

BUILD BEYOND POSSIBLE

with Advanced Robotic Manufacturing

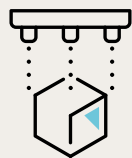
Caracol is a leader in advanced manufacturing, developing robotic platforms for complex industrial production with composites and metals. Since 2015, Caracol has built its tech around one principle: provide the tools for companies to solve their real production needs, so they can produce complex, high-performance applications while cutting costs, lead times, waste, and providing greater flexibility in their parts engineering and value chains.

The company's mission is to change the manufacturing paradigm, making it more efficient, flexible, and sustainable.

An Ecosystem to enable Advanced Manufacturing

Caracol designs and delivers all the key ingredients to provide a fully integrated ecosystem: hardware, software, materials, process and application know-how.

Why this matters for manufacturers



Industrialized tech platform
ready to implement in
production workflow and scale



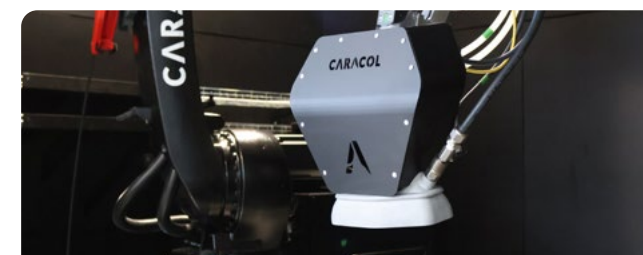
Less integration work,
faster go-to-market



A single partner accountable
for the full process, from part
engineering to industrial output

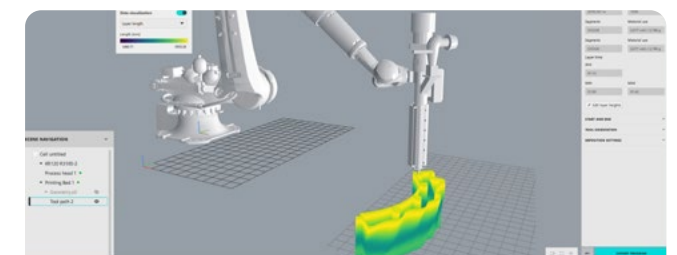
The four ingredients

Caracol's ecosystem combines key elements – hardware, software, materials, and process knowledge. This is what enables customers to implement a new process, from designing phase to industrial production seamlessly.



01. Hardware

Two robotic platforms, Heron AM and Vipra AM, cover the full range of large-format polymer and metal Additive Manufacturing. Modular and scalable, both systems are engineered for lights-out industrial production.



02. Software

Eidos Manufacturing Software Suite is Caracol's proprietary tool to control its robotic platforms. It handles slicing, toolpath planning, process monitoring, fleet management, and AI-capabilities: the link between digital files and machine output.



03. Materials

An extensive portfolio of high-performance composites and metal alloys. Each material is qualified for the platforms, to provide exact processing parameters and characterization info for the application's requirements.



04. Applications & Process

Cross-sector expertise built across the production of hundreds of real industrial applications – covering process development, application engineering, technical training, and global support.



VIPRA AM

Robotic WAAM for large scale metal production

Vipra AM is Caracol's WAAM platform for large-scale metal parts production. Its 9-axis kinematics give manufacturers the motion freedom needed to produce complex geometries, overhangs, and multi-angle depositions that conventional technologies cannot achieve.



- 1 DEPOSITION HEAD
- 2 SENSORS
- 3 ROBOTIC ARM
- 4 EXTERNAL MANIPULATOR

- 5 LINEAR TRACK
 - 6 FUME EXTRACTOR*
WELDING POWER SOURCE*
CONTROL CABINET*
- *on the back, in a dedicated area
separate from the robotic cell

up to **95%**
LEAD TIME REDUCTION

up to **90%**
BUY-TO-FLY RATIO



The most demanding metal applications need advanced tools. Vipra AM is the solution.
Explore configurations, qualified materials, and industrial case studies across aerospace, marine, and oil & gas in the full brochure. [Or click here!](#)

Built for industrial safety

Vipra AM is designed to meet industrial machine compliance directives through a dedicated safety architecture. Powered by **Cold Metal Transfer (CMT)** technology, it delivers safe, stable, and high-quality wire arc additive manufacturing for demanding industrial applications.

