Filternox®

www.filternox.com

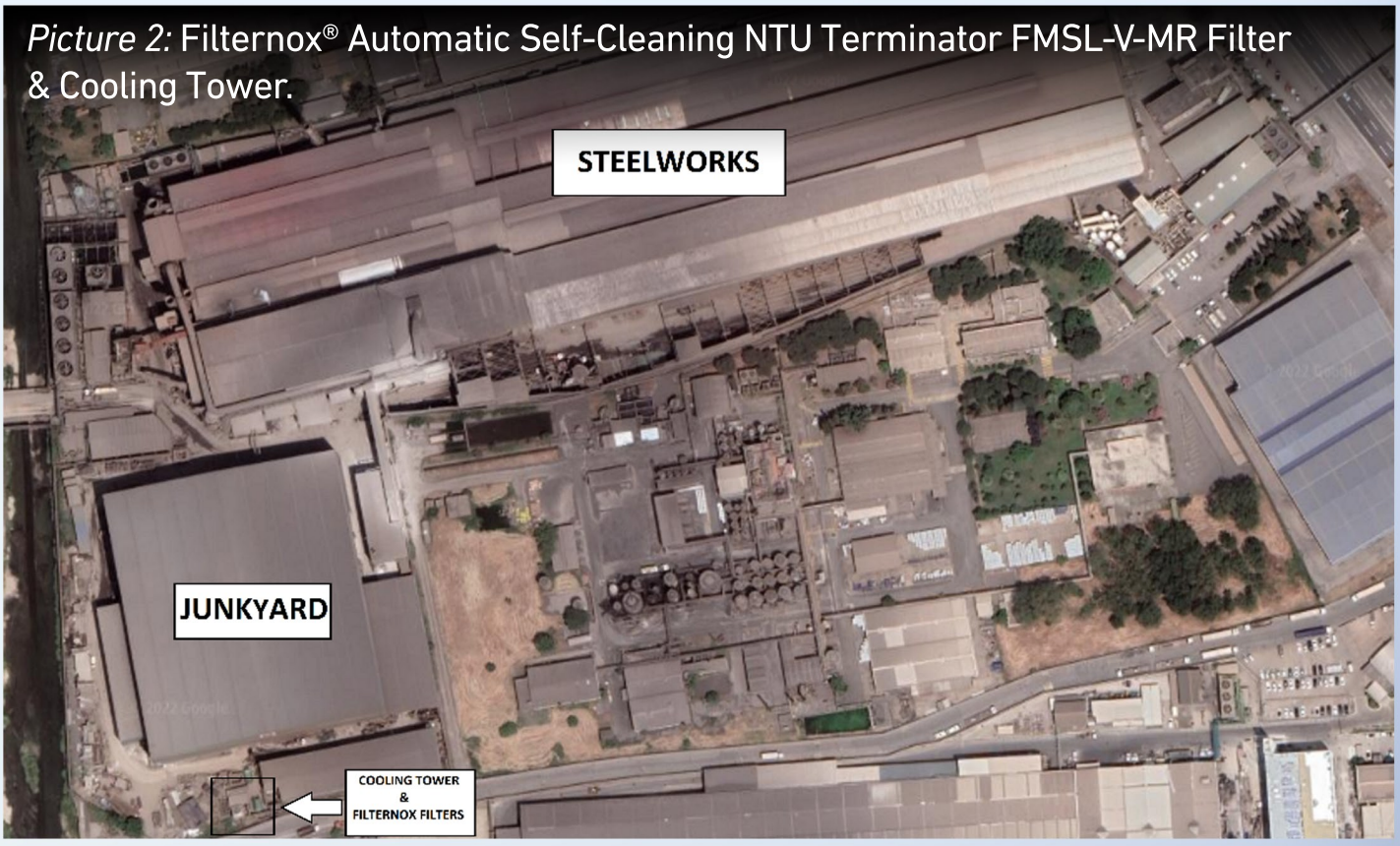
Cooling tower water filtration in steel industry

During the start-up of one of our recently supplied SPT-MR filters, the steel factory officials mentioned that a side stream sand filter would be installed in one of the small cooling towers. Once Filternox® Engineers explained the performance and advantages of the NTU Terminator filter model, the Technical Management preferred to test and see the results of the comparison between both systems.

Filter model	**NTU Terminator FMSL-V-MR**
Volume of the cooling tower	20 m^3
Total volume of the system	100 m^3
Filtration level	Deep Filtration down to 5 microns
Operating Pressure	4 bar
Cooling Tower Make-Up Water	BWR10-SWR10 (Reverse osmosis water treatment of sea and well water)
Circulation Flow Rate of the cooling system	250 m^3/h
Side Stream	20 m^3/h

Picture 1: Filternox® Automatic Self-Cleaning Filter SPT-MR

www.filternox.com



Picture 2: Filternox® Automatic Self-Cleaning NTU Terminator FMSL-V-MR Filter & Cooling Tower.

