

# 3D PRINTED MOLD FOR AUTOCLAVE TO BE USED IN MANUFACTURE OF AIRCRAFT REPAIR PARTS

## Large Format Additive Manufacturing (LFAM) with thermoplastic compounds

LFAM by direct extrusion of plastic pellets offers the ability to 3D print large parts and prototypes, reduces manufacturing lead times, allows the design of complex geometric parts and increases production with lower costs.

LFAM using filled thermoplastic compounds containing glass fiber, carbon fiber, minerals, etc., provides strength and CTE performance which cannot be achieved with unfilled resins.



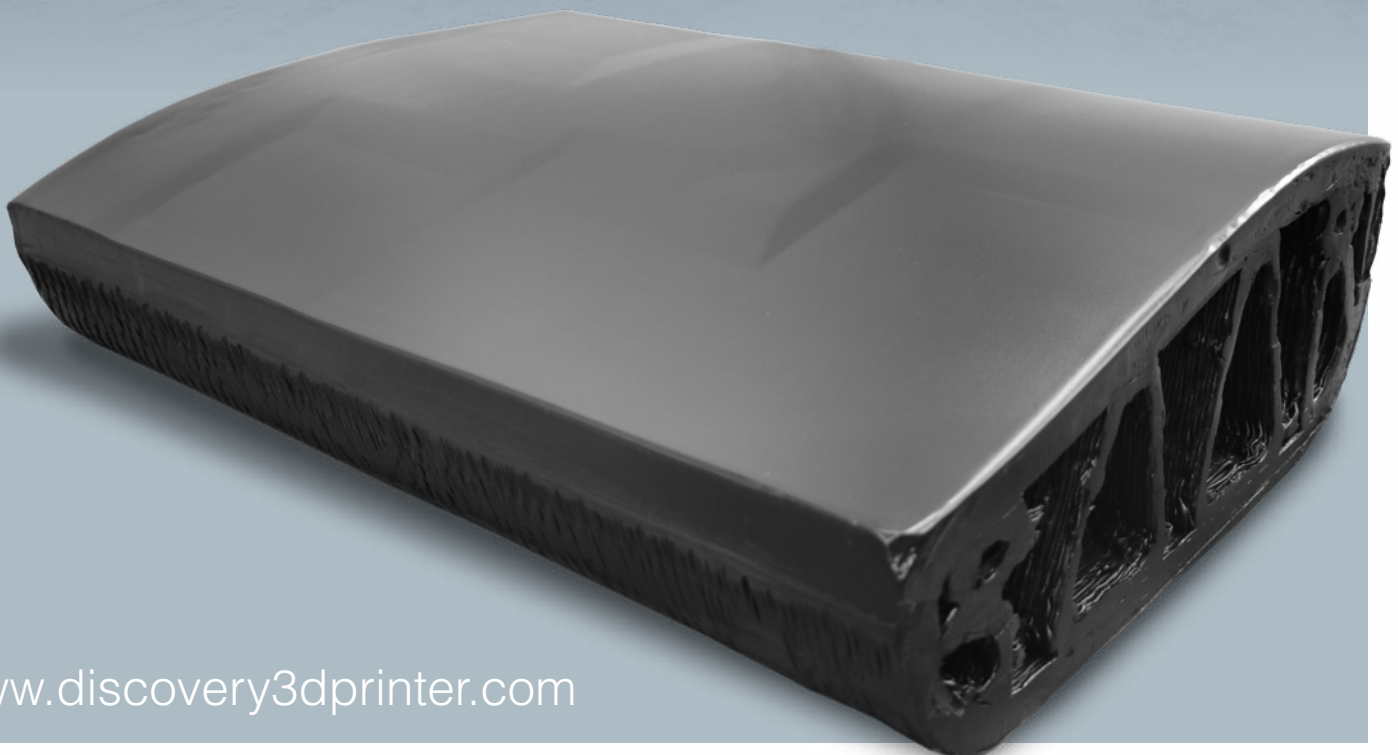
**Customer:** AIRBUS.

**Project:** 3D printed mold for autoclave to be used in manufacture of aircraft repair parts.

**Equipment:** Super Discovery 3D Printer™ manufactured by CNC Bárcenas.

**Technology:** Large Format Additive Manufacturing (LFAM) by extrusion of plastic pellets.

**Material:** SABIC's LNP™ THERMOCOMP™ AM COMPOUND, grade name EZ006EXAR1.



## Scope of the project specified by AIRBUS and FIDAMC

**LFAM of an autoclave cycle curing mold to be used for molding carbon fiber parts.**

- Autoclave cycle ability: 180°C and 140 psi.
- Airtight surface (sealed).
- Low CTE.
- Additional elements for technical assessment: effective area and adhesion between layers, porosity, surface finish.

## Material

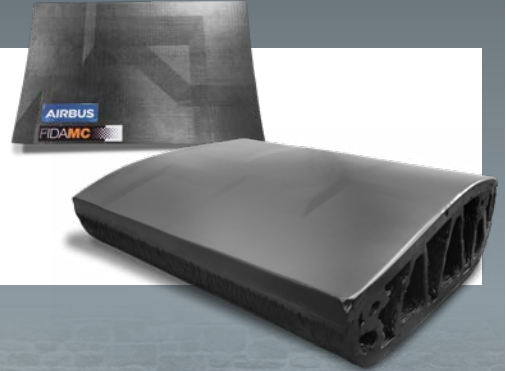
**LNP™ THERMOCOMP™ AM EZ006EXAR1** was chosen because it is a compound of ULTEM™ resin, a material widely used in aerospace applications, and a filler package for dimensional control. Based on PEI resin containing 30% glass fiber, it offers high temperature performance, high modulus, excellent strength-to-weight ratio and low creep.

## Process and results

**Once the preform was 3D printed, the mold was machined.**

### Results:

- A part was cured without the mold suffering deformations under autoclave's pressure and temperature.
- The pre-impregnated carbon fiber part was properly cured and perfectly copied the geometry of the mold.



## Equipment

**AIRBUS has selected the Super Discovery 3D Printer™, a state-of-the-art equipment manufactured by CNC Bárcenas, for several reasons:**

- Wide experience in LFAM, with real success stories in different sectors.
- Broad expertise: 10 years manufacturing high-level performance CNC machinery with industrial design and mechanics.
- Strong capabilities for on demand projects with full customization.
- Easy to use, universal and compatible 3D printers.
- Experienced in processing SABIC's LNP™ THERMOCOMP™ AM ABS, PC and PEI compounds.



**CONTACT US FOR MORE INFORMATION AND WE WILL STUDY YOUR CASE INDIVIDUALLY**



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