ecodepur®

tecnologias de protecção ambiental

ECODEPUR® DEPURWASH
WASH WATER RECYCLE SYSTEMS

COLLABORATION ENGINEERING SOLUTIONS AND PRODUCTS (CESP)

AUTOSPA CAR WASH

JUNE 2015

grupohenriques

PME líder

apesb

v1.0-50615

www.ecodepur.pt
geral@ecodepur.pt

+351 249 571 500
+351 249 571 501

Pólo Tecnológico 1
Av. 21 de Junho, 102 | 2435-087 Caxarias

Pólo Tecnológico 2
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém

ecodepur®
tecnologias de protecção ambiental

BACKGROUND

Drinking water is an increasingly scarce asset, and it should be made every effort to preserve water reserves still available. More than preserve an indispensable resource for future generations, saving water means economic savings for current generations (reducing potable water consumption and costs of waste water rejection).

For washing vehicles it is still used a great quantity of drinking water, and usually the quality of this water is much higher than the necessary for this purpose. The big problem is that in most cases we use drinking water for these purposes only for the reason that it is the only source available.

1

The reuse of treated wastewater as a strategy for fighting the growing scarcity of water is one of the main challenges to humanity.

The water consumption is different for each type of Car-Wash. For example, a self-service user uses much less water and causes more evaporation and transport losses than a washing tunnel.

This System was developing for **Collaboration Engineering Solutions and Products (CESP)**, to apply in **AutoSpa Car Wash**, Kingara Road Next to Nakumatt Junction – Kenya, for receive, treat and recycle carwash wastewater tanking in account the average water consumption indicated and presented in the following table:

CAR WASH	Unit
Pressure Machine Self Service	200 Liters
Number of Cars per day	7 Cars

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

PRESENTATION

In sight of an effective contribution to the resolution of this problem, **ECODEPUR®** developed the **ECODEPUR® DEPURWASH SYSTEM** that allows the treatment of waters generated in **Cars and Machines washing operations**, adapting the quality of treated water to their reuse during the steps of Pre-washing and washing.

ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS reduces up to 90% water consumption in washing operations, resulting not only in an effective contribution to the preservation of the water resource but also an advantageous investment with short-term economic return, since it leads to reduction in the cost associated with the consumption of water and consequently the sanitation taxes applied.

ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS can be applied either in new facilities during the design phase and also in retrofits of existing plants. In existing plants it's possible to use the non-buried option, which minimizes excavation and pavement replacement costs.

The command and control system that integrates **ECODEPUR® DEPURWASH** units is adaptable to the command and control system of the various washing equipment available on the market.

It is recommended that polishing steps, usually of low duration (rinse, and polishing itself), are carried out with potable water or water subject to specific correction (water polishing systems) in order to prevent the appearance of stains and deposits in the paintings. With the continuous addition of this small amount of "fresh water" also outweigh the loss of water by evaporation and transport, allowing the circuit of water and wastewater to work almost in a closed circuit and with almost zero discharge.

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

ADVANTAGES

ECONOMICAL BENEFIT

Management and optimization of consumption with consequent reduction of the associated cost with drinking water consumption. The achieved economic benefit is based on a combination of the following factors:

1 – Reduction of the number of cubic meters of fresh water supply (less m^3 consumed);

2 – Reduction of the water supply taxation (less m^3 consumed at a lower $/$m^3$ cost);

3 – Reduction of the value associated with the sanitation tax applied, since this is typically pegged to the value of drinking water consumed.

Hydric Recycling Potential				
Model	**Recycling capability at hourly peak [m^3/h]**	**Daily Recycling capability (m^3/day)**	**Monthly Recycling capability (m^3)**	**Annual Recycling Potential (m^3)**
ECODEPUR DEPURWASH 1.0	1,0	24	720	8.640

The figures relate to the installed capacity – available hydric potential.

The actual savings must be determined on a case by case basis, based on the volume of reused water and taking into account the taxation applied by the competent authority, or by the $/$m^3$ cost in case of tanker water supply.

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

TECHNICAL BENEFIT

Creation of a strategic water reserve, useful in periods of water shortage by temporary interruption of supply (ruptures, drought, etc.).

ENVIRONMENTAL BENEFIT

Reduction of the level of contaminants released to the environment, in order to comply with local legislation and preservation of natural resources (water), reducing their consumption and thus contributing to their conservation and sustainable use. The use of these systems will also generates a "forward environmental image".

