PASStech
OVERMACH GROUP

Additive Manufacturing Division

www.passtechme.com | www.overmach.it

PASSTECH

- 39 Years in Middle East
- 2,640 Machines installed in Middle East
- 80 Employees in Middle East
- 3 Passtech offices around the world (UAE, Saudi Arabia, and United Kingdom)
- ISO 9001 : 2015 Certified

OVERMACH

- 500 Employees in Overmach Group
- 86 Salesmen on territory
- 189 Specialized technicians
- 6 Overmach Offices in Italy
- 27,000 Installed machine tools in Italy
- 42,000 Customers in the World

eiac
مركز الإمارات العالمي للاعتماد
Emirates International Accreditation Centre
040-CB-QMS

SWTÜV CERTIFICATIONS CERTIFIED ISO 9001:2015

Plot D3-003, Sharjah Airport International Free Zone (SAIF), PO box 8493
Sharjah, United Arab Emirates

OVERMACH

DIVISIONS

OVERMACH ADDITIVE

Rapid prototyping machines represent the current technological frontier for knocking down the time-to-market of a wide category of industrial products. This Division was created on purpose, with a suitable structure for satisfying the high level technology request, dealing with 3Dprinters Stratasys Mojo series uPrint, Dimension, Fortus and objet.

OVERMACH ENGINEERING

Overmach Engineering is responsible for analyzing in solving any production problem of the Customer. Main activities are Technical Analysis of the feasibility, time and methods study, calculation of production volume, supply & proposal for special workpiece clamping equipment for a turn key supply project, etc.

OVERMACH SERVICE

Engineer's, Mechanical Engineers, Electro-technical and CNC Programming Operation one at top basis of high level service.

OVERMACH TOOLS

Overmach tools division is able to offer static and driven toolholders, insert holders, hart metal inserts, mills, drills, taps, borers, steady rest & magnetic hydraulic chucks, filter spin dies, vices, cubes, rotary tables, air filter and angular multiple attachments, Magnetic tables and lifters, Industrial Furniture, Instruments for measuring and workpiece and tools.

SOCIÉTÉ

OVERMACH AFRICA

Thanks to the strong skills acquired and to the consolidated experience of Overmach, this company takes shape, already active in various countries

PASStech OVERMACH GROUP

Part of Overmach Group operative in the Middle East for 39 years, 2640 Installed machines, 80 staff, multicultural and multifunctional company.

OVERMACH MACCHINE UTENSILI

The best machines tools in the world DN Solutions No. 1 Dealer in the world 27,000 installed machines in Italy

OSL OVERMACH

OSL Sri is a company specialized in software for the production management, planning and data collection for mechanical companies, OSL now joined the Overmach Group integrating the previous Overmach Sistemi division

CAR SERVICE S.r.l. GRUPPO OVERMACH

Logistic Partner For Machine Tools' Transport And Handling Since 1983, Car Service Srl is the best solution for the movement of industrial machinery and heavy transport. With an impressive fleet of vehicles, Car Service is able to carry out industrial transports without size limitations on domestic and international territory, with high specialization in transport with cranes and machinery handling.

PASStech
OVERMACH GROUP

- Best Dealer
- Leading Provider

YEARS IN M.E. 39

STAFF IN M.E. 80

STAFF IN ITALY 500

MACHINES SOLD IN M.E 2640

#1 in M.E. & EUROPE

Passtech Machine Tools is part of Overmach Group Company operates in the Middle East for over 39 years with 80 Employees in 3 strategically located Offices and 2,640 sold machines. Passtech supplies global market leading products & supports them with complete after sales & support function, embracing servicing, applications work & turnkey supply bringing value for money & high technology for the whole Middle East region.

Our Product Range

CNC Milling

CNC Turning

CNC Boring

Grinding

EDM/EDW

Waterjet Cutting

Plasma Cutting

Laser Cutting

Robots

Conventional

3D Printers

BANDSAW

Metrology

Pipe Bending

Tools

Fanuc

CAD/CAM & PMS

TopSolid

OSL OVERMACH

Air Filter

Coolant/Lubricants

www.passtechme.com | www.overmach.it

PASStech
OVERMACH GROUP

Brand Partners

Additive Manufacturing

Nikon SLM SOLUTIONS
ExOne
CARACOL
stratasys
ADDiTEC Print Different
SMARTTECH 3D METROLOGY

Metal Cutting Division

DN SOLUTIONS
Hartford
UNITED +GF+ MACHINING SOLUTIONS
correa
NEWAY
Okamoto
PROKING
COSEN
PALMARY
star
FULLTONTECH
BEMATO
belotti cnc machining centers
EXCETEK
TORNI TAICHI
ITAMA MACCHINE UTENSILI
YSP YU-SHINE
XYZ Machine Tools
Cielle
Precihole Inspire - Innovate - Deliver
WIDMA
ITL Industries Ltd.
GURUTZPE
MYDAY MACHINERY INC.
ZOLLER expect great measures

Software Solutions

OSL OVERMACH
TopSolid
GRABCAD PRINT

Tools & Accessories

KENNAMETAL
Cogsdill
COMAND TOOL
D'ANDREA
MG
KINTEK
FILTERMIST
GERARDI
SGS
LNS
STOCK
POSITHREAD
RENISHAW apply innovation™
SMW AUTOBLOK
Alberti
tamburini
NIKKEN

Sheet Metal Machines & Tools

BENDMAK BENDING & DRILLING & WELDING SOLUTIONS
TECHNOLOGY
MVD
DERATECH
TCI cutting
LOCATELLI MECCANICA
axeroll
PEDRAZZOLI
CML
FOR THE WORLD
Alloritools FOR CNC MACHINES
BFT A Member of Dr. Achilleon Group
BLM GROUP
BM MACHINE
PMT Water Jet
RITMAN 瑞马智能
SHENGLONG
大东科技 DARDONTECH
FORSUN

www.passtechme.com | www.overmach.it

PASStech
OVERMACH GROUP

Nikon SLM SOLUTIONS

Brand Partner

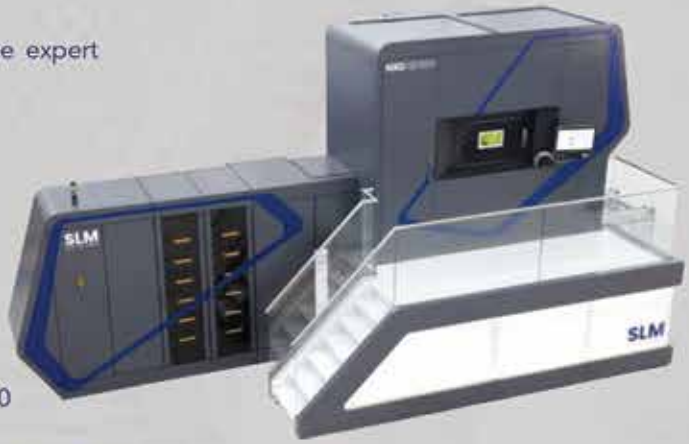
Nikon SLM Solutions

Why SLM Solutions?

