
MX3D
WAAM FOR INDUSTRY
ENGIE
framatome
TotalEnergies
ABB
ALTAIR
Welding Alloys
TEAM
KM
YACHTBUILDERS
MX3D
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WAAM FOR INDUSTRY

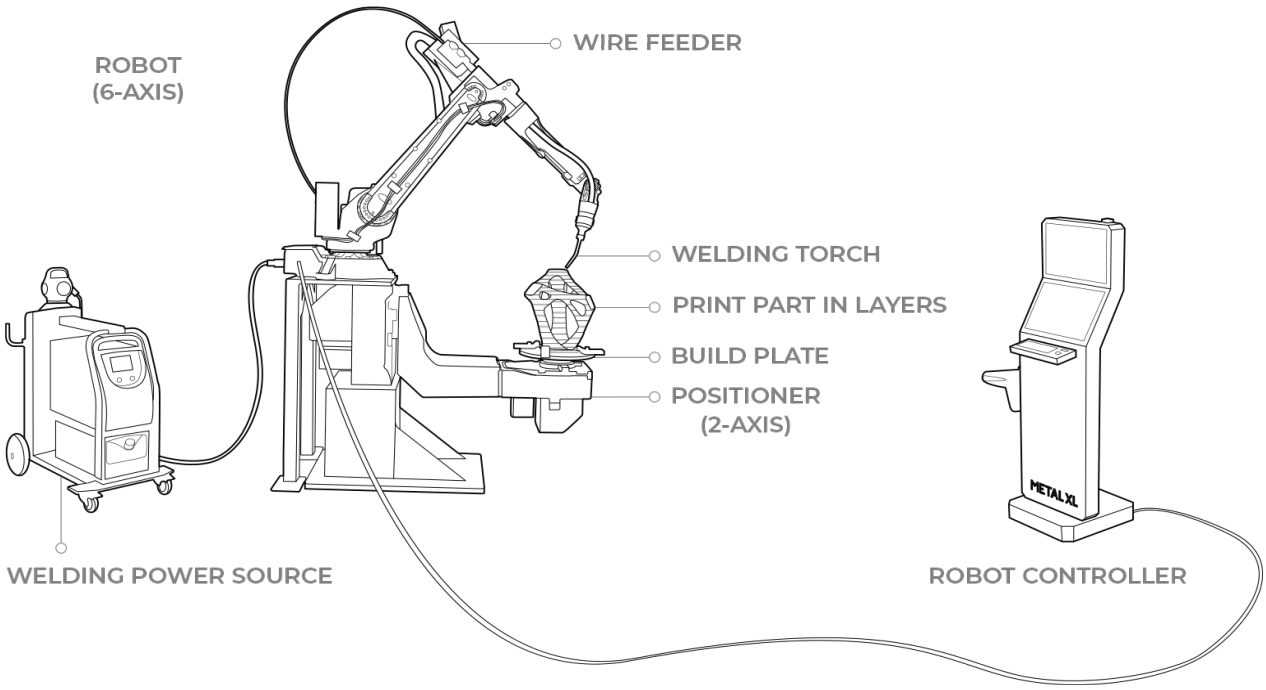
MX3D - WAAM FOR INDUSTRY

MX3D

- 15+ Robots
- 35+ people, IWE - Design Engineers - Material Science
- Delivering quality since 2014
- Creator of the iconic multi-award winning MX3D Bridge
- Assists with Design, Engineering, Testing, Heat Treatment, Miling, Coating and 3D scanning

WHAT IS WAAM?

Wire arc additive manufacturing, in short **WAAM**, is a **metal 3D printing technology** in the subsection of direct energy deposition (**DED**). 3D printing, or additive manufacturing has found its way from prototyping into industrial applications and final products. In comparison to subtractive methods like milling and turning, the material is **added layer-by-layer** such that only the material needed is used. Parts produced with WAAM have mechanical properties better than casting! Its comparable to forged materials.



