

heron aim™

**Turnkey large format additive manufacturing
platform for composite material extrusion**

CARACOL

BUILD BEYOND POSSIBLE

Caracol is a global leader in robotic large format additive manufacturing technologies. Since 2015, our founders pursued the idea of pushing the limits of AM and existing manufacturing technologies beyond what was possible, combining innovation with an industrial vision to respond to client's production needs.

Placing users at the center, Caracol delivers integrated turnkey robotic solutions leveraging additive manufacturing, to provide simpler processes, flexibility, efficiency, sustainability, and enable customers' production continuity.

Index

Heron AM - Introduction	4
Heron AM - Core Elements	6
Extruders	8
Eidos Manufacturing Software suite	10
Robotics	11
Printing beds	12
Automatic Tool Changer	13
Drying & Feeding system	14
Enclosures	
Materials	16
Industries & case studies	21
Tooling	22
Marine	24
Design & Furniture	26
Architecture & Construction	30
Automotive	32
Railways	34
Service	37



HERON AM

Print bigger, print better with Heron AM

The integrated platform
that will drive you to the
next manufacturing revolution

Caracol created Heron AM to evolve the possibilities of Additive Manufacturing on scale, shape, and materials.

CARACOL

HERON AM is Caracol's Robotic Large-Format Additive Manufacturing platform – a modular, polymer and composite pellet extrusion robotic 3D printer, for large scale, industrial applications.

- **FLEXIBILITY**
is freedom in customizing parts' design and geometries.
- **EFFICIENCY**
means optimized lead times and lower costs, without compromising quality.
- **SUSTAINABILITY**
of the production process, aiming for a zero-to-positive impact, by enabling circular economy, cutting waste, and using recycled materials.

Heron AM is the only LFAM platform that **integrates hardware, software, and automation**: providing clients with a **turnkey solution** to maximize flexibility, process control, and performance. As one provider, Caracol delivers quicker innovation, higher customization, and prompt and reliable support.

Application-first

Caracol perfected Heron AM with end-user needs in mind, after years of research and experience manufacturing parts for clients across sectors.

Our aim is to ensure clients' production quality and continuity for the most advanced applications. We do it by providing a reliable technology, and an extensive set of services to help leverage the full potential of your machines across applications.

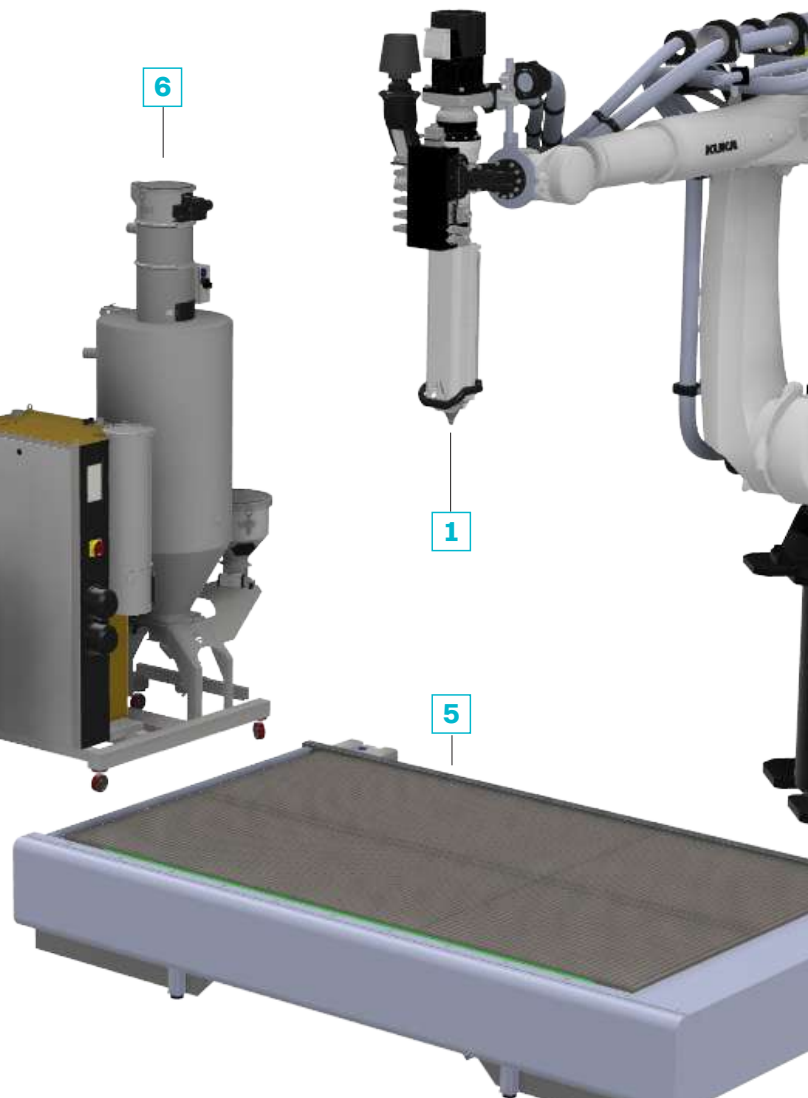
The system is ideal for the production of parts like: tooling (e.g., jigs and fixtures, molds, etc.), prototypes, metal replacement, temporary or permanent substitution of parts, as well as structural and finished parts in several sectors.

Today Heron AM works in factories that meet the highest standards for production, with the most demanding industrial requirements and quality criteria.

Modularity & Integration

The custom turnkey platform Heron AM can be modularly configured to fit clients' needs.

- 1 EXTRUDER
- 2 EIDOS MANUFACTURING SOFTWARE SUITE
- 3 CONTROL SYSTEM
- 4 ROBOTIC ARM
- 5 PRINTING BED
- 6 DRYING & FEEDING SYSTEM
- 7 CONTROL CABINETS



Heron AM can be flexibly integrated in clients' shop floors with different customizable options.