Specializing in Metal

SLM Solutions co-invented selective Laser Melting and the expert advancement of that technology is all we focus on

Co-inventor of Selective Laser Melting Technology in 1996



First to the market with multi-laser systems for industry leading build rates

- Dual laser SLM®280 in 2011
- Quad laser SLM®500 in 2013
- 12 laser machine: NXG XII 600 in 2020

Patented innovations increase productivity and quality

- Bi-directional recoating process - Minimize laser off-time
- Multi laser overlap stitching - Seamless builds with multiple lasers
- Sintered wall gas flow - Minimized variation of material properties

Focus on system safety

- Closed-loop powder handling

Nikon-SLM Product Portfolio

SLM 280
Build Envelope : 280 x 280 x 280 mm
Laser Configuration:
Single (1x700W), Twin (2x700W)
Build Rate: up to 88cm3/h

SLM 500
Build Envelope : 500 x 280 x 365 mm
Laser Configuration:
Twin (2x700W)
Quad (4x700W)
Build Rate: up to 171cm3/h

SLM NXG Xii 600
The NXG series outpaces standard systems with 20x faster speeds and introduces a unique removable build cylinder to slash idle times.

Build Envelope : 600 x 600 x 600 mm
Laser Configuration: 12 x 1000W

www.passtechme.com | www.overmach.it

PASStech
OVERMACH GROUP

Nikon SLM
SOLUTIONS

Nikon SLM Qualified Materials

SLM Solutions' systems support a wide range of materials and new qualified materials are being added on a regular basis. They also support open parameters and materials enabling you to use custom materials based on your specific application needs. Here is a list of qualified materials that are readily available.

Tool & Stainless Steels

Maraging Steel 1.2709, SS 316L, Tool Steel H13, SS 17-4PH, SS 15-5PH

Nickel Based Alloys

INCONEL 625, INCONEL 718, INCONEL 939, HX (2.4665)

Titanium Based Alloys

Titanium Grade.II, Ti6Al4V Grade 23, Ti6Al4V Grade 5, TA15

Aluminium Based Alloys

AlSi10Mg, AlSi7Mg, AlSi9Cu3

Copper Based Alloys

CuSn10, Bronze, CuNi2SiCr, CuCr1Zr

Cobalt Based Alloys

CoCr28Mo6, SLM® Medi- Dent

Our experts continuously collaborate with customers to develop new alloys optimized for selective laser melting and qualified parameters perfectly paired with our powder

Nikon SLM Applications

Selective Laser Melting technology is increasingly being adopted across various Industrial sectors, here are some of the applications in the energy sector.

Valves

Valve Actuators

- Sizes: from <10cm³ to >50X50X50
- Material: SS | Ni
- Systems: SLM280 | SLM500

Pumps

Impellers

- Sizes: from Ø10X10 to Ø100X50
- Material: SS | Ni | Ti | Cu
- Systems: SLM280

Downhole

Filters / Separators

- Sizes: from Ø5X15 to Ø30X150
- Material: SS | In625 | Custom
- Systems: SLM280

Stator Parts

Nozzles / Valves

- Sizes: from 20X30X20 to 70X50X50
- Material: Hx | In718 | In939 | Custom
- Systems: SLM280 | SLM500

Shrouds

- Sizes: from 20X30X20 to 70X50X50
- Material: Hx | In718 | In939 |Custom
- Systems: SLM280 | SLM500

Liners / Transition Pieces

- Sizes: from Ø20X50 to Ø60X100+
- Material: Hx | In718
- Systems: SLM800

Rotor Parts

Blades

- Sizes: from 10X10X20 to 20X20X50
- Material: Under Development
- Systems: SLM280 | SLM500

Bearings

- Sizes: Ø20X15 to Ø60X50
- Material: SS | Hx + Coating
- Systems: SLM280

Combustors

Burners / Fuel Nozzles

- Sizes: from 10cm³ to 20X50X30
- Material: HC | In718 | CoCr
- Systems: SLM280 | SLM500

