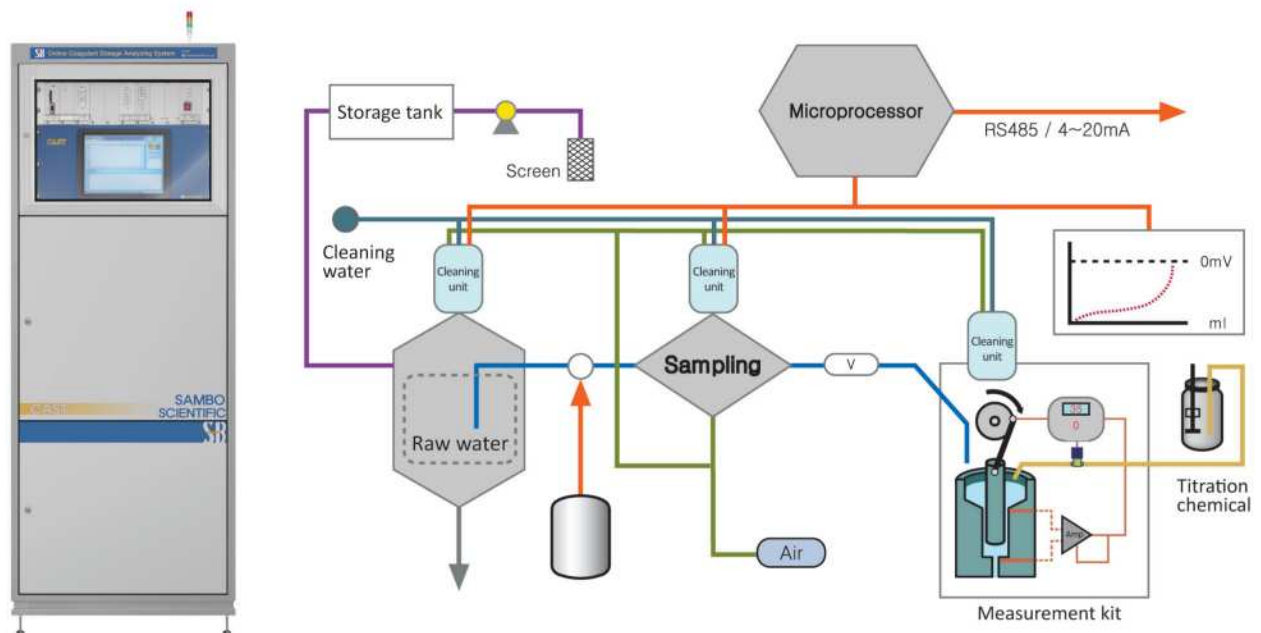


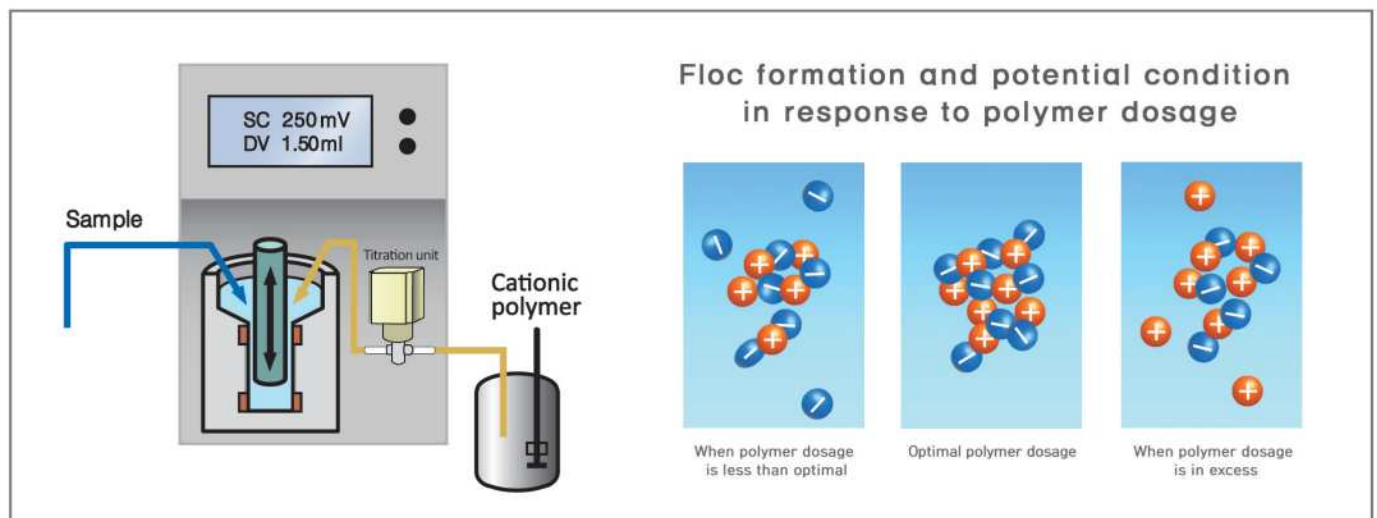


CAST Technology Snapshots

- SBS automatically analyzes a particle's charge and coagulation fundamentals to determine the optimum dosage of chemicals or polymer in real time.
- The above determined dosage is in direct response to variable influent water qualities.
- SBS does this analysis every 10-15 min for optimum control.
- SBS allows for stable control of effluent water or sludge quality and optimized chemical dosing causing significant financial savings.
- Using fully automated systems for real-time measurements and self-cleaning functions minimizes and operator's time and efforts.



〈 Positive ions in response to measured negative charged ions
Real-time continuous measurement of required chemical dosage 〉



WHY CAST make a difference? and Its technical features

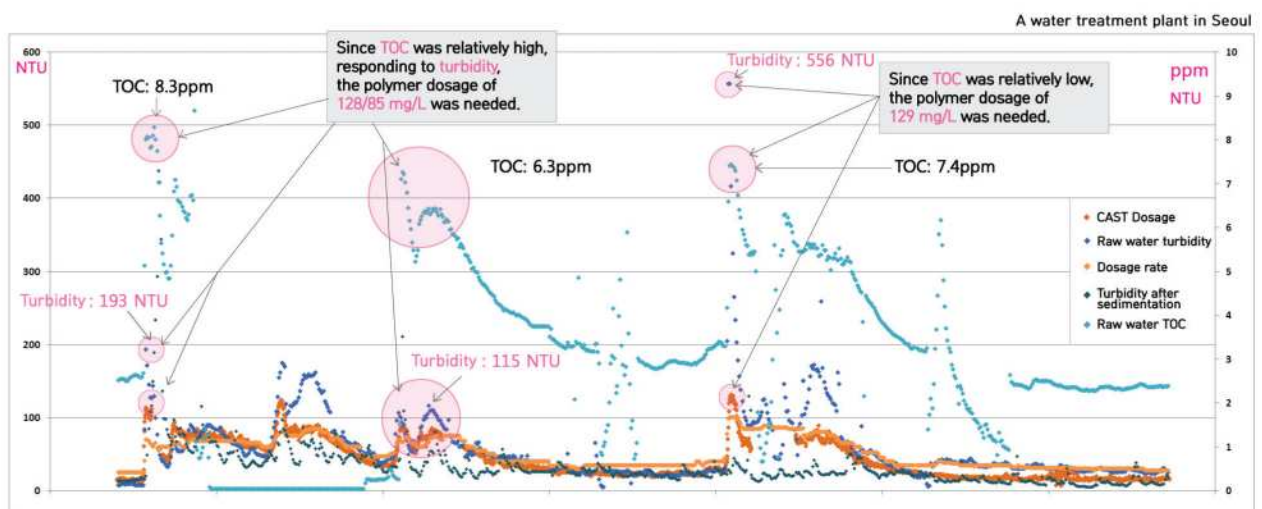
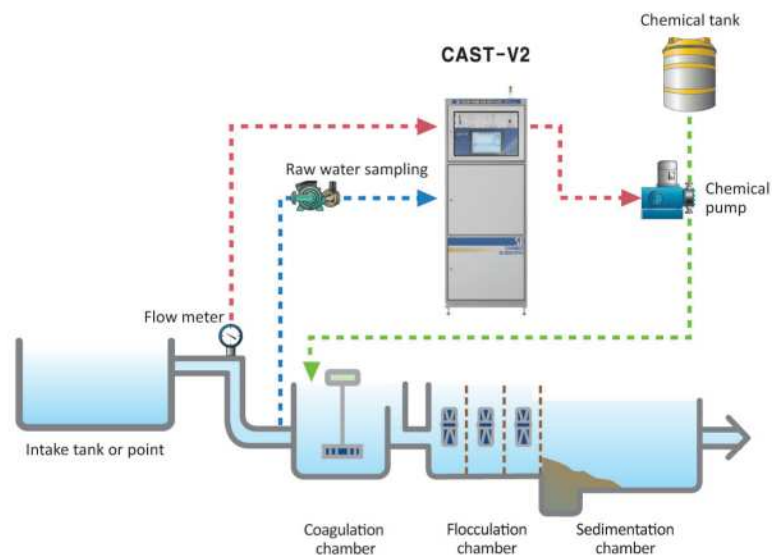
- **Fast and real-time responses to fluctuating flow-rates and variable influent water qualities allows for chemical cost savings.**
 - Avoiding over-dosing or under-dosing as well as determining the ideal dosage is in direct response to fluctuating flow-rates and variable influent water qualities.
 - Cost savings include O&M, chemical, and sludge disposal.
- **Maximizes the efficiency and the convenience for operators.**
 - Fully automated system with easy maintenance.
 - Data logging to show real-time chemical dosage at a glance.
 - Automated control over chemical dosing to meet all effluent goals.
- **Robust design and construction for long-term operation and minimal maintenance.**
 - Highly durable system that includes raw water sampling, piston/measuring cell, and self-cleaning analyzers.
 - Stable operating system that allows for the measurement of water high turbidity and sludge.
(e.g., over 1,000 NTU and 30,000 mg/L of MLSS)
- **Self-recovery functions through self-diagnostic measurements allows for resolutions to technical issues.**
 - 19 different alarms triggered by self-diagnostic measurements
 - The system will resume operation when all the technical issues are resolved and the triggered alarms are removed.
 - Optional text messaging to an operator to inform them when an alarm has been triggered.