The location of the cooling tower is close to the steelworks of the factory and the junkyard. Therefore, the cooling water gets contaminated with iron and dust particles. (Picture 2)

It is well known that, if the water in a cooling tower system is not continuously filtered, it is not possible to keep a constant TSS value. The cooling tower acts like a vacuum air scrubber where the particles from the environment will cause efficiency reduction, clogging, fouling, and the need to inject a growing amount of make-up water. Considering that the make-up water is treated sea water though an RO system, the cost is very high.

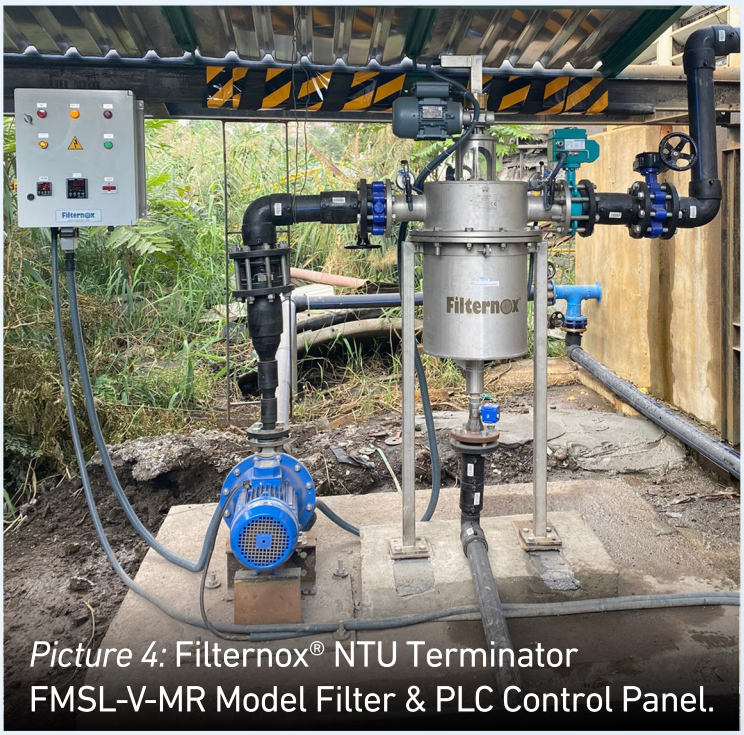
This kind of contaminants are one of the types that Filternox® Automatic Self-Cleaning NTU Terminator FMSL-V-MR filter can best deal with. (Picture 3)

Picture 3: Filternox® NTU Terminator & Cooling Tower.

Filternox®

www.filternox.com

Technical details



Picture 4: Filternox® NTU Terminator FMSL-V-MR Model Filter & PLC Control Panel.

Filternox® Automatic Self-Cleaning NTU Terminator FMSL-V-MR filters perform in-depth filtration. They also minimise the use of chemicals and offer other advantages such as minimum drainage water discharge. For these reasons, the above-mentioned filter model was used in this system with a flow rate of 20 m^3/h and an in- depth filtration level of down to 5 microns. The performed filtration reduced considerably the presence of particles in the cooling tower fluid. (Picture 4)

