

# Cleaning Products Industry

## Introduction

Cleaning products play an essential role in our daily lives. By safely and effectively removing soils, germs and other contaminants, they help us to stay healthy, care for our homes and possessions, and make our surroundings more pleasant.

Cleaning products industries are classified as industrial establishments as per decree 5243/2001. Various emissions can result from this industrial activity as described below. This factsheet intends on identifying the main hazardous wastes and develops ways for its management.

## Process description

Cleaning products are prepared in four-step process using petroleum raw materials.

*Chlorination & Alkylation:* Chlorination and alkylation occur in agitated reactors fitted with cooling system and external reflux condensers to cool the liberated hydrogen chloride gas and reflux the entrained organic mist back to the reactor. The evolved hydrogen chloride and chlorine gases must pass through series of scrubbers to recover such gases.

*Sulfonation:* The third reaction takes place using H<sub>2</sub>SO<sub>4</sub> 98%, SO<sub>3</sub> or oleum. In case of using sulfuric acid, excess acid is used to complete the reaction with heating by steam jacket to 80°C. Sulfonic acid produced from the third equation is then diluted with water to precipitate the sulfonic acid from reaction mixture and separated.

*Neutralization:* Process using sodium hydroxide to obtain the sodium salt AABSS. The latter is dried by spray drier to have fine granules or by drum dryer to obtain flakes. Some plants cancel step (1) and (2) and start from alkyl benzene produced in petroleum refinery.

## **Regulators**

Generally synthetic detergents regulation is necessary for surfactants to do an efficient job of cleaning in a washing machine. This is often achieved by combining different types such as anionics with nonanionics or soaps as foam inhibitors.

## **Builders**

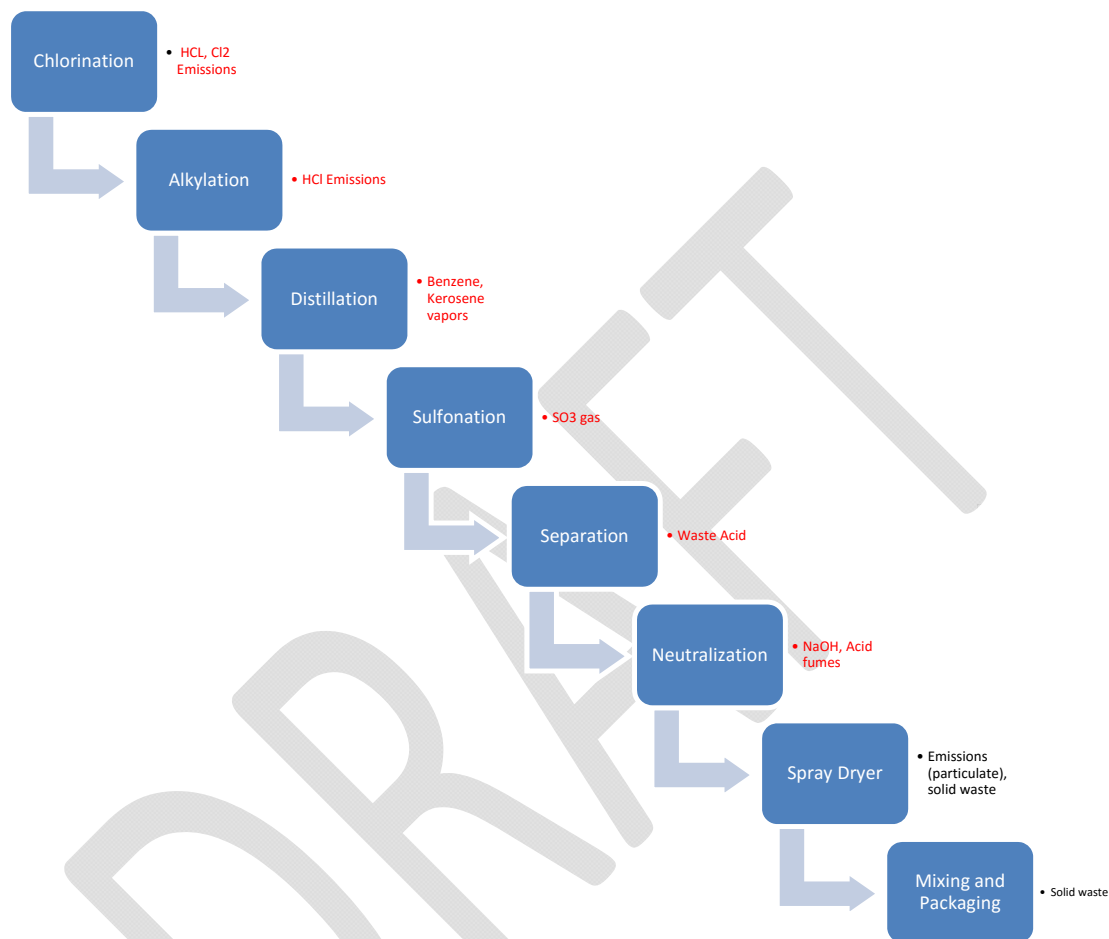
Also builders boost the detergents power. Complex phosphates such as sodium tripoly phosphate, have been used most extensively [30-50%]. These are water softeners prevent re-deposition of soil from the wash water on fibers.

