# Konark NEWS LETTER

*We Care for you*

## Konark Research Foundation

*Testing & Calibration Laboratory*

**Konark Research Foundation (KRF)** is a fully computerised research laboratory offering services in the field of Herbal & Ayurvedic, Pharmaceutical, Agro & Agro Derivatives, Speciality Chemicals, Water & Wasterwater Management, Calibrations and Metal Testing.

***KRF Specilaise in:***

- Ayurvedic product/material analysis
- Stability and drug release testing
- In-vitro dissolution and shelf life studies
- Stability studies
- Estimation of trace level heavy metals
- Testing of residual organic solvents
- Validation of test procedures
- Impurity profile
- Antibiotic assays
- Bulk drugs, formulations and drug intermediary analysis
- Toxic studies as per IP, USP, BP and other international standards

***KRF** has the approval to carry out tests on Drugs/Cosmetics as per the Drugs & Cosmetic Act, 1940 of India (FDA approval no.: DD/PTL/1Date:24th June 2003). KRF is also approved by MoEF (Ministry of Environment and Forest), CPCB (Central Pollution Control Board), NABL & BIS.*

## Textile wastewater treatment process

Textile processing employs a variety of chemicals, depending on the nature of the raw material and end product. Some of these chemicals are different enzymes, detergents, dyes, acids, sodas and salts. Textile finishing industry uses large amounts of water, mainly because of dyeing and cleaning/washing operations. Obviously the wastewater effluent generated from these units contains considerable amounts of hazardous pollutants. If these wastewaters are discharged into the environment they will cause serious and harmful impact not only on underground and surface water bodies and land in the surrounding area but also will have an adverse effect on the aquatic ecological system. Due to usage of dyes and chemicals, effluents are dark in colour, which increases the turbidity of water body. Thus it is essential to purify the wastewater before discharge in order to protect our natural environment from harmful effect of the effluent. Main function of Effluent treatment plant ETP is to clean / treat raw hazardous effluent and recycle it for further use. Effluent Treatment Plant (ETP) designed at Raymond by our konark group is the most cost Effective & technically proven system to remove the unwanted hazardous chemicals, dyes and other chemicals from the wastewater to meets the statutory pollution control requirements, especially for textile wastewaters. The plant is designed to treat total effluent generated in dyeing and finishing process at Raymond through Pre treatment, Secondary Biological & Tertiary treatment system– which includes raw effluent plus system flushing/ rinsing/ backwash streams (total treatment capacity of 3800 CuM/day).

Fig: SWECO Screen Filtration system

**Pre Treatment**

All the process raw waste water (Raw Effluent) from finishing (FE) and dyeing (DE) stream of the plant is first pass through the bar screen cum oil/grease trap, where all particles with dia.> 10 MM as well as pieces of the fiber and other solid materials are removed by bar screen net. Oil is trapped in baffle and tee pipe chamber. From effluent collection sump, the effluent mixture (DE+FE) is then filter throw SWECO vibratory screen filter of 100 micrometer to separate the cotton and other solid suspended matter from the raw effluent. After filtration the effluent is then neutralized by acid dosing in pH correction cum equalization tank. Equalization tank also serves another purpose of cooling down the effluent temperature before feeding it to secondary treatment system.

**Secondary Treatment**

The pre treated effluent is then passed through secondary biological treatment system. Secondary treatment consists of two stage aerobic biological activated sludge process. Activated sludge process is aerobic suspended growth biodegradation process where specialized color/BOD/COD removing bacteria (active biomass/sludge) are used for degradation of soluble organic matter present in effluent. The Retrievable type diffused aeration system is provided in both the aeration tanks (AT-1, AT-2) for maintaining required DO for biodegradation and growth of biomass and also for providing necessary mixing to keep In order to maintain the performance of biological system the online culture dosing system is provided. In culture preparation tank the active bio-culture is developed and added as a seed in both aeration tanks. bacteria in suspension form.

*Fig: Retrievable type air diffuser system (Aeration)*

*Fig: Air blowers for Aeration*

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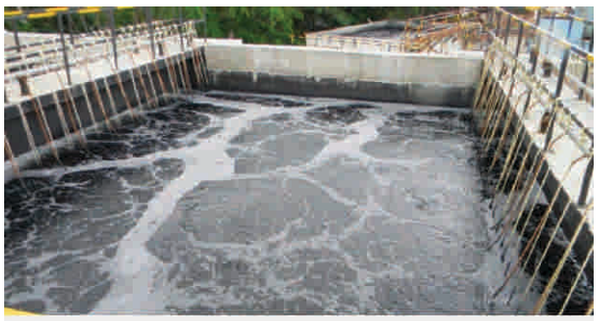

*Fig: Aeration tank (aerobic biodegradation)*

After aeration, the treated effluent flows into a circular secondary clarification chamber, where the biological floc (or sludge) settles under quiescent conditions (by gravity).

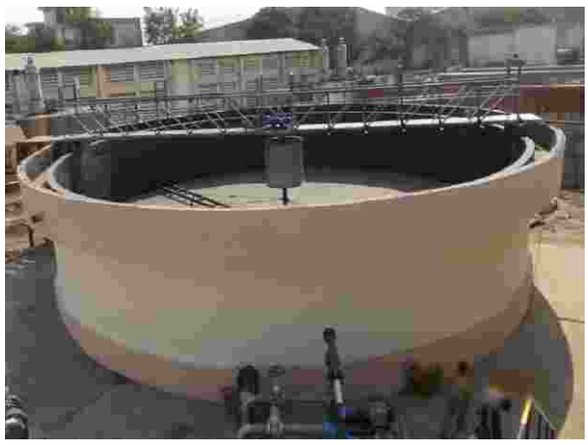

*Fig: Secondary clarifier system*

Settled sludge from the bottom of the clarifier chamber is recycle back to aeration system and excess sludge withdrawn in sludge handling system. The overflow from the Secondary clarifier is then directed to final tertiary treatment unit.