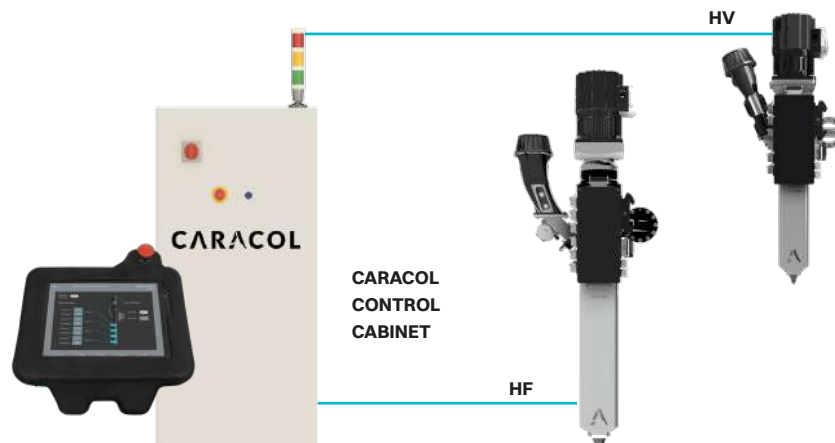
The Engineering team works hand-in-hand with clients' teams to understand manufacturing needs and the types of applications that one intends to manufacture with their system to define the exact layout, additional features, and define the ideal configuration.

BASE CONFIGURATION

SOFTWARE	Eidos manufacturing software suite			
EXTRUDER	HA	HV	HF	xHF
ROBOT REACH	Max 3.1 m (10.6 ft)	Max for smallest unit 3.1 to largest 3.9 m (10.6 to 13.1 ft), extendable with rail		
PRINTING BED	ALU	STEEL or AUTOMATIC		
OPTIONAL FEATURES				
AXES EXTENSION (7th-axis rail or booster frame)	N/A	On-demand		
CNC INTEGRATION	N/A	On-demand		

ONE CONTROL, MANY SOLUTIONS

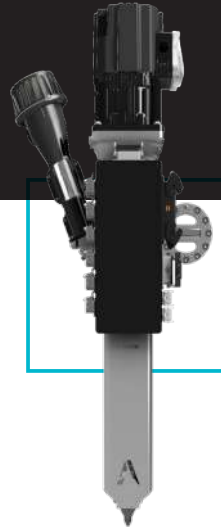
For the industrial range we've developed a **dedicated automation & control suite**. The aim is to **enable true modularity on Heron AM platforms**, flexibly allowing clients to work with a custom system for different needs and applications. A user friendly HMI for smooth control of extruder and process parameters and quick side machine operations, and a unique and centralized control unit - the Caracol Control Cabinet - that can be used with multiple end-effectors with a plug-and-play logic. This enables the introduction of an automatic tool changer for users who have multiple extruders they want to use on a project, or for the hybrid setup.



Extruders

Caracol's extruders are built to guarantee results – from precision, to flexibility, to high throughput – clients can find the best solution for their needs. Built to process a wide range of thermoplastic and composite pellets, from advanced to recycled or bio-based materials.

HERON AM



High Accuracy (HA)

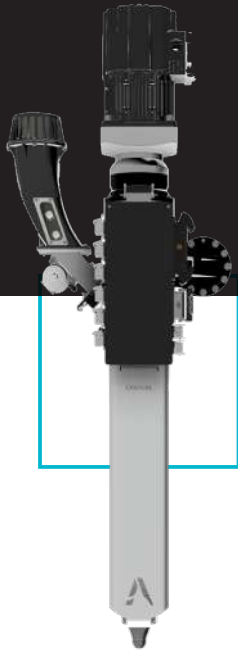
Lightweight, compact, print head – developed to provide agility, quality finishing, detailing, and precision. Ideal for finished parts, such as for design, furniture, and creative industries.

High Versatility (HV)

Flexibly adapts to diverse industrial needs – it was developed to cover a broad range of applications: from finished parts, such as boat super structures, small to mid-sized tools, jigs, and fixtures, to design and architectural structures.

CARACOL

	HA – High Accuracy	HV – High Versatility
Weight (kg - lb)	16	45
Dimensions (mm)	800x300x150	1150x550x300
Max Throughput (kg/h - lb/h) Measured through a standardized qualification procedure	2 kg/h - 4.4 lb/h	12 kg/h - 26.5 lb/h
Heat Zones (#) Studied to ensure optimal distribution of heat zones for best plasticization of materials	3	3
Max Temperature (°C - °F)	350 °C - 662 °F	450 °C - 842 °F
Cooling Zone (#)	1	2
Nozzle Range (min - max, mm)	1 - 5 mm	2 - 8 mm
Melt Flow Modulation (MFM)	NO	YES
Dryer (L; kg/h - L; lbs/h)	75 L; 10kg/h - 22 lb/h	75 L; 10 kg/h - 22.1 lb/h
Layer Cooling Unit & Anti-collision system	INCLUDED	INCLUDED



High Flow (HF)

Robust, high throughput extruder – developed for fast material processing, an extensive range of materials, print quality, and efficiency. Ideal for large tools and molds, boat hulls, and applications in architecture and construction.



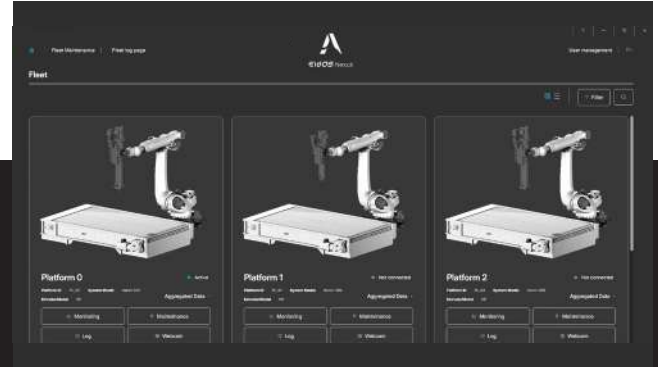
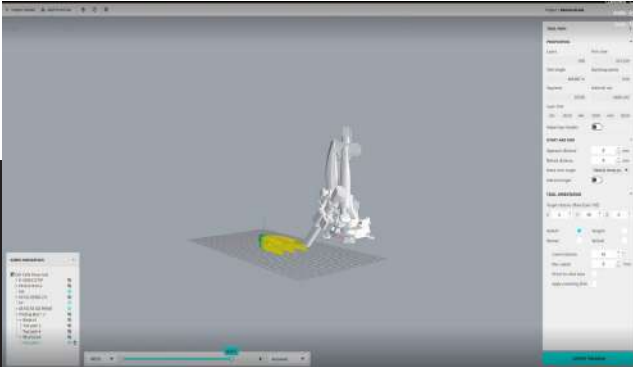
Extreme High Flow (xHF)

