

MedClean Propre Limpio



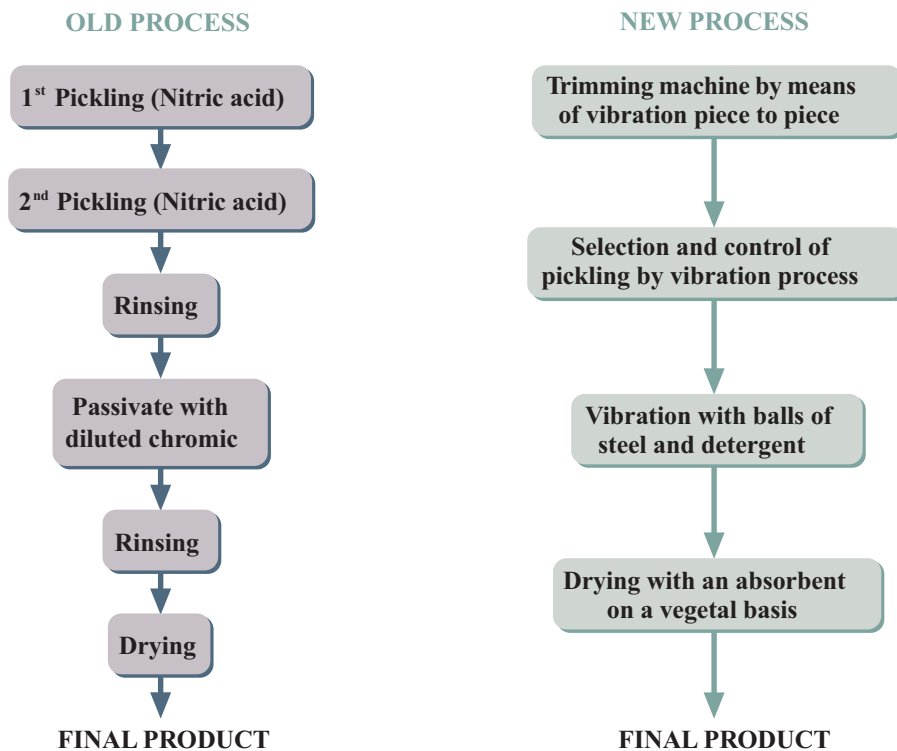
No. 51

Pollution prevention case studies

Substitution of a system of chemical pickling by a process of pickling by vibration

Company background	Munne Alsina, SL (Cornellà de Llobregat, Spain)
Industrial sector	Steel and metal industry. Non-iron metal forge and hot hobbing.
Environmental considerations	<p>The company is dedicated to forging and hot hobbing of non-ferrous metals using brass, bronze and other metals as raw materials to obtain a wide range of articles, basically hobbled pieces for several industrial sectors. The company also manufactures special pieces upon request by its customers.</p> <p>The production process consists of the following steps: first, the moulds are produced according to the pieces to be made; second, the pieces are obtained by means of forging presses that perform, in the same machine, cutting, hobbing and typing. Finally, the finishing process of the brass pieces is made. Finishing is carried out by means of chemical pickling with nitric acid and chromic passivation. Between operations, the necessary rinsings are carried out.</p> <p>During the finishing process, water and acid raw materials are consumed, generating sludge with heavy metals during the treatment of the waste flows in the wastewater treatment plant.</p>
Background	<p>In the production process described in the previous section, Munne Alsina, SL generated acid and chromic aqueous waste flows which, along with the drags with heavy metals, generated sludge in the wastewater treatment plant and water with nitrates.</p> <p>The amount of sludge generated was 69 tons per year.</p> <p>Therefore, the company considered as objectives:</p> <ul style="list-style-type: none"> • To reduce waste generation at source. • To make savings in the purchase of raw materials.
Summary of actions	<p>In order to carry out the objectives proposed, a new installation was installed to replace the process of chemical pickling. This new installation consists of a trimming machine which works by vibrating each individual piece and pickling by vibration with steel balls and detergent which, through physical contact, makes it possible to obtain the desired quality in the pieces.</p> <p>With this new installation, the following is achieved:</p> <ul style="list-style-type: none"> • Reduction in water consumption. • Reduction in electricity consumption. • Reduction in raw materials consumption. • Reduction in the generation of sludge in the wastewater treatment plant. • Less use of hazardous raw materials.

Diagrams



Balances

Material balance

	Old process	New process
Sodium hydroxide (kg/y)	42,911	5,871
Sodium bisulphite (kg/y)	11,880	0
Nitric acid (kg/y)	48,031	0
Chlorhydric acid (kg/y)	2,200	0
Dilute chromic (kg/y)	15,510	0
Vegetal-based absorbent (kg/y)	0	500
Detergent (kg/y)	0	5,000
Water (m ³ /y)	6,497	5,493
Energy (kW/y)	92,000	42,000
Sludge (t/y)	69	5

Economic balance - Savings

Raw material (€ /y)		21,223
Water (€/y)		911
Energy (€/y)		3,900
Treatment of sludge (€/y)		5,050

Total savings (€/y)

31,084

Investment (€)

106,284

Payback period

3.42 years

Conclusions

By carrying out this project, the company has been able to reduce 95.44% the consumption of raw materials, sludge equivalent to 92.75% of the generated waste volume and finally, reduce 15.45% the water consumption. In addition, the quality of the wastewater has been improved, which favours its recycling by means of a previous process of regeneration. This action of pollution prevention at source is part of the environmental policy of the company since it is included within the framework of continual improvement initiated by the company in 2000.

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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