Specification	
Voltage range	-2000 ~ +2000 mV
Positive charge deviation	± 0.05mℓ
Coding method	ASC II (RS485 or 4-20 mA)
Unit dimension	1.97 ft (W) x 2.95 ft (L) x 5.25 ft (H)
Power	200 V, single phase, 60 Hz, 2.7 hp

Application 1. Water Treatment

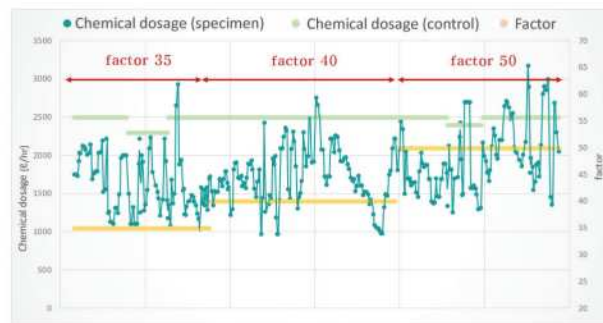
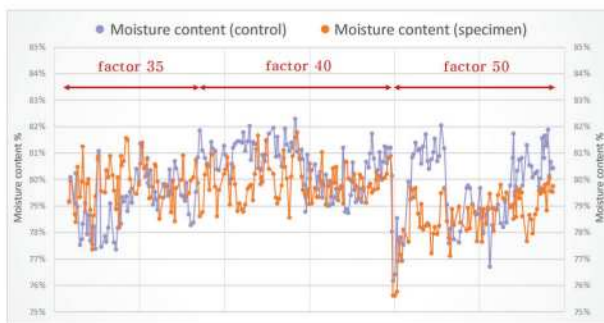
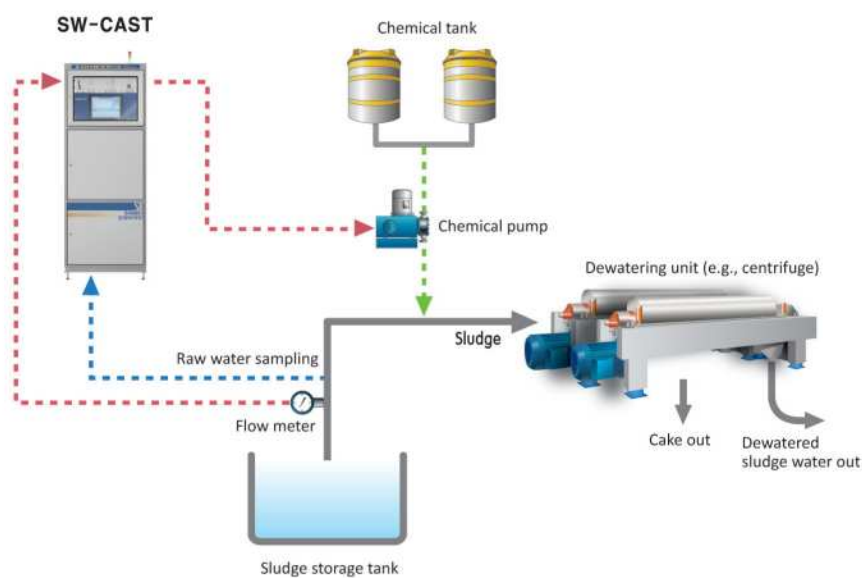
- Using optimal chemical dosing, the SBS will meet effluent water limits while providing chemical cost savings.
- Using real-time response technology the SBS can maintain stable water quality in response to varying water turbidity introduced during inclement weather events.