Build Volume	2.5 x 2.0 x 2.0 m	8.2 x 6.6 x 6.6 ft
Wire Diameter Size	0.8 - 1.6 mm	0.03 - 0.06 in
Wire Feed Speed	1.0 - 15.0 m/min	39 - 590 ipm
Max Deposition Rate	6.0 kg/h	13.2 lb/h

Enclosure

The enclosure features a fully blind automatic door equipped with integrated sensors that prevent operation unless the door is correctly closed and locked. A sensor-equipped floor detects operator presence inside the cell and inhibits system activation in unauthorized conditions.

Real-time process intelligence

Vipra AM's end effector integrates a variety of optional advanced sensor suite for real-time quality data collection, for best-in-class process monitoring.

- **PYROMETER:** The pyrometer measures temperature at each layer, feeding a closed-loop system that automatically regulates inter-layer timing to maintain consistent thermal parameters;
- **PROFILOMETER:** The profilometer scans the bead profile after each pass, delivering automatic morphological data without manual in-cell intervention;
- **THERMAL WELDING CAMERA:** The thermal welding camera and 3D scanner provide full thermal mapping and geometric deviation tracking against the nominal CAD throughout the build.

Designed for easy handling of heavy parts

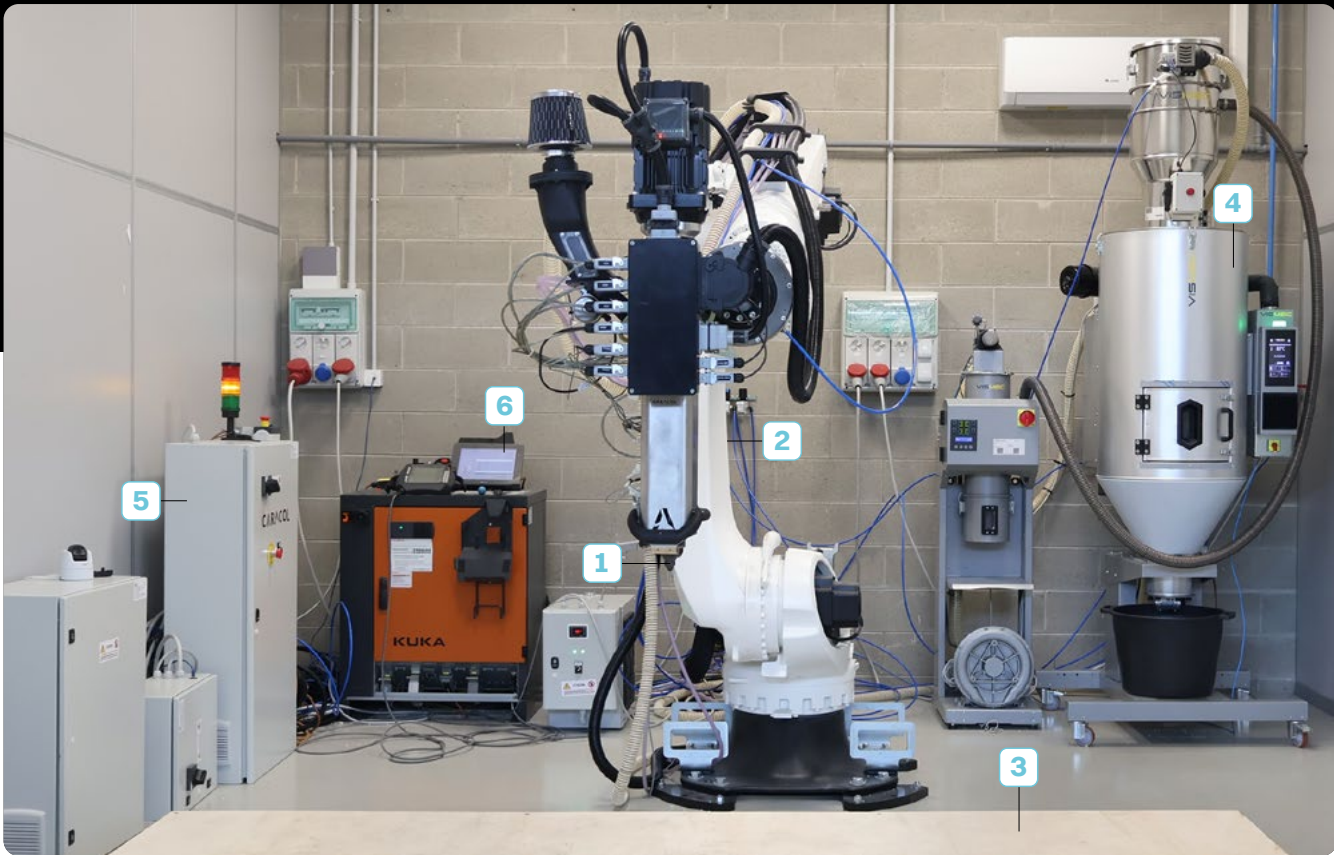
Vipra AM operates on 9-axes, adding a pre-positioning rail for the rotary-tilt positioner to the standard 8-axis configuration. This allows heavy components to be loaded and unloaded without auxiliary lifting equipment inside the cell, reducing operational complexity and safety risk.



