

Taron Rotating Disc Dynamic Filter

REPLACING SECONDARY CLARIFIERS AND TERTIARY FILTERS IN WASTEWATER TREATMENT



SANITAIRE
a xylem brand

The future of wastewater treatment is here.

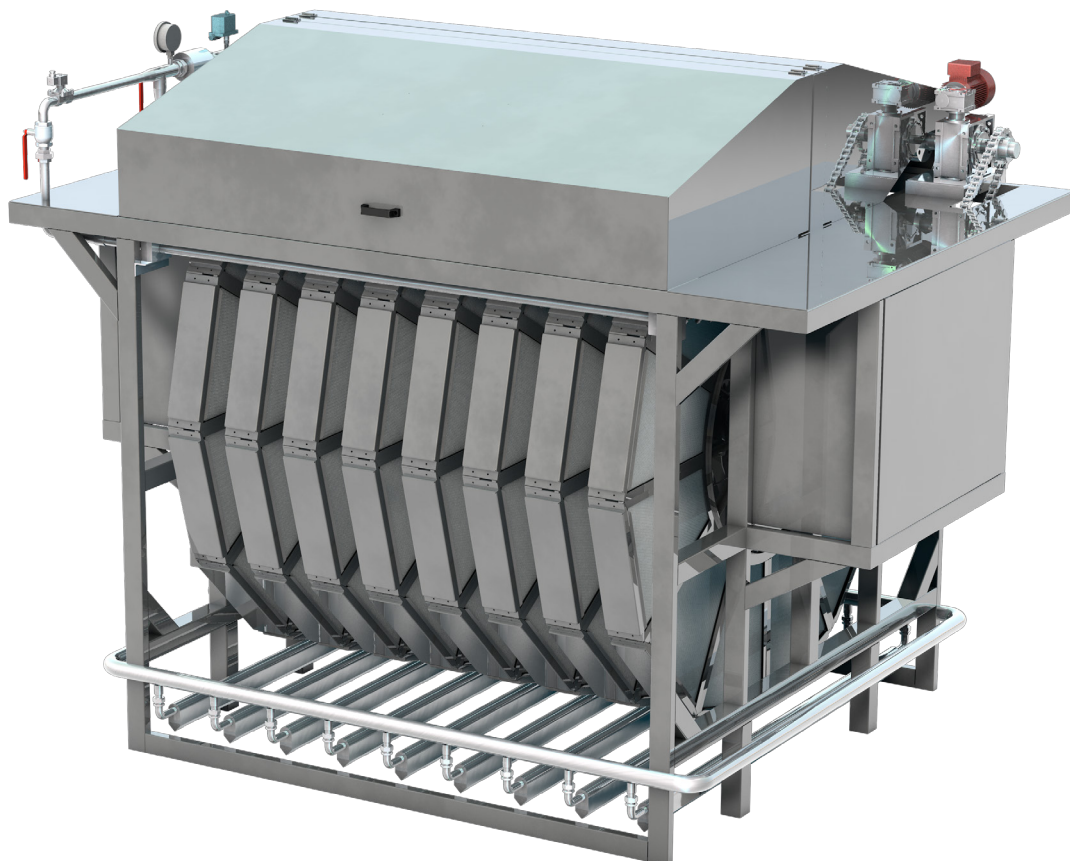
How it works.

The Sanitaire Taron Rotating Disc Dynamic Filter, RDD Filter, is a patent-pending first-of-its-kind technology that combines secondary clarification and tertiary filtration all in one step!

Sanitaire Taron is an innovative, novel filter that relies on the dynamic build up and removal of a sludge cake layer on a micro mesh support.