Other Parts

Heat Exchangers

- Sizes: All
- Material: Al | Ni | Cu
- Systems: SLM280 | SLM500 | NL

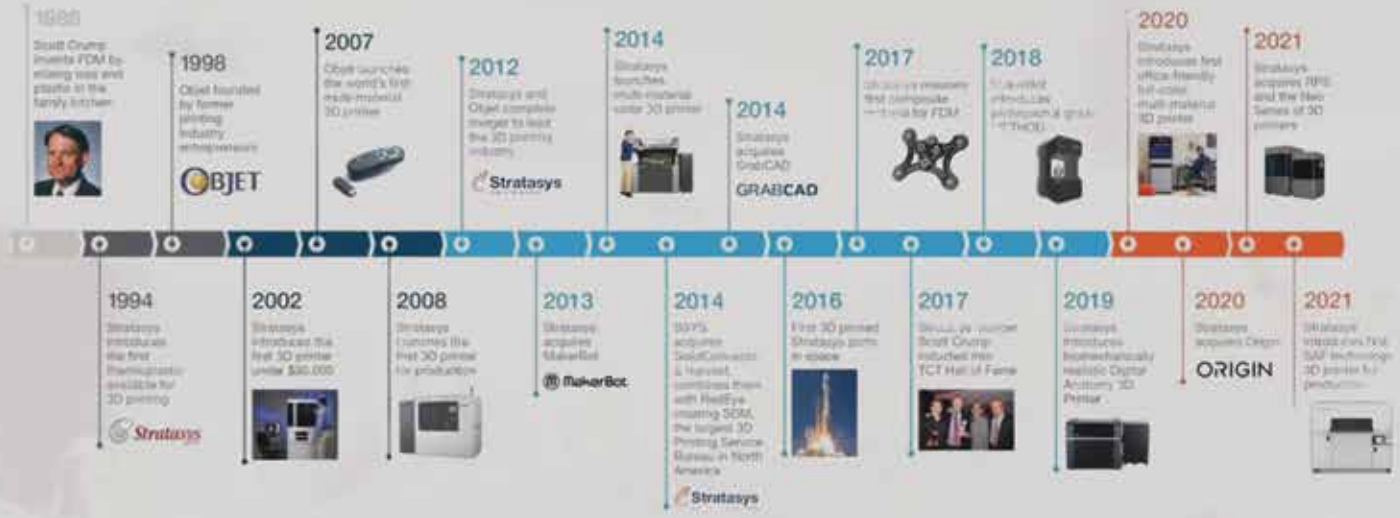
PASStech
OVERMACH GROUP

stratasys

Brand Partner

Stratasys

A 30+ year history of accelerating innovation



Broadest, best-in-class portfolio for the entire value chain

PolyJet	Stereolithography	Industrial FDM	Origin P3	SAF
Prototypes / Medical Modeling	**Prototypes / Tooling / Molds**	**Manufacturing Tools / Production Parts**	**Mass Production**	**Mass Production**
Detailed, multi color, multi-material realism	Proven reproducibility and dependability with industrial-grade materials	Accuracy, consistency, and prevailing standard for industrial 3D printing	Highly complex and accurate parts, with broad material options	Consistently accurate, cost-effective parts at mass production scale

Global Ecosystem for Industry 4.0 Scale

GrabCAD Additive Manufacturing Platform

GRABCAD SHOP · GRABCAD PRINT · GrabCAD SDKs · Identify3D · LINK3D · nTopology · KeyShot

Materials Ecosystem

Antero · ABS-CF10 · Nylon 12CF PA11 · ULTEM™ · BASF · Henkel · covestro

www.passtechme.com | www.overmach.it

PASStech OVERMACH GROUP

stratasys

Stratasys Product Portfolio

FDM® Portfolio

Reliable. Repeatable. Accurate.

F123 Series

Prototypes / Tooling

The all-in-one rapid prototyping system. F123 Series printers combine industrial-grade capability with simple operation.

F770™

Prototypes / Tooling / Molds

Print large on a small budget. Delivers spacious build capacity in an easy-to-use platform with the reliability and consistency of Stratasys FDM technology.

Fortus 450

Manufacturing Tools / Production Parts

Offers a generously sized build chamber to build prototypes, end- use parts and tooling in a production environment.

F900

Manufacturing Tools / Production Parts

Versatile performance on an industrial scale. Enables additive manufacturing at scale while delivering consistent, accurate results.

PolyJet™ Portfolio

Unmatched realism for design and engineering prototypes

J35™Pro

Functional Design / Concept Models

Affordable PolyJet desktop 3D printer suitable for the shared office. Offers multi-material capabilities for functional design and concept modeling.

J55™Prime

Design / Engineering Prototypes

Full-color, high-fidelity printing with tactile, functional and sensory capabilities. Create quick design iterations and high-quality final prototypes, in a compact, quiet, and odorless system.

J8 Series

Design / Engineering Prototypes

The most versatile full-color printers on the market with over 500,000 unique colors, realistic texture simulation, flexible and transparent materials in a click-and-print workflow.

J4100

Prototypes / Manufacturing Tools

An ultra-large build tray, multi- material capabilities, fast throughput, and a wide range of material properties mean unlimited design possibilities and improved productivity.

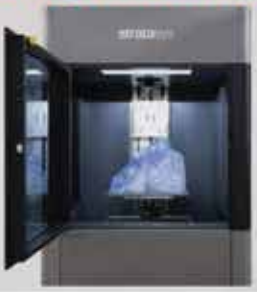
PASStech
OVERMACH GROUP

stratasys

Stratasys Product Portfolio

Stereolithography (SLA)

Build high-quality parts with superior surface quality, accuracy and detail



Stereolithography (SLA) Technology is an additive manufacturing process that uses a vat of liquid UV-curable photopolymer resin and a UV laser to build parts one layer at a time. Benefits of stereolithography include: Parts with smooth sidewall quality and detail Low volume part production of complex geometries Tight tolerances, layer thickness of between 50-200micron Versatile range of photosensitive resin materials for specific applications.

Programmable PhotoPolymerization P3™

Highly complex and accurate parts, with broad material options

Programmable Photo Polymerization P3™ technology, an evolution of digital light processing (DLP) is ushering in a new era in 3D printing: the mass production of functional end-use parts. P3 software precisely orchestrates light, temperature, pull forces and pneumatics to optimize prints for the best possible results. With P3, manufacturers can achieve injection molding part quality and surface finish with incredible accuracy, in a diverse and continuously growing range of high-performance photosensitive resin materials.

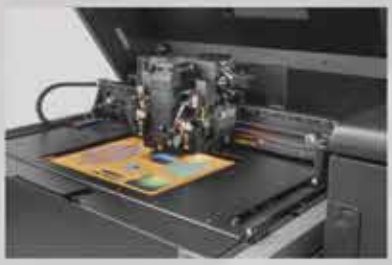
SAF™ Selective Absorption Fusion™

Consistently accurate, cost-effective parts at mass production scale

Selective Absorption Fusion™, The SAFTM powder bed fusion 3D printer controls production and costs. Grow your business through high-volume 3D printing and consistent end-use functional parts with high strength polymers such as High Yield PA11 and PA12

3D Fashion Technology

Revolutionizing the world of fashion



3DFashion Technology, is a revolutionary technology that allows direct-to-textile printing in full color and clear print enabling the creation of spectacular designs and fantastic optical illusionary effects on garments, footwear and luxury accessories. 3DFashion technology enables optimization of the absorption rate mechanism allowing for perfect adhesion on a variety of fabric types.