HERON AM

Robotic LFAM for polymers and composite production

Heron AM is Caracol's pellet extrusion technology for large-scale additive production of polymer and composite parts. Powered by 6+ axis industrial robot arms, the platform delivers unmatched flexibility for producing highly complex part geometries.



- 1

EXTRUDER
- 2

ROBOTIC ARM
- 3

PRINTING BED
- 4

DRYING & FEEDING SYSTEM
- 5

CONTROL CABINETS
- 6

CONTROL SYSTEM

up to

80%

LEAD TIME REDUCTION

up to

50%

COST REDUCTION



Complex requirements need accurate answers. Heron AM provides them.
Scan and explore the full Heron AM brochure for every configuration, technical data, and real case studies. [Or click here!](#)

Extruders

A set of extruders developed to meet specific application requirements - changing throughput, layer height, and materials. All units include control, layer cooling, anti-collision system, and automated drying and feeding.

	HA	HV	HF	xHF
Max throughput	2 kg/h 4.4 lb/h	12 kg/h 26.5 lb/h	30 kg/h 66.1 lb/h	75 kg/h 165 lb/h
Nozzle range	1-5 mm	2-8 mm	5-18 mm	5-24 mm
Max temperature	350°C	450°C	450°C	450°C

Printing Bed

Four configurations, with customizable size and tops:

- FLEXIBLE:** Configurable aluminum frame with interchangeable wood top panels, a cost-effective solution for varied production needs. Payload capacity up to 250 kg.
- HEAVY DUTY:** High rigidity steel frame for demanding production and hybrid print-mill workflows. Interchangeable wood top panels. Payload capacity up to 3000 kg.
- AUTOMATIC (patented):** Steel conveyor system cycling printed parts off the bed for fully unattended production runs, with unmanned clamping and automatic release. Includes heating. Payload capacity up to 500 kg.
- HEATED:** Lightweight aluminum heated plate for best-in-class surface finish and first-layer adhesion, ideal for warpable materials. Up to 110°C per module. Available as add-on for FLEX.

Automatic tool changer

Heron AM can be equipped with a fully automatic tool changing station, enabling seamless switching between extruder, 3D scanning, and milling spindle.

Two configurations available:

- HYBRID SYSTEM:** combines LFAM with 3D Scan, and CNC milling. The robot switches automatically between end effectors, such as extruder and milling spindle, enabling printing, scanning, trimming, cutting, drilling, and surface finishing operations seamlessly.
- MULTI EXTRUDER:** enables automatic switching between two extruders within the same job. Allows combining high-throughput production with precision finishing on a single part, without reconfiguration.

