Manufacturing

Introducing **DEEP Manufacturing**

Large-scale component manufacture

Issue 01

Scale. Quality. Speed.

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DEEP Manufacturing

DEEP Manufacturing began as a response to the limitations of producing large-scale subsea components using traditional manufacturing methods.

We recognized the inefficiencies of forging and casting pressure vessels and other critical offshore equipment, particularly relating to costs, lead times, and material waste.

Through a significant investment in Wire Arc Additive Manufacturing (WAAM), people, and our processes, we can now produce large-scale metal component parts at unprecedented speed, with our manufacturing processes and parts verified by independent third-party bodies.

The subsea engineering resources, knowledge, and experience across DEEP means we can deliver manufacturing projects at an unprecedented scale, faster, and at lower life of project costs compared to traditional manufacturing processes.

The benefits of WAAM

An evolution of a time-tested method

Unlike traditional subtractive manufacturing, which removes material from a solid billet, WAAM builds components layer by layer using an electric arc to melt wire feedstock.

First patented in 1920, the WAAM process allows for the production of complex geometries with enhanced material properties, while significantly reducing waste.

Through unique investments made in the technology, DEEP Manufacturing can produce component parts using WAAM at an unparalleled scale, to the highest quality and at speed.

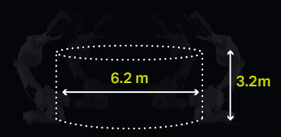
Scale.

Production of large-scale components
Through the use of our single-arm systems, we can manufacture parts up to 2.8 meters in diameter by 3.2 meters in height.

Our multi-arm technology allows us to produce components up to 6.2 meters in diameter by 3.2 meters in height.

The capability to produce parts of this scale has numerous applications, and it especially appeals to the offshore, maritime, and energy sectors, where there is need for low-volume large-scale metal part production.

Single-arm
print volume



Multi-arm HexBot
print volume

Quality.

Production to the highest standards
We take a rigorous approach to quality, meeting the highest industry standards and certifications — an essential requirement in the subsea market, one of our key sectors.

We work closely with DNV, one of the world's leading classification societies, to put in place the highest levels of assurance in our output and procedures. Our procedures, facility and operations are approved to DNV standards. And our Quality Management Systems are approved to ISO 9001 standard.

We also take on the material and product certification of the components we produce, rather than putting this burden on our clients. This process, and the standards to validate outputs, are to the same standards as a traditionally manufactured component.

DNV

ASTM INTERNATIONAL

INSTITUTE OF MARINE Engineering, Science & Technology

bsi ISO 9001 Quality Management Systems CERTIFIED

Speed.

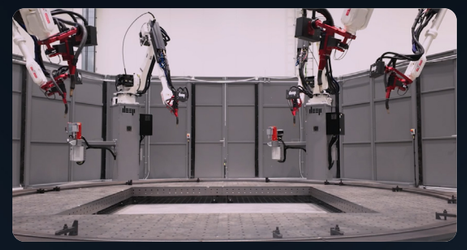
Production of components quickly
WAAM creates structures efficiently. It allows us to manufacture components to 'near net shape'. Using this technique requires less material, resulting in quicker production and reduced waste compared to traditional methods like forging or casting.

Our manufacturing approach can cut lead times for large component parts by more than half. By automating our operations, we can run our facility 24/7, increasing speed of delivery and capacity.

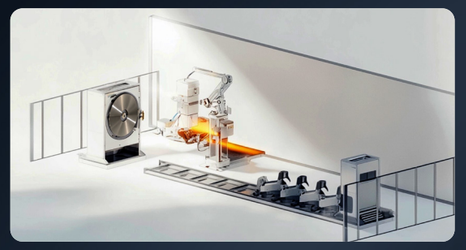
Up to
3x

quicker to produce
vs traditional methods

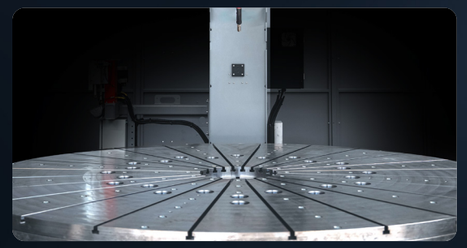
Complex production capabilities



HexBot
Six-arm, synchronised printing for truly large-scale manufacture.



RollerBot
Print complex internal structures with remarkable consistency, efficiency, and quality.



Manipulator table
A single axis table spins to allow the production of near-perfect cylinders.