Taron's modular configurations are characterized by a quantity of vertical discs mounted on a hollow shaft. Each disk is comprised of a robust micro polyester (PES) mesh material and constructed to allow for filtration on both sides of the disc. Filtration occurs as the discs rotate slowly in the biomass developing a head loss across the mesh. Biomass is deposited on the mesh as liquid flows through the panels. The hydraulic pressure then

compacts the biomass via gravitation forming a sludge cake layer. Sludge cake layer thickness is controlled by the rotational speed of discs along with diffusers located beneath the device. Fine pores are created within the sludge cake layer, enabling it to act like a membrane. These features are the driving force behind Taron's stringent filtration. Taron's effluent quality can be characterized by Total Suspended Solids (TSS) concentrations below 5 mg/L and turbidity levels below 10 Nephelometric Turbidity Units (NTU).



The micro mesh material is invulnerable to clogging as all Taron units are equipped with a backwashing system that uses filtrate to completely remove the sludge cake layer after each rotation. The sludge is then returned to the bioreactor, allowing for higher operation of Mixed Liquor Suspended Solids (MLSS) in the process, of up to 15,000 mg/L. Through this

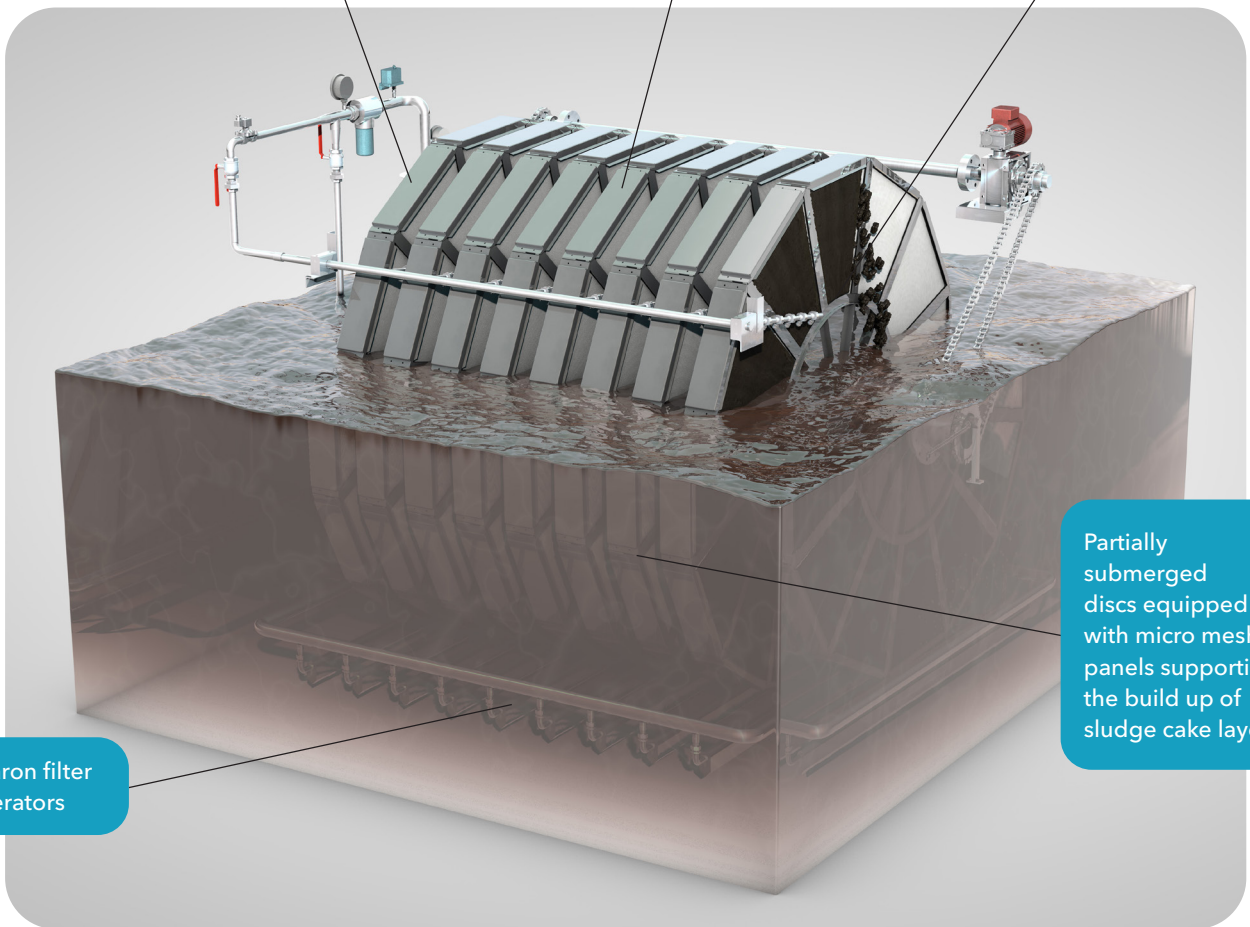
operating principle, the device is able to attain flux rates of 588 - 1,200 gallons/ft³/day (gfd), or 1,000 - 2,040 L/m³/hour (lmh). Taron's capability to function at high MLSS concentrations allows for plants to maximize their biological capacity while reducing the footprint required for the overall wastewater treatment process.