PASStech
OVERMACH GROUP

stratasys

Stratasys Applications

Design Realism

Product Design Appearance Models

- 500,000 colors
- PANTONE validated
- Keyshot integration
- Bump mapping texture
- 3MF file format

PJ full-color & texture 3D printed models enable industrial designers to make smarter design decisions, shorten product time-to-market, and cut 80% of CMF models cost

Rapid Prototyping

Prototype with advanced engineering 3D printing materials

- Achieve part properties close to injection molded parts
- Print dimensionally-accurate assemblies
- Accelerate product design and iteration cycles
- Bring products to market faster

Manufacturing Tooling

Improve production line efficiency with 3D printed manufacturing aids

- Customized low-volume tools and lower costs
- Reduce lead time
- Eliminate assembly steps
- Improve performance, accuracy and ergonomics

Shorten production time with 3D printed tooling

- Cut tooling lead time from months to days
- Reduce costs
- Enable innovative tooling solutions
- Optimize design and build parameters

ABS-CF10 offers excellent stiffness for alignment tools like this weldment fixture

Production Parts

Production parts with High-performance materials

- Pioneered 3D printing on airliners with thousands of flight-approved parts printed on Stratasys FDM machines
- Consistent, accurate parts for demanding low- volume applications
- Materials meeting standards for smoke, fire, toxicity, chemical resistance and vibration

3D printed bracketing for the Airbus A350, manufactured by Stratasys Direct Manufacturing with FDM Technology and ULTEM™ 9085 resin.

PASStech
OVERMACH GROUP

CARACOL

Brand Partner

CARACOL

Caracol's Robotic LFAM Heron Systems have several benefits compared to other production systems

Large Scale Components

Caracol's robotic system prints advanced parts with no scale limits, up to 12 m.

Complex Parts

Caracol's software algorithms and use of a 6-axis robotic arm allow to manufacture a higher number of applications and more complex geometries.

Lower Operating Costs & Flexibility

A highly flexible that adapts to productive needs, it works efficiently with low operating costs without compromising on quality and performance.

Lower Raw Material Costs

Works with a wide range of composites: from advanced techno polymers blended with fibers (e.g., carbon, glass) to recycled material shreds.

Drastically Cuts Material Waste

Can reduce up to 60% raw material used in production, using only material needed and printing without supports, it can also manufacture using recycled material.

HERON AM System Components

1 THE EXTRUDER - MODEL 3
single screw extruding head for thermoplastic composites

2 INTEGRATED SOFTWARE PLATFORM
seamless platform for all key design, optimization and movement controls

3 AUTOMATED CONTROL PANEL
integrated panel for movement, extrusion, and DfAM criteria

4 MATERIAL FEEDING SYSTEM
automated system for quality and control of material feeding

5 METAL GRIP PRINTING BED
aluminum mechanical grip printing bed

6 THE ROBOTIC ARM
6-axis manipulator for extruding head movement

7 ROBOT CONTROL SYSTEM
robotic arm visualization and control system

PASStech
OVERMACH GROUP

CARACOL

Materials

PPGF

Polypropylene with 30% Glass Fiber

Good mechanical and lightweight properties. Replaces glass fiber and aluminium applications with positive business case.
Qualified for Marine structural parts and Aerospace molds and tools. Up to 80° c working temperature.

PACF

Polyamide + 30% Carbon Fiber

Stiff, flame-retardant and lightweight. Suitable for high mechanical performance, lightweight structures subject to mid heat range. Ideal for metal replacement to reduce cost and weight. Up to 130 MPa Tensile Strength and 150°C working temperature.

PCCF

Polycarbonate with 20% Carbon fiber

This thermoplastic has great thermal and mechanical properties. It has been qualified for mid-temperature autoclave processes. It goes up to 130° degrees and 3-6 bars as working temperature and pression.

TPE FLEX

TPE high strength and flex elastomer

This TPE-based high-strength and flexibility elastomer, allows to print large scale rubber-like parts. It is ideal for topologically optimized flexible structures.
Goes up to 90 Shore A and 80°c as a working temperature.

PET-G

Polyethylene terephthalate glycol

Polyester based polymer, also available as recycled, transparent, or carbon fiber reinforced. High impact, chemical and UV resistant, great business case. Ideal for PVC- like, exterior structures and prototype applications. Up to 80°C working temperature.

RECYCLED MATERIALS

e.g., PLA, PP, PET-G

Thanks to its direct-printing pellet extruders, Caracol can work with a wide variety of recycled materials obtained both from grinding waste, collecting client's waste, or purchasing material from upcycled sources.

Applications

Tooling Jig for Suction and Positioning of belly fairing panels for Aerospace OEM

Caracol produces tools for aircraft manufacturing process- this tool is used for suction and positioning operations of panels. Compared to the traditional solution where over 30 parts were assembled, the piece was manufactured as 1 and post produced with CNC in an integrated workflow.

Savings Vs. Traditional Solution

Part Integration	From 30+ to 1
Production time	From 2 months to 2 weeks
Cost Savings	35%

Performance Requirements

Weight	120Kg1
Size	84.8 l x 125 w x 32.7 h

Hull for Sailing Dinghy manufactured with Recycled Material

Caracol manufactured a functioning sailing boat, with a 3D printed hull made with 100% recycled PP GF. The boat was designed, produced and tested by athletes that compete in the Open Skiff sailing category to validate the boat's functioning.

Savings Vs. Traditional Solution

Production time	40h
Customizable	100%
Cost Savings	40%

Performance Requirements

Weight	48Kg
Size	280 l x 129 w x 32.5 h

PASStech
OVERMACH GROUP

CARACOL

Build Stronger, Build Faster with Vipra AM

Caracol created Vipra AM to evolve the possibilities of Additive Manufacturing on scale, shape, and materials, bringing its know-how on robotic LFAM to metals. Vipra AM is Caracol's Robotic Large-Format Additive Manufacturing platform – an adaptive metal robotic 3D printer, for large scale, industrial applications.