## **Additives**

Some additives (up to 3%) are used to add certain properties to the detergents such as sodium silicate, which acts as corrosion inhibitor to protect metal and washer parts. Carboxy methyl

cellulose has been used as an antiredeposition agent. Tarnish inhibitors carry on the work of corrosion inhibitor and extend protection to metals such as German silver. Fabric brighteners are fluorescent dyes. Enzymes are also added to reduce the stain, particularly those of a protein nature.

The common activities at cleaning product industries are outlined in the following chart.



References: UNIDO, MSCIPP, ERM studies.

**Cleaning Product Industry Hazardous Waste Description and Management**

Description of waste	Waste Code (EWC)	Waste Classification (Dangerous Goods Classification)	Basel Class.	Storage	Transport (UN-Code)	Treatment	HS-Code
Other organic solvent, washing liquids and other	070104*	3	A3140	3	1993	R1	3814

The content of this draft Fact Sheet has been compiled to the best of our knowledge. The fact sheet will be continuously updated based on consultation with concerned industries or relevant stakeholders.

<b>mother liquors</b>							
<b>Aqueous washing liquids and other mother liquors</b>	<b>070601*</b>	<b>8</b>	<b>A4140</b>	<b>8B</b>	<b>1903</b>	<b>D10</b>	<b>28</b>
<b>Acids</b>	<b>110105*</b>	<b>8</b>	<b>A1060</b>	<b>8B</b>	<b>3264</b>	<b>D9</b>	<b>3204</b>

European Waste Code (EWC) 070104\*: Other organic solvent, washing liquids and other mother liquors

European Waste Code (EWC) 070601\*: Aqueous washing liquids and other mother liquors

European Waste Code (EWC) 110105\*: Acids

Waste Classification (Dangerous Goods Classification) 3: Flammable Liquids



Waste Classification (Dangerous Goods Classification) 8: Corrosives



Basel Classification A1060: Waste liquors, acids

Basel Classification A3140: Waste non-halogenated organic solvents

Basel Classification A4140: Waste consisting of or containing off specification or outdated chemicals

Transport Code (UN) 1903: Disinfectants, liquid, corrosive, n.o.s

Transport Code (UN) 1993: Flammable liquids, n.o.s.

Transport Code (UN) 3264: Corrosive liquid, acidic, inorganic, n.o.s.

D9: Physico chemical treatment facility (for example: evaporation, drying, calcination, neutralization, precipitation)

D10: Disposal on land (for example: incineration in a licensed rotary kiln with >1,050C)

R1: Use as a fuel.

**Disposal Facilities****Recosoil (Baden-Württemberg, Lösemittelrecyclinganlage) - Recosoil Recycling GmbH**

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