

DEVELOPMENTS IN EFFLUENT TREATMENT – PART I

REF: TT/ OCT 2021/ WK 2

Introduction

The main aim of wastewater or effluent treatment is reduction of pollutants in particular from aquatic ecosystem. Besides pollution, the supply of water is also diminishing due to limited conventional wastewater treatment processes.

The conventional treatment systems which are physio-chemical treatment followed by biological treatment system are installed in majority of textile industries. The first step in the wastewater treatment is to mix the waste water discharged from different stages in the processes. Thereafter, the large solids are removed by physical methods. The chemical treatment helps in reduction of color and suspended solids and helps in reduction of BOD and COD. This physico-chemical treatment is followed by biological treatment process which further reduces BOD and COD values. In some of the textile process houses which do not have much organic load in their effluents; uses an activated adsorption system or an Ozonation system instead of biological treatment.

Since long these conventional processes are being followed in treating effluents to meet standard discharge requirements. However, developments in this area are necessary and some of the new technologies being used and introduced for wastewater treatment.

Like in Tertiary Treatment Textile effluents require advance treatment methods to remove contaminants to prepare the treated effluent for reuse. Tertiary operations include removal of residual organic color compounds by adsorption and removal of dissolved solids by membrane filtration. The adsorption process is used to remove color and other soluble organic pollutants from effluent. The process also removes various chemicals that cannot be treated by conventional treatment methods. Dissolved organics are adsorbed on surface as waste water containing these is made to pass through adsorbent. Most commonly used adsorbent for treatment is activated carbon.

Reverse Osmosis, after primary, secondary and/or tertiary treatment is also one of the advanced processes which help in the removal of organics and dissolved salts. For this, wastewater is passed at high pressures through the membrane. The applied pressure has to be high enough to overcome the osmotic pressure of the wastewater stream, and to provide a pressure driving force for water to flow from the contaminated compartment through the membrane into the treated water compartment.



Apart from the above-mentioned advancements, another development has taken place in this area is **“Zero Discharge or Zero Liquid Discharge”**.

Zero Liquid Discharge

Ground water table is depleting speedily, crisis of potable water is rising rapidly. The textile industries require water for its operations and also discharge effluents that pollute the fresh water. So, it becomes absolute necessity to reuse, recover and recycle the water and work towards achieving ‘Zero Liquid Discharge’ i.e. the quantity of water used is all recycled back within the system.

Zero Discharge is a wastewater treatment process developed to completely eliminate all liquid discharge from a system. It refers to a treatment process in which the plant discharges no liquid effluent into surface waters; the wastewater will be treated and used again in the process. The process also makes effective use of wastewater treatment, recycling, and reuse, thereby contributing to water conservation through reduced intake of fresh water. Zero discharge solutions can be achieved by concentrating the effluent using various techniques, including membrane-based and multiple effect evaporation-based systems, and recovery and recycling of water.



Fig 1.1 Zero Liquid Discharge Process Flow
Ref: austrowatertech.com

References:

1. <https://www.tandfonline.com/>
2. <https://www.ceeindia.org/>
3. <https://www.intechopen.com/>
4. <https://www.watertechonline.com/>

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

UNSCRAMBLE THE JUMBLE WORDS
EVNOITNALNOC
REVREES
OMISSO
ATERW

Last week`s Answers: 1) LEAKING 2) PARTICLES 3) DISADVANTAGE 4) TRADITIONAL

Wishing you a great week ahead!

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arc@resil.com | www.resil.com.