With its DNA in industrial production of large-scale parts, Caracol perfected Vipra AM with end-user's needs in mind, following years of research and experience manufacturing parts for clients across sectors.

key benefits of Vipra AM:

QUALITY

Made to build high-strength, high-integrity parts that meet the demanding specifications of advanced industries

EFFICENCY

Drastically cut lead times (up to 90/95% vs traditional forging or casting) and lower costs

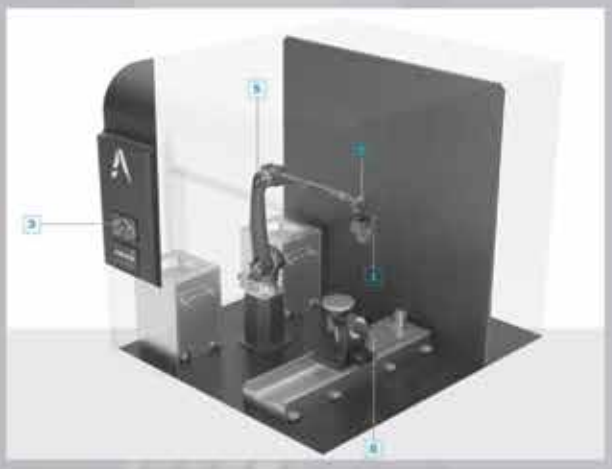
SUSTAINABILITY

Cutting material used and waste significantly, achieving buy-to-fly rations as high as 90%, and lowering the overall impact of production

FLEXIBILITY

Allowing high degree of customization in design and geometries, printing on-demand complex parts, eliminating needs for large stock

Vipra AM System Components



1 DEPOSITION HEAD

Vipra system comes with two deposition head options, XQ (Extreme quality) based on Plasma arc deposition technology and XP (extreme productivity) based on Cold Metal Transfer technology

2 SENSORS

Vipra AM's sensors offer real-time monitoring of key parameters, including layer geometry through laser scanning and welding cameras, thermal development around the weld pool using thermal cameras and pyrometers, and the gas flow of the shielding system

3 EIDOS MANUFACTURING SOFTWARE SUITE

Caracol developed its software suite Eidos Manufacturing after years working on LFAM, slicing strategies, and robotic cinematics. The suite completes Vipra AM's platform to provide full control and flexibility

4 CONTROL CABINET

5 ROBOTICS

Caracol equipped the Vipra AM with a 9 axes industrial anthropomorphous robotic arm and positioner kinematics, to maximize flexibility and 3D print parts with complex geometries.

6 EXTERNAL MANIPULATOR

7 WELDING POWER SOURCE

PASStech
OVERMACH GROUP

CARACOL

Our Materials

ER70S
Steel

High-quality carbon steel, strong and ductile. Reliable for general fabrication, construction, repair work, and sectors that demand durable and efficient materials.

316L
Stainless Steel

A durable austenitic stainless steel with excellent corrosion resistance, especially in chloride- rich environments. Resists to acids and solvents (e.g., marine, water treatment, chemical).

17-4PH
Stainless Steel

Precipitation-hardening stainless steel that combines high strength and hardness with good corrosion resistance. Suitable parts with high mechanical performance

Invar 36

An iron-nickel alloy known for its very low coefficient of thermal expansion, making it ideal for precision instruments and applications requiring dimensional stability over a wide range of temperatures.

CuAl8Ni6
Copper Alloy

A copper-aluminum-nickel alloy known for excellent corrosion resistance, high mechanical strength, and good wear resistance. Ideal for marine and industrial environments with harsh conditions.

410NiMo

A martensitic stainless-steel alloy with nickel and molybdenum that enhances strength and toughness. Ideal for part with corrosion resistance and wear resistance

Ti64 (Ti-6Al-4V)
Titanium Alloy

A high strength, low density, and excellent corrosion resistance material. This alloy is widely used in the aerospace sector where lightweight and strength are paramount.

2319
Aluminum Alloy

High strength material, well suited for aerospace components that operate at elevated temperatures. Known for its good mechanical properties after heat treatment

Inconel 625

A nickel-based superalloy with exceptional strength, fatigue and corrosion resistance, and in a wide range of temperatures.

Case Study - MULTI-MATERIAL NECK FLANGE

We produced multi-material neck flanges using Vipra AM, leveraging the system's flexibility to manufacture with two materials: Inconel 625 for its strength and corrosion resistance and ER70S Steel for its versatility and durability. This approach delivers a high-performance solution designed to withstand the extreme pressures, temperatures, and corrosive environments found in the Oil & Gas industry.

BENEFITS

- MULTI-MATERIAL PRODUCTION: easy integration of two materials to optimize part performance, functionalities and costs.
- OPTIMIZED PART: Inconel 625 was used in high- stress, high-corrosion regions, and ER70S steel for less critical areas, to maintain a material-efficient design while guaranteeing part performance.
- INCONEL 625: ideal for components exposed to severe environments, it provides exceptional fatigue and stress-corrosion cracking resistance.
- ER70S STEEL: it offers good mechanical properties and, when used in combination with Inconel 625, it adds cost-efficiency without compromising on performance.

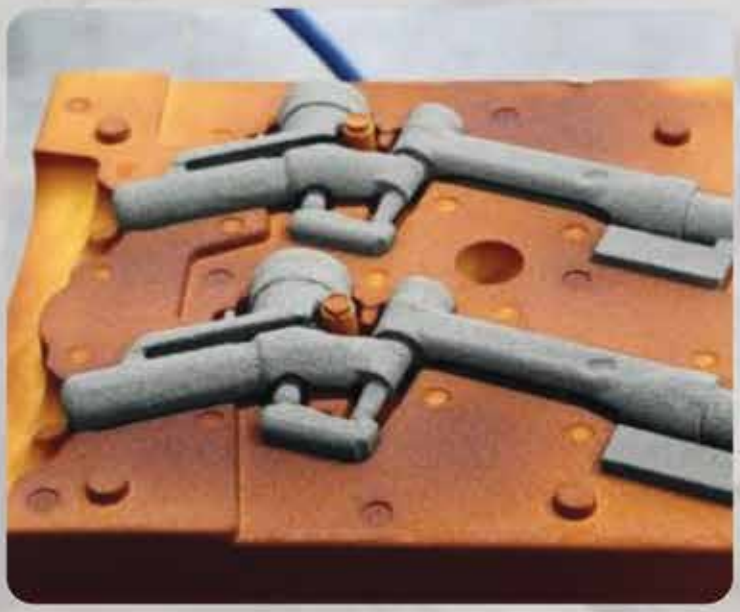
MANUFACTURING SET UP	
SYSTEM	Vipra XP
MATERIAL	Inconel625 + ER70S Steel
POST-PROCESSING	CNC
DEPOSITION RATE [kg/h]	5
WEIGHT [kg]	22
DIMENSIONS [mm]	270x270x110
PRINT TIME [hr]	4.3

PASStech
OVERMACH GROUP

ExOne

ExOne

Pioneers & Global AM Leaders



Since 1995, ExOne has been on a mission to deliver powerful 3D printers that solve the toughest problems and enable world-changing innovations.

