

PANEL BOARD, PULP & PAPER APPLICATION

WOOD PULP EFFLUENT TREATMENT AND RECOVERY PLANT

CONVENTIONAL BIOLOGICAL SYSTEMS

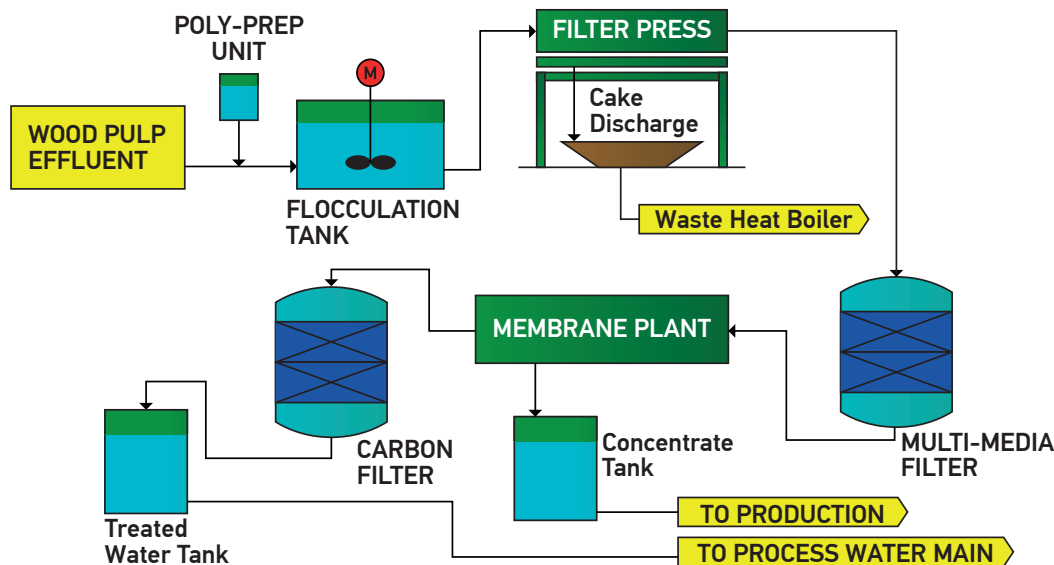
These systems are reaching the end of their product life cycle as they:

- are capital-intensive;
- no longer satisfy the demands of the Environmental Agency or the Company Accountant;
- produce two outputs, neither of which are amenable for recovery or re-use:
 - a low quality final effluent containing of inert solids, organic substances and residual biomass;
 - waste activated sludge known as biomass.

THE «ZERO DISCHARGE» WOOD PULP EFFLUENT PLANT

The Esmil «Zero Discharge» Wood Pulp Effluent Plant combines the advantages of conventional physico-chemical processes with proven membrane technology. **All solid and liquid phase outputs are recoverable thereby resulting in a «zero discharge» plant.**

The plant can be substantially automated and an operator can be fully trained within a matter of weeks.



- **Permeate** for use as general site process water or boiler feed;
- **Concentrate** for use as chemical make-up water;
- **Solid Cake** for use in waste heat boiler.

INNOVATION THROUGH DEVELOPMENT

Innovation was key in the following two areas:

- Development of the Reverse Osmosis membrane plant, which was carried out in association with the international research and development expertise of Desalination Systems Inc of the USA, the world's largest supplier of speciality membranes.
- Formulation of a new polyelectrolyte for efficient flocculation of wood pulp effluent.

REFERENCES

1995 - MDF effluent, Kronospan, Chirk, North Wales
 1996 - MDF effluent, Kronospan, Sanem, Luxembourg
 1998 - MDF effluent, Kronospan, Szczecinek, Poland
 1998 - MDF effluent, Kronospan, Lampertswalde, Germany
 1999 - MDF effluent, Caberboard, Stirling, Scotland
 1999 - MDF effluent, Kronospan, Chirk, North Wales, second plant
 1999 - MDF effluent, Unilin, Sedan, France
 2000 - MDF effluent, Binder, Hallein, Austria
 2001 - MDF effluent, Interpanel, Zamora, Spain
 2001 - MDF effluent, Finsa, Padron, Spain
 2001 - MDF effluent, Unilin, Sedan, France, second plant

SPECIALISTS IN THE TREATMENT OF CHALLENGING INDUSTRIAL EFFLUENTS

BENEFIT SUMMARY

Competitive Edge of Esmil Plant versus Biological Plant

ESMIL ADVANTAGE	JUSTIFICATION
Low Capital Cost	Fewer process stages Minimal civil engineering requirement Minimal earth working requirement
Rapid Investment Pay back	Reduced effluent disposal costs Reduced towns water / natural water take requirement Reduced manpower requirement No generation of by-product such as waste sludge
Product/Resource Recovery Effluent Reduction, Recycle & Re-use	Non destructive treatment process Excellent final effluent quality Process water recovery for general re-use RO concentrate recovery for reuse as chemical make up water Solids recovery for on site incineration
Confidence of Environmental Compliance	Robust treatment process that is not affected by toxins, overloading or adverse temperature Fixed physical barrier thereby guaranteeing compliance No emission of odours or green house gasses State of the Art Technology
Modular System	Discrete process units for incremental upgrading

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