Backwashing removes sludge layer after each rotation

Modular expansion up to 20 discs

Sludge layer thickness controlled by rotational disc speed, aeration and spray wash system

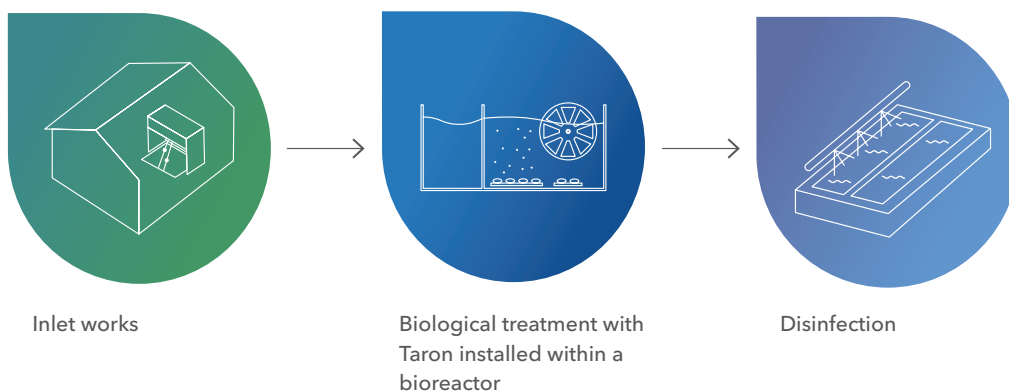


Taron filter aerators

Partially submerged discs equipped with micro mesh panels supporting the build up of sludge cake layer

A simpler wastewater treatment process.

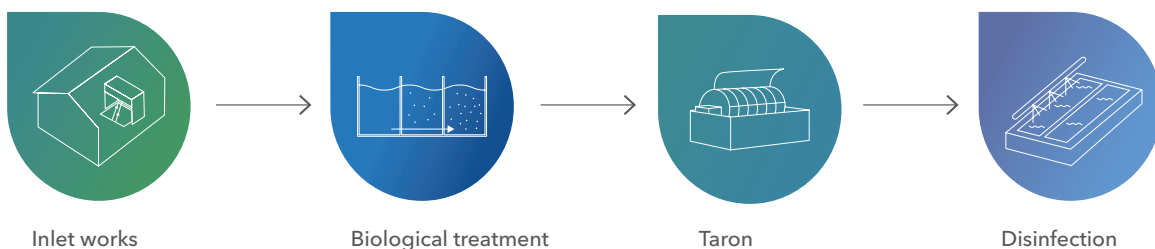
Taron is designed to replace both secondary clarification and tertiary filtration steps in the wastewater treatment process. This results in significant capex savings as Taron civil works required is minimal compared to secondary clarifiers. In addition, Taron offers installation versatility as it can be integrated into a biological treatment system in multiple ways, limiting the required footprint.