ExOne's sand 3D printing systems quickly transform granular materials – including silica and ceramic sand – into precision metal casting molds and cores, innovative rapid tooling solutions, as well as functional end-use designs for consumer products and architectural restoration.

Industrial customers use our technology to:

- Save time and money
- Reduce waste
- Increase manufacturing flexibility
- Deliver designs and products that were once impossible

What is Binder Jetting?

Binder jetting is a method of 3D printing in which an industrial printhead quickly deposits a liquid bonding agent onto a thin layer of powdered particles, such as foundry-grade silica or ceramic sand. The process is repeated layer by layer, using a map from a digital design file, until the object is complete.

Initially developed at the Massachusetts Institute of Technology in the early 1990s, ExOne obtained the exclusive license to this inkjet-in-powder-bed method of 3D printing in 1996. After ExOne launched the market's first commercial binder jet 3D printer for metals in 1998, it went on to launch its first sand 3D printer, the S15.

Debuting in 2010, the S-Max® series has gone on to become the world's most trusted sand 3D printing system. After the acquisition by Desktop Metal in 2021, ExOne focused on expanding adoption of sand 3D printing in foundries, for tooling applications, and with innovative infiltrated designs that reduce lead times and costs.

PASStech
OVERMACH GROUP

ExOne

ExOne Product Portfolio

S-Max® Flex

User-friendly and affordable robotic sand 3D printer. Features an industrial robot with an end effector using advanced Single-Pass Jetting. Launched in 2022.

MAIN SPECIFICATIONS

Job box (L x W x H): 1,900 × 1,000 × 1,000 mm
Build volume: 1,900 l (67 ft³)
Build rate**: up to 115 l/h
Layer height***: 0.28 – 0.5 mm
Loss on ignition (LOI)****: 1.1 %

S-Print®

A fast, flexible, reliable and compact sand 3D printing machine. Delivering highly accurate complex parts from digital data since 2005.

MAIN SPECIFICATIONS

Job box (L x W x H): 800 × 500 × 400 mm
Build volume: 160 l (5.6 ft³) Build rate**: up to 40 l/h Layer height***: 0.2 – 0.5 mm
Loss on ignition (LOI)****: 1.0 – 2.1 %

S-Max®

A large and robust sand 3D printer known for reliable performance. Double job box option. Printing cold-hardening binders since 2010.

MAIN SPECIFICATIONS

Job box (L x W x H): 1,800 × 1,000 × 700 mm
Build volume: 1,260 l (44 ft³)
Build rate**: up to 125 l/h
Layer height***: 0.2 – 0.5 mm
Loss on ignition (LOI)****: 1.0 – 2.1 %

S-Max® Pro

Our fastest and smartest large sand 3D printer. All-new automated printhead and recoater. Innovative production features. Introduced in 2019.

MAIN SPECIFICATIONS

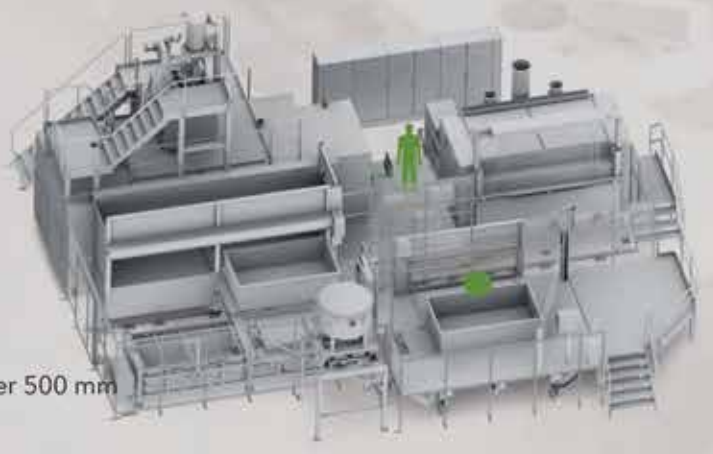
Job box (L x W x H): 1,800 × 1,000 × 700* mm
Build volume: 1,260 l (44 ft³)
Build rate**: up to 145 l/h
Layer height***: 0.2 – 0.5 mm
Loss on ignition (LOI)****: 1.0 – 2.1 %

Exerial™

Series production of complex inorganic sand cores and molds is possible with the Exerial™ 3D printer, containing two job boxes.

TECHNICAL DATA

Job box: L 2,200 × W 1,200 × H 700 mm
Build volume: 2 × 1,848 l (2 × 65.3 ft³)
Build rate: 200 – 250 l/h Layer height: 0.3 mm
Dimensional accuracy: up to +/– 0.5 mm, +/– 0.1 % over 500 mm



www.passtechme.com | www.overmach.it

PASStech OVERMACH GROUP

ExOne

Sand 3D Printing Binders

Furan

Self-Hardening Binder System

CASTING MATERIAL
Steel, Iron, Non-Ferrous Metal

LOI*
1.0-2.1%

CHARACTERISTICS**
Hot strength: 5-8***
Filigree character: 6-8
Strength: 7-8
Environmental impact: 5
Finishing: 5-6

MOLDING MATERIAL
Standard Process: Silica Sand
Alternative: Synthetic Sand

CHP

Cold-Hardening Binder System

CASTING MATERIAL
Steel, Iron, Non-Ferrous Metal, Bronze

LOI*
1.4-2.1%

CHARACTERISTICS**
Hot strength: 7-10
Filigree character: 10
Strength: 8-10
Environmental impact: 6
Finishing: 10

MOLDING MATERIAL
Standard Process: Silica Sand
Alternative: Synthetic Sand

HHP

Hot-Hardening Binder System

CASTING MATERIAL
Steel, Iron, Non-Ferrous Metal, Bronze

LOI*
1.5-2.1%

CHARACTERISTICS**
Hot strength: 9-10
Filigree character: 7-8
Strength: 9-10
Environmental impact: 4
Finishing: 7-8