IMPELLER

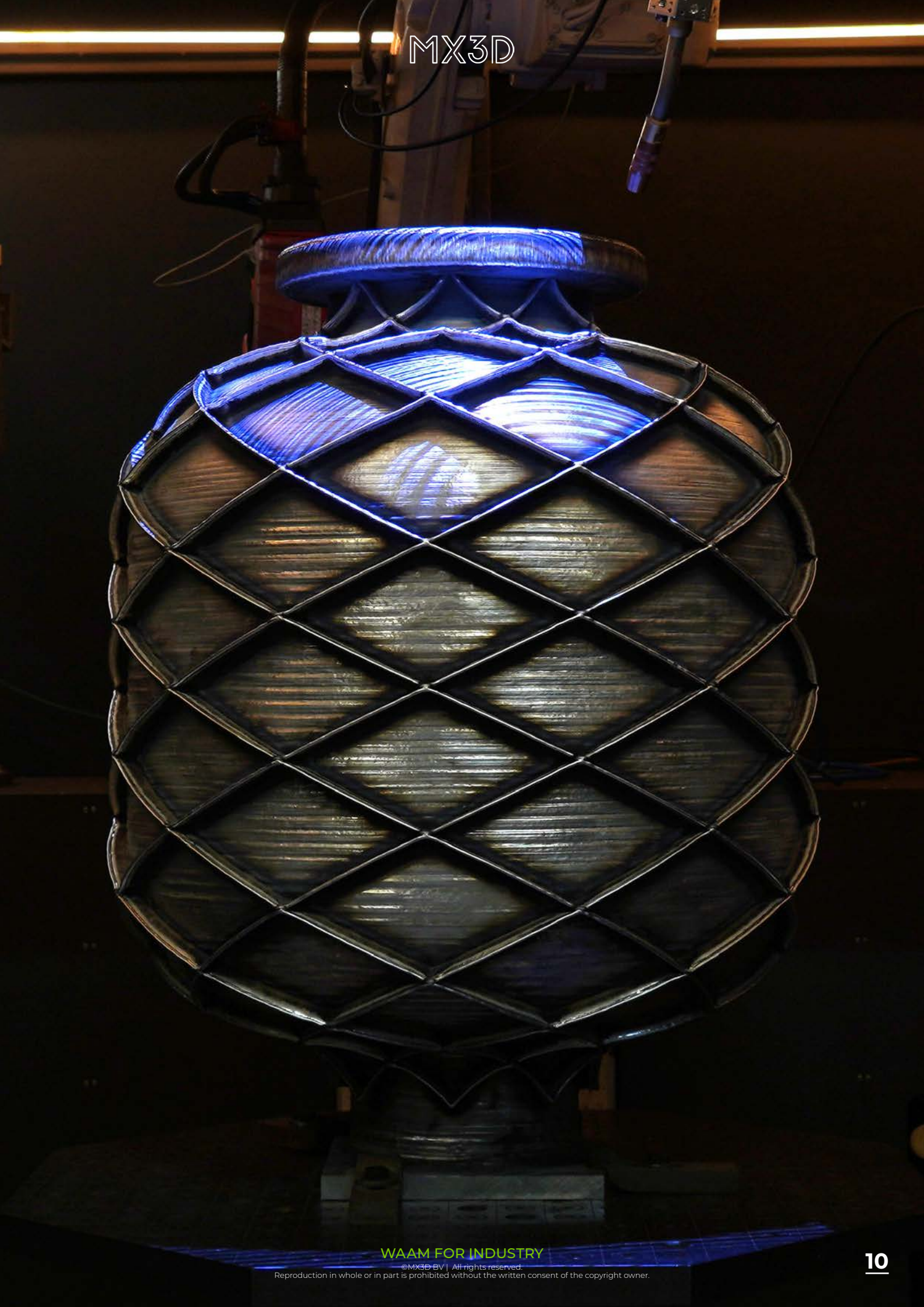
VALVE

PULPER SCREW

Welding Alloys

WAAM FOR INDUSTRY

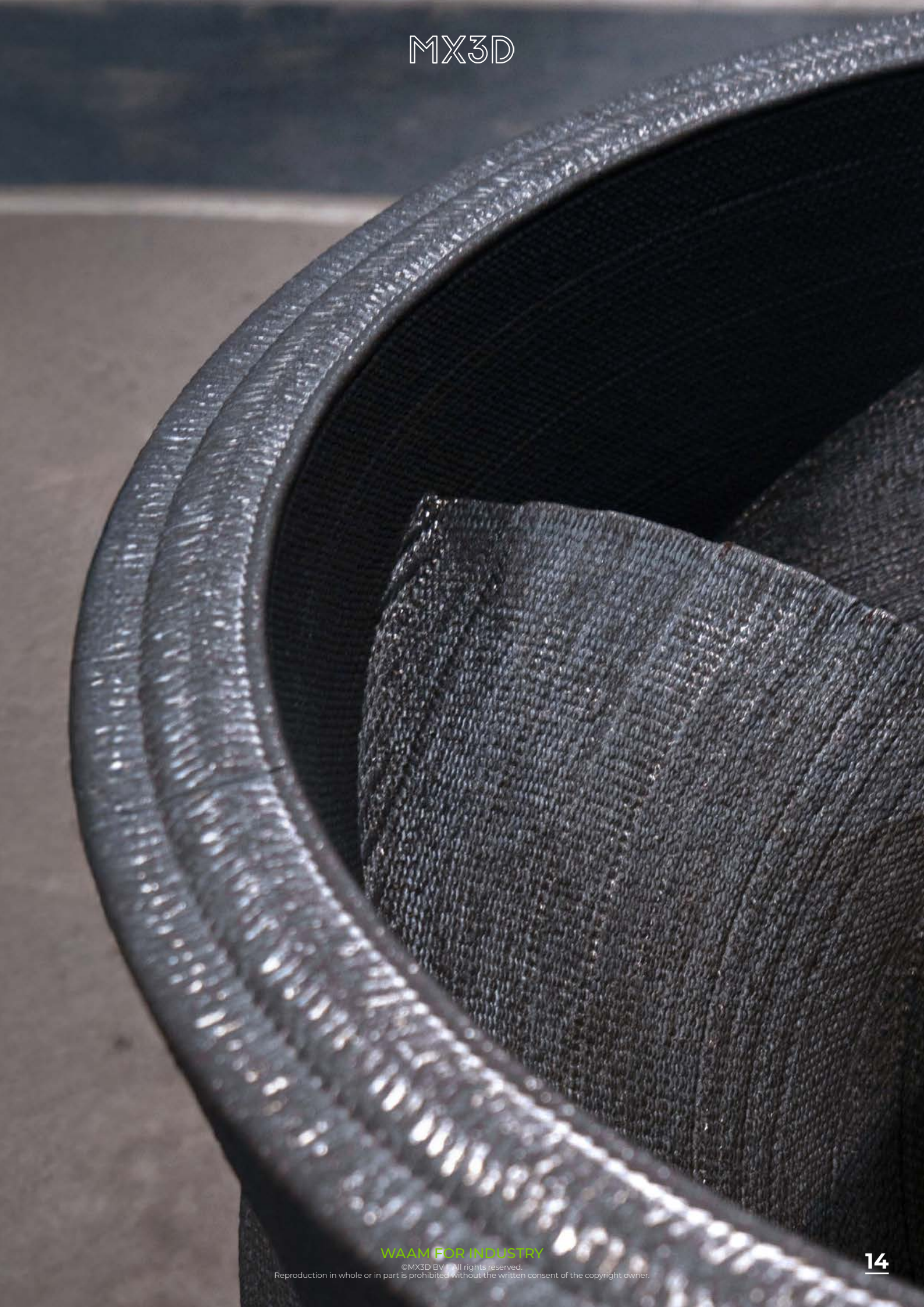
PRESSURE VESSEL



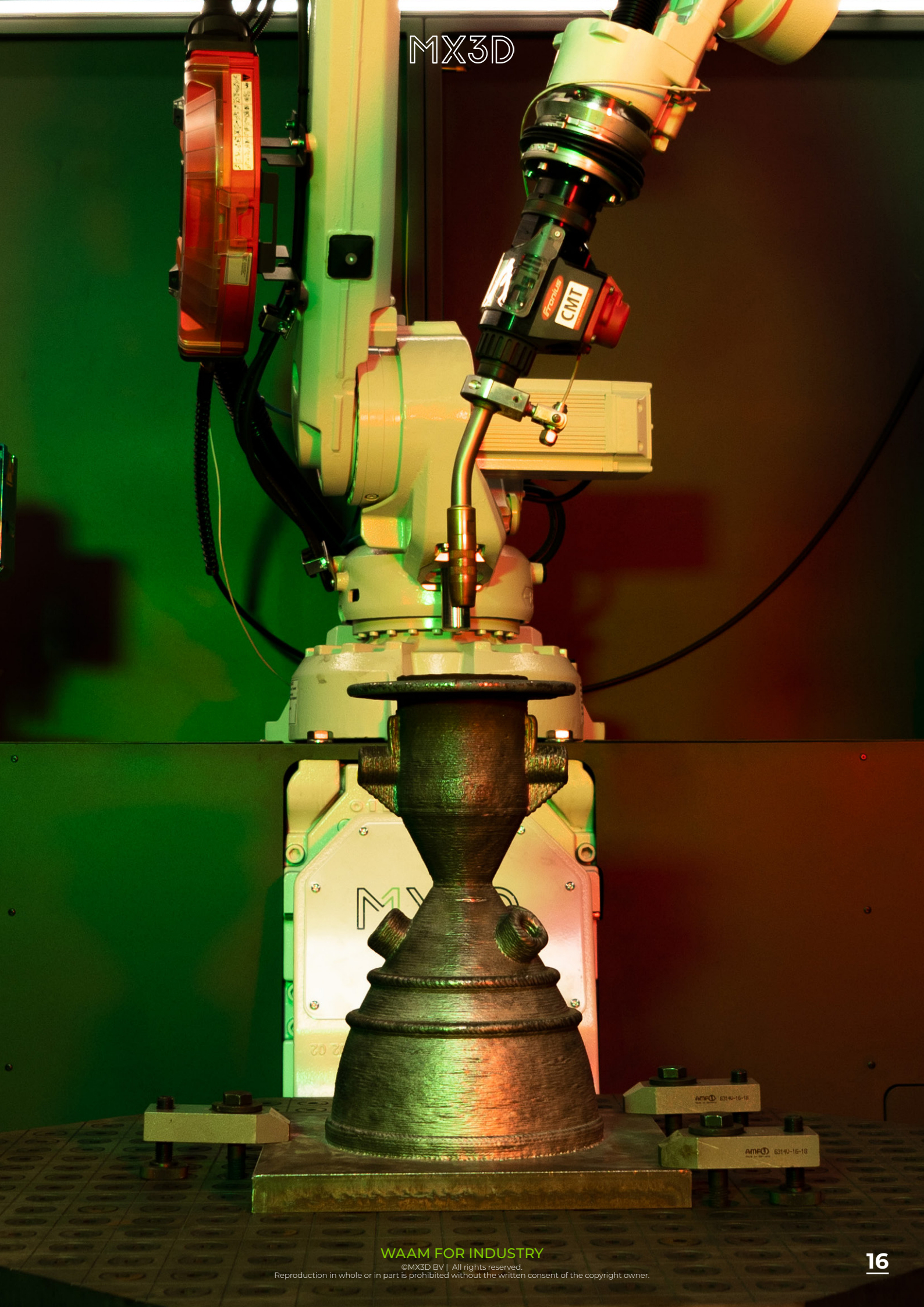
CYLINDER

EPR

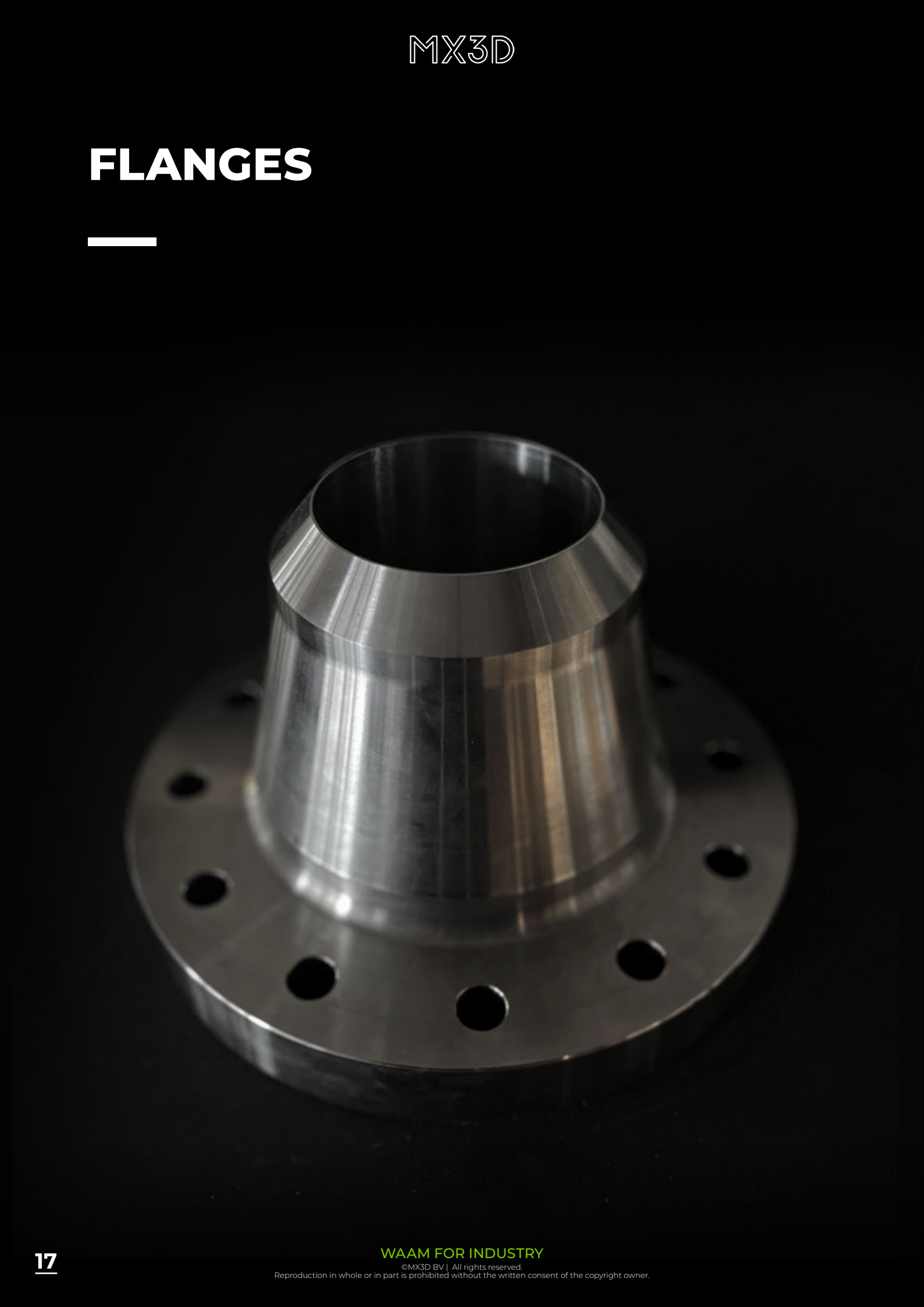
framatome

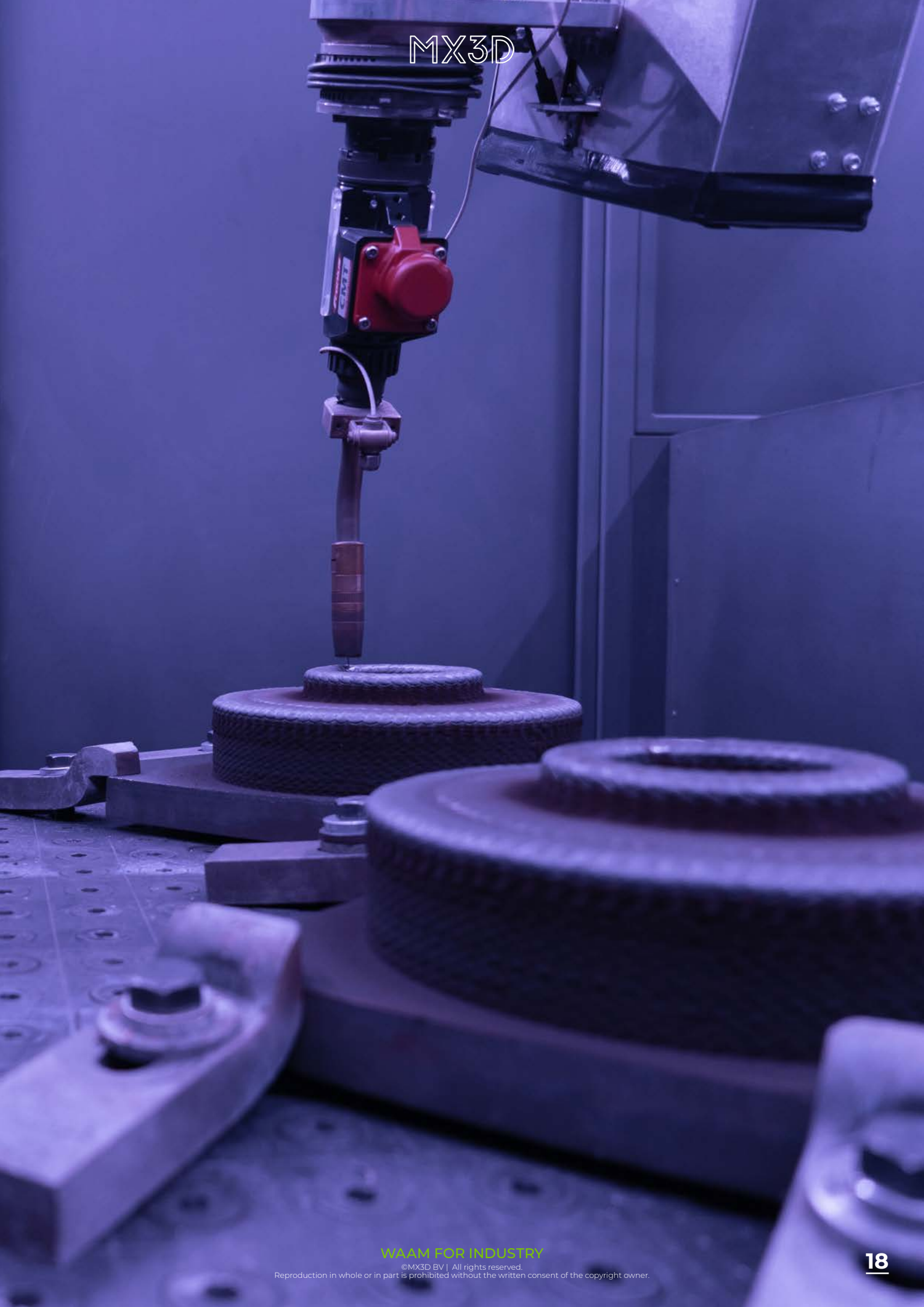


ROCKET THRUSTER



FLANGES



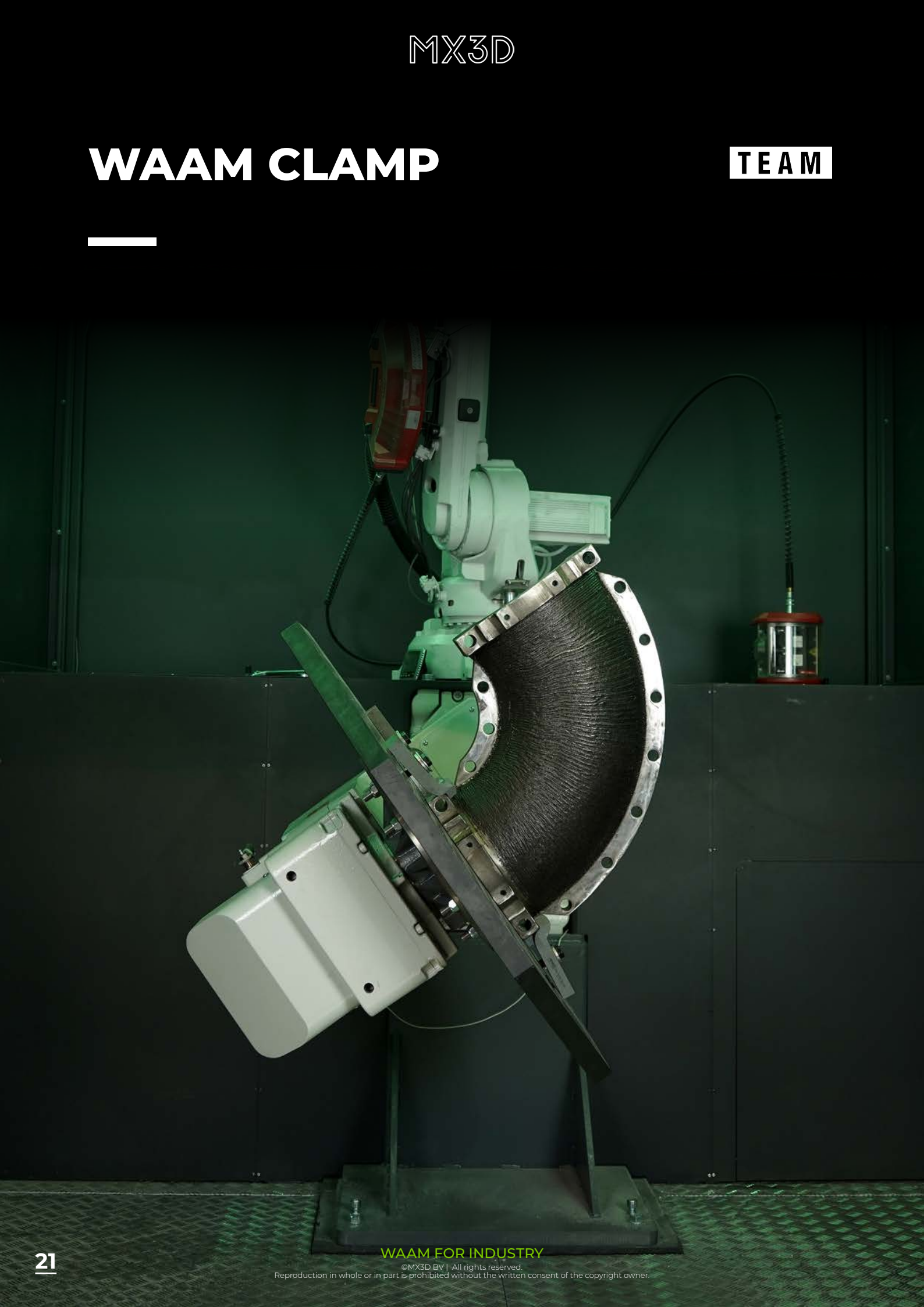