Engineered to maximize throughput, precision and material flexibility, with advanced plasticization and thermal control. The xHF extruder features a dual chamber and custom nozzles, to process two materials at the time, aimed at producing high-performance composite parts for a more precise and efficient use of materials

	HF - High Flow	xHF - Extreme High Flow
Weight (kg - lb)	75	205
Dimensions (mm)	1500x550x350	1780 x 425 x 650
Max Throughput (kg/h - lb/h) Measured through a standardized qualification procedure	30 kg/h - 66.1 lb/h	75 kg/h - 165 lb/h
Heat Zones (#) Studied to ensure optimal distribution of heat zones for best plasticization of materials	3	8
Max Temperature (°C - °F)	450 °C - 842 °F	450 °C - 842 °F
Cooling Zone (#)	2	2
Nozzle Range (min - max, mm)	5 - 18 mm	5 - 24 mm
Melt Flow Modulation (MFM)	YES	YES
Dryer (L; kg/h - L; lbs/h)	150 L; 25 kg/h - 55.1 lb/h	800 L
Layer Cooling Unit & Anti-collision system	INCLUDED	INCLUDED

Eidos Manufacturing Software suite

Caracol's Eidos Manufacturing software solutions are developed and tailored for Heron AM platforms - Caracol's Robotic Large-Format Additive Manufacturing platform for polymer and composite pellet extrusion.



Eidos Builder

Seamlessly develop the slicing and set your printing parameters with a user-friendly interface. Visualize your virtual robotic platform to simulate prints, and choose your printing approach: from planar to angled or non-planar, enjoy full control and accuracy on your slicing to work on complex tool paths and setting your production parameters.

What to expect from Eidos Builder:

- Optimized workflow for best user experience
- Configurable modular machine and tools setup
- Slicing strategies planar, angled, multiplanar along plane and along curve, non-planar, conformal, spiral, surface based, path sequencing
- Robot library, 6 + 2 external axes
- Material library with preset process parameters of qualified and custom materials
- Fast toolpath recalculation with part displacement
- Toolpath simulation with collision and singularity check
- Custom or automatic process-specific parametrization
- Pre-production analysis of printing time and consumables

Eidos Nexus

Enhance the experience for working with your robotic platforms with smart features such as fleet management, live process and machine monitoring, data logging, efficient data handling and analysis, remote technical support and decision-making, as well as introduce AI-enabled control and automation features.

Ensure you can maximize efficiency and quality to effectively scale your industrial production capabilities.

What to expect from Eidos Nexus:

- Multi user level
- Real-time process monitoring
- Live system monitoring
- Data visualization and charting
- 3D data mapping
- Job data logging and history visualization
- Preventive maintenance
- Remote technical assistance
- Management dashboard of full fleet
- Connectivity
- Area monitoring
- Expandability to advanced monitoring tools

Robotics

Caracol chose 6+ axes industrial anthropomorphic robotic kinematics to maximize flexibility and allow Heron AM to 3D print parts with complex geometries.

Modularly set up the system around manufacturing needs and applications - from different sized systems to collaborative robots or hybrid cells from printing to post-processing.

Furthermore, the print volume can be extended by placing the robot on a rail and/or a plinth. Caracol works with a multi-robot approach, allowing clients to select the best automation solution to fit their needs from a range of leading global brands (e.g., KUKA, FANUC, ABB) - custom developments can be evaluated.



Printing beds

As print beds are key for successful production, each model developed by Caracol fits specific manufacturing needs, customizable in size.



ALU

The aluminum frame structure with interchangeable top panels provides flexibility and a convenient set up. Top panels include poplar wood, polymer, glass, or heated options depending on need.



STEEL

Guarantee high rigidity, planarity, and durability with the steel bed. The top panels can be interchanged (e.g., poplar wood, glass, polymer, or heated) depending on need.



AUTOMATIC

The automatic bed for unmanned part clamping and unloading was designed for stability, providing a solid grip for the part during the job and automatically releasing it after printing for continuous production.

	Studio	Industrial	
	ALU	STEEL	AUTOMATIC
Composition	Aluminum + Interchangeable material top (MDF, Glass, ...)	Steel + Interchangeable material top (MDF, Glass, ...)	Full steel frame and optimized shape profiles
Dimensions (print surface) (m - ft)	1,5x3 - 4.9x9.8	1,5x3 3x3 - 4.9x9.8 9.8x9.8	1,5x2,5 - 4.9x8.2
Modular Extension	YES	YES	N/A
Heating	Optional	Optional	Optional

Automatic Tool Changer

To combine LFAM with CNC, Caracol set up a fully automatic tool changing station that enables the automated switching between extruder, 3D scanning, and milling spindle.

Printing & Finishing

To combine LFAM with CNC, Caracol set up a fully automatic tool changing station that enables the automated switching between extruder and milling tools.

This ensures that the manufacturing process is continuous and doesn't require any human intervention, ultimately reducing downtime and manual operations. CNC machining can be employed for several operations following the part printing, such as: trim contours, cutting, drilling, milling.

BENEFITS

- **Automated scanning and milling** in a single robotic platform, reducing manual rework and setup time.
- **Increased part quality and finishing accuracy**, especially on large and complex geometries thanks to dedicated and semi-automatic calibration procedures.
- **Reduced operator involvement** through integrated tool change and calibration cycles.

