

TECHNOLOGY FOR P RECOVERY AS STRUVITE STARTING FROM WASTE WATER WITH CRYSTALLIZATION REACTOR



Keywords: • *struvite* • *wastewater* • *crystallization* • *Ostara Pearl* • *nutrient recovery*

Key facts:

- **Category of the technology:** Ostara Pearl crystallization reactor
- **Input:** Wastewater from WWTP, magnesium salt and NaOH
- **Output product(s):** Struvite / Effluent for discharge
- **Available capacity:** 2 t/day
- **Focusing geographical areas:** EU28
- **Technology status:** TRL 9
- **EC/MS Authority permits:** N/A



Summary of the technology:

The Struvite Recovery System of the Madrid Sur WWTP is designed to recover phosphate from a combined feed, in the range from 50 to 120 m³/h maximum anaerobic digested sludge, dehydration overflows and flotation overflows. The system is dimensioned to produce 2 t/day of the product ready to be commercialized.

The Nutrient Recovery facility consists of 2 groups of feed pumps, a crystallising reactor and its associated pumps, valves etc., a draining and drying product step, a product sorting and packaging step, a programmable logic controller (PLC) cabinet, an engine control centre, a MgCl₂ storage tank and a NaOH storage tank.

The draining of the dehydration and the clarification of the flotation are fed into the lower part of the reactor where they are diluted with recirculation and injected with MgCl₂ (32%) and NaOH (25%). Inside the reactor the struvite (MgNH₄PO₄·6H₂O) precipitates in a controlled way in small hard granules. At the top of the reactor, an integrated clarifier retains the granules inside the reactor. The effluent is sent to a tank from where it is pumped to the primary decantation of the WWTP. Struvite particles are collected from the bottom of the reactor, washed, dried, sorted by size and packaged for shipment.

Competitive position and advantages:

- This nutrient recovery system helps save on chemical costs, reduce sludge loads, and create a new revenue stream through the sale of high value recovered fertilizer. Plus, it reduces the carbon footprint.
- Ostara's Pearl[®] technology recovers phosphorus from liquid wastewater streams, preventing nuisance struvite formation in pipes, pumps and digesters, while helping plants meet strict phosphorus limits, and reducing sludge volumes and disposal costs.

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