Greenfield

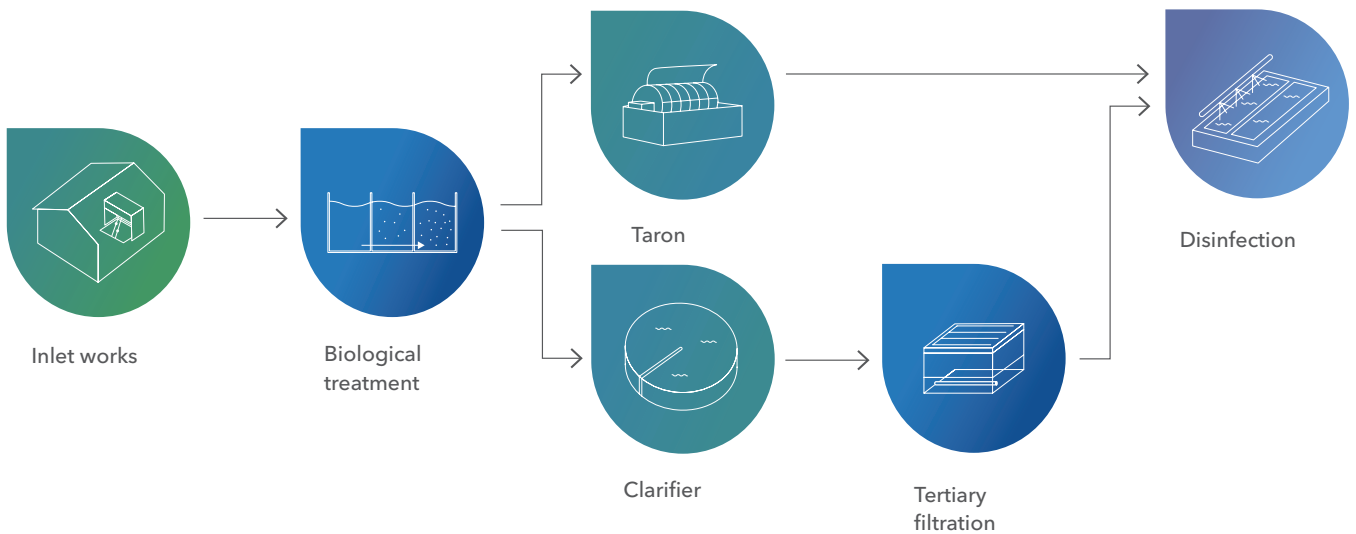
Taron can be integrated inside the biological treatment reactor. This significantly reduces capex since Taron doesn't require an individual basin. For new installations with Taron, bioreactors can be designed for smaller capacities relative to traditional wastewater treatment processes that utilize secondary clarifiers.

This can be attributed to Taron's ability to operate at significantly higher MLSS which requires less bioreactor capacity and contributes to additional capex savings. This can also be achieved by installing Taron in a separate basin as shown below.



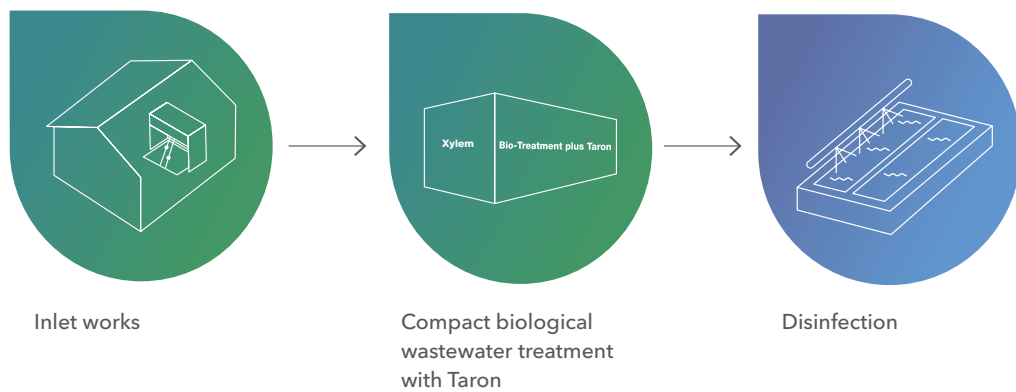
Retrofits & Upgrades

Taron can be installed in a separate structure immediately after the biological treatment portion of the wastewater treatment process. This can be done by either developing a new structure for Taron, or by utilizing an existing structure, clarifier, or tank.



