# OSMO – in tune with the times.

**Text:** Christopher Rieth **Photo:** OSMO

OSMO Membrane Systems meets challenges for which no standard solutions exist. Itembraces the complete repertoire of processes for treating water and process liquids. On the following pages, we try to give you an overview of the processes applied in the respective industrial segments.

# OSMO's range of treatments.

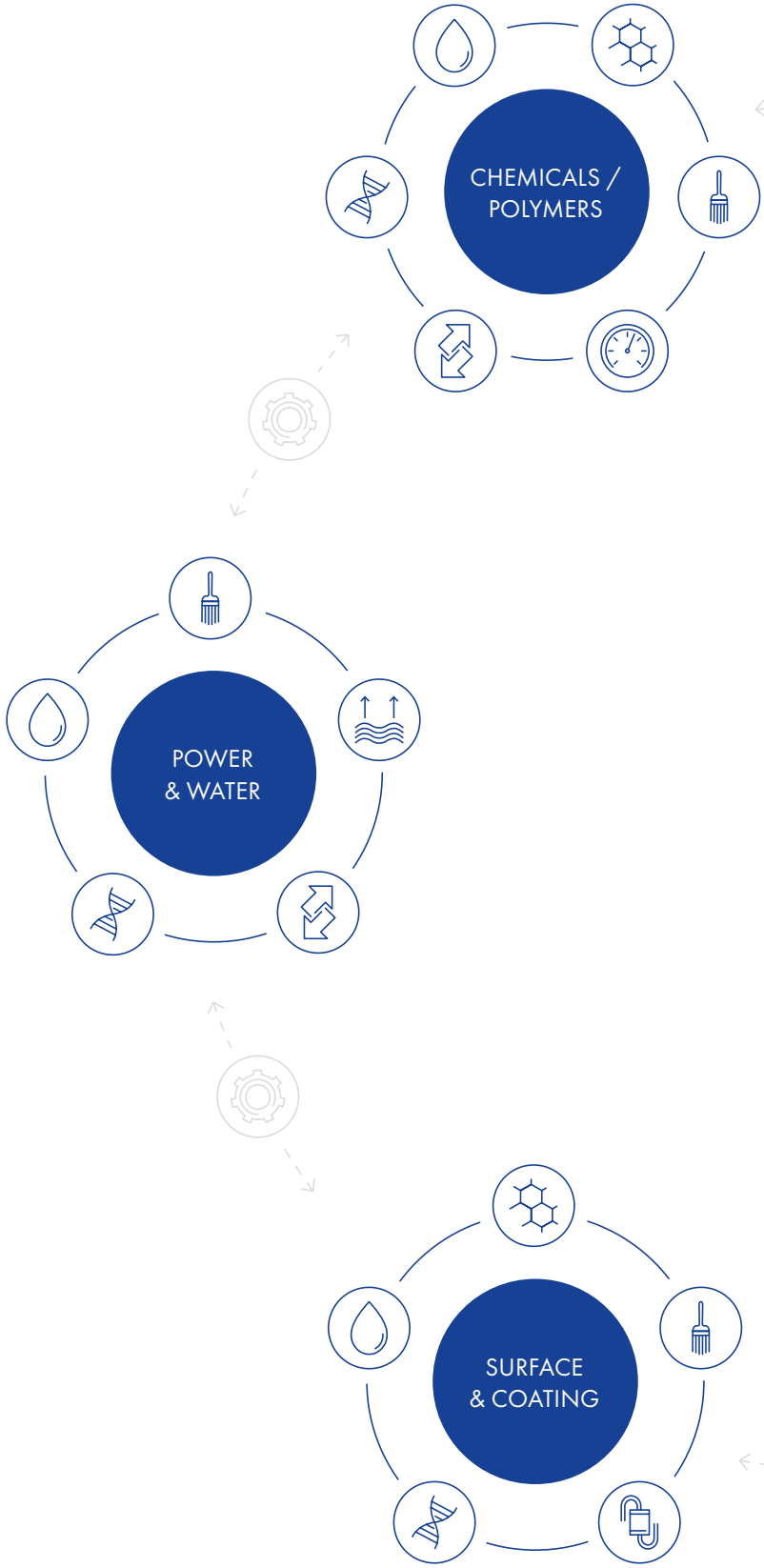
MICROFILTRATION
- Separation of micro-particles such as hydroxides, CaCO3, particles produced during grinding, catalysers
- Concentration of suspensions
- Separation of sludge
- Removal of colloidal substances from acids and bases