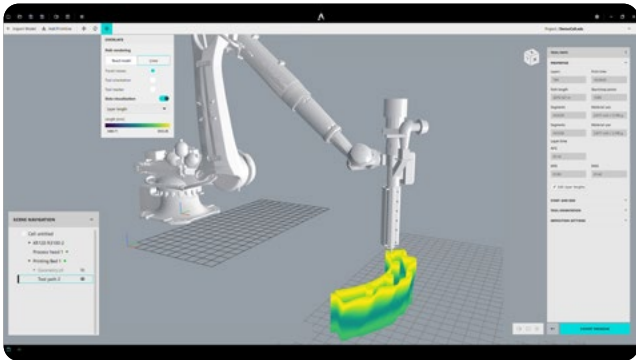


Eidos Manufacturing Software Suite

The brain behind process and motion

Eidos Manufacturing is Caracol's proprietary software suite, developed specifically for robotic large-format additive manufacturing. It covers the full production workflow - from digital file to machine execution - and connects process control, monitoring, and data management in a single platform integrated with Heron AM and Vipra AM.

The suite is built around two modules with distinct functions:



Eidos Builder

The slicing and programming environment for robotic LFAM. **Builder converts 3D models into optimized machine programs, supporting advanced toolpath strategies across 6+2 axes** — from planar to non-planar and conformal. It includes toolpath simulation with collision and singularity check, a material library with preset process parameters, and pre-production analysis of print time and material consumption.

To work with fully automated hybrid workflows, **Eidos Builder also enables the Print, Scan & Machine functionalities to combine different processes** and enable continuous multi-process production cycles.



Eidos Nexus

The monitoring and fleet management platform. **Nexus provides real-time process and machine monitoring, 3D data mapping, job history**, preventive maintenance, remote technical assistance, and full fleet management via a centralized dashboard. Raw data streams directly to ERP, MES, and third-party applications via API.

Eidos Nexus also integrates AI-based process control capabilities that enable the platform to monitor, analyze, and adjust production autonomously.



Eidos goes deeper than any overview can cover
Scan the full brochure to explore slicing strategies, AI-powered process control, and everything in between. [Or click here!](#)

Configurable modules for every production challenge

Eidos Builder and Eidos Nexus can both be extended with additional modules, activated on request to address specific production requirements – from hybrid manufacturing workflows to AI-driven process control.

Eidos Builder Optional modules

	Heron AM	Heron AM - Hybrid Manufacturing	Vipra AM
Slicing & toolpath planning	✓	✓	✓
Hybrid workflow (print, scan, and machine)		✓	
Vipra-specific deposition parameters			✓

Eidos Nexus Modules deep dive

	Lite	Advanced	AI
Live Monitoring	✓	✓	✓
Remote Service	✓	✓	
Remote control software updates	✓	✓	✓
Preventive Maintenance	✓	✓	✓
Fleet Management	✓	✓	✓
Management Dashboard		✓	✓
Time Series		✓	✓
Digital Twin		✓	✓
API		✓	✓
Smart Quality Reports + Predictive Maintenance + Material Development Agent + Closed Loop Agent			✓



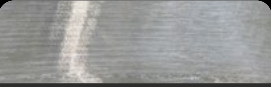
A growing material portfolio, qualified for industrial composite production with Heron AM

Caracol continuously develops and qualifies new materials in collaboration with leading suppliers. Every formulation is tested and validated for large-format robotic extrusion, from standard polymers and recycled composites to high-temperature advanced materials, to guarantee process reliability and part performance across applications.

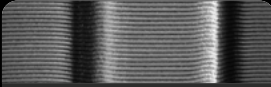
A qualified metal alloy portfolio, built for the most demanding industrial production with Vipra AM

Caracol continuously qualifies new metal alloys in collaboration with leading material suppliers. Every wire feedstock is tested and validated for WAAM production – covering mechanical, thermal, and corrosion properties – to guarantee deposition reliability and part performance across industrial applications.

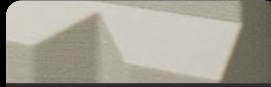
GENERAL PURPOSE AND RECYCLED



PET-G Polyethylene Terephthalate Glycol
rPETG
rPETG + 30% GF

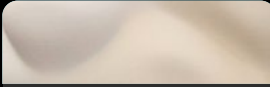


ABS Acrylonitrile Butadiene Styrene
ABS + 20% CF
ABS + 20% GF



PP Polypropylene
rPP + 30% GF

FLEXIBLE & ELASTOMERIC



TPE High Strength and Flex Elastomer

HIGH-TEMPERATURE & STRUCTURAL



PC Polycarbonate
PC + 20% CF



PEI Polyetherimide
PEI + 20% CF



PA Polyamide
PA66 + 25% GF

BIO-BASED & SUSTAINABLE



PLA Polylactic Acid
PLA
PLA + Oyster / Olive / Pine

UV AND CHEMICAL RESISTANT



ASA Acrylonitrile Styrene Acrylate
ASA + 20% GF



HDPE High-Density Polyethylene
HDPE + 20% CF



Every polymer is validated for a different production challenge.