- When compared conventional testing such on-site Jar-test, the SBS system, giving automated feedback control, is far superior.



< Variable optimum dosage of polymer in response to fluctuating TOC and turbidity during summer time (hurricane duration)>

Application 2. Sludge disposal and treatment (dewatering)

- Stable control over sludge cake dryness and optimal polymer usage done in real time.
- Technically help a process after the sludge dewatering because of reduced suspended solid concentration in dewatered sludge water.



〈 Comparison of moisture contents of control and specimen 〉

〈 Variable chemical dosages in response to factor 35, 40, and 50 〉

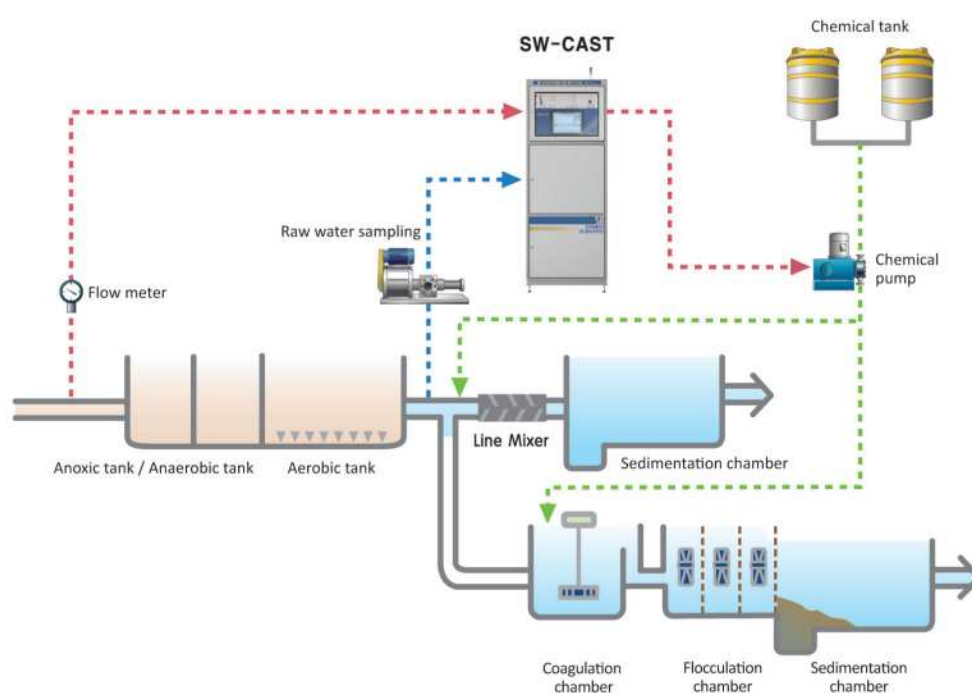
Specimen: CAST dosage / Control: Fixed dosage