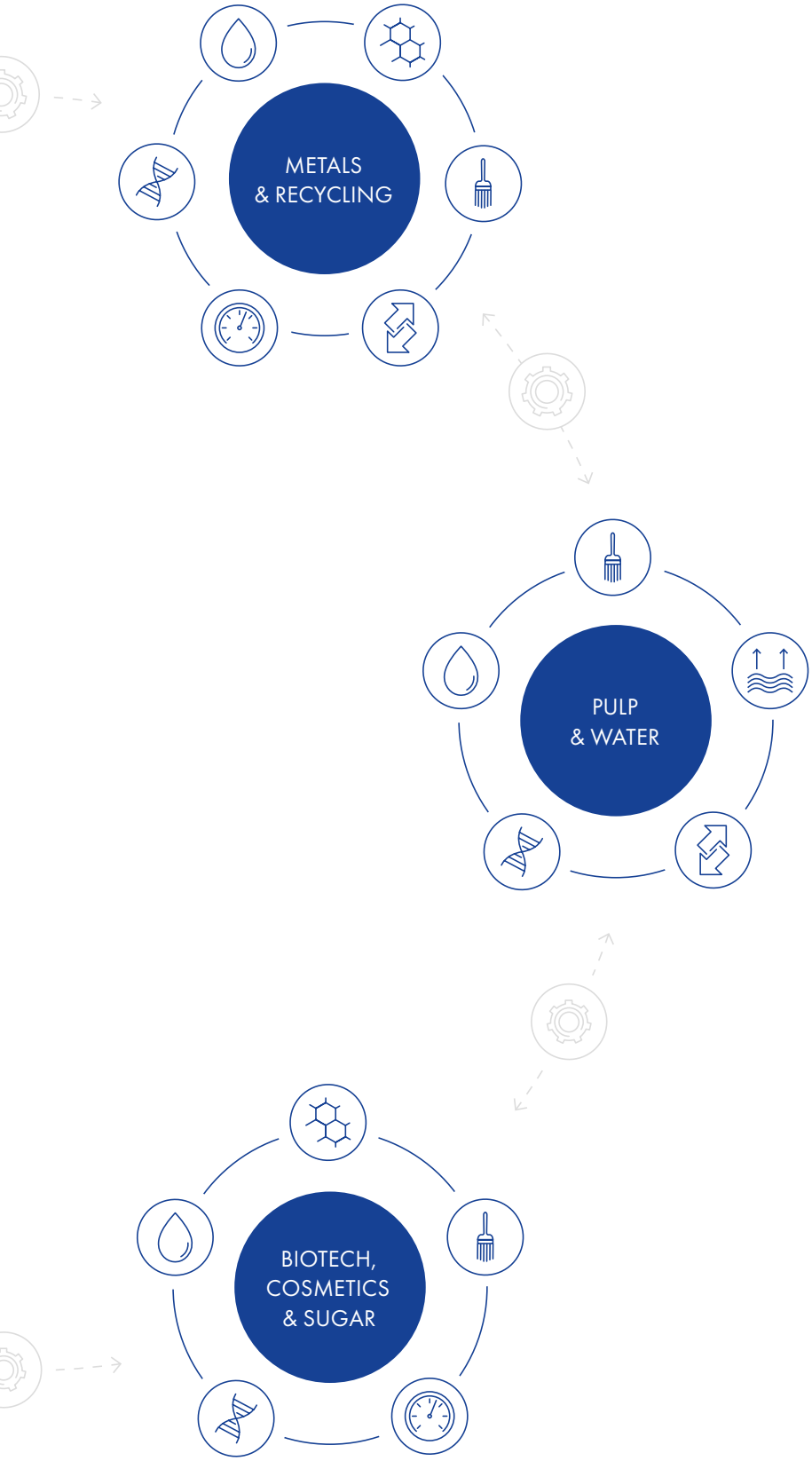
ULTRAFILTRATION
- Concentration of suspensions such as water-soluble printing inks and paints
- Recovery of recyclables such as coating inks in the paper industry
- Separation of clouding substances from river water, acids and bases for example Dehydration of paint suspensions such as for cataphoretic painting and electrocoating