**Tertiary Treatment**

The biologically treated effluent in secondary treatment is then passed through final polishing tertiary treatment system. In this treated effluent passes through from reaction tank (RT)- to- Tertiary clarifier (TC)- to -Chlorine contact tank (CCT)- to- Pressure sand filter (PSF) –to- Activated carbon filter (ACF) units. In reaction tank (RT), chemical dosing should only be provided in case the secondary outlet contains higher colour, otherwise no chemicals are added in RT. In CCT tank the hypo dosing is provided to disinfect the effluent and to protect biological growth/ biofouling in PSF/ACF. A Multimedia filter PSF and ACF are provided for removal of residual colour, odour and suspended solids. Finally filtrated treated effluent (ACF outlet) is collected in Treated water holding tank for further usage in RO/UF and gardening purpose.

*Fig: Tertiary system (TC/ CCT/ PSF/ ACF)*

**Treatment Performance**

The plant is commissioned and running successfully at present flow around 1800-2600 m3/day. The photograph shows the initial raw effluent verses final treated water outlet quality. The table shows the monthly average inlet and outlet parameters of last five month data. Nearly 90-98% colour, COD, TSS removal was achieved by purely biological process. Our specialized culture is able to achieve nearly 90-94% colour reduction without any primary step.

Table: The raw effluent monthly average feed parameters

| Month | Flow | Feed to Aeration | | | | |
|---|---|---|---|---|---|---|
| | | pH | TDS | TSS | Colour | COD |
| | m3/d | | mg/l | mg/l | Ptco | mg/l |
| Jun-13 | 2218 | 7.04 | 6245 | 642 | 13672 | 2366 |
| Jul-13 | 2076 | 6.95 | 6076 | 835 | 14006 | 2170 |
| Aug-13 | 2280 | 6.86 | 10445 | 1088 | 10930 | 1926 |
| Sep-13 | 1808 | 7.02 | 7607 | 1059 | 14114 | 2207 |
| Oct-13 | 1777 | 6.78 | 7150 | 924 | 13797 | 2359 |

Table: The treated water average outlet parameters

| Month | ACF Outlet | | | | |
|---|---|---|---|---|---|
| | PH | TDS | TSS | Colour | COD |
| | | mg/l | mg/l | ptco | mg/l |
| Jun-13 | 7.23 | 4375 | 7 | 143 | 67 |
| Jul-13 | 7.22 | 4473 | 4 | 130 | 55 |
| Aug-13 | 6.73 | 5221 | 5 | 133 | 62 |
| Sept-13 | 7.10 | 6370 | 5 | 134 | 106 |
| Oct-13 | 7.16 | 5802 | 6 | 145 | 99 |

*Fig: Raw effluent and Treated water outlet*

# Water: Go With the Flow

Water is one of the body's most essential nutrients. People may survive six weeks without any food, but they couldn't live more than a week or so without water. That's because water is the cornerstone for all body functions. It's the most abundant substance in the body, accounting for up to 75 percent of body weight. It helps keep body temperature constant at about 98.6 degrees, and it transports nutrients and oxygen to all cells and carries waste products away. Water helps maintain blood volume, and it helps lubricate joints and body tissues such as those in the mouth, eyes and nose. And water is truly a liquid asset for a healthy weight—it's sugar free, caffeine free, and—most importantly—calorie free.

**How Much Water Do Kids Need?**

The daily amount of water that a child or teen needs will depend on factors such as age, weight and gender. Air temperature, humidity, a person's activity level and his or her overall health affect daily water requirements, too. The Kids' Total Daily Water Requirements chart below can help you identify about how many liters of water your child or teen needs each day (one liter is about four cups of liquid). These water recommendations are set for generally healthy kids living in temperate climates; therefore, they might not be perfect for your child or teen.

The amount of water that your child or teen needs each day might seem like a lot, but keep in mind that the recommendations in the chart are for total water, which includes water from all sources: drinking water, other beverages and food. Notice that fruits and vegetables have a much higher water content than other solid foods. Their high water content helps keep the calorie level of fruits and vegetables low while their nutrient level remains high—another perfectly great reason for kids to eat more from these food groups.

So how do you apply total water recommendations to your kid's day? As a rule of thumb, to get enough water, your child or teen should drink at least six to eight cups of water a day and eat the recommended number of servings of fruits and vegetables every day. Also pay special attention to your child's or teen's water consumption when he or she is physically active. Before, during and after any physical activity, kids need to drink plenty of water, especially in hot weather. The goal is to drink one-half to two cups of water every 15 to 20 minutes while exercising

.

**Kids Total Daily Water Requirements**

| Age Range | Gender | Total Water (Liters/Day) |
|---|---|---|
| 4-8 years | Girls and boys | 1.3 |
| 9-13 years | Girls | 2.1 |
| | Boys | 2.4 |
| 14-18 years | Girls | 2.3 |
| | Boys | 3.3 |

**Note:** Total water includes all water contained in food, beverages and drinking water.




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