

KWE WATER TREATMENT PLANT
MODEL KWE 500
(BIOPHYSICAL PLANT)

DESCRIPTION — USE — MAINTENANCE

1. INTRODUCTION

The system has been especially designed and manufactured **to biophysically** (without use of chemicals) treat **wash water coming from car washing** activity being carried out either manually / or by Automatic Vehicle Washing Machine.

in order to preserve the quality of the water sent back to the car wash system, air is blown into the storage tank of water to be treated and that of purified water. **The purpose of the aeration is to prevent anaerobic process to set-in that creates degradation phenomena with the formation of bad and unpleasant odors.**

(This will depend on the organic matter found in the Influent and may not be essentially required).

The quartzite filtering station and following activated carbon adsorption complete the purification process of the wash water. The quartzite-filtering phase removes any sedimentable or suspended matters from the water that escaped the previous treatment phases. The activated carbon adsorption section eliminates the residue organic matters such as oils, detergents and solvents. The plant is net designed to deal with substantial quantities of free oil. The water, following the aforesaid biophysical treatment, is suitable to be sent back to the bus / car wash system and to be drained as it will meet the limits specified by local pollution control committee.

2. ADVANTAGES OF BIO PHYSICAL PLANTS

The biophysical systems are comparatively advantageous since there is no recurring consumption of chemical products and no sludge is produced (both present in the chemical- physical type purification system).

Since no chemicals are used the **problem of maintaining correct chemical** balances, checking their levels and cost of chemicals are avoided.

3. FEATURES

The system consists of 2 filtering columns one each of quartzite and activated carbon mounted on common base **plate with sludge pump. The pump for** backwashing and pump for transferring the recycled water to the main wash water tank is also mounted on

the base. **The operation is controlled manually / automatically by means of a control panel.**

The base plate is rigidly constructed from MS channel, angles. All channels, angles and filter columns are treated for anticorrosion. Doors are made of zintec sheets flitted with locks, which are provided for protection and aesthetic look. The control panel; housed in a watertight box is mounted within the framework. The plant is finished in attractive colours.

4. SYSTEM DESIGN

The system has been designed based on the dirty wash water quantity and in relation to pollutants in the water.

The supply flow rate of the system has been set at 2.5 cubic meter/hour max.

The system **is self-run by level switches** that will pilot the starting and stopping of the electric pumps. Therefore no particular care and maintenance is required. It will be sufficient to simply check the efficiency of the filters on the odd occasion. Pressure gauge is provided to determine backwashing frequency of quartzite filter. It is recommended that Filter columns may be washed once in a day or at a frequency as required.

5. CHARACTERISTICS OF WASTE WATER

The wastewater to be treated comes from the external washing of vehicles. The water is characterized by the presence of mineral oils, surface-active agents, solid suspended matter and solid sedimentable matters.

The detergents used in the individual pre-washing phases such as shampoo and wax are the so-called "ecological car/bus wash" products which are largely neutral in nature and biodegradable.

The amount of water used is directly bound to the actual number of vehicles washed. The maximum capacities for KWE BP-500 model for bus / car wash systems will be 2000 lit/hr approx.

6. TREATMENT CYCLE

(See Application Sheet & Flow Diagram)

The treatment cycle consists of:

- a) Sedimentation
- b) Oil separation
- c) Biological oxidation (wherever required)
 - d) Purification systems
 - i) Quartz filtering
 - ii) Filtering through adsorption material
 - e) Treated Water Tank
 - f Aeration
- g) Recycling the treated water.

An underground tank of 12 m³ capacity for collection of the dirty water is provided. This is divided into 3 tanks V1 , V2, V3 of 4m³ each. The tank provides for 4 hours settling time.

a) Sedimentation In the first tank V1 the separation of sand and water takes place.

b) Oil separation

From tank V1 the water flows to V2 through a 'T' joint. The oil floats on the upper surface and separation of oil and water takes place. Oil is drained into tank V4 through a gate valve. The sediments settle at the bottom of the tank.

c) Biological Oxidation Tank.

The Water, so far devoid of sediments, oil, etc. is stored in tank V3 that acts as storage for the purification cycle.

Air is blown into this tank to avoid deterioration of the biological level of the water (if required).

d) Purification System : Quartz

filtering (QF 500)

The water from the tank V3 is taken into the quartzite filtering station QF500 through a sludge pump. The quantity of water taken is 2.5 lit/hr at a maximum pressure of 3 kg.