Hybrid Systems

Taron can be integrated as a hybrid solution. Should a plant have the desire to keep existing secondary clarifiers and complement them with Taron, this can easily be done by splitting flow from the bioreactor between the two units.



Decentralized & Container

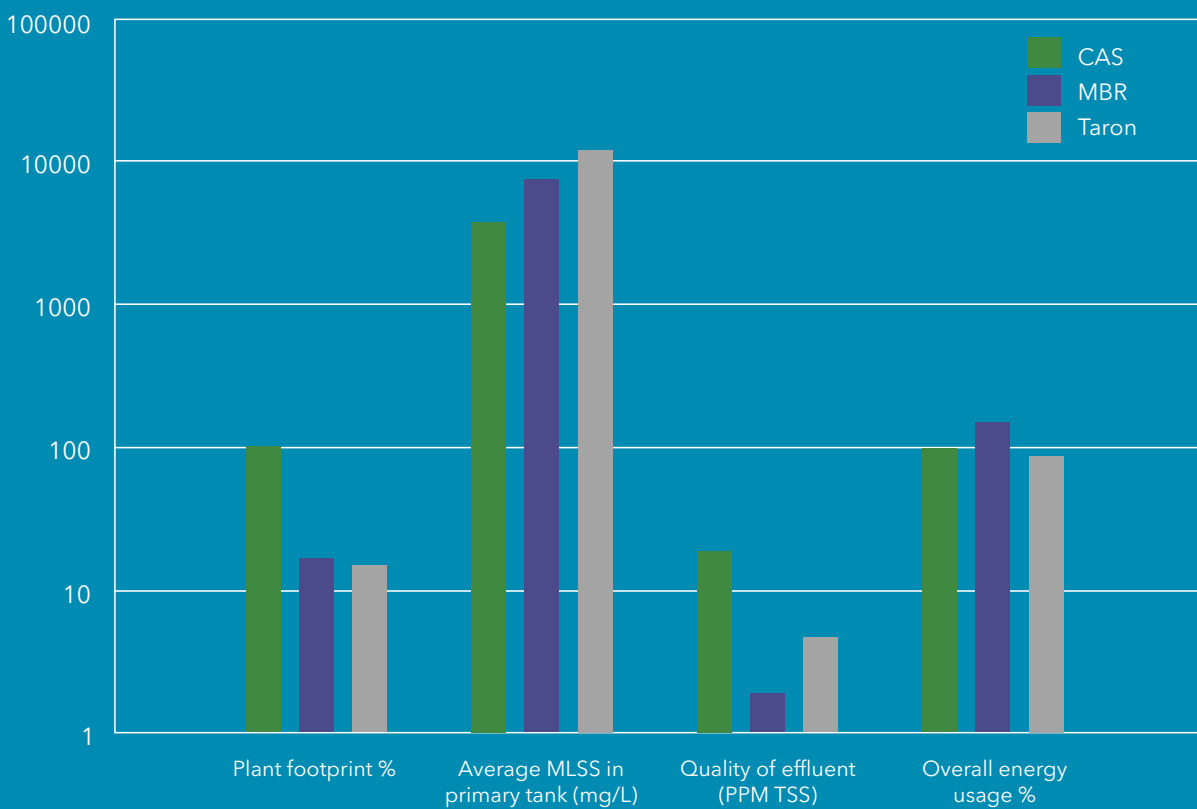
The biological reactor and Taron can be shipped as a packaged unit in a compact configuration. This is ideal for plants that operate under small flow capacities.

Taron's robust design provides high effluent quality with low operational and capital expenditures. It replaces the traditional filtration and clarification process with a smaller footprint solution.