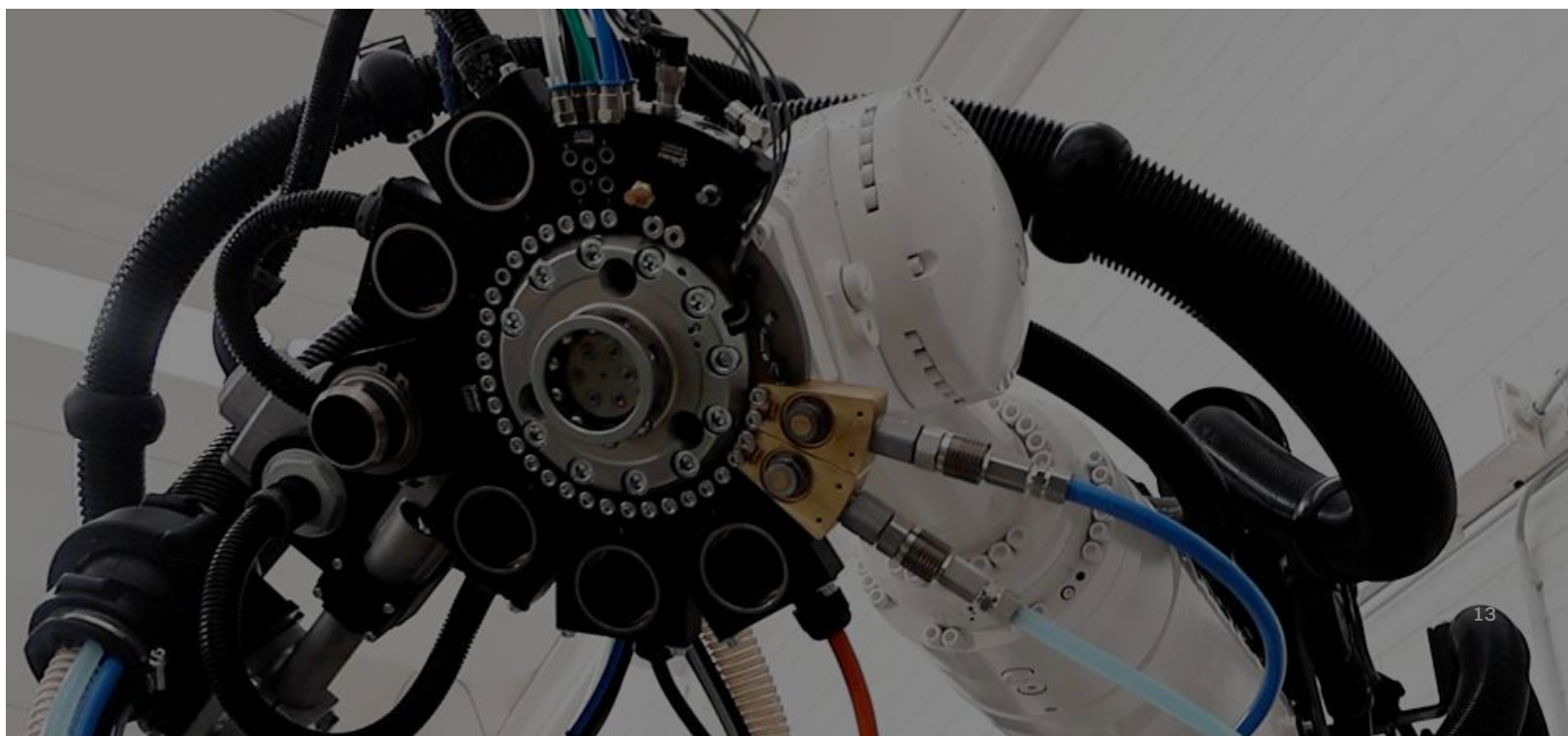
Dual Extruder

Thanks to the automatic tool changer, Heron AM users can also employ multiple extruders to achieve different goals / finishes on the parts produced.

By automatically switching between industrial line extruders (such as HV and HF) the user can choose to work with high throughput / large nozzle sizes for fast and efficient production, and then switch to fine detailing and smaller features with a smaller extruder and nozzle.

APPLICATIONS

- **Particularly well-suited for applications** where robotic milling meets precision requirements - such as the marine, automotive or creative industries - for producing finished components, aesthetic parts, and prototypes.
- **Ideal for industries requiring flexible**, automated manufacturing of small production runs, minimizing post-processing and manual labor while ensuring high precision and efficiency.



Drying & Feeding system

The direct and continuous supply of material is possible with the automated material drying & feeding system, developed by Caracol. The unit is connected to the extruder to input pellets throughout the printing cycle, avoiding manual operations.

Pellets are stored at the right humidity and temperature and dried for best performance and quality. Different sizes and performance of drying and feeding systems have been tailored to match different extruders to have always the right combination for a stable process.



AUTOMATIC EXTRUDER PURGING SYSTEM

All Heron 400 models come equipped with a standard self-cleaning system for extruder purging at the end of each print job. This advanced feature allows safe, unattended printing even with demanding materials like carbon-fiber-reinforced polycarbonate (PC CF), significantly reducing the need for manual intervention. Thanks to this function, prints can finish overnight without requiring an operator to clean the extruder, ensuring maximum safety, uptime, and machine utilization.

Enclosures

Enclosures and perimetral protections are needed to operate the machine guaranteeing safety for operators and optimal printing conditions.



Caracol has developed different configurations for clients to opt for depending on their production space and needs. From open air **Safety Light Curtains** and **Protective Cages**, to the Advanced Enclosure developed to control all environmental parameters, monitor printing, guarantee safety, process repeatability, and quality, to a **Portable Container Unit** to set up manufacturing of parts in any location.



Materials

3D printing thermoplastic and composite pellets for industrial application

HERON AM

Caracol works with its materials partners daily to qualify advanced thermoplastic composite materials for its process. This includes a range of materials from bio-based, recycled, to high-temperature materials such as autoclave composites, tested to guarantee efficient production, top technical properties, and minimizing costs and waste.

