IN-SITU ELECTROPLATING

Let us show you how the Nicol & Andrew in-situ plating and machining process can help prevent costly downtime and shipping headaches

The method of depositing metal on metal by means of In-situ Electroplating was pioneered and developed over 50 years ago.
It has been successfully used since then to restore, repair, insulate and impart anti-corrosive properties to most base metals and alloys. The theory of In-situ plating is simple. It is a portable process whereby metal is deposited from a water-based solution onto a metal part, in restricted areas, creating an electrochemical bond. Durability of the surface treated in this manner can be extended by as much as five times of some original specifications. No Hydrogen embrittlement occurs and it is usually a much denser and harder deposit that conventional bath plating.

The application and use of in-situ electroplating in industry has been made simple with newer lightweight portable units, enabling on site repairs. Great savings can be achieved by eliminating expensive dismantling, down time, possibly prolonged loss of production and of course re-assembly. In-situ Electroplating is now an integral part of the manufacturing process for many industries.

The area of the work piece to be treated is used as a factor to calculate the precise deposit of the metallised solution, which enables considerable accuracy in rebuilding worn surfaces to a predetermined specification. The range of deposit can be calculated from .0001 - .1000".Consequently little or no machining may be required upon completion of the plating process.

Whilst in use, the in-situ plating process most resembles electric arc welding but without the heat. An electrode is connected to the work piece, but unlike arc welding, the process does not draw an arc. Instead the current passes through either a hand held or fixed anode wrapped with absorbent material. This conveys the metallised solution to the work piece and ensures a constant supply of solution.
As the anode is moved over the area requiring treatment, the electrically activated solution commences to deposit the metal in a micron for micron fashion. The metal to metal bond produced is electrochemical in nature and very strong.

Typical users of this remarkable repair solution are: -

- Aerospace and Aircraft Industries Turbine shafts, landing gear, air frames.
- Navy & Maritime Services Bearing journals and hydraulic surfaces.
- Offshore Industries Corrosion and wear protection in saltwater environments
- Industry using Moulds & Dyes Repairs to parting lines and cavity damage.
- Construction, Transport and Plant Repairs to hydraulic rams, cylinders etc.
- Electrical and Electronic
- PCB Conductor lines, bus bars, commutators etc.
- Hydraulic ram and Cylinder Refurbishment Better than new repairs to damaged rams
- Steam Turbine Generators Repair to steam cuts, Hydrogen seals and flanges etc.
- Tool Rooms Restoration of acceptance gauges scored machine ways etc.
- Food Processing Industries Repairs to metallic surfaces and stainless steel.
- Printers Repairs to plate cylinders and defective copper on inking drums.
- Power Stations Repairs to shafting, bearing housing, hydrogen seals, flanges electrical controls and slip rings etc.

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Other methods of restoring metal surfaces: -

1. Metal Spraying
Low cost and widely used. However this process can have poor directional control over the deposit, and in some circumstances the end result can be poor due to thermal distortion. It is a portable service but over spray sometimes restricts use. Post repair machining is nearly always required. Quality of deposit fair to good but deposit is usually porous to some extent.

2. Welding
Precision work very poor, thermal distortion and heat cracks are a frequent problem. Quality of deposit dense but not without blowholes and post repair machining is always required.

3.Bath Plating
This method provides good bonding and build up of metal but it is an extremely slow process and demands a tank and sufficient solution to totally immerse the work piece. It is obviously not transportable and produces plating with 'Hydrogen embrittlement' which results in difficult machining.

4. In-situ Plating
Excellent precision build up and bonding quality providing a very dense deposit that machines (if required) extremely well. The process is entirely mobile, uses the minimum of solutions, does not create heat cracks or thermal distortion and produces a build up of a very dense composition without hydrogen embrittlement or porosity.

Typical rate of deposit using a nickel solution (52 ROCKWELL C, 530 BRINELL) is .001" in two minutes. The finished surface being able to withstand operating temperatures 1000F (540C).