		Moisture content (specimen)	Moisture content (control)	Chemical dosage of specimen (L/hr)	Chemical dosage of control (L/hr)	Saved chemical (%)
factor 35	Minimum	77.4%	74.1%	1040	2300	-
	Maximum	81.6%	81.9%	2933	2500	-
	Average	79.8%	79.2%	1623	2440	33%
factor 40	Minimum	78.6%	78.1%	970	2500	-
	Maximum	81.8%	82.3%	2758	2500	-
	Average	80.0%	80.5%	1727	2500	31%
factor 50	Minimum	75.6%	76.2%	1262	2400	-
	Maximum	80.1%	82.1%	3180	2500	-
	Average	78.7%	79.7%	1986	2479	20%

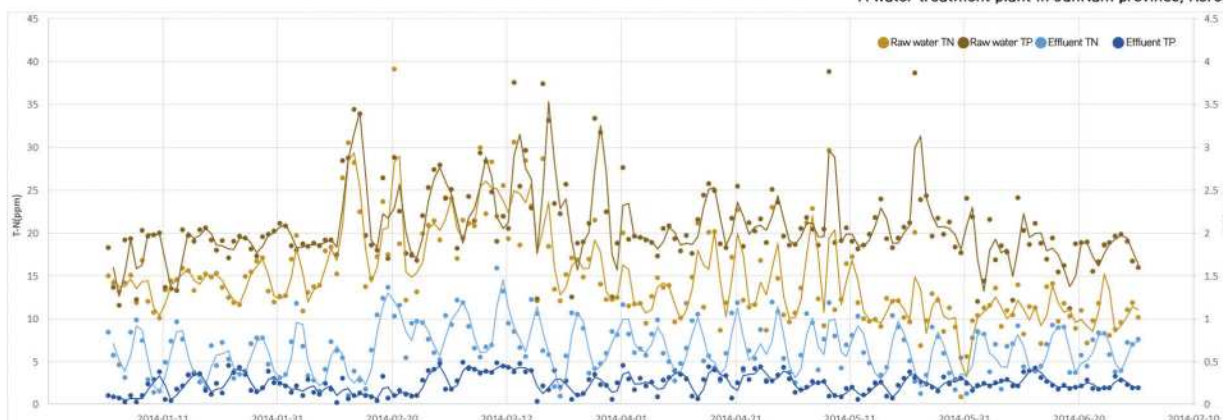
〈 The results of saved chemical amount through the CAST technology identifying optimum polymer dosage to a sludge dewatering process 〉

Application 3. Advanced wastewater treatment (Total phosphorus, TP removal)

- Ability to determine optimal chemical dosage and controls in response to stoichiometric TP removal in variable influent water qualities.
- Stable operation allows for the SBS system to handle high suspended solid concentrations in influent water.
- Flexible operation of the SBS system allows for different TP removal limits.



