



 Desktop Metal.

[Case Study]

Ecrimesa Group

www.desktopmetal.com



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Overview

Founded in 1964, Ecrimesa Group produces steel and aluminium with cutting-edge technologies: investment casting, MIM, machining and additive manufacturing.

Based in Northern Spain, the company today produces more than 9,000 different parts for customers in the automotive, defense, aerospace, textile and food industries around the globe.

Being the first company worldwide to develop the MIM process of fabrication in continuous furnace with catalytic debinding, Ecrimesa Group's facilities include the latest machinery and qualified staff to develop projects in the most efficient technology.

01

The Challenge

Every year, MIM suppliers around the world produce billions of metal parts for a long list of industries, from automotive to aerospace and nearly everything in between.

While each manufacturer producing those parts face their own challenges, some - like how to cut costs, how to speed up production runs and how to quickly retool manufacturing lines to reduce downtime - are never far from their minds.

They're challenges Ecrimesa Group is intimately familiar with.

With a catalog of more than 9,000 unique parts, the company must produce, maintain and catalog a vast inventory of manufacturing tooling, and be nimble enough to quickly create new casting and metal injection molds as their customers bring them new parts and modify old designs.

To keep up with the constant demand for both new and existing parts, the company must be able to quickly retool manufacturing lines for different jobs, and do it all while keeping costs - both for their customers and themselves - as low as possible. This presents immense challenges for Ecrimesa as each new geometry requires a new tool (mold).

These molds commonly take 8-12 weeks to produce and cost Ecrimesa and their customers thousands of dollars. These high costs and long lead times make it extremely difficult to prototype these parts, as the customer won't see their first parts until the molds have been cut, and the money and time have been consumed.

To do it, Ecrimesa turned to the next-generation manufacturing technology of the Desktop Metal Studio System.

At Ecrimesa Group, we are dedicated to continually improving the quality and productivity of our services and products, and our investment in additive manufacturing is part of that commitment.

The design freedom and tooling free-manufacturing enabled by the Studio System allows us to produce parts that are precisely tailored to our customers' needs, and to produce functional prototypes without the lead times and tooling costs associated with traditional manufacturing methods.

—

Eduardo Valenzuela
Commercial Engineer
Ecrimesa Group

02

Studio System Success

Ecrimesa's investment in the Studio System paid off almost immediately.

The Studio System makes it easy to print parts with extremely similar material properties and surface finish to Metal Injection Molding by utilizing the same powders and sintering process.

Rather than injecting material like in MIM, this material is extruded out of a nozzle layer by layer to build up the part, with no tooling required. Ecrimesa engineers simply upload the CAD file, and in a few hours the part is ready to go into the furnace.

That ability to quickly create parts has allowed company engineers to quickly create a wide variety of prototypes for both new and existing customers.

In addition to creating prototype customer parts, Ecrimesa is using the system to develop prototype pieces for use in sintering tests as part of the mold-making process for customers in the automotive, defence, locksmith and industrial machinery industries.

03

Why Desktop Metal?

Before investing in the Studio System, Ecrimesa explored a variety of other 3D printing technologies, and even invested in a wax printing system to create patterns for investment casting.

While the wax system helped show how 3D printing could complement the company's existing manufacturing, it was limited to only making patterns that later still required casting.



To find a more end-to-end solution, the company began exploring metal 3D printing, and benchmarking a variety of parts with different companies and printing approaches.

The decision to ultimately invest in the Desktop Metal Studio System was based on tests in which Studio parts showed superior density and minimal distortion after sintering.

04 Part Fabrication and Comparison

With traditional manufacturing, customer's MIM prototypes would generally be produced via machining, an expensive process given the small intricacies and geometry that are common in MIM.

Using the Studio System, those prototypes can be produced far more quickly and at far less cost, allowing customers to test parts for functionality and iterate on designs before spending thousands to invest in tooling.

By allowing for more extensive functional testing than ever before, metal 3D printing helps manufacturers develop better parts than many of their traditionally-manufactured counterparts.

4140 Prototypes - Studio System



Created to allow customers to validate part designs before investing in tooling, these parts also helped Ecrimesa validate the capabilities of the Studio System.

Using the system, the company was able to create a wide range of parts with vastly different geometries, from cylinders to open rings to knurled surfaces.

The tooling-free nature of the Studio System not only allowed Ecrimesa to print these parts quickly, but also significantly reduced lead times and per-part costs, allowing Ecrimesa and its customers more opportunity to iterate on the designs, resulting in better-performing parts.

These parts were printed in 4140 steel to take advantage of the materials exceptional toughness, high fatigue strength and resistance to abrasion and impacts.

17-4PH Stainless Steel Prototypes - Studio System



Both of these parts, a handle for consumer products (left) and a test part for the defense industry (right), were printed to allow customers to explore functional prototype designs before committing to production.

Using the Studio System, Ecrimesa was able to produce both parts significantly faster than with traditional manufacturing, allowing customers more opportunity to test and refine designs, resulting in better-performing parts.

The tooling-free nature of the Studio System also means that these prototypes can be produced in far less time - days rather than weeks or months for traditional methods - and at significantly less cost.

These parts were printed using 17-4PH stainless steel to take advantage of its high strength and hardness, resulting in highly durable parts.

04 Evaluation

At Ecrimesa, the Studio System's impact was immediate. The system's ability to go from digital design to printed metal parts in just days allows the company's customers to significantly shorten their development timeline with quick, functional prototypes, and ultimately produce a better final design.

Traditional manufacturing methods, by comparison, require weeks for the fabrication of hard tooling before a single part is produced, reducing the company's ability to prototype. For machined prototypes, the small part size and intricate features add significantly to prototype cost.

The expanded design freedom offered by additive manufacturing, meanwhile, allows Ecrimesa to develop new parts with improved performance and specialized designs that can be customized to meet end-users' exact needs and are not constrained by the limitations of traditional manufacturing constraints, such as undercuts, lattices, and generative design.

About Desktop Metal Inc.

Desktop Metal, Inc. is accelerating the transformation of manufacturing with end-to-end metal 3D printing solutions. Founded in 2015 by leaders in advanced manufacturing, metallurgy, and robotics, the company is addressing the unmet challenges of speed, cost, and quality to make metal 3D printing an essential tool for engineers and manufacturers around the world. In 2017, the company was selected as one of the world's 30 most promising Technology Pioneers by the World Economic Forum, and was recently named to MIT Technology Review's list of 50 Smartest Companies. For more information, visit www.desktopmetal.com.

About Ecrimesa Group

Founded in Santander, Spain in 1964, Ecrimesa Group today encompasses three companies - Ecrimesa, Mimecrisa and Mecansa, which are dedicated to the manufacture of steel and aluminum parts via the microfusion process. With state-of-the-art capabilities, including a mold-making workshop, wire machines, high-speed five-axis machining centers, on-site smelting center and heat-treating capabilities, Ecrimesa can oversee all parts of the production of metal parts. Annually, the company produces more than 9,000 different parts for customers in the automotive, defense, aerospace, textile and food industries around the globe.