



Case Study
BIO-CEL® MBR
Textile Wastewater
Treatment

Case Study: Industrial BIO-CEL[®] MBR Modules

Enhance the discharge quality of existing conventional treatment plant using ultrafiltration step at textile factory in Italy



PROBLEM

Limited high-quality water sources to be used in textile industry



SITE

Loro Piana SPA Textile Factory, Quarona, Italy



OUTCOME

Reusing treated water saves up to 30% of the water consumption at the plant

OBJECTIVE

A new generation of BIO-CEL[®] modules is responsible for the treatment of 1920 m³/d of wastewater produced from a textile factory in Italy.

The aim of the revamping the plant with an MBR system is the recovery of the wastewater for reuse within the production cycle, leading to a maximum annual saving of 30% of the water consumption.

In this plant a hybrid system is used. This means the wastewater is divided into two lines: the old conventional line (partially overloaded) and the new filtration step with BIO-CEL. Another positive effect of adding the new step is that the previously overloaded decanter works much better than before.

MATERIALS & METHODS

Using 4 BIO-CEL[®] XL-2 modules split between two filtration tanks, a constant daily process water production of 1920 m³ is guaranteed.

The treatment units upstream to ultrafiltration includes:

- Coarse screen
- Fine screen filtration: 150 micron
- Equalization with pH adjustment (value of 7)
- Biological oxidation
- Dividing the flow to parts A and B
- A-1: Secondary decanter
- B-1: 1 mm fine screening
- B-2: MBR
- B-3: Ozonation
- B-4: Reverse osmosis



Figure 1 One filtration tank with BIO-CEL® XL-2 modules

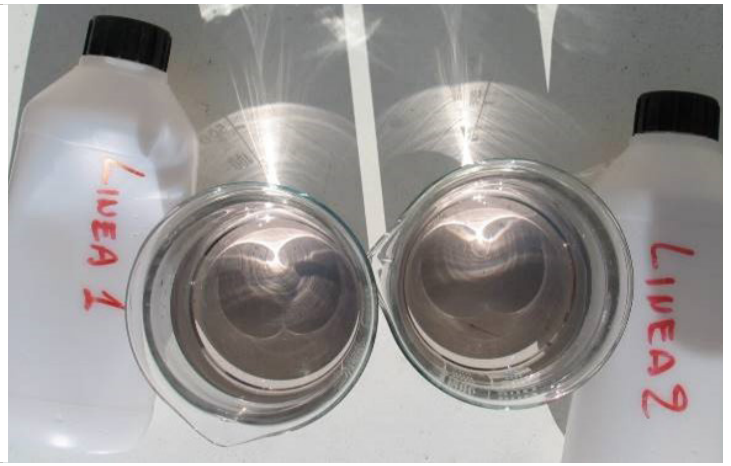


Figure 2 Wastewater results following treatment with BIO-CEL

RESULTS

The results of table 2 indicate that BIO-CEL® modules can treat the wastewater from textile production, meeting the required quality to be reused in the production line.

The conventional system is working parallel to the MBR system. However, the design of the MBR system allows the treatment of 100% of the flow through the MBR stage.

CONCLUSION

Adding an MBR system to the existing conventional activated sludge (CAS) process reduced the load to the conventional system and allows less consumption of fresh water from natural resources. This is beneficial for the sustainability of the textile industry. The customer now saves up to 30% of their water consumption each year.



Figure 3 BIO-CEL® XL-2 module

Tables & Data

Table 1 Plant Design Data

Parameter	Value
Module Type	4 x BIO-CEL® XL-2
MLSS	8 g/L
Solid Retention Time	25 d
Minimum Temperature	20°C (68°F)
Hourly Peak Flow Rate	80 m ³ /h
Net Average Flux	10.4 LMH

Table 2 Water quality from different unit operations at WWTP

Parameter	Raw Influent	After Equalization Tank	Effluent MBR System	Effluent CAS System	Required Standards
COD (mg/l)	300	300	10	120	15-20
BOD (mg/l)	120	120	3	50	8
Total Nitrogen (mg/l)	10	10	1	2.5	1
Total Phosphorus (mg/l)	2	2	2	2	2
TSS (mg/l)	100	100	≤ 5	80	5
Turbidity (NTU)			0.4	150	0.6