MOLDING MATERIAL
Standard Process: Synthetic Sand

Inorganic

Inorganic Binder System

CASTING MATERIAL
Non-Ferrous Metal, Light Metal

LOI*
~0.3%****

CHARACTERISTICS**
Hot strength: 3-4
Filigree character: 8-9
Strength: 5-6
Environmental impact: 10
Finishing: 9

MOLDING MATERIAL
Standard Process: Silica Sand
Alternative: Synthetic Sand or Combination

Binder Jetting |Process Overview

Liquid binder applied to powder to form parts and tooling

Digital File Prep

Machine & Material Prep

3D Printing

Next steps depend on application and specific materials

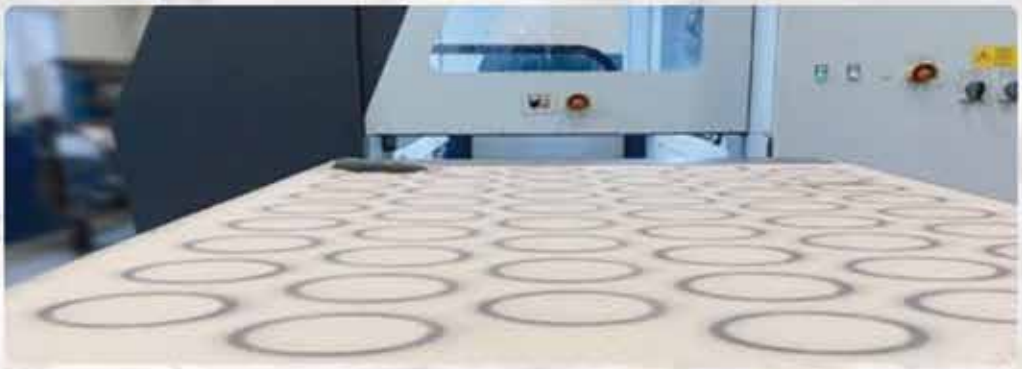
Sand molds & cores	Sand tooling	Metal & Ceramics (Desktop Metal)
Depowder	Depowder	Cure
Cure Optional ■	Coat or Infiltrate ■	Depowder
		Debind & Sinter ■

www.passtechme.com | www.overmach.it

PASStech
OVERMACH GROUP

ExOne

ExOne Case Studies



GREDE

INDUSTRY/ PRODUCTS
Heavy duty trucks, industrial and agriculture equipment, automotive

HEADQUARTERS
Iron Mountain, Michigan

EMPLOYEES
3,800

GREDE

EXONE SOLUTIONS

EXONE BINDER JETTING SYSTEMS
S-Max® and S-Max® Pro

MATERIALS PRINTED
Silica sand with furan binder

ALLOYS POURED
Gray, ductile, and specialty irons

BINDER JETTING SUPER FLEET

With the success of its first two ExOne S-Max® sand 3D printing systems, Grede is continuing to expand its binder jetting capabilities. One additional S-Max® Pro is set to be added to the Iron Mountain foundry to keep up with the ever-increasing demand for complex cores that can be printed in one piece to eliminate hard-to-find assembly labor.

EISENGIESSEREI MEZGER

INDUSTRY/ PRODUCTS
Machine- and hand-molded cast parts, metal processing and installation

HEADQUARTERS
Kallnach, Switzerland

EMPLOYEES
45

Eisengiesserei Mezger AG

FEATURES

EXONE S-MAX® PRO - 2 Job Box

ADDITIONAL DESANDING STATION
Vacuum extraction unit with funnel system for quick and clean desanding at the push of a button

ADDITIONAL FLUIDMATIC SYSTEM
Central, automatic material supply for a seamless printing process

SIEMENS MINDSPHER & ExOne SCOUT APP
The machine-monitoring app Scout is a key step in providing ExOne's printers with a complete digital workflow.

TRADITIONAL PROCESS

The cores for the iron cast are procured from an external supplier. As such it was not possible to react to customer requests or last-minute changes.

MANUFACTURING TIME
10 days

EXONE PROCEDURE
Preparation and post-processing times are reduced and the casting molds can be flexibly adapted to all changes.

MANUFACTURING TIME
12 hours

PASStech
OVERMACH GROUP

ADDiTEC™
Print Different

Brand Partner

ADDITEC

Additec 3D is a pioneer in advanced metal additive manufacturing, offering cutting-edge Directed Energy Deposition (DED), Liquid Metal Jetting()LMJ and hybrid 3D printing systems. Their solutions are built to provide flexibility, speed, and precision, enabling industries to produce large, complex parts and carry out high-value repairs efficiently.

Key highlights of Additec's 3D solutions:

Flexible technology

Supports both laser-wire and laser-powder processes.

Hybrid capability

Combines additive and subtractive operations in one system.

High productivity

Delivers large-scale builds and fast deposition rates.

Multi-material processing

Allows for complex, tailored part designs.

Industrial applications

Trusted by aerospace, energy, automotive, and heavy industries for production and repair.

Products

AMDROiD™
Print Different

6 kW fiber laser for high deposition rate

AI-Powered Software Delivers precise, optimized toolpaths.

100% raw material is used by melting wire to form parts.

Wire feeder rated for common metals including Al & Cu

Closed Loop Laser Power Modulation Using Pyrometer

Robot arm and positionerfor multi-axis large-scale geometries

HYBRiD 3™
Print Different

Multi-Tech Platform
Manufacturing System with Liquid Metal Jetting(LMJ), Laser Directed Energy Deposition(LDED) and CNC Machining.

Class Leading Processing Heads
Advanced processing heads for LDED and LMJ, backed by over a decade of development expertise.

Post-Machining
Subtractive process provides post-machining capabilities to achieve desired surface finish and tolerances for parts printed

Complexity
90° overhangs and complex gyroid designs have been successfully fabricated.

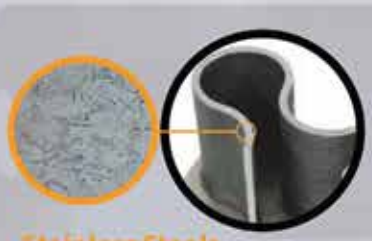
Cost Savings
Low wire feedstock and equipment costs lower the overall COGS

Material Utilization
100% raw material is used by melting wire and ejecting droplets to form parts.