Caracol's Heron AM platforms are made to process a broad range of materials, thoroughly tested, and qualified for direct, continuous printing: from advanced polymers and composites to recycled materials from upcycled waste or parts at the end of their life.

The **MATERIAL LAB** constantly works to expand the range of materials selecting new materials and studying mechanical, thermal, chemical properties of printed parts, to provide the best options on the market for our clients' applications and guarantee reliable and repeatable production.

CARACOL





PET-G Polyethylene Terephthalate Glycol

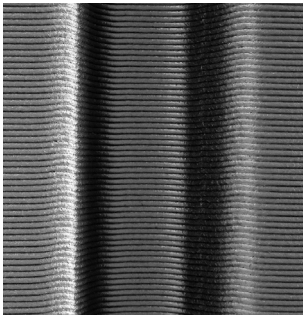
This polyester-based polymer can be found in recycled transparent, or glass fiber reinforced versions, and has excellent surface finishing and UV resistant properties. It goes up to 70°C (158°F). Ideal for PVC-like, outdoor and indoor finished parts, cold tooling, design and furniture applications and architecture sector.



RECYCLED
rPET-G



COMPOSITE & RECYCLED
rPET-G + 30% Glass Fiber
(also UV version)



ABS Acrylonitrile Butadiene Styrene

Recommended when glues, coating or other chemicals need to be applied, it has good mechanical properties and is stable during prints. Qualified for low temperature applications up to 80°C (176°F) like prototyping, vacuum tight molds and tools for trimming and gripping, and finished functional parts not subjected to mechanical pressure.



COMPOSITE
ABS + 20% Carbon Fiber
ABS + 20% Glass Fiber



COMPOSITE & RECYCLED
ABS + 20% recycled CF



PP Polypropylene

Highly resistant to solvents and chemicals, lightweight polymer, with good mechanical properties and impact resistance. It can resist up to 80° C (176°F) and it is qualified to produce functional parts in several sectors, suitable also for marine applications.



COMPOSITE & RECYCLED
rPP + 30% Glass Fiber

Materials

HERON AM



ASA Acrylonitrile Styrene Acrylate

Recommended when glues, coating or other chemicals need to be applied, it also stands out for its UV resistance, good mechanical properties and high thermal resistance, up to 90°C (194°F). This material is qualified and employed for marine components, outdoor applications, design and furniture finished parts.



COMPOSITE

ASA + 20% Glass Fiber



PLA Polylactic Acid

This biodegradable thermoplastic is derived from renewable plant resources like corn starch and sugarcane. It is ease of use, environmentally friendly and it is characterized by a smooth and glossy surface finish. It is used for decorative industry and indoor furniture. It is also available with bio-fillers.



BIOBASED PLA



BIOBASED & COMPOSITE

PLA + 50% Cork / 20% Oyster /
40% Olive / Pine / Coffee / Algae

CARACOL



PC Polycarbonate

Recommended for its great mechanical and thermal properties, up to 130°C (266°F). The carbon fiber-reinforced composite can withstand mid-temperature autoclave processes (up to 3-6 bars). It is ideal for functional and engineering applications, including autoclave molds and heat-resistant cure tools as well as lamination tooling.



COMPOSITE

PC + 20% Carbon Fiber



PEI Polyetherimide

Excellent flame retardancy with UL94 V0, outstanding heat-resistance, stable physical and mechanical properties, high strength and stiffness up to 200°C (392°F), and great chemical resistance to fluids such as hydrocarbons and alcohols. Ideal for high-temperature autoclave tools and structural end parts in sectors like aerospace.



COMPOSITE

PEI + 20% Carbon Fiber



TPE High Strength And Flex Elastomer

This TPE-based high-strength and flexibility elastomer is ideal for optimized pliable structures. It goes up to 70 Shore A and 80°C (176°F) as working temperature, and it is extensively used to print large-scale rubber-like parts for logistics, furniture, seating and design-related components.



NATURAL

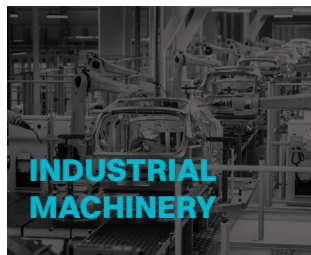
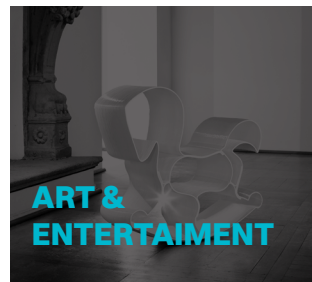
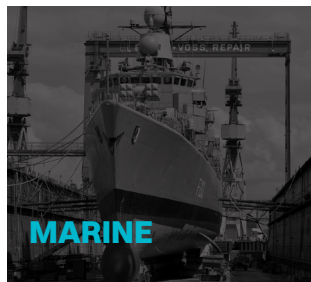
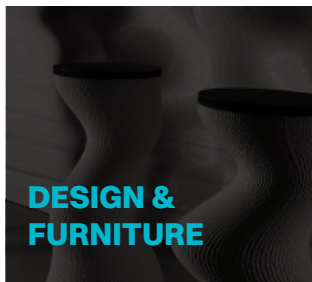
TPE

From technology to applications

Additive manufacturing at
the service of diverse industries

Caracol developed its platforms to expand the potential of additive manufacturing to large, complex, industrial applications. After years 3D printing parts and components alongside industry leaders, the application-first approach is part of the company's DNA and drives technological innovation.

THE INDUSTRIES WE WORK IN:



Our case studies



Tooling

More efficient and sustainable production starts with 3D printed tools, molds, jigs, and fixtures. Manufacturing tools becomes easier, faster, cheaper and more sustainable overall.