ROBOT ARM

ABB
ALTAIR

WAAM CLAMP

TEAM



AIR VENT

KM YACHTBUILDERS

TURBINE

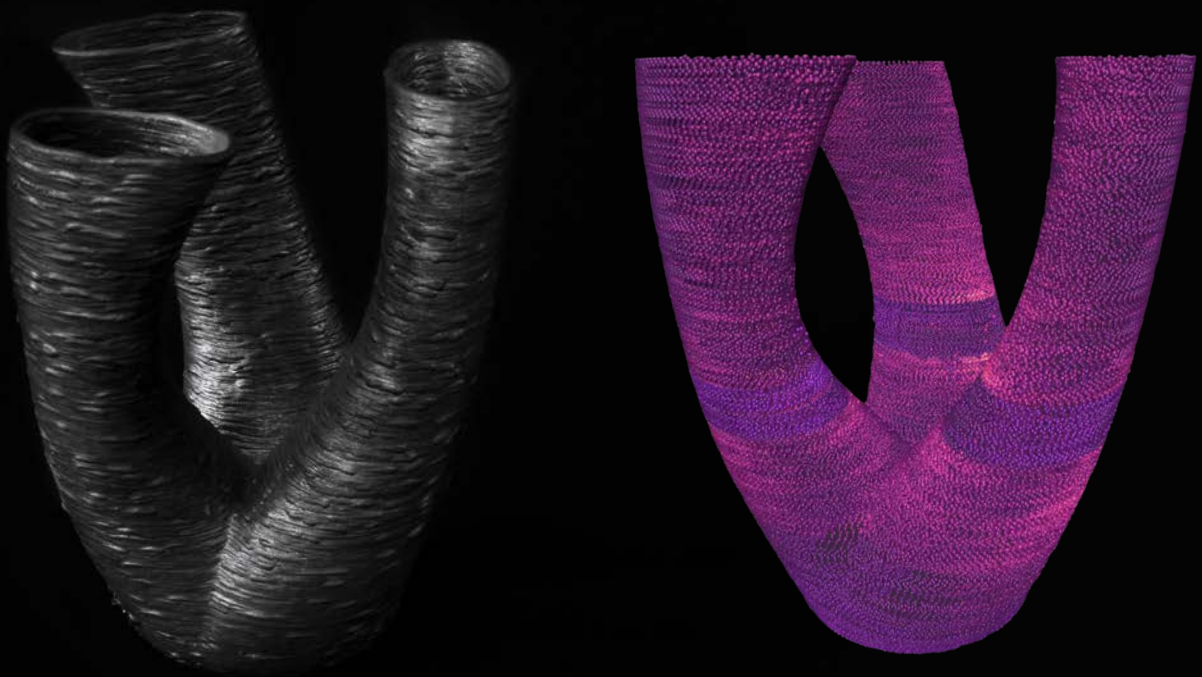
TotalEnergies

BENEFITS OF WAAM

WAAM is well-suited for producing **complex steel parts**. It enables easy modification of designs without incurring additional tooling costs, making it **ideal** for producing **large volumes** of **parametrically designed parts**.

