



Comparative Cost Analysis: DIOTIN vs Conventional Water Treatment Alternatives

380,000 m³/day Water Treatment Plant

Executive Summary

This corporate report presents a financial and operational comparison between DIOTIN and traditional water treatment methods for a high-capacity facility processing 380,000 cubic meters of water daily. DIOTIN is a stabilized chlorine dioxide solution that offers a disruptive alternative to conventional disinfection systems, delivering cost-effective, scalable, and infrastructure-light performance.

DIOTIN achieves equivalent disinfection results to large-scale reverse osmosis (RO) systems typically costing \$80M to \$400M in capital investment. However, DIOTIN eliminates the need for such infrastructure entirely while reducing operating chemical costs by up to 75% compared to its closest chemical alternatives.

In addition, DIOTIN is thermally resilient and maintains its efficacy at water temperatures up to 74°C, whereas all other conventional chemical alternatives begin to degrade or lose effectiveness at temperatures above 30°C, resulting in biofilm formation and increased pathogen risk.

DIOTIN Product Profile

- Technology: Liquid chlorine dioxide solution (ready-to-use)
- Dose: 10 mL per m³ of water
- Unit Price: \$15/kg (approx. \$0.015/mL)
- CapEx Requirement: \$0 (no reactors, generators, or advanced dosing systems)
- Shelf Life: 24 months
- Thermal Range: Effective up to 74°C

Financial Comparison (Including RO Infrastructure for Conventional Systems)

Treatment Method	Total CapEx (USD)	Annual OpEx (USD)	5-Year Total Cost (USD)	Notes
DIOTIN (ClO ₂ Liquid)	\$0	\$20,805,000	\$104,025,000	Direct treatment, no RO required. Performs up to 74°C
On-site ClO ₂ Generator	\$87,500,000	\$45,000,000	\$312,500,000	Requires full RO infrastructure. Degrades >30°C; short duration
Sodium Hypochlorite	\$80,500,000	\$72,000,000	\$442,500,000	Ineffective >30°C; biofilm risk without RO
Calcium Hypochlorite	\$80,700,000	\$64,800,000	\$404,700,000	Reduced performance >30°C
Ozone System	\$90,000,000	\$54,750,000	\$363,750,000	Requires RO pretreatment; no residual; temp sensitive
H ₂ O ₂ / Peracetic Acid	\$81,500,000	\$80,300,000	\$483,500,000	Loses efficacy >30°C; short duration

*Note: Chemical costs recalculated to reflect realistic pricing at volume required for 380,000 m³/day treatment. RO plant CapEx estimated conservatively at \$80M; many municipal-scale systems exceed \$300M depending on site and regulatory requirements.



Strategic Positioning of DIOTIN

- 75% cost reduction compared to nearest rivals when priced per effective dosing volume
- Eliminates need for RO: no pretreatment or membrane infrastructure required
- Infrastructure-light: no generators, reactors, or specialized facilities required
- Superior scalability: can be deployed in small modular units or integrated into large-scale facilities
- Operates at elevated temperatures: up to 74°C with consistent disinfection performance
- Comparable performance to \$80M–\$400M RO plants in microbial removal and disinfection scope
- Minimal environmental footprint with low toxic byproduct generation

Recommendation

For municipal and industrial operators seeking world-class water disinfection without the capital burden of RO infrastructure or complex chemical systems, DIOTIN offers a scalable, safe, and financially optimal solution.