

## EFFLUENT TREATMENT – PART I

REF: TT/ MARCH 2021/ WK 5

### Introduction

Effluent is wastewater discharge from industrial facilities. Effluent usually flows from the industry premises directly into the treatment facility and it cannot be directly discharged into a river or any water body unless it is cleaned and treated first. Untreated effluents are pollutants which causes water pollution.

Effluent generally contains one or more contaminants like:

- Fats, oils and greases
- Chemicals
- Detergents
- Heavy metal particles
- Solids
- Food waste

Textile effluents consist of several synthetic dyes and toxic chemicals containing acids, Sulphur, alkalis, naphthol, nitrates, hydrogen peroxide, surfactants, soaps, detergents, salts and toxic heavy metals. The desizing and scouring are the two processes that contribute to the generation of toxic effluents. Dye is the most difficult constituent of the textile waste water to treat. Each type of fiber is dyed with different types of dyes. The textile industry utilizes various chemicals and large amount of water during the production process. The water is mainly used for application of chemicals onto the fibers and rinsing of the final products. The waste water produced during this process contains large amount of unfixed dyes and chemicals containing metals which are capable of harming the environment and human/ aquatic health. The textile waste water can cause hemorrhage, ulceration of skin, nausea, skin irritation and dermatitis. The chemicals present in the water block the sunlight and increase the biological oxygen demand thereby inhibiting photosynthesis and re-oxygenation process.

The contaminants in textile wastes are various Organic substances such as dyes, starches and detergents, which undergo chemical and biological changes which consume dissolved oxygen from the water and destroy aquatic life.

Different types of contaminants in textile effluents are:

- **Inorganic contaminants** – Alkalis, mineral acids, neutral salts (Chlorides, Sulphates, Phosphates and Silicates) and oxidizing agents like peroxides, chlorine and chlorine dioxide. These may not



impact the BOD level, but some of these compounds may increase the TDS load in the effluent water.

- **Organic contaminants** – Dyes, organic acids, thickeners, finishing agents, detergents etc.
- **Moderate to high BOD but readily degradable** - Starch sizes, vegetable oils, fats and waxes, biodegradable surfactants, organic acids like acetic acid and reducing agents such as Hydros, Sulphites etc. These are readily degradable contaminants present in the textile effluents.
- **Very high BOD and slowly degradable** - Dyes and fluorescent brighteners, fibers and polymeric impurities, polyacrylate sizes, synthetic polymer finishes and silicones; these contaminants are difficult to biodegrade. They have too high BOD value with slower degradation,
- **Moderate BOD and difficult to degrade** - Wool grease, PVA sizes, starch ethers and esters, mineral oil, spin finish, surfactants , anionic and non-ionic softeners fall into this category.

**BIOLOGICAL OXYGEN DEMAND (BOD)**

It is the amount of oxygen consumed by bacteria and other micro-organisms while they decompose organic matter in presence of Oxygen at specific temperature.

**Effluent Treatment**

The aim of wastewater or effluent treatment is to remove as much of the suspended solids as possible before the effluent is discharged back to the environment. Primary treatment removes about 60% of suspended solids from wastewater and secondary treatment removes more than 90% of suspended solids. Such treatment plant ensures that the contaminated and polluted water from industries get treated and become reusable before being released back to nature.

References:

1. <https://www.wwdmag.com/>
2. <https://vikaspedia.in/>
3. <https://nptel.ac.in/>

.....To be continued.....

UNSCRAMBLE THE JUMBLE WORDS
UENTEFFL
ASTEW
LOGICALBIO GENOXY ANDDEM
ABLEREUS

Last week`s Answers: 1) INDUSTRY 2) COLUMN 3) IMMERSION 4) ASSESS

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