QUALIFIED FOR PRODUCTION

3D print certifiable tools and molds fit for highest production standards

FASTER PRODUCTION

Reduce lead times drastically from design to finished with part consolidation

DESIGN FOR USE

Lighter tools, with ergonomic features, for easier operations and logistics

OPTIMIZED RESOURCE USE

Cut use of raw materials and waste and introduce sustainable alternatives,

MATERIALS INNOVATION

Use advanced composites qualified for high temp autoclave processes

LONG-LIFE AGILITY & VERSATILITY

Flexibly print different parts or materials, adapt daily to your needs



TRIM & DRILL JIGS

With Heron AM, Caracol produced customized trim and drill tools for a leading European aircraft manufacturing OEM, enabling positioning and vacuum gripped drilling for airplane fuselage panels. Their flexibility and tailor-made design highlight the value of LFAM in delivering efficient, fast, and repeatable manufacturing solutions.

MANUFACTURING SET UP

MATERIAL	ABS + 20% GF
PRINT TIME / POST-PROCESSING	30hrs - Machining
WEIGHT / SIZE	750 kg - 1500 x 5800 x 600 mm
LEAD TIME REDUCTION	80%
WEIGHT REDUCTION	80%
WASTE REDUCTION	70%
COST SAVING	30%



AUTOCLAVE DIRECT MOLD

Automotive cure tool for autoclave lamination of racing car's rear body panel. The finished carbon fiber part is manufactured by Duqueine Automotive, for its Le Mans Prototype racing car. Before final use the tool is CNC fine machined.

MANUFACTURING SET UP

MATERIAL	PC + 30% GF
PRINT TIME / POST-PROCESSING	16hrs - CNC
WEIGHT / SIZE	300 kg - 1000 x 2300 x 2400 mm
LEAD TIME REDUCTION	50%
WEIGHT REDUCTION	20%
WASTE REDUCTION	50%

Marine

In the marine sector, LFAM is key in the production of large-scale molds for yacht structures, lightweight sail and racing boat parts and custom yacht components, such as superstructures, and boat or canoe hulls. 3D printing can accelerate maintenance for large ships and minimize down times.

PART OPTIMIZATION

Print geometrically complex parts, optimized for weight and performance

SPECIALIZED MATERIALS

Use qualified materials, from fiber-reinforced to sustainable alternatives

FLEXIBLE PRODUCTION

Agile production for part customization on a scalable, cost-efficient basis

DESIGN FREEDOM

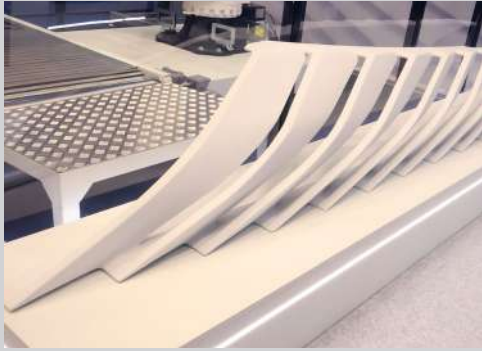
Consolidate assemblies in single parts, reducing post-processing and lead time

FASTER PRODUCTION

Accelerate production cutting steps and eliminating assemblies and tooling

GREEN BOAT BUILDING

Non-toxic to sustainable materials, optimized designs with less raw material



YACHT AIR GRILLES

The Pershing GTX116 is the flagship model of the GTX series, the Sport Utility Yachts range offered by Pershing, a Brand of Ferretti Group. The GTX116 leverages LFAM technology for some of its main superstructures: air grilles and visor above the windshield are 3D printed with Heron AM.

MANUFACTURING SET UP

MATERIAL	ASA + 20% GF
PRINT TIME / POST-PROCESSING	72hrs - Gel coating
WEIGHT / SIZE	40 kg - 4200 x 400 x 400 mm
LEAD TIME REDUCTION	50%
WEIGHT REDUCTION	15%
WASTE REDUCTION	60%



FUNCTIONAL MONOLITHIC CATAMARAN

Caracol collaborated with V2 Group to develop the first functional 6-meter-long monolithic catamaran for open waters. This boat was produced in a single print, leveraging the Heron AM robotic platform to develop a product that will be industrialized and scaled.

MANUFACTURING SET UP

MATERIAL	rPP + 30% GF
PRINT TIME / POST-PROCESSING	160 hrs - Sanding and painting
WEIGHT / SIZE	1200 kg - 5000 x 2300 x 1500 mm
LEAD TIME REDUCTION	20%
WASTE REDUCTION	30%

Design & Furniture

Caracol began developing its robotic LFAM by working on producing interior design pieces in a more efficient and sustainable manner. The creative freedom, combined with the flexibility of a cost-effective manufacturing and sustainable process make this technology ideal for 3D printed furniture and design parts.

DESIGN FREEDOM

Fully leverage creative flexibility with 6-axes robots & computational design

CUSTOM-MADE, ON-DEMAND

Customize at single-unit level, print on-demand from a digital library

INNOVATE MATERIALS

From bio-based, recycled post-industrial or post-consumer plastics and more

EFFICIENT USE OF RESOURCES

Cut waste, eliminate tooling and supports, and recycle scraps

TO NET-ZERO PRODUCTION

A cleaner process to minimize energy and material consumption

EFFICIENT IN SPEED AND COST

Non-toxic to sustainable materials, optimized designs with less raw material



FURNITURE AI GENERATED

PORTAL is an immersive installation that explores the convergence of AI-generated design, circular materials, and advanced robotic manufacturing. Adopting Caracol's technology to produce unique designs, PORTAL brings to life a new generation of striking furniture pieces that embody innovation, efficiency, and environmental consciousness.

HERON AM

MANUFACTURING SET UP

MATERIAL	rPET-G + 30% GF
PRINT TIME	4 to 10 hrs
WEIGHT	10 to 25 kg
SIZE	800 x 850 x 700 mm



LUXURY RETAIL EXPERIENCE

Recarlo partnered with Caracol AM to elevate its retail spaces through innovation and design. Through Heron AM technology, Recarlo was able to bring to life the wall panels it has envisioned, combining impactful design features and sustainability with its iconic aesthetic and brand identity, redefining the luxury retail experience for its stores.