A water treatment plant in JunNam province, Korea



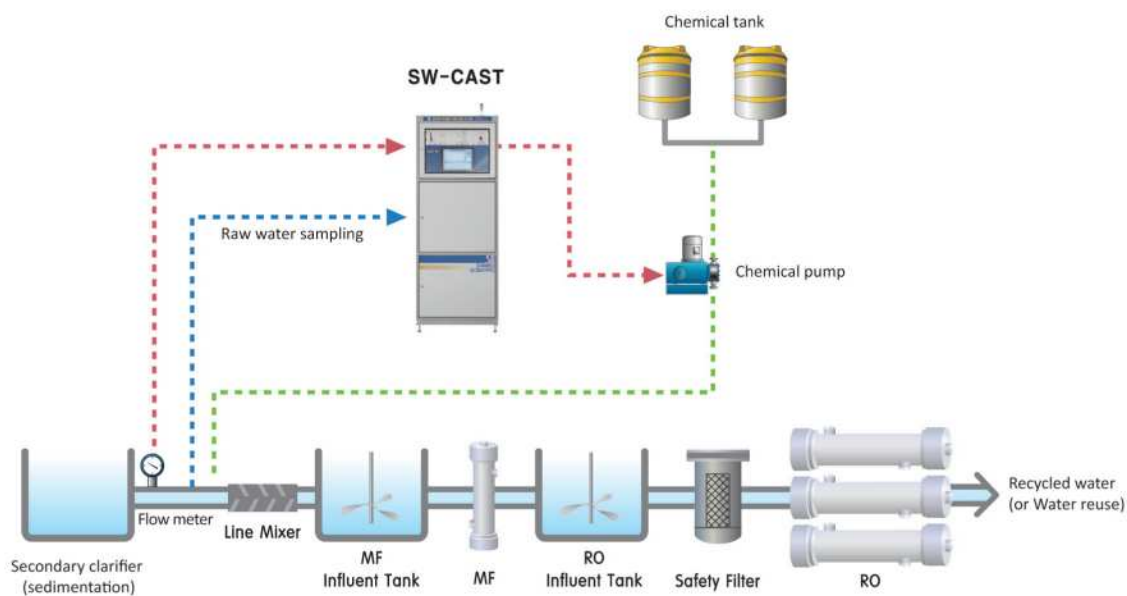
	Raw water TN	Raw water TP	Effluent TN	Effluent TP
Minimum	0.87	1.12	0.96	0.02
Maximum	39.16	3.88	15.92	0.49
Average	14.92	2.07	6.51	0.24

2014.01.01~2014.06.30

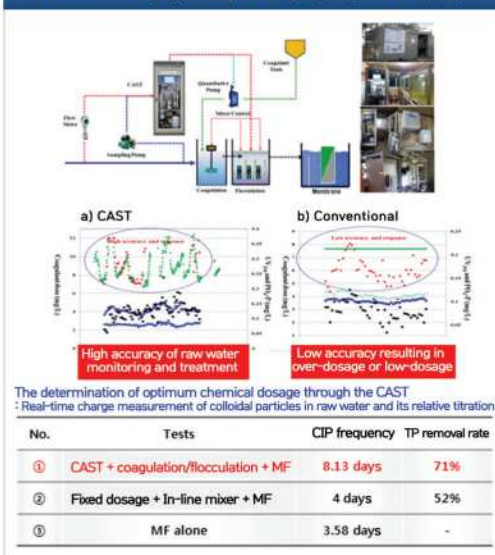
< The results of TP removal using CAST technology >

Application 4. Recycled water treatment (MBR: Membrane bioreactor and MF/UF/RO membranes)

- Effective control over TMP, flux, cleaning frequency, and membrane performance.
- Technically help a process after MBR process.
- Appropriate management of concentrate water from a RO unit

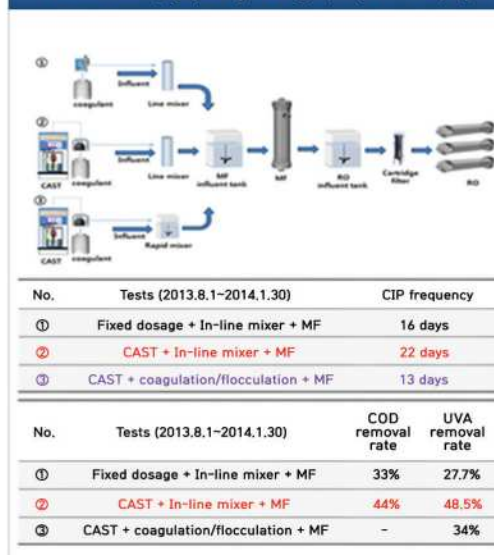


Case study (1): 25,000 gal/d (100 m3/d)

