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RECOVERY TECHNOLOGIES

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ELECTROLYTIC PICKLING OF ANNEALED BENDED TUBES FOR HEAT EXCHANGERS

WITH AN ATTENTIVE EYE TO NATURE

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Bended tubes after annealing

Bended tubes after the treatment

ELECTROLYTIC PICKLINGOF ANNEALED BENDED TUBES FOR HEAT EXCHANGERS

Condoroil Group is now offering a revolutionary plant solution which adds to the already innovative electrolytic pickling systems for stainless steel tubes and bars.

This plant allows to develop all the process steps (pickling, brightening, passivation and rinse) **for annealed bended tubes for heat exchangers.**

Thus, all mechanical cleaning and brightening operations are replaced with high technical, economic benefits and time reduction.

Since some years the first **electrolytic** pickling tunnel, manufactured by Condoroil for Marcegaglia in Forlì (for pickling of stainless steel tubes), brought an important costs reduction for the facility where it is operating.

In the electrolytic pickling and brightening, the use of electric current allows to use the new sulphuric based product DESCALINOX 860, classified only as corrosive since free of hydrofluoric and nitric acid.

It is obvious the advantage in management of a bath that uses and handles harmless substances on the contrary of what happened with traditional pickling baths in which very toxic substances were present.

The advantages are in terms of no risk for the operators and no gaseous emissions since product is free of hydrofluoric acid and the well-known NOx.

QUALITY OF THE RESULTS

The anodic treatment step allows to remove not only the superficial oxide but also the contaminants eventually present in the material surface.

The superficial aspect of the tube, thanks to presence of proper levelling agents contained in the DESCALINOX solution, appear not only pickled but also polished, therefore homogeneous compared to the not annealed section.

THE PLANT

The plant is divided into three units: two storage tanks and a working bath.

The necessary current for the pickling process is supplied by a proper instrument called rectifier.
The first section contains the necessary electrodes for the current passage, as to say 2 nets in special alloys.
The cathode current coming from the rectifier is supplied to their ends.
After the treatment time, the rinse step is activated and carried out in the same pickling tank.

The bended tube is placed inside the treatment plant where its surface is submitted to anodic currents which develop the pickling action.
The motions which create inside the liquid allow to get an excellent results also in the most critical area for the traditional pickling.

The pickling liquid level, inside the plant, is kept steady and adjusted at the working temperature around 40°C through a cooling system in continuous of the working solution.
The pickled bended tube is cleaned inside the plant through a rinse step.

Amount of current per surface unit is kept constant depending upon type and number of treated bended tubes.
The plant creates two kind of wastes that must be properly treated: the spent pickling solution and rinse water.
Both are produced by a process that uses harmless solutions, with saline contaminants absolutely compatible with the traditional chemical physical purification plants.
In any case it is possible to optimize the treatment cycle of the wastes by inserting optional modules for regeneration of the electrolytic bath and for the so said water "zero discharge".

The emissions are essentially composed by hydrogen and oxygen. The entire pickling line is equipped with a proper suction hood that assures the prompt gas evacuation and a washing tower for abatement of eventual acid drag outs traces.

ADVANTAGES

Pickling cost reduction
Costs of raw material used in the electrolytic system is slightly lower compared to the ones used in the traditional system.

Time reduction:
The pickling line allows to get excellent qualitative results in a reduced time

Accidents prevention:
The use of a harmless pickling solution (Descalinox 860) improves the working conditions and remarkably reduces the risks connected with management of the solutions when working or for storage.

Environment protection:
The electrolytic plant is arranged for the "zero discharge" wastes management with regeneration of the electrolytic solution and water recycling.