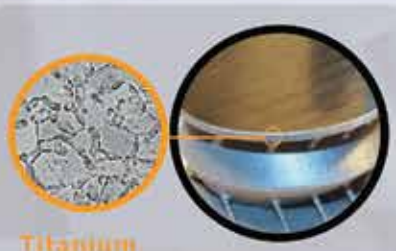
PASStech
OVERMACH GROUP

ADDiTEC™
Print Different

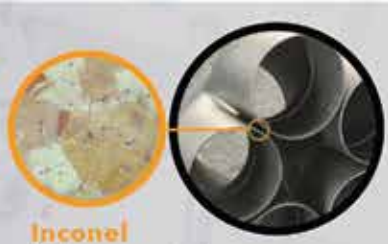
Material Options



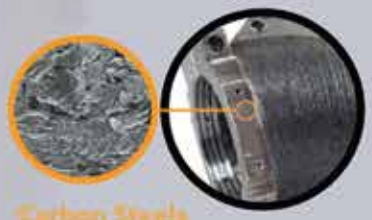
Stainless Steels
Fully supported:
316L(EN 1.4404) 3001 (E014316) and 304 (EN 1.4307).



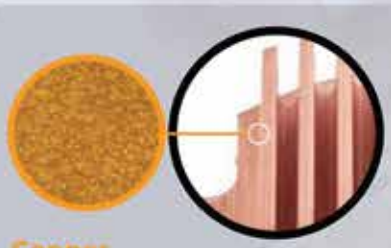
Titanium
Fully supported:
Titanium Grade 5 (EN 3.7165).



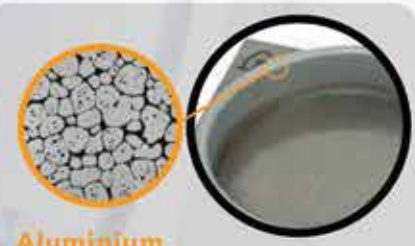
Inconel
Fully supported:
Inconel 718
Inconel 625 (EN 2.4600).



Carbon Steels
Fully supported:
SAE 4140 (EN 1.7225)
A-5.18:ER70S-6 (EN 1.5130).



Copper
Under Development



Aluminium
Under Development

Applications

Four Blade Turbine
Print Time: 30 h
Material: Stainless steel 316L
Wire diameter: 1.2 mm
Model Size: 35 x 28 x 28 cm
Model Weight: 17 lbs.
Application: Energy Industry

Rocket Nozzle
Print Time: 52 h
Material: Stainless steel 316L
Wire diameter: 1.2 mm Model Size: 63 x 55 x 55 cm Model Weight: 28 lbs.
Application: Aerospace Industry

Overhang Test
Print Time: 3.5 h
Material: Aluminum Wire Diameter: 1.2 mm Model Size: 13 x 14 x 9 cm
Model Weight: 0.6 lbs.
Application: Prototyping

Helix Wind Turbine
Print Time: 26 h
Material: Stainless steel 316L
Wire diameter: 1.2 mm
Model Size: 67 x 34 x 34 cm
Model Weight: 17.5 lbs.
Application: Wind Power

Merge Collectors
Print Time: 2h 50m
Material: 316L
Wire diameter: 1mm
Model Size: 10x10x16cm
Model Weight: 12lbs.
Application: Prototyping

Print Time: 5 h Material: Ti6-Al-4V Wire diameter: 1mm
Model Size: 13x13x20 cm
Model Weight: 2.3 lb
Application: Prototyping

PASStech
OVERMACH GROUP

SMARTTECH 3D
METROLOGY

Brand Partner

SMARTTECH 3D

SMARTTECH is a Polish manufacturer of contactless 3D optical scanners. With metrologically verified accuracy, we ensure precision and reliability in every product we deliver. Collaborating with universities and institutes of technology both in Poland and globally, we continually innovate and enhance our devices, launching new products that provide the most accurate and dependable results.

- High resolution 3D scanners (detectors from 1.6 Mpix up to 24 Mpix)
- Efficient SMARTTECH3D software which can handle huge amount of data
- Metrologically certified accuracy
- 3D scanning with texture (colored cloud of points X,Y,Z with RGB)
- The unique features like the projection of the color map of deviation

SMARTTECH 3D Product Range

Industry and technical applications

MICRON3D
green stereo

SMARTTECH3D
ON

SMARTTECH3D
Robotized

SMARTTECH3D
Photogrammetry

Non-technical applications – archaeology, medicine, etc.

MICRON3D
color

SMARTTECH3D
med

MICRON3D
color stereo

PASStech
OVERMACH GROUP

SMARTTECH 3D
METROLOGY

Case Study - Automated defect detection

Project:
Customised automated defect detection and recognition for turbine

Aim:
Automatic pdf with categorized and mapped defects

Devices used:
Scanner 3D MICRON3D green stereo 18MPix
Clients robotic arm

Case Study - Production- quality control

Project:
3D scan of a large cast- heavy industry_ military equipment

Aim:
Quality control of the casting made

Devices used:
MICRON3D green 10MPix
Geometric markers

Case Study - Motocycle Industry- accessories

Project:
Designing the engine cover based on 3D scans

Aim:
Preperaing object for scanning:
Titanium oxide for the shining parts

Devices used:
3D Scanner MICRON3D 10 MPix with FOV:
800x600x350 - 300x200x210 mm

PREVENTIVE & AMC

BREAKDOWN SERVICE

MACHINE RELOCATION

RETROFITTING

SPARE PARTS

SERVICE

CALIBRATION

TRAINING

TELE SERVICE /
REMOTE SUPPORT

EVALUATION OF
OLD MACHINE

PASStech

OVERMACH GROUP

Much More than the Machine Tools Supplier

MONDAY – FRIDAY (UAE)
Passtech Direct: +971 6 552 9983 / 84 / 85

SUNDAY – THURSDAY (SAUDI)
+966 59 8877 337 (Dammam)
+966 56 6026 086 (Riyadh)
+966 56 7121 063 (Jeddah)

24/7 Customer Care

+971 50 109 6568

www. passtechme.com