Two-axis manipulator
Our two-axis manipulator allows for the manufacture of complex geometries and hemispheres.

With more than 18 robots, we operate one of the world's largest concentrations of WAAM systems.

Robust assurance pathway

DEEP Manufacturing has developed a quality assurance pathway in line with best industry AM practice, such as DNV and ASME.

Recommendations · Procedure Qualification · Manufacture · Inspection · Post-Processing · Coupon Testing · Certification · Delivery

A complete solution

A world-class team assists throughout the entire production process.

Our technical team, which spans engineering, R&D, and materials development, works tirelessly to uphold the quality and expand the capability of our WAAM offering.

While our application engineers work with you to optimise your designs for printing, leading to efficient production and superior quality.

How will you use WAAM?
We can manufacture large-scale bespoke components for a wide range of applications and industries. Here are some examples:

- Cylinders
- Pressure vessels and equipment
- Pipeline components
- Flanges
- Kelly tubes

Talk to us about your project
If you'd like to discuss a manufacturing need or meet one of the team, please get in touch.

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deepmanufacturing.com

Pre-production

- Feasibility analysis
- Materials selection and development
- Prototyping and testing
- Process optimisation
- Material testing
- Design optimisation
- Design validation

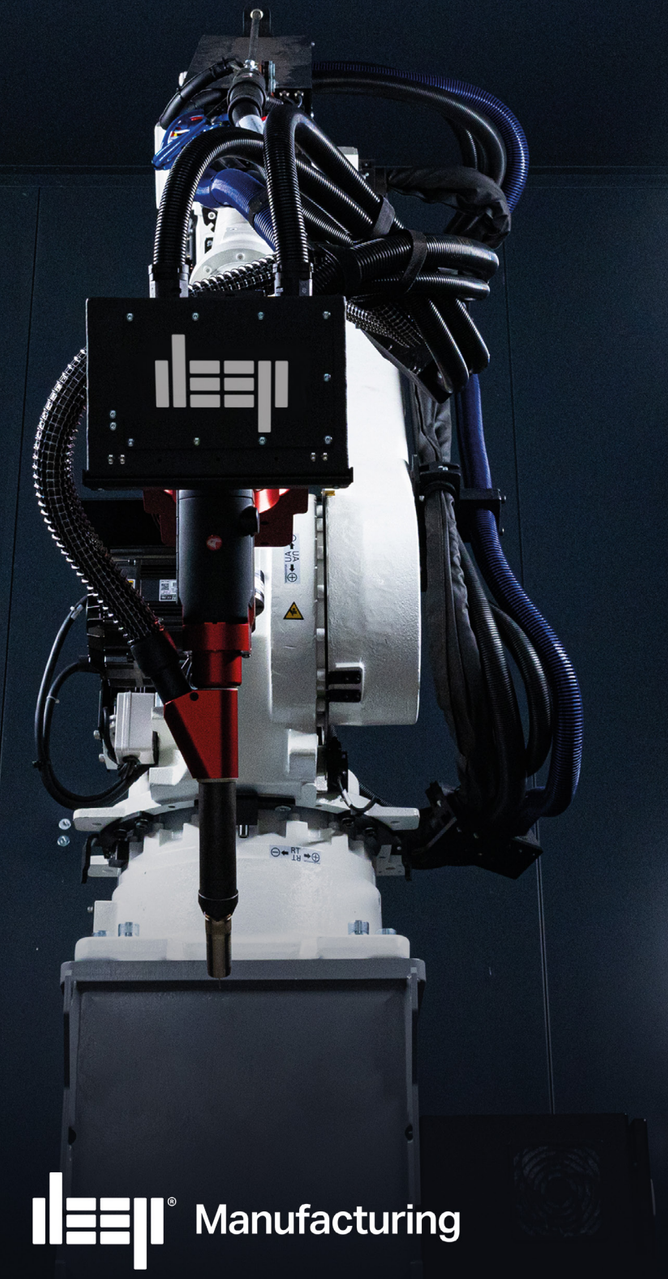
Production

Post-production

- Access to trusted partners
- Destructive testing
- Non-destructive testing
- Surface treatment
- Machining, milling, and turning
- Assembly
- Cleaning
- Certification

● HQ - Bristol, UK.

Manufactured in the UK. Shipped the world over.
DEEP Manufacturing is a global business, shipping time-critical components to customers across the globe.



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