Formed in 1973, CORIMA TECHNOLOGIES SAS developed the knowledge to design and manufacture tooling, and complex parts. Since 1997 CORIMA TECHNOLOGIES have specialized in electroforming, which is the galvanic process of depositing Nickel or Copper.

In 2009 CORIMA TECHNOLOGIES expanded and modernized its manufacturing facility to reinforce its position as an international specialist in electroformed moulds, and to support its customers on projects of larger sizes (Electroforming Nickel tanks: 7m × 4m × 2.5m).

Nickel tools are generally used for the moulding of carbon fibres or prepreg glass fibre, which is widely used in the aeronautical industry.

Another focus of nickel moulds are RTM tools (Resin Transfer Moulding) used in the production of polyester parts, to improve the quality and production rate.

Electroforming facilitates the production of complex parts for the aeronautical, space, medical and other industries.
■ DESIGN
Our engineering department carries out the complete design of your tools from your digital part data and specifications in conjunction with our project managers.
We use:
CATIA V4 & V5
SOLID WORKS

■ MODELING
We machine Polyurethane or Epoxy models for the following applications:
- Bath model for electroforming
- Master model for the manufacturing of a Carbon mould
- Style master models
- Silicon implementation
Modeling capability 7000 x 4000 x 2000mm

■ COMPOSITES
Composites manufacturing:
- Carbon/Epoxy or Glass/Epoxy
- Prepreg infusion
- Retention 60°C/120°C/180°C
- Oven capacity:
  7000 x 4000 x 2500 temperature 250°C

■ MAINTENANCE & REPARATION
We undertake the maintenance and repairing of tools manufactured by ourselves.
We use on the following methods:
- Nickel welding
- Refilling of Nickel or Copper
- Repairing of composite moulds
- Tool adjustment by a three-dimensional measuring machine

■ ELECTROFORMING
The electroforming process is carried out at the scale of an atom and allows for very accurate reproduction of details.
The process allows the deposit of several millimetres of pure metal (Nickel or Copper) on to a model. This metal deposit is then removed from the model to obtain a mould skin or part.
Maximum dimensions 7000 x 4000 x 2500mm.

■ THE NICKEL DEPOSIT
Applications
> RTM tools
> Moulding of prepreg
> Technical parts
> Rotomoulding
> Complex parts
> Technical Nickel deposit

Advantages of the Nickel deposit:
> Adjusting of the tool to compensate for springback
> Surface hardness of 15 to 40 HRC
> Resistant to corrosion and minor abrasion
> Can be polished to a mirror finish
> Reproduction of grain textures (Leather, tissue….)
> Excellent heat conductivity
> Depositing of two metals, Nickel and Copper

■ COPPER DEPOSIT
Applications
> Wave guides
> Particle accelerators
> Additional deposit on Nickel
> Electrodes to create good shape & detail for spark-erosion
> Technical Copper deposit

Advantages of Copper coating:
Excellent heat conductivity
Excellent electric conductivity

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LAY-UP TOOLS

Lay-up moulds are made up of a hard metal Nickel skin mounted on a Steel frame. This allows a higher volume of parts produced compared to Composite moulds. They allow for the manufacture of serial parts with a perfect surface detail throughout the lifetime of the tool. Tool maximum operating temperature: 250 °C.

For the manufacturing of a mould, it is necessary to machine a Polyurethane master model, which is used as either the master model or bath model. The deposit will take place by an atomic juxtaposition at a speed of 0.01 mm/hour. The model will be frequently taken out of the Nickel tanks in order to measure the deposit and if necessary adjust the shields and anodes to obtain an even Nickel thickness.

The flexibility of a 4 to 6mm Nickel shell allows the shape to be dimensionally adjusted which, in some cases, is necessary to compensate for part springback.

 Nickel LAY-UP tool
Tool for the manufacturing of prepreg part in an autoclave

Prepreg tool for leading edges
Tail stabilizer G250
Possible sizes for this type of tool: 1 to 7 meters

Manufacturing process for a Nickel lay-up tool:
Nose cone
Falcon 7X mould

CAD Design
Laminated Epoxy resin/glass fibre bath model.
A thin silver layer (1µm maximum) is sprayed onto the bath model to make it conductive

FOR LOW PART MANUFACTURING (<100 parts) WE RECOMMEND CARBON MOULDS
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FOR LOW PART MANUFACTURING
(<100 parts)
WE RECOMMEND CARBON MOULDS

Tool for engine cowlings
Engine cowling ‘BR 710’
Possible sizes for this type of tool: Ø 4 meters

Tool for turbine fairings
Helicopter (Hindustan Aeronautics LTD)
Possible sizes for this type of tool: 1 to 6 meters

Handling into the Nickel tanks.
As soon as the Nickel layer reaches between 4 to 6mm of thickness we demould.
Tool frame manufactured in parallel with electroforming stage.
Mould ready for dispatching.
The electroforming technology allows the manufacturing of technical parts with high electric and thermal properties. This mechanical part will be machined after the electroforming stage.

Moulding of reinforced glass fibre and resin. The operating pressure is 4 bars at a maximum temperature of 100° C. For RTM moulds the thermal control is very important for the productivity of the tool. Nickel moulds have excellent heat conductivity, and allow shorter manufacturing times.

**RTM**

**Control**

Air-conditioned inspection room of 80m² with temperature and humidity recording during measurement of tools.

**MEASURING DEVICES:**
- Laser tracker
- Three-dimensional control
- Roughness measuring
- Vacuum measuring
- Hardness measuring
- Ultrasonic hardness measuring
- Electrochemical laboratory for analysis

**Environment**

A commitment for the future.
Subject to prefectural authorization, CORIMA TECHNOLOGIES is a registered environment plant (CPE), and is committed to respect the environment, together with DREAL.

**Manufacturing units**

**COMPUTERS:**
Centralized computer system, including ERP.

**WORKSHOPS:**
3000 m² air-conditioned workshops divided into 6 units:
Engineering, modeling, composites, electroforming, welding, inspection.

Different means of handling
5 overhead gantries: Maximum 6.3T
2 Forklifts: Maximum 4.0T
Grinding booths, dry or water curtain painting booths.

**Quality**

CORIMA TECHNOLOGIES certification ISO 9001 – 2008, showing it’s willingness to progress and to respond to its customer’s expectations.
Electroforming technology allows the manufacturing of technical parts with high electric and thermal properties. This mechanical part will be machined after the electroforming stage.

Medical

The electroforming technology allows the manufacturing of technical parts with high electric and thermal properties. This mechanical part will be machined after the electroforming stage.

Space

From a machined metal mandrel, the electroforming technology allows the manufacturing of complicated serial parts, without any welding to a thickness of several microns.

Aeronautical

A Nickel or Nickel-Cobalt leading edge:
- protection against erosion on Composites blades
- protection of wings or Winglets

Moulds and Silicon Parts

At CORIMA-TECHNOLOGIES, we have over 40 years experience in the use of silicones. We manufacture technical parts which require important knowledge for the use of silicones and also for the production of tools.

We use 4 different kinds of silicones:
- Silicon 60 shore using temperature of 180°C for the pressurization of prepreg composites.
- Inflatable Silicon skins for the pressurization of prepreg composites.
- Silicon technical parts
- Silicon covers for surface/sand blasting treatment.