CASE STUDY

CAESAR PAC
Water reuse in the paper industry

THE CLIENT
Caesar Pac Carton & Paper Products Co. is a premium provider of corrugated cartons in the Kuwaiti & middle-east regional Market. They specialise in producing corrugated boxes, both brown and white, five-colour printing and die-cut boxes including micro-flutes, point of purchase and display cartons. They are part of the Caesars Group of companies, a leading industry in Kuwait with diverse business interests such as operating a chain of restaurants and confectioneries, manufacturing of corrugated cartons, trading in food stuff, industrial equipment, spares, tools, IT Solutions; travel and tourism.

THE BACKGROUND
For the construction of the new factory, Caesar Pac required a compact wastewater treatment system to be built in the basement of their new factory. Due to the large volume of daily process water, and the fact that they cannot discharge the wastewater into the sewer, Nijhuis designed a WWTP solution which reuses more than 90% of wastewater.

INSTALLATION FACTS
- **Customer:** Caesar Pac Carton & Paper Products Co.
- **Industry:** Paper Industry
- **Location:** Kuwait
- **Flowrate:** 4580 m³/day

SCOPE OF SUPPLY
- **Contract type:** Design and build, total wastewater treatment and reuse system
- **Added value services:** Design, project management and engineering, manufacturing, delivery, installation, commissioning, training on site and monitoring.
- **Solution:** 2x filter drum screen, 2x microfilter, flocculation / flotation (IPF 135), continuous aerobic biotreater MBBR, Ultra filtration, electrodialysis reversal (EDR), decanter.
- **Intelligent Services:** i-MONITORING
- **Official start date:** 2018
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**CUSTOMER BENEFITS**

1. Compact solution which fits in the limited available space
2. Low environmental footprint
3. Maximum reuse of treated waste water within their process.
4. Recovery rate EDR >90%
5. Nijhuis application knowledge

**SOLUTION**

The wastewater from the factory is first filtered by a rotary drum screen to remove the large particles and then equalized in a balance tank of approx. 800 m³. From this tank, the wastewater will be pumped to the flocculation/flotation system. A part of this flow will be further treated with micro filters and reused within the process and the remaining amount of wastewater of approx. 2100 m³/day will be further treated.

To cope with the limited space, Nijhuis has chosen a biological treatment solution with the lowest possible footprint, a compact 3 stage MBBR system and which fits into the available space of the basement. The pre-treated and conditioned water is then directed to the Ultra Filtration system which is executed with special low fouling membranes to prevent frequent cleaning and to ensure optimal operational conditions.

The final step of treatment is electrodialysis reversal (EDR) to achieve the high recovery rate of more than 90%. Electrodialysis is an electric field gradient driven process, enabling separate mineral matters from feed solution while moving dissociated ions through ion-perm selective membranes and forming two different flows - desalted flow called dilute and a concentrated flow called concentrate.