As you can see the “in-situ” process offers a metal restoration and treatment service that is far superior in many ways to the other methods described. Its absolute versatility makes it an obvious choice for most aspects of industry where metallic surfaces are prone to wear or corrosion.

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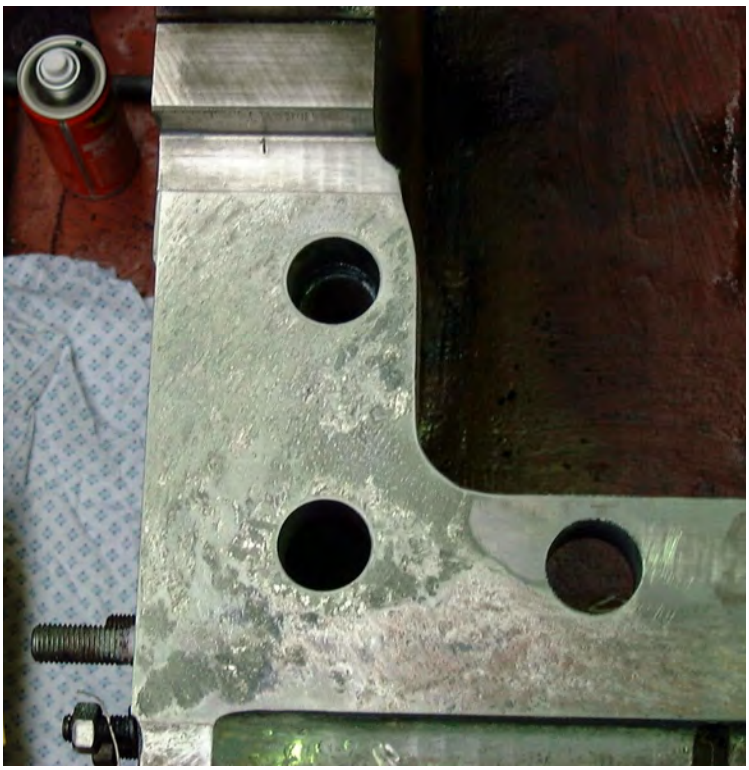
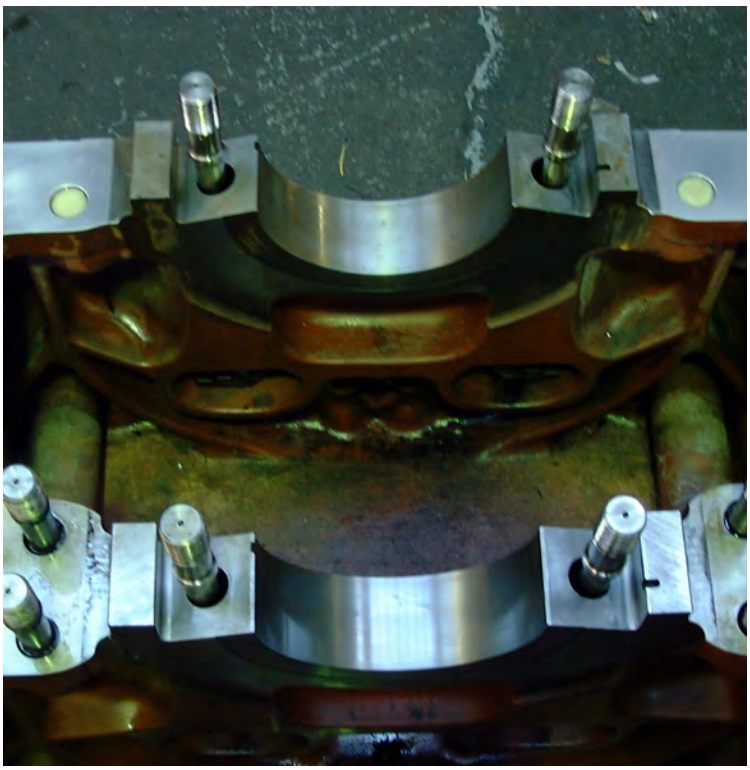
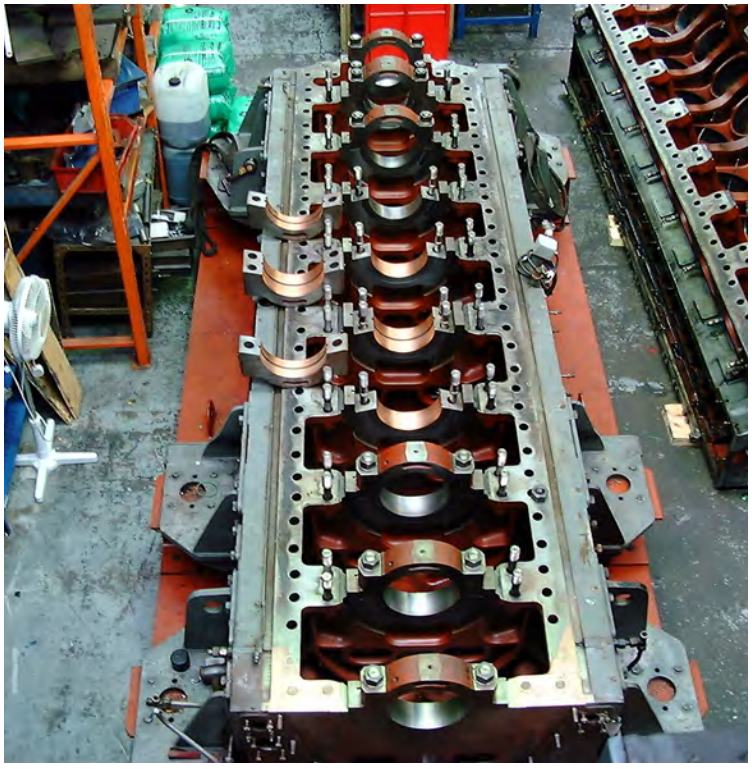
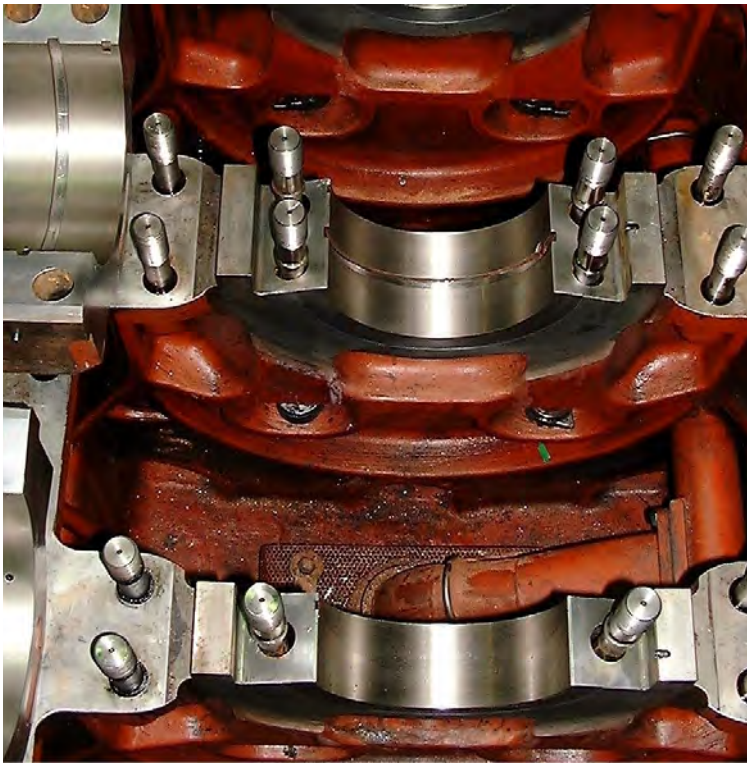
IN-SITU ELECTROPLATING BEDPLATE









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On Site Machining
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