

REDUCING CHEMICAL USE IN SEAWATER REVERSE OSMOSIS WITH SPECTRAGUARD 111



SpectraGuard™ 111 CONCENTRATED LIQUID REVERSE OSMOSIS ANTISCALANT

APPLICATION:

Seawater Reverse Osmosis

TECHNOLOGY:

SpectraGuard111

CAPACITY:

3 x 800 m³/day 2-pass SWRO units per vessel



CONTEXT

A leading international luxury passenger cruise line uses multiple seawater reverse osmosis (SWRO) plants across its fleet to produce both potable and service water on board. Each vessel in this class is fitted with three high-capacity 800 m³/day 2-pass SWRO units.

As a company committed to sustainability, this cruise operator was looking for ways to optimize their water management while reducing its environmental impact. To that end, they chose to trial H₂O Innovation's antiscalant solution, SpectraGuard 111 (SG111), as it aligned with their operational and sustainability goals.

SOLUTION

SG111 is a highly concentrated, dendrimer-based, and phosphate-free antiscalant developed specifically for seawater reverse osmosis systems.

Its 11x super-concentrated formula allows operators to optimize performance with smaller quantities of product; as such, SG111 significantly reduces chemical usage, storage space, and packaging waste. Furthermore, it drastically minimizes shipping requirements: because fewer drums are needed, this leads to fewer deliveries, a reduced freight volume, and lower overall CO₂ emissions. This not only streamlines logistics for the crew but also helps reduce the plant's carbon footprint.

RESULTS

Considering that each of the 15 plants operating across the cruise line's fleet would typically use around 52 25-kg drums of traditional antiscalant per year, they would require approximately 780 drums annually. Making the change to SG111 across the entire fleet would reduce this total to 45 drums per year. This represents a 94% reduction in total chemicals used.

Each plant would therefore need to purchase and store only three drums of SG111 annually, as opposed to 52 drums of traditional antiscalant.

Benefits of SG111:

- Lower overall chemical consumption
- Cost savings
- Lower storage and handling requirements
- Reduced packaging waste
- Decreased shipping and logistics costs
- Reduced environmental impact

CONCLUSION

The shift to SG111 has yielded significant environmental benefits for the cruise operator, including a reduction in plastic waste, shipping-related emissions, and energy use associated with product handling.

Additionally, SG111's phosphate-free formula helps protect marine ecosystems from nutrient pollution, which is also in keeping with the cruise line's broader sustainability goals.

As such, SG111 proves to be a highly efficient and sustainable antiscalant solution. For this cruise line and for any organization operating SWRO systems, it offers a practical, high-performance alternative tailored to the demands of large-scale marine desalination.

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