NANOFILTRATION
- Separating of organic molecules, e.g. for CSB reduction, and cleaning of bases in the pulp and food industries
- Cleaning of acids by separating off metals or organic molecules
- Demineralisation of solutions such as NaCl separation from dyes
- Retention of molecules such as dyes and humic matter
- Separation of multivalent ions such as phosphate, sulphate and hardness
- Concentration of process solutions

REVERSE OSMOSIS
- Demineralisation of water for industrial purposes, such as cooling water, boiler feeder water and process water
- Treatment of industrial wastewaters for feedback into the process
- Manufacture of drinking water
- Cleaning of wastewaters such as landfill seepage water

HIGH-PRESSURE REVERSE OSMOSIS
- Concentration of salt solutions (sodium nitrate, sodium sulphate, brines)
- Concentration of organic substances, e.g. isopopanol, glycol, sugar solutions
- Preparation of high saline process solutions
- Recovery of metals






### ION EXCHANGE PROCESS

- Removal of residual dyes and salts from solutions
- Removal of ammonia for condensate processing
- Removal of metals from process solutions
- Complete demineralisation using mixing bed ion exchanger or electrode ionisation (EDI) as in VGB-S-412-2012-09 (previously R 450 L)
- Softening of water

### MEMBRANE DEGASSING

- Removal of CO2 to increase the pH value
- Removal of CO2 as a pretreatment for complete demineralisation
- Removal of O2

### DIALYSIS METHOD

- Paint bath maintenance for cataphoretic painting systems
- Demineralisation of water
- Recovery of acids
- Recovery of recyclables

### ACCESSORIES

- Neutralisation for cleaning solutions and regeneration solutions of ion exchanger
- Pre and post-treatment stages, such as filter stations, heat exchangers, conditioner stations, demanganisation / de-ironing and active carbon filters
- Chemical stores and dosing containers for e.g. regeneration of ion exchangers
- Dosing systems for diverse membrane systems such as antiscalant, acids and bases
- Cleaning stations (CIP) having different levels of automation

### SERVICE AND MAINTENANCE

- Performing of regular services including checks of operating parameters
- Cleaning of membrane
- Troubleshooting
- Sale of spare parts and chemicals
- System optimisations

### PILOTING AND PROCESS DEVELOPMENT

- Membrane screening tests with our flexibly deployable MemCell and Auto-MemCell
- Process development in close collaboration with our R&D department
- Range of diverse test systems to rent and buy

# OSMO provides the finest separation technique for the milestone phosphorous recovery project.

Foundation stone ceremony for the Hamburg phosphorous recycling system.
© Hamburg Wasser

# At the start of March, OSMO Membrane Systems was commissioned by Hamburger Phosphorrecyclinggesellschaft mbH to supply ultra-fine separator stages for the TetraPhos® process developed by REMONDIS.

**Text:** Christopher Rieth **Photo:** Hamburg Wasser / OSMO

From the sewage sludge of purification plants, the REMONDIS TetraPhos® process is used to recover phosphorous and saleable raw materials having the same quality and availability. For this, the sludge is subjected to thermal utilisation in the mono sewage sludge incineration system associated with the REMONDIS TetraPhos@ process, and the ash is subjected to wet-chemical treatment. The ash here is dissolved into diluted phosphoric acid. This phosphoric acid solution enriches with the phosphorous part of the ash and is then filtered and cleaned. This enables RePacid phosphoric acid to be recovered for industrial applications and fertiliser production. Also, iron and aluminium salts are generated, that in turn can be used for phosphate elimination in the sewage plant and close an additional important cycle. Another recyclable produced is gypsum for the construction material industry.

Sample photo

OSMO has already delivered the membrane separator stage for the pilot system installed at REMONDIS since 2015. The initial place of use for the pilot system was the Hamburg sewage treatment plant in Kohlbrandhöft. After the successful pilot phase, a large-scale system is being realised in Hamburg by Hamburger Phosphorrecyclinggesellschaft mbH, a joint venture between REMONDIS and Hamburg Wasser.

Phosphorous recycling in Hamburg is being funded by the Federal Ministry for the environment, nature conservation and nuclear safety.

The system will enter operation in 2020, and from around 20,000 tons of sludge ash every year will produce around 7,000 tons of ultrapure phosphoric acid, 36,000 tons of iron and aluminium salts and 12,000 tons of gypsum.

For the first time around the globe, this method can be used to recycle economically and efficiently the important raw material concentrating in the sludge ash during wastewater purification. There is only limited worldwide availability of phosphorous, but it is essential for plant growth and so for food production overall.

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