Scan to explore the full Heron AM Materials brochure: specs, applications, and real production examples across transportation, construction, and design. [Or click here!](#)

VERSATILE & COST-EFFECTIVE

- ER70S-6
- ER100S-G
- 316L
- 17-4 PH
- 410 NiMo

STEEL

STEEL

STAINLESS STEEL

STAINLESS STEEL

STAINLESS STEEL

LIGHTWEIGHT & HIGH STRENGTH

- Al2319
- Al6061
- Al7075

ALUMINUM ALLOY

ALUMINUM ALLOY

ALUMINUM ALLOY

THERMAL CONDUCTIVITY & HARSH ENVIRONMENTS

- CuAl8Ni6

COPPER ALLOY

GREAT THERMAL PROPERTIES

- Invar 36
- Inconel 625

IRON-NICKEL ALLOY

NICKEL-BASED SUPERALLOY



Everything you need is in the full Vipra AM Materials brochure.

Scan to explore qualified alloys, technical specs, and real production examples across aerospace, energy, marine, and oil & gas. [Or click here!](#)

Global success stories across industries

Caracol's application-first approach is built on years of manufacturing experience alongside industry leaders, covering the most demanding production requirements in industrial manufacturing.

Industries we work with:

AEROSPACE
& DEFENSE

AUTOMOTIVE



MARINE



RAILWAYS

ENERGY &
INDUSTRIALART &
ENTERTAINMENTARCHITECTURE
& CONSTRUCTION

DESIGN

ADVANCED PARTS
& TOOLS

EDUCATION



Every production challenge has a story behind it.

Scan to explore Caracol's full case study library by technology, industry, and material. [Or click here!](#)



MARINE

THE FIRST 3D PRINTED CATAMARAN

The first functional 6-meter monolithic catamaran for open waters, produced in a single uninterrupted 160-hour print with recycled rPP + 30% GF. The project eliminated the need for molds and assembly, reducing material waste by 30% and lead time by 20%, while establishing a fully repeatable production process ready for industrialization.



AEROSPACE & TOOLING

COMPOSITE LAMINATION MOLD

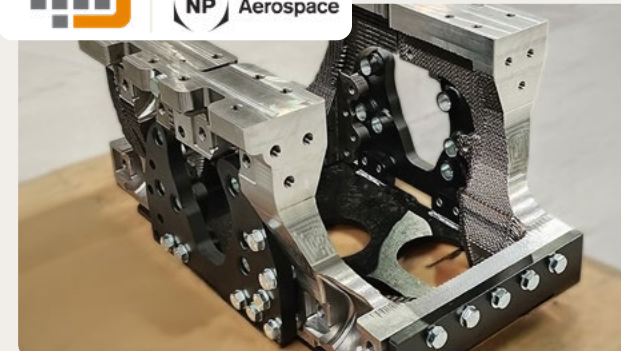
Produced with Heron AM in PC + 20% CF, combining robotic LFAM with CNC machining and autoclave post-processing in a single hybrid workflow. The monolithic structure for aerospace manufacturing eliminated assembly joints and cumulative tolerances, delivering 50% reduction in lead time, 30% in production costs, and 50% in material waste.



DESIGN & FURNITURE

PORTAL: FURNITURE POWERED BY ADVANCED MANUFACTURING

A collection of sculptural chairs designed by internationally renowned designers, produced with Heron AM using recycled and bio-based materials. AI-generated designs were translated directly into physical pieces through robotic LFAM, demonstrating on-demand, mold-free production of fully customized furniture at scale.



AUTOMOTIVE

MASTIFF SUSPENSION & DIFFERENTIAL CARRIER

A structurally critical 110 kg load-bearing component for a protected vehicle, produced with Vipra AM in ER100 steel in approximately 60 hours of printing. The multi-axis WAAM process enabled complex overhangs, delivering up to 50% lead time reduction and zero tooling costs.