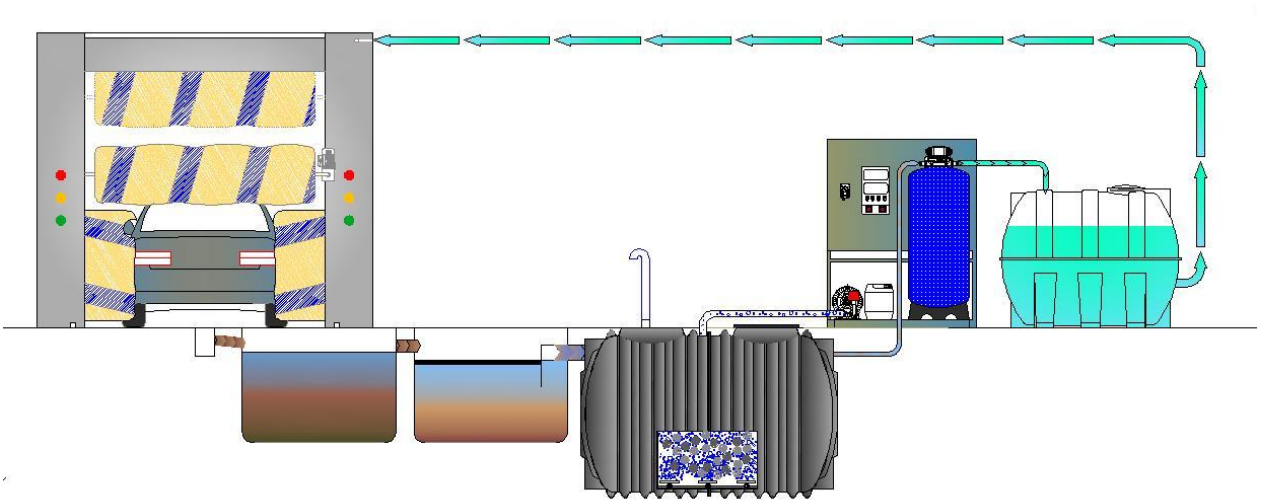
ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS offers the following additional benefits:

- Ease and flexibility of installation (reduced human intervention)
- Absence of odors;
- Ease and comfort of operation and maintenance (automatic operation/minimizing human intervention);
- Low cost of first investment and operation;
- Industrial Design (State-of-the-art equipment);
- Absence of noise;
- Functional safety (hydraulic and sanitary).

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

SYSTEM CONSTITUTION



A complete line of carwash water treatment consists of a set of treatment operations, placed in series, with a view to achieving the predefined treatment objectives. In order to maximize water recovery and treatment, we recommend the following treatment line:

ECODEPUR® DEKTECH

Primary Lamellar settling, with optimized operation by Hydraulic load reduction by introducing a system of lamellae (Lamellar Settling) and by developing "Discrete solids Settlement" process and Plug Flow light liquids flotation.

Note1: If the existence system, soak pit and later to a storage tank of about 6000l, have the ability to operate as a sludge trap, retaining the solids, sand, rocks, mud, etc. the use of a Primary Lamellar Settling could be avoid.

Note2: Is also a technical solution to upgrade the existent system with **Primary Lamellar settling, ECODEPUR® DEKTECH 6.**

Note3: If the existence system, should be replaced by a new sludge trap system, we recommend the use of a **Primary Lamellar settling, ECODEPUR® DEKTECH 20.**

v1.0-250615

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

ECODEPUR® DEPUROIL NS 6 with CE EN858 Class 1

Light Liquid Separator, CE EN858 -1, Class1 (< 5,0 mg/l), with pre-decantation, double coalescent system, automatic closure device with solid float, sampling shaft and cast iron cover, B125 class with "SEPARATOR" inscription according with CE EN 858 – 1.

ECODEPUR® DEPURWASH 1.0

Treatment, Storage and pressurization of treated effluent in order to proper recycling by the Carwash system without any danger to the machines, people or the environment.

ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS are constituted by the following elements:

1- Modified Mobile bed Biological Reactor MBBR -NEW ECODEPUR!

The effluent from the Oil Interceptor is routed to a biological reactor to promote the removal of dissolved organic matter from detergents emulsions, chemicals and dirt withdrawn from vehicles. The biological reactor uses MBBR technology (Mobile Bed Bio-Reactor) which is based on the development of biomass in plastic carriers wich float free in the mixed liquor. The use of synthetic carriers allows the growth of a bigger concentration of biomass per unit volume than conventional systems. This effect makes the reactor more robust and less sensitive to variations of concentration and flow. Toxic events or hydraulic shocks have a much smaller effect on the efficiency of treatment since it does not affect the total population of biofilm and ensures a faster recovery.

To ensure the complete treatment, the system incorporates the addition of bio-enzymes specific for the degradation of hydrocarbons contaminated effluent.