This filtering station consists of 1 electrically welded mild steel sheet column appropriately coated for anti - corrosion and filled with accurately riddled filtering material with different granule sizes (silicon quartzite). This operation is required to eliminate all the suspended matters from the treated water. When the gauge indicates that the filter is clogged, a

backwash with purified water restores its correct efficiency. The backwash water is then conveyed to the initial storage tank (1" chamber of the DWCT). Following filtration, the water outflowing under pressure is conveyed to the activated carbon filter column

Activated Carbon Filter (ACF 500) :

From the quartz filtering station water is taken into the Activated Carbon Filter ACF-500.

The water reaches the adsorption station, which consists of 1 electrically welded mild steel sheet column appropriately coated for anti - corrosion and filled with adsorption material (activated carbon) in order to ensure a contact time of 20-25 minutes.

This operation eliminates the residual organic matters such as oils, detergents and solvents.

If the column clogs up, the same procedure for backwash as explained for the quartz filter is applicable. Following filtration, the water out flowing under pressure may flow to:

- the underground RWCT (Recycled Water Collection Tank) which acts as a storage tank of purified water to be re-circulated
- the sewers after passing through the final inspection pit

e) Treated Water Tank:

The water treated through the previously described sections i.e., (sedimentation, oil separation purification cycle) is collected in tank V3 which acts as a storage for of treated water to be recirculated / reuse.

f) Aeration

In order to preserve the quality of the water sent back to the car wash system, air is blown into the storage tank of water to be treated and that of purified water.

The purpose of the aeration is to prevent anaerobic process to set-in which create degradation phenomena with the formation of bad and unpleasant odors.

g) Recycling the Treated Water

The treated water is reused for washing of vehicles. Fresh water is added to this tank to top up the lost water or this water is recycled and added to the fresh water tank by a centrifugal pump.

KWE -BP500	APPLICATION SHEET	
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KWE – WATER TREATMENT AND RECYCLING PLANT

Treatment : Sand filtration/Adsorption through activated carbon/Arration

Vehicles Washed / Day : 35 Body wash @ 200 Lt./bus and 10 Under chassis wash @700 ltr./bus.

Total 14000 ltr./shift

Treatment capacity : 2.5- 3 cu m/hr

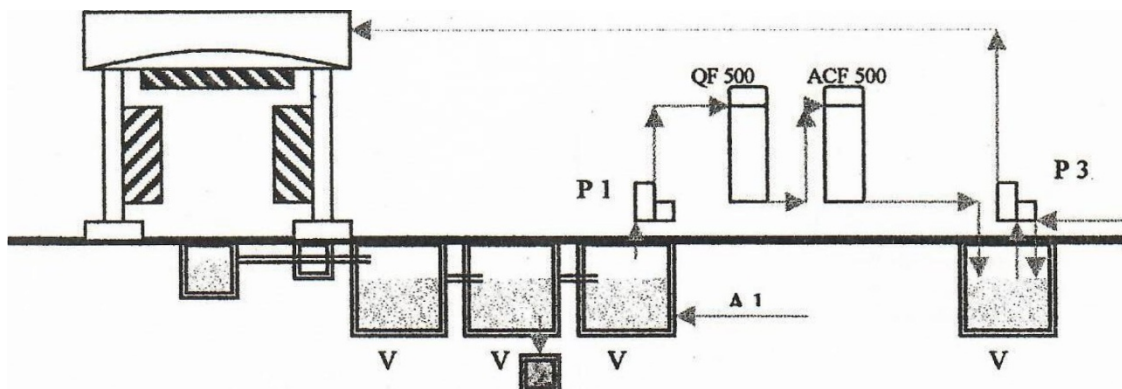
Influent : Body washes under chassis wash by automated/manual means

Recycle percentage : 80%

Discharge : municipal sewer (compliance with DPCC NORMS)

Use for fresh water : for topping up recycled water

Voltage supply : 415v /50HZ ph with Netural



Minimum net volumes of below ground tanks in cubic meters

Basic wash facility with under chassis washes V	O.T.	V	V	V
	4	4	4	5

OIL TRAP-

0.25

Plant Compositio

	Ref.	Description
Bio Physical Plant	QF 500	Quartzite/sand filter
	ACF 500	Activated Carbon filter
	P1	2.2 kw sludge pump 0.8 lps @3 bar Pressure with valves for flow control
	P2	.75 kw monobloc pump 0.8Lps with Valves for f back washing of filters
	P3	.75 kw Monobloc filter pump 0.8 lps having ball valves flow control
Air injunction	A	Air Line

line

