

Med *Clean* *Propre* *Limpio* *Mediterranean*


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Pollution prevention case studies

Energy recovery in a textile company

Company background

The company is located in the region of Denizli (Turkey). It is a relatively modern company, which operates as a commission dyer. Its main activity is cotton textile wet processing. The main type of fabric processed is mostly cotton (up to 80-85%), although processes of manmade fabrics also take place.

Industrial sector Textile industry

Environmental considerations

The impact of textile companies' activities on the environment mostly depends on the dyeing technique, which is usually highly water and energy consuming.

Actually, it is estimated that wet processes use up approximately 60% of the energy consumed in the textile industry. In an integrated textile mill 70% to 85% of the overall thermal energy consumption takes place in the wet treatment stage. Besides, the share of electrical energy consumption of the wet processing stage is around 25%. It is therefore crucial to recover the greatest possible amount of thermal energy for both economic and environmental reasons.

Background

Great amounts of hot water from hot dye bath discharged into the treatment plant obviously implied significant heat losses.

Summary of actions

The company installed a heat exchanger to recover heat from the process. Heat recovery from hot dye bath discharges of the dyeing machines was achieved with a 28.85% cost efficiency in terms of thermal energy recovery.

The cost of a heat exchanger is €406 for a 1 t/hour capacity, and it increases with the capacity. The company needed a capacity of 26 t/hour for heat recovery. Thus, when including additional elements necessary for heat recovery, the cost of the equipment reached €10,556.

Balances

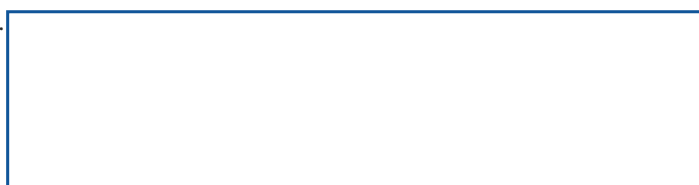
	Old process	New process
Material balances		
Energy consumption (MJ/year)	71,692,991	51,003,884
Water consumption (m ³ /year)	239,526	239,526
Raw material consumption (t/year)	1,589	1,589
Wastewater generation (m ³ /year)	198,806	198,806
Waste generation (kg/year)	42,493	42,493
Economic balance		
Energy consumption cost (€/year)	671,014	477,791
Water consumption cost (€/year)	218,482	218,482
Raw material consumption cost (€/year)	343,818	343,818
Wastewater treatment cost (€/year)	38,308	38,308
Waste management cost (€/year)	3,550	3,550
Other costs		
Annual total cost (€)	1,275,172	1,081,949
Investment (€)		10,556
Annual savings (€)		193,223
Payback period		1 month

Conclusions

With the implementation of this new cleaner technique, the company has significantly reduced its energy consumption by 28.85% along with its overall cost, thus putting less pressure on the environment. Moreover, the fact that heat recovery practices resulted in a €193,223 annual saving allowed for a very short pay-back period, less than one month.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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