ADDRESSING THE FOLLOWING CHALLENGES:

- Stormwater & Flooding
- Aging Infrastructure
- Regulatory Compliance
- Stressed Water Supply

GENERAL FEATURES



Comparison of Taron, Conventional Activated Sludge (CAS), Membrane Bioreactor (MBR) systems and general technology features.

Modular Disc Filter Sizes

The modular nature of Taron filters allows scalability to suit various wastewater treatment plant needs, and offers a varying number of discs for the output flow.

Model (number of discs)	Active surface [m ²]	Backwash flow [m ³ /h]	Backwash power [kW]	Rotation power [kW]	Output flow (min) [m ³ /h]*	Output flow (med) [m ³ /h]*	Output flow (max) [m ³ /h]*	Dimensions LxWxH [mm ³]
4	13.0	3.11	1.10	0.25	10.4	19.5	28.6	2443x2205x2610
5	16.2	3.89	"	"	13.0	24.3	35.7	2693x2205x2610
6	19.5	4.67	1.50	0.25	15.6	29.2	42.8	2943x2205x2610
7	22.7	5.44	"	"	18.2	34.1	50.0	3193x2205x2610
8	26.0	6.22	2.20	0.37	20.8	38.9	57.1	3443x2205x2610
9	29.2	7.00	"	"	23.4	43.8	64.2	3693x2205x2610
10	32.4	7.78	2.20	0.37	26.0	48.7	71.4	3943x2205x2610
11	35.7	8.55	"	"	28.6	53.5	78.5	4193x2205x2610
12	38.9	9.33	2.20	0.37	31.1	58.4	85.7	4443x2205x2610
13	42.2	10.11	"	"	33.7	63.3	92.8	4693x2205x2610
14	45.4	10.89	3.00	0.55	36.3	68.1	99.9	4943x2205x2610
15	48.7	11.66	"	"	38.9	73.0	107.1	5193x2205x2610
16	51.9	12.44	3.00	0.55	41.5	77.9	114.2	5443x2205x2610
17	55.2	13.22	"	"	44.1	82.7	121.4	5693x2205x2610
18	58.4	14.00	"	"	46.7	87.6	128.5	5943x2205x2610
19	61.6	14.77	"	"	49.3	92.5	135.6	6193x2205x2610
20	64.9	15.55	"	"	51.9	97.3	142.8	6443x2205x2610

*Obtained with Sludge Volume Index ~ 130 ml/g



The modular and scalable disc design can be integrated into the aerated biological reactor, or installed in an external filtration tank.

Pilots

Two pilots installed in Italy and the U.S. in 2019 have delivered exciting results. In both pilots, Taron is located after the plant's existing biological reactors and utilize their mixed liquor for filtration. The U.S. pilot has been tested under various MLSS concentrations, and under these varying parameters, Taron managed to achieve low TSS concentrations and turbidity levels (see table below for more details). Taron's ability to provide superior effluent quality at high MLSS concentrations is attributed to its capability of operating at high flux rates.

Wastewater treatment plants that contain secondary clarifiers and tertiary filters operate around a maximum MLSS of 4,000 mg/L. Like Taron, MBRs can operate at significantly higher MLSS. However, Taron can operate at 50-100 times greater flux rates than MBRs.



Various concentrations of MLSS that Taron is capable of treating, along with the quality of effluent that can be obtained as an end result.

Data from Italy and U.S. pilots:

Italian pilot, installation April, 2019

Parameter	Minimum	Average	Maximum
Flux gfd [l/mh]	298 (507)	670 (1,139)	1,247 (2,121)
MLSS RDD Filter tank [mg/L]	3,800	12,415	24,910
Filtrate turbidity [NTU]	1.7	3.9	12.3

U.S. pilot, installation November, 2019

Parameter	Minimum	Average	Maximum
Flux gfd [l/mh]	247 (420)	801 (1,362)	1,207 (2,052)
MLSS RDD Filter tank [mg/L]	3,500	8,305	19,960
Filtrate turbidity [NTU]	2.4	5.6	14.6

For more information, contact
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