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

2-Tertiary Polishing and Command module, set up in a ready-to-install metal Skid, with all components pre-assembled in factory under ISO 9001 certified conditions:

After the decanting period which succeeds the aeration/reaction phase, the effluent is pumped to the filtration module. In this step, several physical-chemical phenomena occur in order to remove suspended particles (which are retained the calibrated screens 100 and 25 μm) and refractory organic matter (which is adsorbed by the contact surface of the activated carbon granules).

Since adsorbed organic matter will permanently occupy the available contact surface in the activated carbon granules, it will be required monitoring the quality of the treated effluent in order to determine the saturation point of the carbon bed, at which point it will require replacement.

The sequence filtration in synthetic screens and activated carbon system is supplied already installed on a metallic structure which includes also the side channel blower, the dosage bio-enzymes system, and the Electric Panel, ensuring a simplified installation and minimizing working hours.

3-Treated water storage tank

The treated and clarified effluent flows to a storage tank, constituting a ready to be reused water reserve.

The reservoir is fully opaque with black color made with UV protection material in order to prevent the development of algae and other microorganisms during storage period.

4-Booster System

Recycled water booster pumps that will supply the car wash system with treated water. A minimum level probe located in the storage tank will protect the pressure pump to run dry in case of lack of water.

In order to ensure a high functional safety to the recycle line, the **ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS** is equipped with by-pass outlet to evacuate excess effluent (treated water reuse under the production capacity) and fresh-water intake system in case of lack of treated water (treated water needs above the production capacity).

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

MAIN FEATURES

ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS can be applied in either new installations or also in existent ones. In this last case, and in order to minimize installation costs, the biological reactor can be installed above ground, and it will be just need to be installed a small lifting station after the oil interceptor.

Modelo	Peak Flow [m³/h]	Volume Biological Reactor [liters]]	Volume Storage Tank [liters]	Total Power Installed [kW]
ECODEPUR DEPURWASH 1.0	1,0	3.000	1.500	1,6

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

INCLUSIONS

In the supply of the **ECODEPUR® DEPURWASH WASH WATER RECYCLE SYSTEMS** it's always included:

- Pre-engineered installation accessories:
  - (1) Modified Mobile Bed Biological Reactor MBBR VT3.0;
  - (1) Tertiary Polishing and Command module, set up in a ready-to-install metal Skid, with the following components pre-assembled in factory under ISO 9001 certified conditions:
    - (1) Side Channel Blower;
    - (1) Enzymatic solution Preparation and Dosing system;
    - (1) Recycled water booster pumps to car wash system supply;
    - (1) Electric Panel;
    - (1) Tertiary polishing system, consisting in screen filters and an activated carbon filter;
    - All necessary internal connections;
  - (1) Treated Water Storage Tank, RAH VT 1,5;
- Treatment System's Operation Manual;
- Disclaimer about the design and manufacture of the Treatment System;
- Technical support for installation of the treatment system (phone or Skype);

CE **The electromechanical equipment constituents of Waste Water Treatment Plant, type ECODEPUR ®, have CE marking according to Directive 89/106/EEC of 28 December 1988.**

The equipment production under controlled conditions, the use of quality raw materials and the finished product inspection, in accordance with the demands of the **standard ISO 9001**, guarantee the final product quality.

Ecodepur – Tecnologias de Protecção Ambiental, Lda., is an company Certified in accordance with the requisites of the Standard NP EN ISO 9001:2008 (Certified nº 0 01 08335), covering the "Conception, Production, Marketing, Maintenance/Exploration and Post – Sale Assistance of Wastewaters Treatment Systems".

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques

ecodepur®
tecnologias de protecção ambiental

MAINTENANCE

The simplicity of the treatment unit, coupled with its automatic functioning allows the maintenance is limited to an operations set whose routine is often dictated by the normal practice of exploitation. It's normally just needed to monitor the correct operation of electromechanical equipment installed (command and control panel), to check the level of the enzymes reservoir and their replacement in case of need and periodic cleaning of the accumulated by-products (sludge and oils).

With a frequency dictated by the practice of exploitation (analytical monitoring of the treated effluent and head loss between filters) will also be required periodic replacement of activated carbon charge and filter screens.

GUARANTEE

Five (5) years, covering any manufacturing defects of the PE tank.

Electric equipments present **Two (2) years** covering any manufacturing defects

ECODEPUR® will not be responsible if there are clear indications of poor installation, misuse or poor maintenance, or if it is shown that the equipment was overloaded.

v1.0-250615

www.ecodepur.pt
geral@ecodepur.pt
+351 249 571 500
+351 249 571 501
Pólo Tecnológico 1 | PORTUGAL
Av. 21 de Junho, 102 | 2435-087 Caxarias
Pólo Tecnológico 2 | PORTUGAL
Z. I. Casal dos Frades, 68 | 2436-661 Seiça - Ourém
grupohenriques