

ELECTROLYTIC PICKLING ,
ELECTROPOLISHING AND
EDM (ELECTRO DISCHARGE
MACHINING) UNITS
FOR STAINLESS STEEL
AND SPECIAL ALLOYS
MOD. ELETTRA

WITH AN ATTENTIVE
EYE TO NATURE





ELETTRA ELECTROLYTIC PICKLING, ELECTROPOLISHING AND EDM (ELECTRO DISCHARGE MACHINING) UNITS FOR STAINLESS STEEL AND SPECIAL ALLOYS

APPLICATION

THE DEVELOPMENT OF MORE AND MORE DIFFICULT ALLOYS TO BE PICKLED, THE NEED TO PICKLE IN LINE AND, STILL, INCREASING COSTS AND DIFFICULTIES IN THE USE OF TOXIC ACIDS SUCH AS NITRIC AND HYDROFLUORIC ACID, ARE PROMOTING THE USE OF THE ELECTROLYTIC TECHNOLOGY FOR THE PICKLING OF STAINLESS STEELS AND SPECIAL ALLOYS ABOVE ALL DUPLEX AND SUPER DUPLEX.

CONDOROIL IS GLAD TO PRESENT YOU A COMPLETE RANGE OF UNITS, NAMED **ELETTRA**, FOR IN LINE APPLICATION, WITH INDUCED CURRENT, OR AT BATCH WITH DIRECT CURRENT.

THE ELECTROLYTIC TECHNOLOGY IS ALSO APPLIED IN ELECTROPOLISHING AND IN ELECTROEROSION PROCESSES (TO ELIMINATE SUPERFICIAL DEFECTS WHICH WOULD BE HIGHLIGHTED IN THE DEFORMATION I.G. TUBE DRAWING).

ADVANTAGES

ECONOMIC

COST REDUCTION IN CHEMICALS
COST REDUCTION IN PERSONNEL UP TO ZERO UNIT FOR IN LINE APPLICATION
COST REDUCTION FOR DISPOSAL

MANUFACTURING

DRAMATIC REDUCTION OF TREATMENT TIMES (I.G. SUPERDUPLEX FROM SEVERAL HOURS TO FEW MINUTES)

ENVIRONMENTAL

ELIMINATION OF HYDROFLUORIC AND NITRIC ACIDS
ELIMINATION OF NITRITES AND FLUORIDES FROM WASTE WATER
EASY TO OPERATE WITH ZERO DISCHARGE
DRAMATIC REDUCTION OF WORKING TANKS VOLUMES

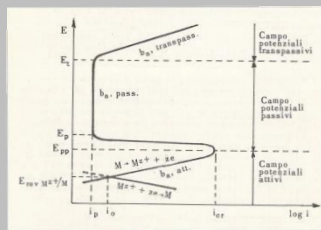
LOGISTICS

SINCE FREE OF TOXIC COMPOUNDS, IT IS POSSIBLE TO PLACE THE PLANT DIRECTLY IN THE PRODUCTION AREA

FLEXIBILITY

SAME PLANT CAN PICKLE ALL KIND OF MATERIAL (CARBON STEEL INCLUDED) WITH SAME SOLUTION.
SAME PLANT CAN CARRY OUT ALSO ELECTROPOLISHING AND ELECTROEROSION BY CHANGING KIND OF SOLUTION.

WORKING PRINCIPLES



FOR THE PICKLING OPERATION, THE SURFACE IS CHARGED POSITIVELY BY DIRECT CONNECTION TO THE ANODE OF A RECTIFIER, OR BY INDUCTION IN CASE OF IN-LINE PICKLING

THE APPLIED VOLTAGE IS GREATER THAN THE TRANSPASSIVATION POTENTIAL

THIS ALLOWS TO QUICKLY SOLUBILIZE BOTH SUPERFICIAL OXIDE AND THE BASE METAL.

TO OBTAIN THE CURRENT CONDUCTION, CONDOROIL PROPOSES AS ELECTROLYTE, A SOLUTION OF SULPHURIC ACID, **DESCALINOX P23**, CONTAINING LEVELING AGENTS.

