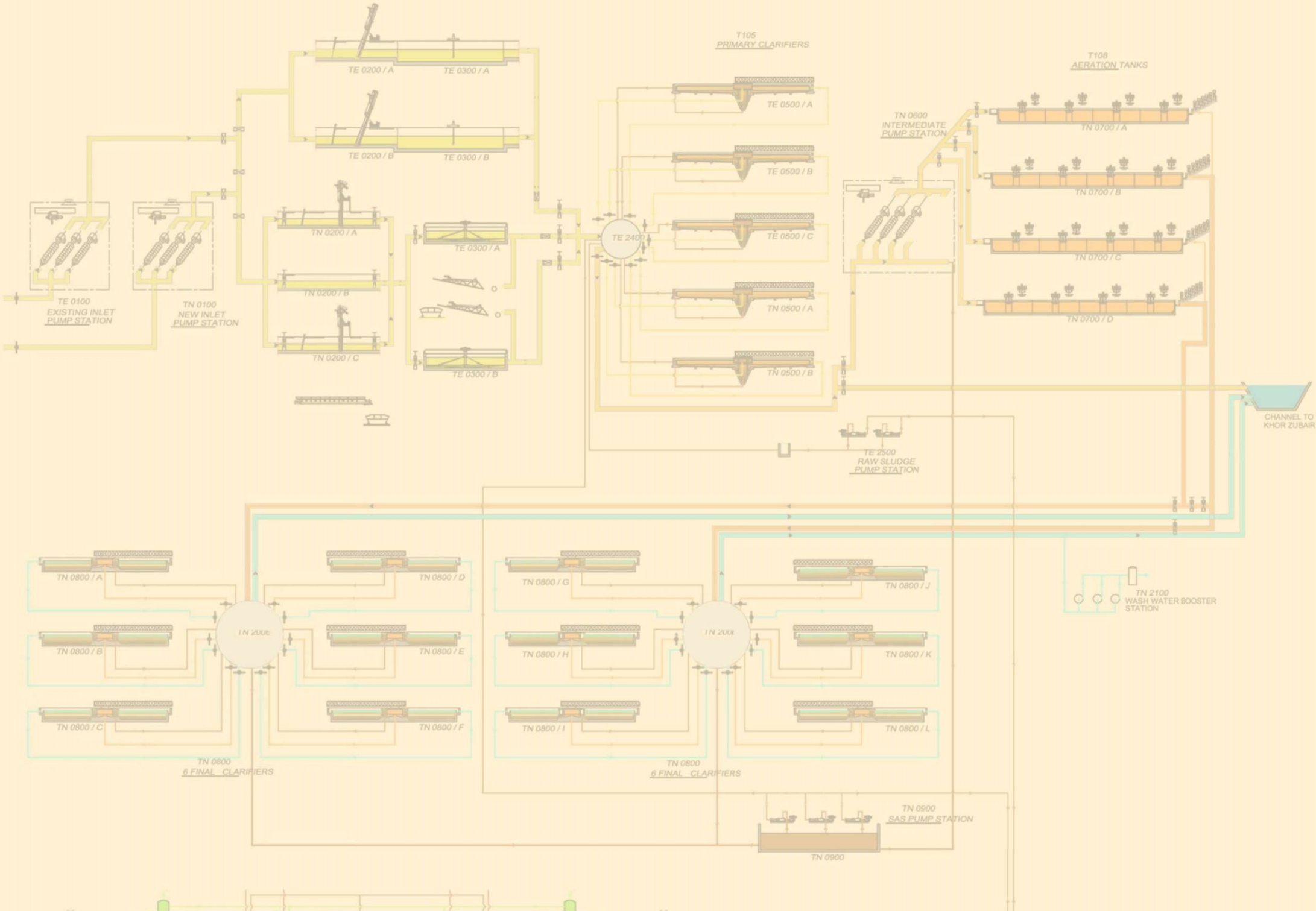
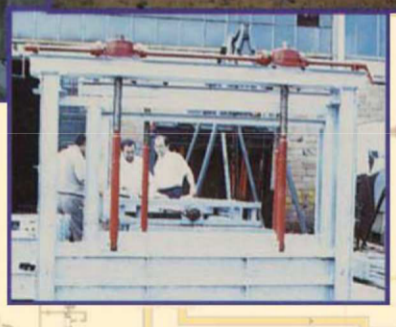
COMPACT SOLUTION PREPARATION & DOSING UNITS



Item	Code number	Name	No's
1	01	Motor (0,25 kW)	1
2	02	Key	1
3	03	Shaft (SS AISI 304)	1
4	04	Key	1
5	05	Roller Bearing	1
6	06	Roller Bearing	1

Item	Code number	Name	No's
7	07	Housing	1
8	08	Seal	1
9	09	Impeller (SS AISI 304)	1
10	10	Nut	1
11	11	Dosing Pump	1
12	12	Polyethylene Tank	1


TE 0200 / A
TE 0300 / A
TE 0200 / B
TE 0300 / B
TE 0100
EXISTING INLET
PUMP STATION
TN 0100
NEW INLET
PUMP STATION
TN 0200 / A
TE 0300 / A
TN 0200 / B
TN 0200 / C
TE 0300 / B
T105
PRIMARY CLARIFIERS
TE 0500 / A
TE 0500 / B
TE 0500 / C
TN 0500 / A
TN 0500 / B
TE 2400
TN 0600
INTERMEDIATE
PUMP STATION
T108
AERATION TANKS
TN 0700 / A
TN 0700 / B
TN 0700 / C
TN 0700 / D
CHANNEL TO
KHOR ZUBAIR
TE 2500
RAW SLUDGE
PUMP STATION
TN 0800 / A
TN 0800 / D
TN 0800 / B
TN 0800 / E
TN 0800 / C
TN 0800 / F
TN 0800
6 FINAL CLARIFIERS
TN 0800 / G
TN 0800 / J
TN 0800 / H
TN 0800 / K
TN 0800 / I
TN 0800 / L
TN 0800
6 FINAL CLARIFIERS
TN 2100
WASH WATER BOOSTER
STATION
TN 0900
SAS PUMP STATION
TN 0900



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