

LIFE+ PROGRAMME

The (EC) No 614/2007 Regulation of the European Parliament and of the Council of 23/05/2007 established the new European Programme for the financial support of products and technologies aimed at protecting the environment: LIFE +.

LIFE + replaces the previous LIFE program (Environment, Nature and Third Countries), the Community Framework Programme for cooperation in promoting sustainable urban development, the Community Action Programme for the promotion of non-governmental organizations active in the field of environmental protection and Forest Focus program.

The objective of LIFE is to contribute to the development, implementation and updating of policy and legislation on the environment. This financial instrument is also designed to facilitate the integration of environment into other policies and to contribute to sustainable development in the European Union.

LIFE + co-finances environmental activities in the European Union (EU) and in certain third countries (EU accession countries, members of the European Environment Agency, the Western Balkan countries affected by the process Stabilisation and Association). The funded projects may be proposed by operators, public and private bodies or institutions.

LIFE + consists of three thematic components:

▶ **Nature and Biodiversity.**

The Nature projects contribute to the implementation and development of the guidelines "Birds", "Habitat" and the Natura 2000 network. Biodiversity projects focus on innovative practices aimed at halting the loss of biodiversity in Europe.

▶ **Environmental Policy and Governance.**

It supports innovative or demonstration projects that show innovative solutions relating to relevant environmental issues.

▶ **Information and Communication.**

It supports projects aimed at the communication and awareness campaigns on the environment, and training initiatives and campaigns for the prevention of forest fires.



LIFE09 ENV/IT/000174 

ULTRA CRASH TREATMENT

NEW DECISIVE AND CLEAN
TECHNOLOGY FOR THE LONG
STORAGE OF THE METALLIC
WIRES

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UNIVERSITÀ DEGLI STUDI DI TRENTO



METALLURGICA
ABRUZZESE

BACKGROUND & OBJECTIVES

One of the most popular and effective protection of the wire is the galvanic coating or galvanizing. The wire should be subjected to degreasing, pickling, fluxing and preheating to 100 ° C, before being immersed in a bath of molten zinc at 455 ° C.

This system does have a strong environmental impact:

- ▶ Very high energy (300,000 kcal / ton)
- ▶ Consumption of water (100 l / ton)
- ▶ Use of dangerous substances (1 kg / ton)
- ▶ Production of waste (10 kg / ton of dust, zinc dross and foams)
- ▶ Air emissions (1000 m3/ton fumes from plating baths containing ammonia, hydrogen chloride, zinc dust and other zinc-containing)

The aim of the project is to replace the current phase of hot dip galvanizing with a more environmentally innovative technology, greatly reducing the impact of the process of securing the wire.

PROJECT

The Cavatorta Group, long known for its commitment to environmental protection, has developed a new environmentally friendly process for galvanization of ferrous materials.

This led to the new project **Ultra Crash Treatment**, which won a prestigious award from the European Commission under the LIFE + financial support, which has recognized the innovative nature of the project and the environmental contribution that this sector can make.

The project, under construction at **Metallurgica Abruzzese SpA** aims to replace the process of hot dip galvanizing of steel wire with **an innovative coating process by spraying cold zinc dust**: this process resolves all environmental issues related to the hot dip galvanizing.

This treatment will be preceded by **a preliminary micro shot peening ceramics**, which will allow on the one hand the product activation for optimal adhesion of the zinc, the other phases of the elimination of degreasing, pickling, fluxing and preheating.

The project therefore involves the construction of two

prototypes: one for micro shot peening ceramics and the other for cold galvanizing spray.

The technologically innovative aspect of the project is then represented by the inclusion of such technology in an area in which they are not used.

Exceptional partner of the project is the **Department of Materials Engineering and Industrial Technologies, University of Trento**, directed by Prof. Alberto Molinari.

DEVELOPMENT ACTIONS

The project is divided into three macro-activity:

- ▶ **Study, design and development of the treatment process by means of wire rod micro shot peening ceramic** (ceramic micro shot peening study of wire rod and wire; micro shot peening prototype design, construction, installation, testing and validation of the prototype for micro shot peening ceramic). In this phase the collaboration of the University of Trento will be particularly important, which will have the task of testing the laboratory prototype, analyze the results and contribute to the design of the system micro shot peening. Metallurgica Abruzzese will be responsible for design, test and debug the system micro shot peening ceramics in its final configuration.
- ▶ **Study, design and development of the process of galvanizing cold-spray** (study of the zinc coating by spraying cold; prototype design of cold-galvanizing spray, construction, installation, testing and validation of the prototype for cold galvanizing spray). In this activity, the University of Trento will be responsible for research on conventional cold-spray systems and the definition of treatment parameters, facilitating Metallurgica Abruzzese in the analysis of test results. Metallurgica Abruzzese will design, development and testing of the new system of cold-galvanizing spray.
new lay-out of the process obtained by the assembly of the two previous steps (assembly and connection of
- ▶ the **Two prototypes described earlier to form the pilot line**, pilot line connection with the production cycle, testing and experimentation of operation and process validation).

EXPECTED RESULTS

Environmental Benefits

- ▶ Allow the micro shot peening ceramic, compared to the traditional blast or descaling, a decrease of energy consumption by 50%;
- ▶ The new cold galvanizing spray will allow a substantial reduction of energy consumption by about 56% for the current stages of drying, cooling and galvanizing takes about 300,000 kcal / ton of product, using the cold spray method, the consumption will be reduced to about 130,000 kcal / ton;
- ▶ Total elimination of waste (about 10 kg / ton of ash, zinc skimming and matte zinc);
- ▶ Total elimination of smoke emissions into the atmosphere (1000 m3/ton smoke from the galvanizing bath containing toxic substances: ammonia, hydrogen chloride and zinc dust);
- ▶ Significant improvement of the working environment

Technical and economic benefits

- ▶ Increase the efficiency of oxide removal system and less roughness (switching from a roughness (Ra) greater than 5 µm with a roughness of less than 3 µm), with a consequent reduction in the thickness of the zinc layer deposited the order of 30%, there is also a reduction in treatment time up to 10 times, and the amount of flow of about 3 times;
- ▶ Reduction of the deflection of the lower energy limits the average cold deformation induced by the transformation of the kinetic energy of the shot in cold plastic deformation of the surface of the wire subjected to treatment;
- ▶ Reduction in consumption of machine parts subjected to the flow of micro-dots, estimated in 70%;
- ▶ Significant reduction in the consumption of zinc, estimated at 35%, with obvious economic effects