

MedClean Propre Limpio

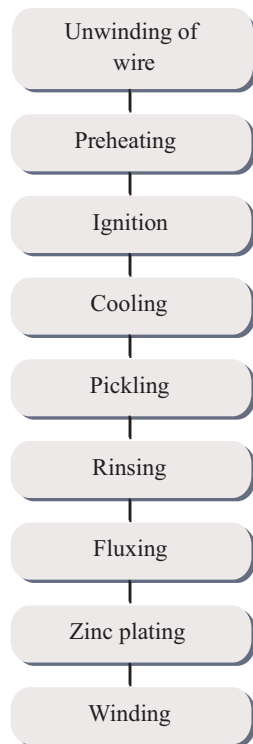

No. 80
Pollution prevention case studies

Cleaner production in the metalworking industry

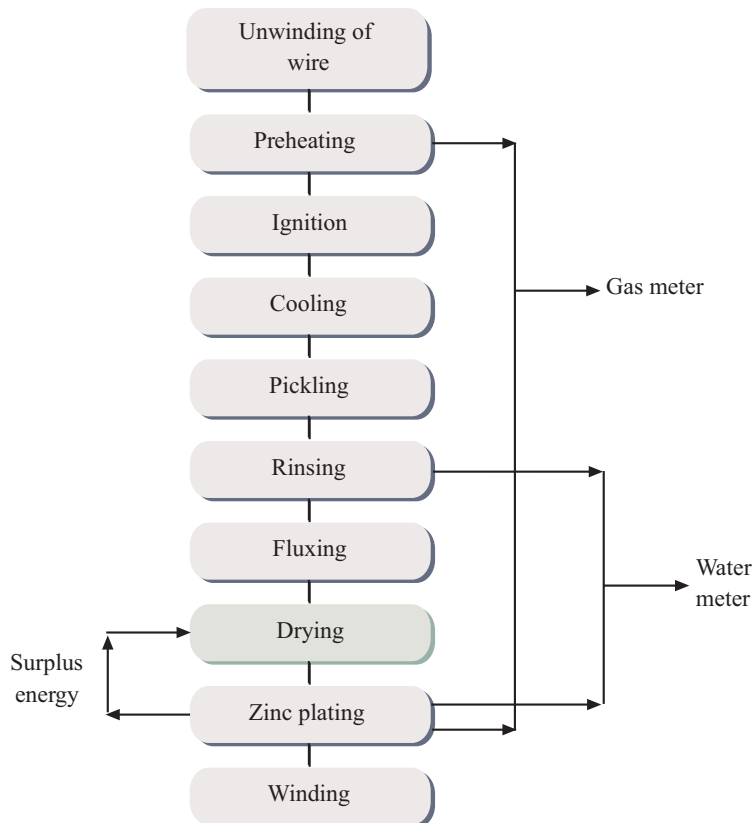
Company	Žica Sarajevo is a medium-sized enterprise producing wire and wire products. The production programme comprises low-carbon wire, high-carbon wire and steel ropes. Annual production amounts to 8,376 tons of wire. The total number of employees is 262.
Industrial sector	Metalworking industry, production of wire and wire products.
Environmental considerations	<p>Based on an environmental analysis of the entire company, it was determined that the most interesting unit for a detailed diagnosis and introduction of cleaner production measures was the zinc plating unit.</p> <p>The analysis showed that many types of waste were generated in this plant, and that there were opportunities for the introduction of some improvements in the work method in this continuously operating unit.</p>
Background	<p>Within the EC LIFE Third Countries project “Capacity Building in Cleaner Production”, 2002-2005, the analysis carried out in the unit chosen as the focus of diagnosis revealed problems that were typical for iron and steel production:</p> <ul style="list-style-type: none"> • Excessive water consumption, and resulting wastewater generation that needed to be addressed. • Excessive energy consumption: electricity, gas. • Excessive consumption of different lubricants, chemicals, salts and similar agents. <p>An additional problem was an existing wastewater treatment plant, which was not operating due to physical damage and malfunctioning of automatic mechanisms.</p>
Summary of action	<p>A team of experts identified a set of minimisation measures, of which the three most interesting ones were implemented, while the remaining ones would be implemented in due time. Measures focusing on the reduction of energy and water consumption and raw material management were selected as priority, including:</p> <ul style="list-style-type: none"> • The continuous measuring of gas and water at points where it was the most necessary and feasible, with the purpose of consumption control and its their reduction. Two gas meters and two water meters were installed. One gas meter was installed to measure the gas consumption in the preheating and ignition process, and the other in the zinc plating process. Water meters were installed to measure water consumption in the rinsing process, after pickling and in the zinc plating process. • The surplus of thermal energy from the zinc bath was used for the drying of wire after the fluxing process in the drying chamber. That is how the zinc plating process was technically improved. • Monitoring of auxiliary metals consumption for their rational use.

Diagrams

Zinc plating process before the introduction of cleaner production measures



Zinc plating process after the introduction of cleaner production measures



Balances

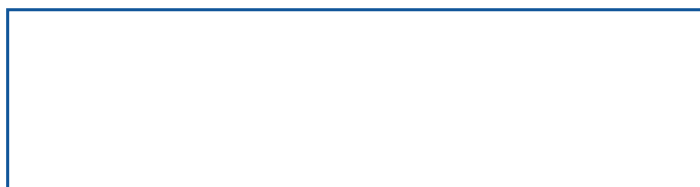
Energy Consumption	Old process			New process		
	Based on production of 1,665 t of wire		Costs (€)	Based on production of 1,665 t of wire		Costs (€)
Water	18,981 m ³	11.4 m ³ /t	25,795	5,334 m ³	3.2 m ³ /t	7,249
Natural gas	265,867.2 Sm ³	159.68 Sm ³ /t	79,078	247,218 Sm ³	144.03 Sm ³ /t	73,532
Acid	46,620 l	28 l/t	4,782	24,120 l	14.4 l/t	2,474
Total costs			109,655			83,255
Annual savings for the amount produced per programme						26,400
Annual savings for the amount produced in 2003						54,204
Total investment						500
Payback period of the investment						Immediate

Conclusions

By applying the above-mentioned measures, within one year the company reduced, water consumption by 72%, natural gas consumption by 10%, and the amount of acid consumed by 49%, accounting for an annual saving of €26,400, with an immediate payback on investment.

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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