CARACOL

MANUFACTURING SET UP

MATERIAL	rPET-G + 20% GF
PRINT TIME	55 hrs
WEIGHT	160 kg
SIZE	2000 x 3900 x 400 mm
POST-PROCESSING	Cutting

HERON AM



CARACOL



HERON AM

CARACOL

Architecture & Construction

Today LFAM has the potential to radically transform how buildings are made, introducing new materials and methods to provide flexibility in design and production, cost efficiencies, and sustainability. Going beyond 3D printed house construction, LFAM can support the development of custom features, such as wall paneling, formworks, and more.

TIME SAVING

Produce at high speed and efficiently structures and components, pre-fabricate elements to reduce time on-site

BIO-BASED & RECYCLED MATERIALS

Ability to innovate on materials, working with bio-based or recycled alternatives to limit the impact of raw materials used

GEOMETRIC COMPLEXITY

Introduce intricate designs, structures, and solutions that bring both aesthetic and performance benefits (i.e., resist to natural disasters)

ZERO WASTE

Manufacture using only the materials necessary, eliminating scraps and waste

FLEXIBLE PROCESS

Both in design and construction, allows to introduce changes at an advanced stage of the project, tech can be set up in remote locations for local production

REDUCED CARBON EMISSIONS

Process is more efficient and less polluting vs. traditional process that use large quantities of cement



DOMINO 3.0 | GENERATED LIVING STRUCTURE

Designed by Kengo Kuma & Associates for the Biennale Architettura 2025, Domino 3.0 explores the dialogue between nature and advanced production. For the installation, Caracol produced six custom TPE joints, showcasing the role of robotic additive manufacturing in flexible and innovative construction.

MANUFACTURING SET UP

MATERIAL	TPE
WEIGHT	27 to 54 kg
SIZE	400 x 650 x 700 mm



CUSTOM COLUMN FORMWORK

In construction and architecture, large format 3D printing's use is rapidly growing. Heron AM has proved to be a powerful solution across applications, including advanced structural parts. Vitruvian, an early adopter of technology, has pioneered the use of LFAM to produce reusable, high-strength formworks for concrete casting.

MANUFACTURING SET UP

MATERIAL	PP + 30% GF
PRINT TIME	15 hrs
WEIGHT / SIZE	16 kg – 600 x 500 x 850 mm
LEAD TIME REDUCTION	30%
WASTE REDUCTION	100%

Automotive

3D printing in automotive is a valuable way to provide the industry with increased design freedom and optimized costs in vehicle development and is showing its value across the supply chain. From prototyping to new products testing, from tooling to finished parts - on large formats, 3D printing is entering the automobile manufacturing at scale. See what Caracol can deliver.

MANUFACTURING AGILITY

Flexibility and quick lead times and production cycles from design to part production and product development

CONSCIOUS RAW MATERIALS

From materials innovation with lightweight high-performance solutions, to recycled materials and zero waste

CUSTOMIZE AT SINGLE-UNIT LEVEL

Low volume and highly personalized parts become possible and cost-effective

CONTINUOUS QUALITY

Delivering reliable processes and accurate parts production

FREELY EFFICIENT

Eliminate the need of assembly and tooling also on complex geometries

TRANSFORMED SUPPLY CHAIN

Digital warehouses and localized, just-in-time, production of custom components and spare parts



CUSTOM CAR BODYWORK

Heron AM was adopted by Castelletto Circuit to manufacture the entire bodywork of a custom racing Legend cars category. The project showcases how innovation in digital manufacturing can be an efficient way to transform high-performance automotive production.

MANUFACTURING SET UP

MATERIAL	ABS + 20% GF
PRINT TIME / POST-PROCESSING	150hrs - Sanding and painting
WEIGHT / SIZE	173 kg - 3600 x 1900 x 1200 mm
LEAD TIME REDUCTION	50%

HERON AM



3D PRINT END-PARTS FOR CUSTOM VEHICLES

Van Venrooy and Caracol leveraged the Heron AM large-format 3D printing platform to produce custom ABS-CF end-parts (rear bumpers, fenders, taillight covers) for bespoke utility vehicles, dramatically optimizing efficiency and reshaping the supply chain.

MANUFACTURING SET UP

MATERIAL	ABS + 20% CF
PRINT TIME	5 days
POST-PROCESSING	Sanding and painting
LEAD TIME REDUCTION	85%
WASTE REDUCTION	60%
COST SAVING	30%

CARACOL

Railways

With innovation on flame-retardant materials, rail transportation is quickly evolving to introduce the benefits of additive manufacturing. Today manufacturers can produce sturdy, cost-effective parts, from maintenance or production tooling or finished parts for trains, electric railway vehicles, light rail (LRVs) and trams.

MANUFACTURING FLEXIBILITY

Design, test, and quickly iterate different large scale components to deliver innovation and to reconfigure railway vehicles: from prototyping to finished parts

HIGH-PERFORMANCE MATERIALS

Find the most suitable qualified engineering-grade materials to serve your critical needs: flame-retardant, heat-resistant, and high mechanical performance

QUALITY-FIRST

3D printed materials and parts today can reach safety-compliant standards and fire hazards (i.e., V0)

COST OPTIMIZATION

Cut development and manufacturing costs with flexible manufacturing solutions, deliver the future of mobility

MINIMIZED VEHICLE DOWNTIMES

With digitalized inventory and localized production: lower costs and time on supply of spare parts, temporary or permanent substitutions, as well as large rolling stock components eliminating assembly and tooling

GREENER PRODUCTION

Minimize waste and raw material usage at every stage of production: from prototyping to high-performance molds, and functional parts



SIMULATOR DRIVER DESKS

Caracol's LFAM platform enabled the creation of highly detailed, functional parts very quickly for Alstom, eliminating the need for machining, tooling, and molds, while meeting the client's requirements for validation and visualization.

