

SuperOx[®]

Complete Destruction of PFAS



Aquarden
TECHNOLOGIES

PFAS

The presence of per- and polyfluoroalkyl substances (PFAS) in our environment is a growing and acute global concern. PFAS are nicknamed ‘forever chemicals’ as they are extremely carcinogenic and highly persistent in nature. Through their widespread use in household products and industry, they leach into our environment and accumulate in the human body for years with adverse health effects.

Several technologies exist to capture PFAS in water. Unfortunately, many conventional methods for PFAS destruction are inadequate – e.g., chemical oxidation, biology, and ozonation. High-temperature incineration plants (>> 1000°C) can destroy PFAS but have a high energy and CO₂ footprint where the actual fate of PFAS is still questionable. Hence, Aquarden has developed a commercial and robust solution called SuperOx[®] based on Supercritical Water Oxidation (SCWO) for destroying PFAS. With SuperOx[®] you obtain full PFAS destruction and no uncontrolled emissions.



Aquarden's SuperOx[®] SCWO solution is a cost-efficient and fully automated method for treating PFAS.

The End of Forever Chemicals

Ion exchange resins and other PFAS-selective adsorbents are highly effective at adsorbing PFAS from water. Upon saturation with PFAS, these spent adsorbents can be replaced with fresh adsorbent, while the PFAS-saturated adsorbent is sent to our SCWO plant SuperOx[®] for complete destruction. The figure on next page illustrates the entire process.

Supercritical Water Oxidation (SCWO)

Supercritical water is a fourth state of water that exists above 374°C and 221 bar and is a fantastic medium for breaking down organic micropollutants within seconds to their most basic components. Aquarden's modular SCWO system, SuperOx[®], can completely destroy PFAS-saturated adsorbents or concentrated PFAS streams off-site or on-site, leaving only H₂O, CO₂, N₂ and minerals as byproducts. The table below illustrates the typical oxidation efficiency of SuperOx[®] with a 99.99% destruction rate.

	Feed (µg/l)	Destillate (µg/l)
PFHpA	1100	<0,0010
PFOA	2200	0,0014
PFNA	130	<0,0010
PFBS	1,4	<0,0010
PFHxS	7700	0,0093
PFOS	12500	2,6
PFOSA	25	<0,0010
PFHxA	76	<0,0050
PFBA	400	<0,0010
PFPeA	39	<0,0050
PFDA	12	<0,0010
FTS 6:2	940	<0,0010
Sum	25000	2,6

Results from PFAS contaminated leachate before/after SCWO treatment with SuperOx[®].

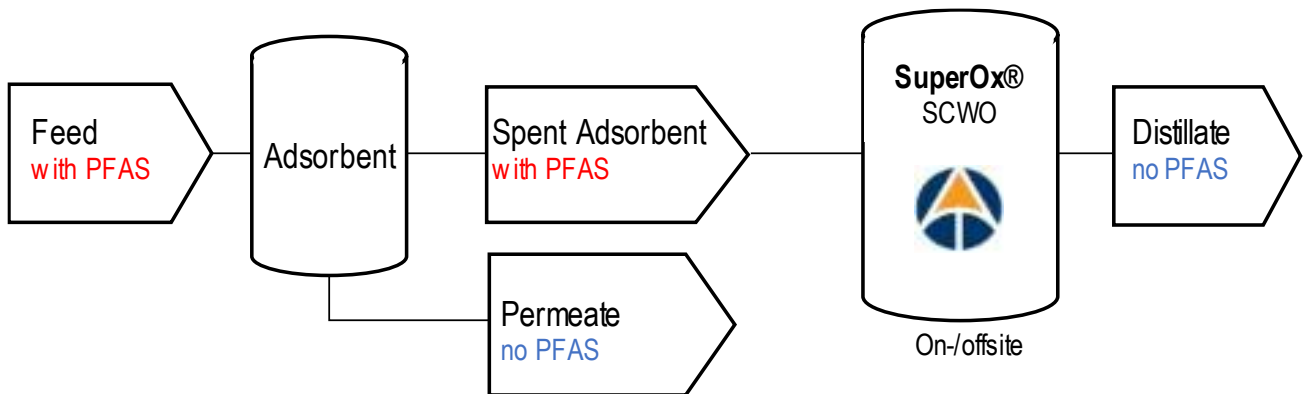


Figure 1: Example PFAS treatment train using Aquarden's SCWO plant, SuperOx[®], for PFAS destruction.

Main benefits

Fits all sizes: The Aquarden SuperOx[®] PFAS destruction system is completely modular and scalable to fit your needs. SuperOx[®] can be set up onsite or offsite.

Complete PFAS Destruction: PFAS wastes – e.g. spent adsorbents, sludge, concentrates, etc. – can be destroyed safely and completely with SuperOx[®].

Total system integrator: We are with you all the way with full service and support.

Worldwide solution: We offer our solutions globally.

About Aquarden

Aquarden is an expert in treatment of problematic water and delivers solutions for solving the toughest water challenges. We offer tests, consultancy, turnkey systems, and services – all customized to meet your specific requirements. Solutions are integrated into your individual production and water treatment processes.

Our mission is to help you in meeting the highest environmental standards for industrial wastewater treatment by providing sustainable and effective solutions where all wastestreams are 100% controlled. Our proprietary prize-winning SCWO system, SuperOx[®] destroys all organic and toxic compounds in water completely and efficiently and allows for reuse of energy and water.



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