CAR WASH

CAR WORKSHOPS: A SERIOUS GAME APPROACH TO MANAGING WASTE
CONSIDERED HAZARDOUS

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CASE STUDIES:
“Hazardous wastewater management plan for car repair shop”

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1. **INTRODUCTION**

Cleaner production spotlight about savings on water, energy and raw materials and minimizing waste generation, economic benefits from its initial measures may be used for medium-cost technological cleaner production solutions. Fluids are used extensively in an automotive repair business. Fluids are sometimes used within the engine or other vehicle systems. They are also used for cleaning and other purposes. Protecting the environment requires that we conserve, control and recycle fluids wherever possible.

A lot of automotive processes, such as pretreatment installations (degreasing, phosphatation, passivation,...), electrocoat, wet sanding lines, carwash and spraybooths, require a high amount of deionized water. The continued increase in costs for water supply and waste water treatment makes that the last few years a lot of research was done to investigate the possibilities of water recuperation in this area.

In the followings you can learn about the industrial waste water handling methods and procedures.

2. **OBJECTIVE**

The industrial ecology recognizes that the waste cannot be reduced and/or eliminated in one single production process because usually there are inevitable wastes. Therefore, the production processes must be connected so that the recycling of the natural processes is realized in the industry. In the fine chemical industry it is especially true since there are process waste waters (PWWc) which are inevitably arising during the technology. On the other hand, these PWWs contain valuable organic compounds that can be utilized e.g. solvents of another industrial process. To complete this goal special techniques are to be applied the so called physicochemical treatment methods.

3. **BASICS CONCEPT**

This work deals with two physicochemical treatment methods. This study is recommended for the proper application of the different waste water treatment tools.

**Treatment of waste water by Centrifugal and Centripetal Forces:**

In these stages we use an apparatus with the spiral path having a shaft rotating with high velocity. Centrifugal force is generated when a water waste is pouring in. Sludge particles and light substances re-separate from it along every single centimetre of the spiral path, which can be up to 700 cm in length. While heavy particles move outwards centrifugally towards the baffle sand are deposited, light liquids simultaneously flow in wards towards the inner wall, sludge dewater by sedimentation and filtering, and then can be removed. This process can be used in small and medium size workshop.
Wastewater systems

These include a variety of electrical, physical and chemical process arrangements that result from tailoring systems of unit operations to a specific treatment reuse application. The assemblies range from simple filtration systems to large complex plants.

The system can take wastewater and give back clean water plus a recovered by-product, affordably. Performance and economies of these practical process solutions are what set us apart and can help transform costly liabilities into raw material or product assets and find new profit centers and help to improve the bottom line. These systems will offer solutions to avoid environmental hazards. Recycle the aqueous waste effluent streams and meet the most stringent environmental regulations while reducing the operating costs, even creating a new profit center.

The system offers a comprehensive line of treatment. Standard units combine use of cartridge-mixed media filtration, carbon adsorption and multiple odor control options. Filter systems are available in a variety of standard configurations for treatment and reuse of wash-water. Complete reclaim systems are available for new installations or retrofitted to existing locations. Partial to "near-zero" discharge water recovery is available. The designing can be addressed to the variable nature of the applications besides washing equipment. Materials of construction allow for operation in most harsh environments. This kind of technology is more reliable for big size plants and auto repair workshop.
Physical-Chemical Treatment

The Physical-Chemical Treatment System can be used in special cases in automotive repair workshop where the wastewater is severely contaminated with many elements. This process is a quick and robust process that employs powdered activated carbon. This advanced stand-alone process is capable of tertiary treatment levels. The process can be operated in conjunction with biological treatment. When operated in the moving bed mode, carbon protects aerobic bacteria against toxic shock loadings and upsets while controlling odor and color. Powdered activated carbon provides a significant amount of surface area for biomass attachment and growth. The system is well suited for “difficult-to-treat” wastewaters where other alternatives are impractical or easily upset. Its effectiveness and feel-safe performance for treatment of hydrocarbon-impacted water is well known. This system also serves excellent pretreatment functions in complex wastewater reuse treatment trains.

4. CONTENT: POLICIES TO MINIMIZE THE GENERATION OF HAZARDOUS WASTE

4.1 Policies to minimize the generation of hazardous waste in production areas:

One purpose of waste management plan is to minimize the generation of hazardous waste. The steps listed below are crucial to follow in the company.

Techniques for the minimization of wastewater are summarized below:

- Reduction at source: reduction in the consumption of water with changes and/or improvements in the processes or operating procedures. Some examples of this technique:
  - Elimination of leakages;
  - Changes in operational procedures;
  - Reformulation of products;
  - Modification of equipment;
  - Purification of raw materials and supplies.
- Reuse: reuse of wastewater directly in another operation or process;
Figure 3 Reuse of wastewater from process 2 to process 1

- Reuse with regeneration: total or partial removal of contaminants from the wastewater to reuse this stream in another operation or process.
- Recycling with regeneration: total or partial removal of contaminants from the wastewater to reuse this same stream in the same operation or process.

The application of the techniques described above has the following advantages:

- Reduction in the final wastewater flow generated and consequent reduction in cost of wastewater disposal.
- Reduction in the consumption of an exhaustible natural resource - water - reducing the cost of water intake.

4.2 Example for a well-organized waste storage area.

4.3 Training and dissemination:

The information contained in this study management of hazardous waste is generated and disseminated in a manner particular to the staff in the garage, they have the chance to participate on relevant industry trainings.