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part of saur mission water

SIX®

Suspended Ion Exchange

#missionwater

Transforming water treatment with enhanced organic matter removal

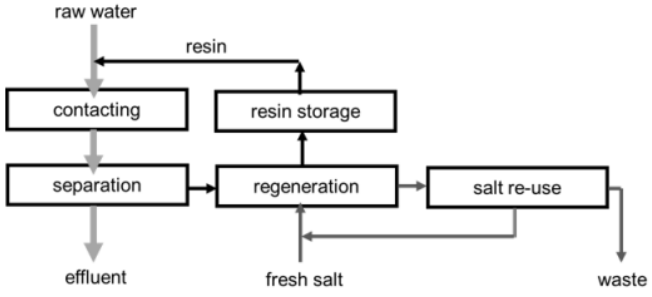
SIX® is a suspended ion exchange process developed by PWNT as an alternative or complementary solution to coagulation for organics removal. It is suitable for treating surface waters to remove dissolved organics.

The advantages of SIX®

- Efficient removal of organics (60-90%)
- High UV transmission achieved (>90%) and other benefits downstream from an early removal of organics
- No iron or aluminum based sludge
- Flexibility in resin selection – compatible with a variety of commercially available resins (opening up possibilities for softening, sulfate and nitrate removal, and even specific substances like PFAS)
- Very minimal chemical requirement – the only major chemical is salt (sodium chloride) for regeneration
- Resin is recycled with low resin attrition and loss, thus low additional resin is needed over time, and low level of waste are generated
- Short resin contact times and high frequency of regeneration, implying no risk of resin blinding or biofouling
- Full-scale resin service life > 5 years
- Possible regeneration with bicarbonate, especially when treating waters high in total dissolved solids (TDS)

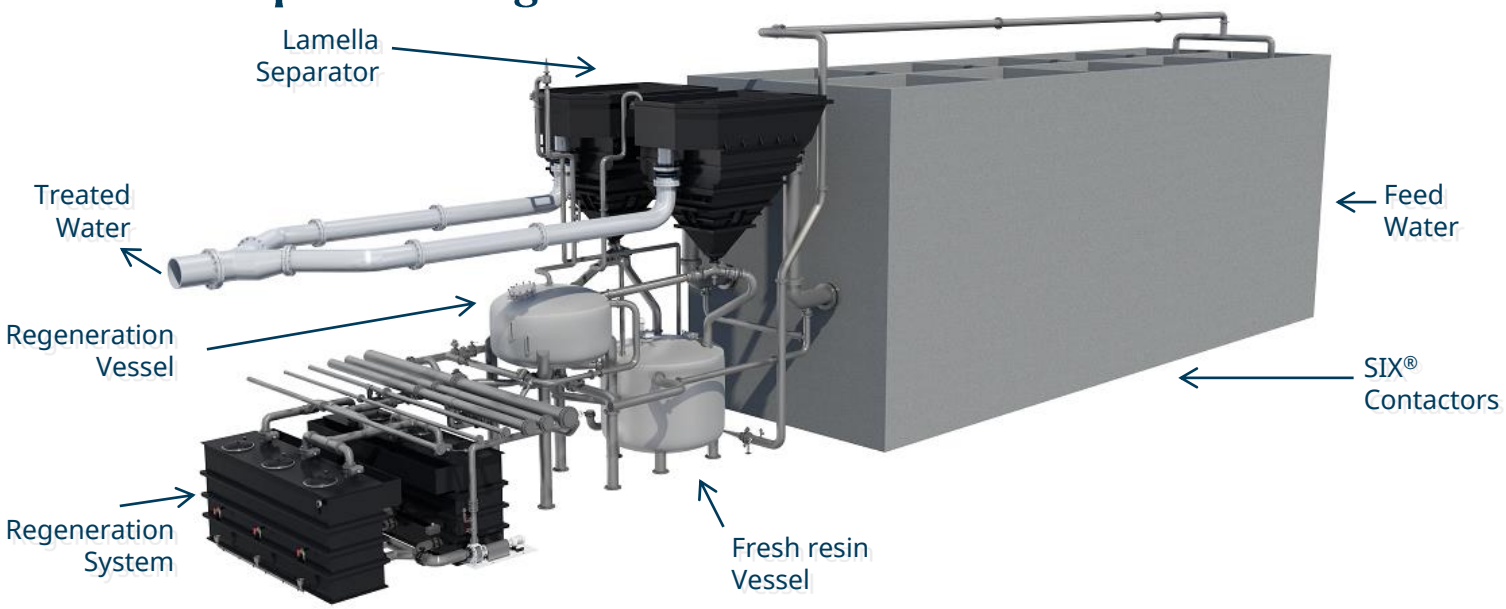
SIX® process description

- Anion exchange resin is used for DOC removal
- Resin is suspended, so process is ideal for waters (i.e., raw) with suspended solids
- Resin is mixed by air in a five-chamber contactor
- Resin is never pumped, but travels through process by gravity and eductor



- Resin is batch regenerated, with regenerant used up to five times before disposal
- All resin is regenerated after it passes through the contactor (“single pass”)

PWNT SIX® process diagram



References

Andijk III
- The Netherlands
- Since 2014
- 120 MLD (32 MGD)
- SIX® installed

Mayflower WTW
- United Kingdom
- Since 2019
- 90 MLD (24 MGD)
- SIX® installed

Pilots

Andijk PWNT R&D
- The Netherlands
- SIX® pilot x 2
(Lewa pilot since 2009; Nova pilot since 2011)

Lövo WTW
- Sweden
- SIX® pilot (2016/17) for treating water from Lake Mälaren

Invercannie WTW
- Scotland, UK
- SIX® pilot (2016/17) for treated water from River Dee

Görvälnverket WTW
- Sweden
- SIX® pilot (2018) with Norrvatten for organic removal

Hall WTW
- United Kingdom
- SIX® pilot (2019/20) for organics removal from River Trent

Alderney WTW
- United Kingdom
- SIX® pilot (2020/21) for treating water from Longham Lakes

Llobregat WTW
- Spain
- SIX® pilot (2023/24) with ATL for river water with high turbidity

Velsen WWTP
- The Netherlands
- SIX® pilot (2024) for ammonium removal from wastewater (Rijnland)

Witches Oak WTW
- United Kingdom
- SIX® pilot (2024) for organics removal from River Trent

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