



LIFE 09 ENV/IT/000185

MDPATC

NEW ECO-PROCESS OF SUPERFICIAL TREATMENT
OF THE METALLIC WIRE PRODUCTS

Results Achieved

1. Introduction

“MDPATC” project has been implemented by Trafiliera e Zincheria Cavatorta from the 1st of November 2010 and the 31st October 2013.

Goal of the project was to find a green solution for the production of goods deriving from the wire rod, such as nails, screws or nets, since the manufacturing methods applied nowadays cause the production of huge quantities of problematic waste, scraps and excessive water and energy consumptions, beside the emission of acid gasses.

The new pilot plant, built in order to demonstrate the feasibility of using greener manufacturing procedures if compared to those used until now, is based on 3 main innovative elements:

2. Mechanical descaling system;
3. Applicator of plasma-microwaves;
4. New coating bath composed by Zn-Al-Mg.

The wire rod which enters in the plant is completely cleaned (up to 95%) thanks to a new mechanical descaling system which totally avoid the use of water and acids; in their place the coordinator makes use of hard prismatic elements made of the same alloy of the material to be treated and entirely recovered after their use in the same application or in different applications.

After the wire drawing, the metallic wire undergoes a microwave plasma treatment which eliminate the remainig impurites equivalent to more or less 5% and activate the surface of the product for the following phase (dip coating).

Dip coating occurs through a coating bath operating with a new composition made of Zn-Al-Mg. The new system works at lower temperature if compared to traditional baths and needs less quantities of Zinc to operate, therefore less toxic gasses are produced.

The European Commission has recognized the value of the project and decided to financially support it.

After 3 years of hard work Trafiliera e Zincheria Cavatorta is able to finally present the results achieved:

5. Results achieved

If compared to a standard system for the manufacturing of products deriving from the wire rod such as nails, screws or nets, the innovative system is able to:

- ✓ Reduce the energetic consumption of descaling and dip coating procedures (around - 120 kWh/ton);
- ✓ Completely avoid the use of water (-100%);
- ✓ Completely avoid the use of dangerous substances (hydrochloric acid, ammonium chloride, zinc chloride) (-100%);
- ✓ Totally avoid the production of dangerous waste (-100%);
- ✓ Totally avoid the toxic emissions in the atmosphere deriving from the use of acids (-100%);
- ✓ Reduce the toxic emissions deriving from the dip coating;
- ✓ Reduce the production of Zinc scraps;
- ✓ Reuse metallic waste products in the descaling process;
- ✓ Improve the working conditions

Besides the environmental benefits listed above, it is possible to obtain the following technical-economical benefits:

- ✓ Reduction of Zinc consumption;
- ✓ Improvement of the quality of the finished product (physical properties, for example increased resistance to corrosion).

Whether the pilot line implemented would be adequate by the companies which produce metallic wires in the only Europe, it will be possible to achieve the following environmental benefits (source IIDI Bruxelles, 2004):

- 3,2 millions cubic meters of water saved each year;
- 95'000 tons of chloridric and solphoric acid not used each year;
- 24'000 tons of metallic scraps reused in the mechanical descaling system;

Beside the reduction of toxic emissions and the improvement of working conditions, aspects which are hardly quantifiable.

6. The future

The diffusion of the results of the project, even if only on a European level, would mean the production of extremely positive environmental results on the whole European population; to understand better the potential benefits, think about the reduced water needs of the companies operating in the sector and the elimination of the possibility of spills of acids in the environment when transporting them or the substantial reduction of toxic emissions in the environment.

For the previously mentioned reasons, Trafileria e Zincheria Cavatorta is at disposal of everyone interested in the technology developed; the company is willing to transfer the Know-How obtained through the implementation of MDPATC in order to spread it at least on a European level.

The coordinator will give to everyone interested in the technology developed a complete support, in particular:

- For the replication of the pilot line realized;
- For the industrialization of the pilot line in order to make it able to operate with quantities of wire rod higher than 1000 Kg/h;
- For the adaptation of the pilot line in order to treat other types of products.

Trafileria e Zincheria Cavatorta's technicians will be at complete disposal of the companies interested for any kind of needs in order to simplify knowledge transfer.

For more information visit:

www.cavatorta.it