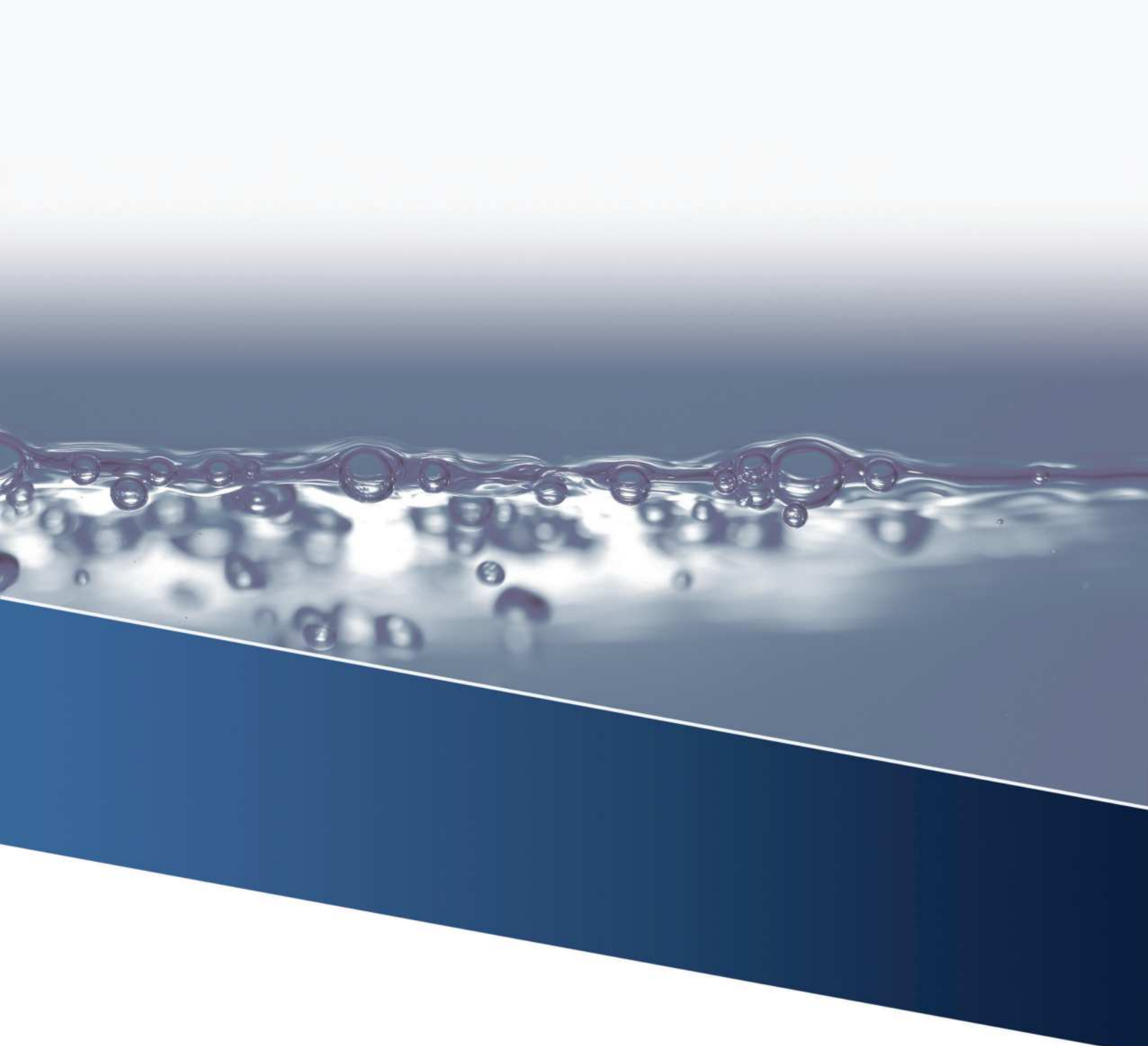


< Flux: 14.7 gfd (25 LMH) – Submerged MF >

Case study (2): 25,000 gal/d (100 m3/d)



< Flux: 35.3 gfd (60 LMH) – Pressurized MF >



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