MANUFACTURING SET UP

MATERIAL	rPETG + 30% GF
PRINT TIME / POST-PROCESSING	20hrs - Sanding and Drilling
WEIGHT / SIZE	35 kg - 2100 x 820 x 500 mm
LEAD TIME REDUCTION	90%
WASTE REDUCTION	40%

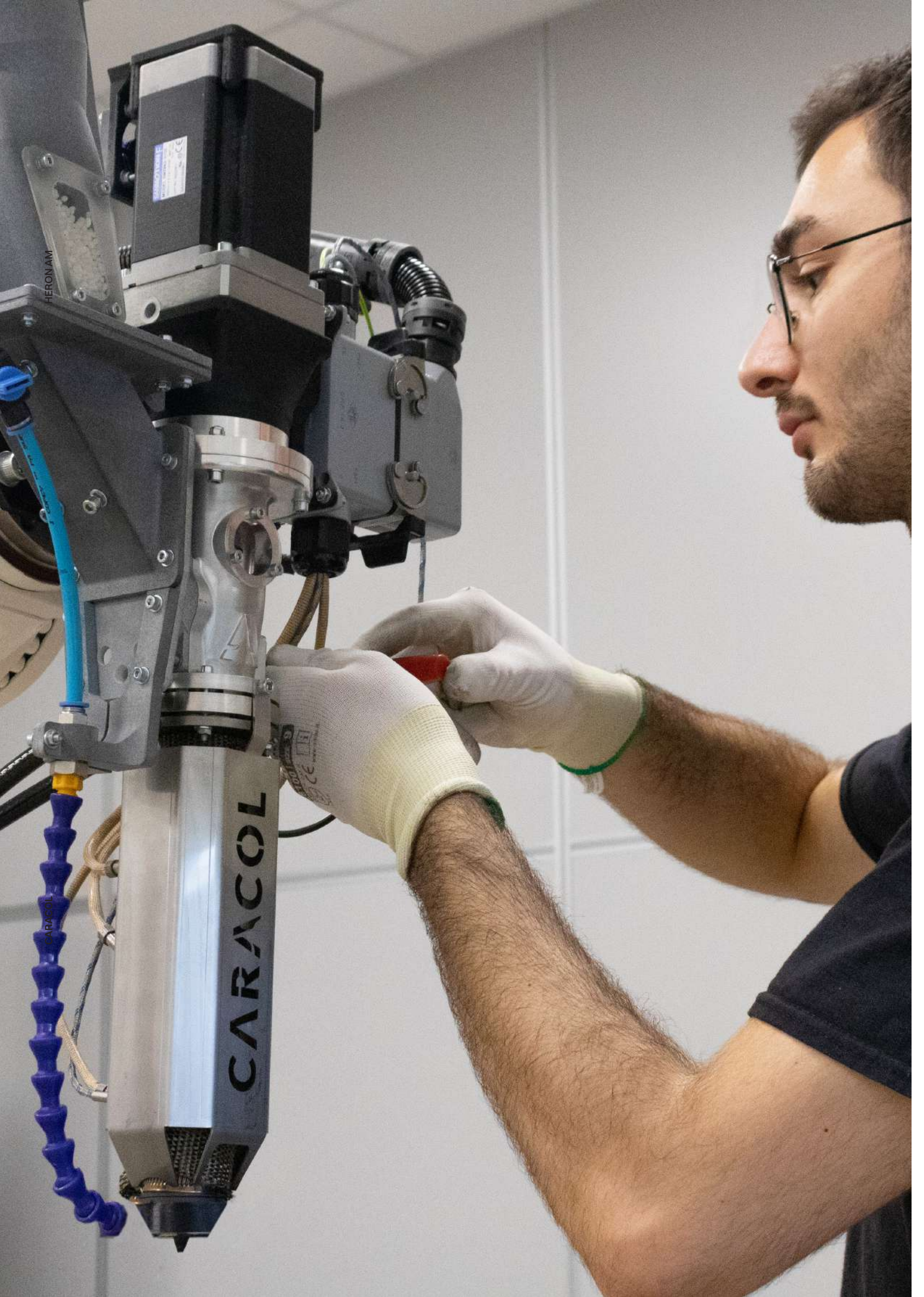


1:5 TRAIN NOSE MOCK-UP

The collaboration with Alstom involved Caracol in the creation of a 3D-printed mock-up of a train nose for the AGV Italo train (Italian high-speed train). This mock-up, built at a 1:5 scale, aimed to streamline the design phases through a geometrical fit check, ensuring quicker iterations and reducing the risk of errors in later production stages.

MANUFACTURING SET UP

MATERIAL	ABS + 30% GF
PRINT TIME / POST-PROCESSING	25hrs - Sanding and Drilling
WEIGHT / SIZE	30 kg - 1000 x 1400 x 1450 mm
LEAD TIME REDUCTION	60%
WASTE REDUCTION	60%
COST SAVING	40%



Service

At your service, from designing your production layout to guaranteeing your manufacturing continuity.

At Caracol we want to ensure we provide best-in-class solutions to optimize your production efficiency.

Our team oversees the installation, layout design, and start-up of our LFAM platforms, providing training to manage the technology correctly and safely, teaching you how to perfect your skills printing with LFAM, applications know-how, and assistance with maintenance, spare parts, and remote support.

All with the aim of ensuring your successful manufacturing of parts and production continuity.



SERVICE PACKAGES

Learn about the different options you can access; from the Light to the Continuity packages, you can choose a support customized to your know-how and needs. Includes: WARRANTY, MAINTENANCE, SPARE PARTS, HOTLINE, TRAINING, and more.



TRAINING PROGRAMS

Become an LFAM expert with our tailored programs made to help you advance your skills from CAD to Slicing, to operating your machine and 3D Printing to Post-Processing.

CARRACOL



Copyright 2025 Caracol S.r.l.

Via Marisa Bellisario, 6C
Bartassina (MB) | Italia

General Requests: info@caracol-am.com

Commercial Requests: bd@caracol-am.com

This document and its parts cannot be duplicated or shared with third parties without the explicit consent by Caracol S.r.l. This document's conformity has been verified with regards to the described hardware and software.

Minimal differences and variations on the technology cannot be excluded with the utmost certainty.

All information in this document has been checked, any edits or technical improvements and variations to the described technology will be published in following versions.

Version: HERON AM - 2510

caracol-am.com

HERON AM - 2510

CARACOL