IN CASE OF ELECTROEROSION AND/OR ELECTROPOLISHING PROCESSES, IS INSTEAD PROPOSED A MIXTURE ADDITIVATED WITH CONCENTRATE SULPHURIC AND PHOSPHORIC ACIDS, **DESCALINOX 860 INOX**, WHICH OPERATES ON THE EDGES BY SOLUBILIZING HOMOGENEOUSLY THE MATERIAL

AIR EMISSIONS TREATMENT



THE GASEOUS EMISSIONS ARE COMPOSED BY HYDROGEN AND OXYGEN WITH EVENTUAL DRAG OUT OF THE ELECTROLYTE SOLUTION

THE WHOLE PICKLING LINE IS EQUIPPED WITH A PROPER EXHAUST SYSTEM THAT ENSURES THE QUICK EVACUATION OF GASES AND WITH A WASHING TOWER TO ABATE EVENTUAL TRACES OF ACID DRAG OUTS.

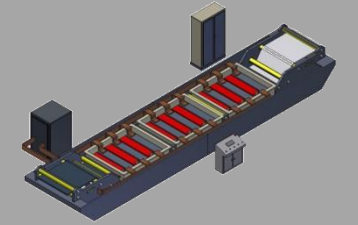
PLANTS FOR IN-LINE APPLICATION



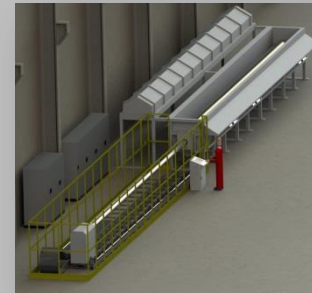
THE FIRST PICKLING TUNNEL WORKING DIRECTLY ON A LINE OF WELDED TUBES PRODUCTION HAS BEEN IMPLEMENTED AT MARCEGAGLIA FORLÌ FACILITIES IN YEAR 2000.

TODAY THE LINES ARE 10 MAINLY THANKS TO THE POSSIBILITY TO ANNEAL, PICKLE, DRY, MARK AND PACK THE TUBE DIRECTLY ON THE PRODUCTION LINE AVOIDING COSTLY HANDLING

BY ANALOGY, THE PROCESS HAS BEEN LATER EXTENDED TO TREATMENT OF BARS, RODS, COILS AND PLATES AND TO ELECTROPOLISHING PROCESSES OF TUBES.



PLANTS FOR BATCH APPLICATION



THESE UNITS HAVE BEEN MAINLY STUDIED TO IMPLEMENT EXTERNAL AND INTERNAL TREATMENT OF TUBES DEPENDING ON THE DIAMETER OF THE TUBES TO BE PROCESSED, TWO UNITS ARE POPOSED. THE FIRST UNIT IS FOR TUBES WITH DIAMETERS BETWEEN 120 AND 1200 MM. IT IS SEMIAUTOMATIC. THE SECOND IS FOR TUBES WITH DIAMETERS BETWEEN 35 AND 250 MM. IT OPERATES FULLY AUTOMATICALLY.

A PARTICULAR APPLICATION HAS BEEN DONE FOR PICKLING AND/OR ELECTROPOLISHING OF ANNEALED BENT TUBES FOR HEAT EXCHANGERS.



WASTEWATER TREATMENT



WASTEWATER TREATMENT

THE TUNNEL GENERATES TWO KIND OF WASTES THAT MUST BE PROPERLY TREATED: SPENT PICKLING PRODUCT AND RINSE WATER.

BOTH ARE PRODUCED BY A PROCESS THAT INVOLVES THE USE OF NON-TOXIC SOLUTIONS AND ARE CHARACTERIZED BY PRESENCE OF SALINE CONTAMINANTS COMPATIBLE WITH THE TRADITIONAL PURIFICATION PLANTS (CHEMICAL-PHYSICAL).

IN ANY CASE IT IS POSSIBLE TO OPTIMIZE CYCLE OF THE WASTE TREATMENT BY INTRODUCING OPTIONAL MODULES FOR THE SULPHURIC BASED ELECTROLYTIC BATH REGENERATION, ACHIEVING THE "ZERO DISCHARGE" OF WATER.

TO CLOSE THE CIRCUIT THE FOLLOWING UNITS ARE PROPOSED:

TAOS 700 FOR DRAG OUTS RECONCENTRATION AND SIMULTANEOUS PRODUCTION OF DEMI WATER TO BE USED IN THE FINAL RINSE

RESIBED FOR REGENERATION OF PICKLING ACIDS