- Excellent material properties, **better than casting**.
- No need for **special moulds or fixtures**.
- Great for **large unique, emergency parts or small series in specialty materials**.
- Aligns with the growing interest in **parametric design**.
- From 20>20.000+ kilograms of metal per piece.

WAAM generates **less material waste** compared to traditional manufacturing processes. This contributes to **cost savings** and significant **environmental benefits**.



CERTIFICATION

MX3D has a **certified** additive manufacturing facility for **robotic wire arc additive manufacturing** (Wire-DED). The qualification includes control relating to feedstock, equipment, personnel, process and build control covering multiple metal alloys.

The company has **extensive experience** in the **qualification** of projects in the Oil and Gas industry (using PED, API20S or DNV-T-B203), working closely with Lloyds Register, The Welding Institute (UK), DNV, GL and Bureau Veritas. It follows **standards** such as SPEC, ASTM, SAE, AISI, and BS.

LRQA
CERTIFIED

ADDITIVE
MANUFACTURING
FACILITY QUALIFICATION

POST PROCESSING

3D-printed metal can be treated like any other metal after production.

A common step is **sandblast** a part so that the residual dust layer from the production process is cleaned.

Printed parts can also be **milled**, **polished** and **coated**.

SAMPLES

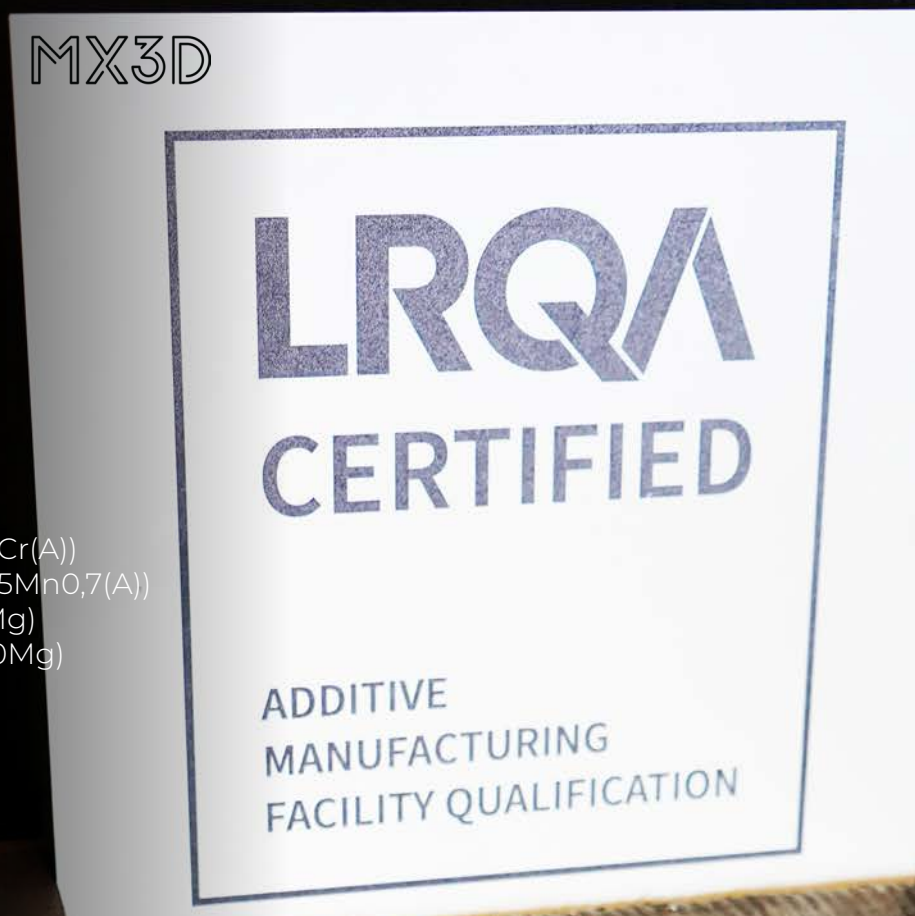
On request, MX3D can provide a **sample box** with a range of our most common materials.
For current pricing and shipment estimates, please reach out to sales@mx3d.com