https://www.filternox.com/filters/fms-v-mr/

https://www.filternox.com/filters/ntu-terminator/

Filternox®

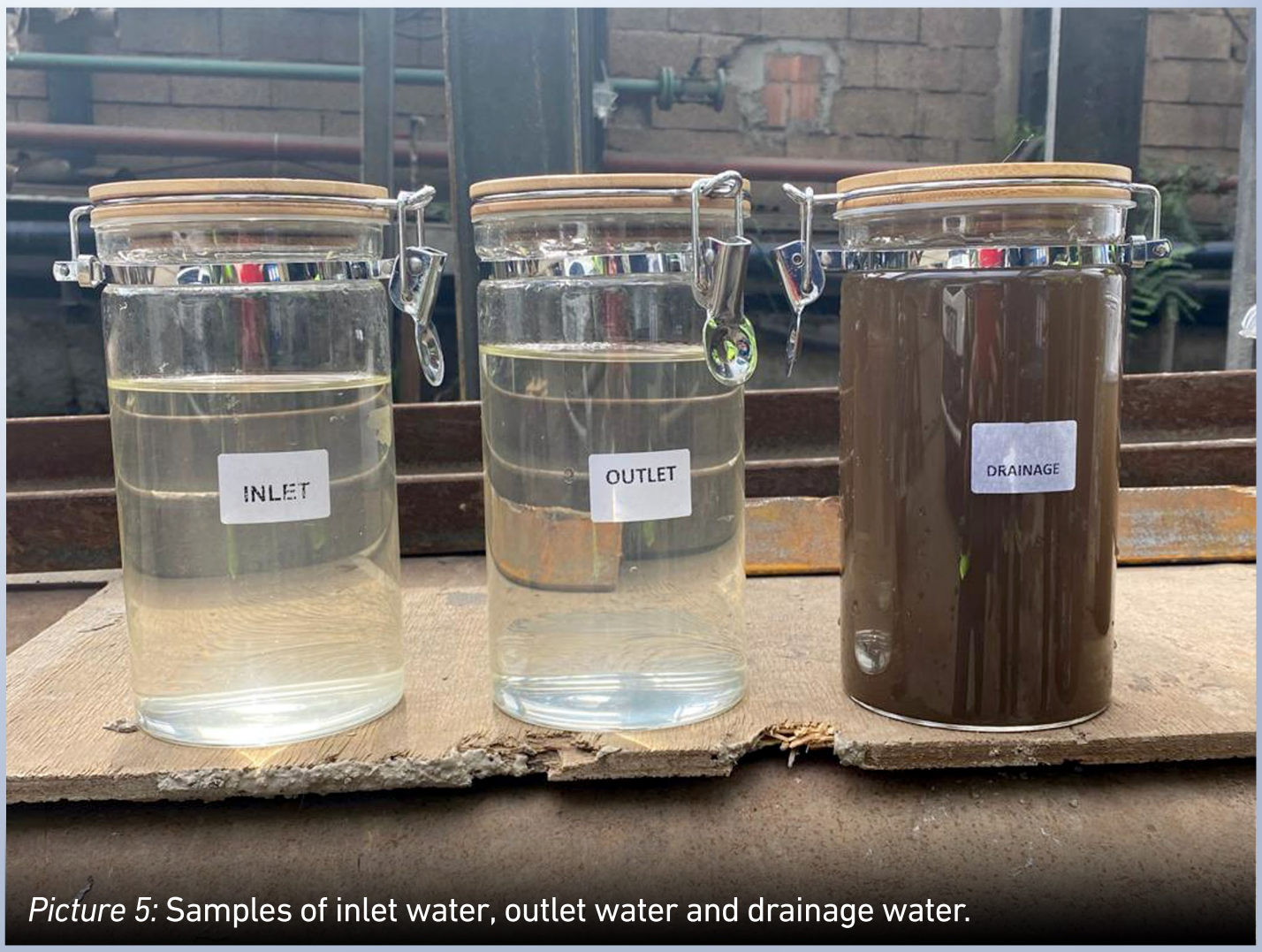
www.filternox.com

Filternox® filtration performance test

	INLET	OUTLET	DRAINAGE
TSS (ppm)	20	12	626
Turbidity (NTU)	8	5,9	438

Test report was obtained on 07 October 2022.

The samples obtained on site are shown in Picture 5. The first evaluation of the Filternox® NTU Terminator efficiency is outstanding, impossible to achieve with any other mechanical filter, regardless of its filtration degree.
According to a particle distribution analysis of the filtered water, the average size of particles in the sample was 1.18 µm



Picture 5: Samples of inlet water, outlet water and drainage water.

Filternox®

www.filternox.com

Filternox® NTU Terminator FMSL-V-MR VS Sand Filter

	NTU TERMINATOR	SAND FILTER
FEED PUMP	4 kW	4 kW
BACK FLUSH TIME PER DAY	6 Minutes	40 Minutes
BACK FLUSH ENERGY CONSUMPTION (PER DAY)	0.4 kWh/ day	2.66 kWh/ day
BACK FLUSH WATER CONSUMPTION	0.36 m^3/ day	13.2 m^3/ day
WORKING FREQUENCE	Twelve Times/day	Twice/day
DIMENSIONS (BODY DIAMETER X LENGTH)	14" x 53"	63" x 95.6"

Back-Flush Energy Consumption (kWh)

	NTU TERMINATOR	SAND FILTER
IN A DAY	0.4 kWh/ day	2.66 kWh/ day
IN A WEEK	2.8 kWh/ week	18.66 kWh / week
IN A MONTH	11.2 kWh/ month	74.66 kWh/ month
IN A YEAR	134.4 kWh/ year	896 kWh/ year

Back-Flush Water Consumption (m^3)

	NTU TERMINATOR	SAND FILTER
IN A DAY	0.36 m^3/day	13.2 m^3/day
IN A WEEK	2.52 m^3 / week	92.4 m^3 / week
IN A MONTH	10.08 m^3 /month	369.6 m^3 / month
IN A YEAR	120.96 m^3/year	4435.2 m^3 / year

+ Filternox® NTU Terminator Filter consumes **thirty-six times less water** than the Sand Filter during their back-flushing times. Thus, Filternox® NTU Terminator Filter offers large water savings.

+ The backflush water consumption of Filternox® NTU Terminator Filter represents a cost of **184 USD** per year, whereas the cost of this water consumption of the Sand Filter is **6,676 USD** per year.

+ Filternox® NTU Terminator **filters 11.3 m^3 more water** than the Sand Filter per day.

+ The Sand Filter's constructional volume is approximately **sixty-two times bigger** than that of the Filternox® NTU Terminator Filter.

+ The electricity consumption of the Filternox® NTU Terminator Filter during back-flush represents a cost of **26 USD** per year. Compared to this, the electricity used by the Sand Filter costs **173 USD** per year.

The results presented above were obtained with the filters operating at a flow rate of 20 m^3/h. If we were to filter a higher flow rate, these costs would increase proportionally.

All prices are given as of October 2022

To save energy, water and chemicals consult with Filternox

www.filternox.com