ENERGY & INDUSTRIAL

SAMPLING VALVE BODY FOR OIL & GAS

A stainless-steel SS316L sampling valve body designed for 5 bar line pressure, produced with Vipra AM in 7.5 hours of printing - replacing a casting process that traditionally required approximately 60 days. Near-net-shape WAAM production eliminated mold preparation, cutting lead time by up to 90%.



AEROSPACE & TOOLING

HIGH-PRECISION AUTOCLAVE CURE TOOLS

A stringer mold for aircraft fuselage composite panels, produced with Vipra AM in Invar 36 in 14 hours of deposition at 5 kg/h. The material maintains dimensional stability up to 280°C through repeated autoclave cycles, preventing warping and ensuring consistent composite quality over the tool's full service life.



Services & Training to fit your needs

Service packages: the right level of support, from day one.

Maximizing uptime and process stability requires consistent technical support tailored to your production environment. Caracol's service packages cover every stage of the machine lifecycle, from standard warranty to fully managed continuity programs.

	NO PACKAGE	LIGHT	LIGHT+	CONTINUITY Only Heron AM	CONTINUITY+ Only Heron AM
Warranty	✓	✓	✓	✓	✓
Yearly Maintenance		✓	✓	✓	✓
Spare Parts Kit	✓	✓	✓	✓	✓
Hotline	✓	✓	✓	✓	✓
On-demand Training			✓		✓
Warranty Extension				✓	✓

Training builds the expertise your production demands

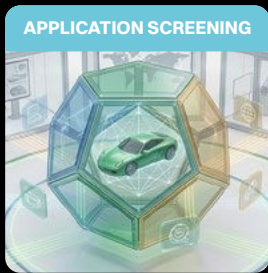
Caracol offers structured training programs for every role and experience level, delivered by specialists with direct production experience across industrial sectors.

	STARTUP*	ON-DEMAND	ACADEMY only for Heron AM
Timing	Free Video Training for Engineering 2/3 days for Operators	40 or 80 hrs based on your service package (extendable)	40 hrs / 1 week
Focus	Key operating skills	Full project support + Direct line with our service team	Advanced LFAM training
Where	Online for Engineer On site for Operators	Online / optional on-site	On-site at Caracol
Target	Designers, Engineers, Operators	Designers, Engineers, Operators	Operators, Engineers, PM, Sales

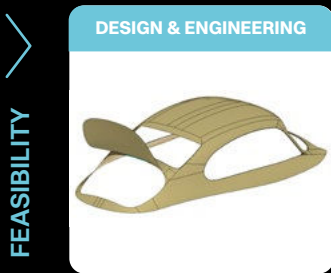
*Always included.

Caracol's commitment: accompanying users from concept to production.

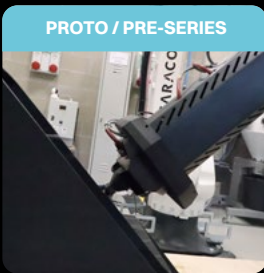
Caracol supports its users through their production journey, ensuring they successfully scale their industrial projects. The end-to-end approach ensures the new technology is fully integrated into workflows and delivers expected returns.



APPLICATION SCREENING



DESIGN & ENGINEERING



PROTO / PRE-SERIES



PRODUCTION

Technical & Operational Feasibility

Certifications, LFAM-specific geometry, production volumes, material compatibility, supply chain fit - all assessed before any commitment.

Design & Engineering for AM

Where needed, components are re-engineered from scratch; optimizing deposition strategy and material selection for the process, not the other way around.

Prototyping & Validation

First-article production, mechanical and metallurgical testing, and application-specific certification when required.

Production at your site

Once the technology is integrated into your production plant, you can deliver repeatable and qualified part output, even in remote or operationally demanding environments, adapting to whatever timelines and requirements come up.

Economic Viability

Manufacturing costs and lifecycle evaluation, to determine whether it actually makes sense to proceed.



Services evolve with your production needs.

Scan to download the full services brochure: packages, training programs, and everything Caracol offers to keep your system running at its best. [Or click here!](#)