TESTING

MX3D has extensive experience with various tests required for qualification. We do this with **certified 3d parties**.

For instance pressure test to show conformity for the PED (European norm for the manufacturing and testing of Pressure Vessels)

MATERIALS



ALUMINIUM

5356: EN ISO 18273: S Al 5356 (AlMg5Cr(A))
5183: EN ISO 18273: S Al 5183 (AlMg4,5Mn0,7(A))
4018: EN ISO 18273: S Al 4018 (AlSi7Mg)
4046: EN ISO 18273: S Al 4046 (AlSi10Mg)
4000 series
5000 series

STEEL

(Stainless) Steels
308LSi: EN ISO 14343 – A: 19.9LSi
316LSi: EN ISO 14343 - A: 19.12.3LSi
Duplex ER2209: EN ISO 14343 - A: 22.9.3NL

Carbon Steels
G3Si-1: EN ISO 14341-A: G 3Si1
G4Si-1: EN ISO 14341-A: G 4Si1

High-Strength Steels
NiMo: EN ISO 16834-A: G Mn3Ni1Mo
NiCrMo: EN ISO 16834-A: G Mn3Ni1CrMo

Steel Alloys
Stainless Steels
Maraging Steels
Tool Steels
Mild Steels
Low alloy Steels
Duplex Steels

NICKEL ALLOYS

Ni625 EN ISO 18274 : S Ni 6625 (NiCr22Mo9Nb)
Ni718 EN ISO 18274 : S Ni 7718 (NiFe19Cr19Nb5Mo3)

BRONZE

CuSn6: EN ISO 24373: Cu 5180A
CuSi3 : EN ISO 24373: S Cu 6560
CuAl8: EN ISO 24373: S Cu 6100
CuAl8Ni6: EN ISO 24373: S Cu 6328

MX3D uses off-the-shelf welding wire with standard 3.1 material certificates.

FACILITY

Since 2014 MX3D has been the **innovation leader** in 3D metal printing for steel structures.

With **15+ industrial robots**, MX3D has a large production facility **specialised in 3D metal printing** of metal structures. MX3D manufactures parts in a qualified facility, with qualified machinery and materials.

Gijs van der Velden / CEO MX3D

"Our data-centric engineering approach combines design, test results and qualification standards to optimise part design and the manufacturing process. This approach allows for cost-effective mass customisation. It offers an intelligent and innovative perspective for the future of the energy, nuclear, maritime and manufacturing industry"

CERTIFIED STRUCTURAL AND MATERIAL ANALYSIS

MX3D produces parts with mechanical properties better than casting and comparable to forged material, aligned with new and existing international standards.

MX3D collaborates with **certified partners** across the world to **validate the material** and structural properties of WAAM-printed elements.

Certified partners

- **Arup, Engineering Services (INTERNATIONAL)**
- **Element, Material Research (INTERNATIONAL)**
- **Imperial College London, Engineering Services (UK)**
- **Bologna University, Engineering Services (IT)**
- **Belgium Welding Institute, Material Research (BE)**
- **Norwegian University of Science and Technology, Material Research (NO)**
- **University West, Material Research (SE)**
- **Technical University of Twente, Structural Research (NL)**
- **Technical University of Eindhoven, Fatigue (NL)**

M1 SYSTEMS

The **M1 Metal AM System** offers a turnkey solution for printing high-quality, medium-to-large-scale metal parts.

The system is the industry standard for robotic WAAM systems and has been acquired by large industrial parties.

Built with quality hardware components from renowned manufacturers, the M1 Metal AM System integrates **MetalXL**, MX3D's **dedicated WAAM-workflow** for advanced CAM, control/monitoring, and post-print data analytics.

M1 includes an **8-axis** industrial robotics system enabling complex prints, a multi-transfer mode GMAW power source for flexible print procedures, and a WAAM-dedicated **MX3D Control System** for intelligent automation, real-time print monitoring and high-resolution data logging.

MX3D

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