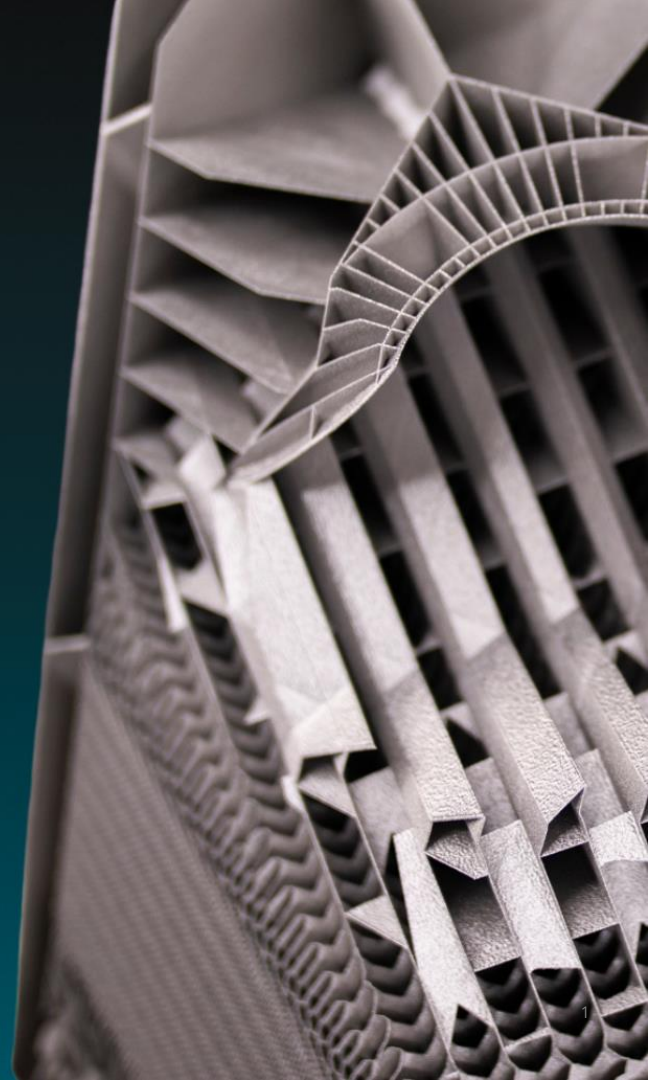




Stay Cool: 3D Printed Parts in Heat Exchanger Design Let Efficiency Explode

RMforum 2024

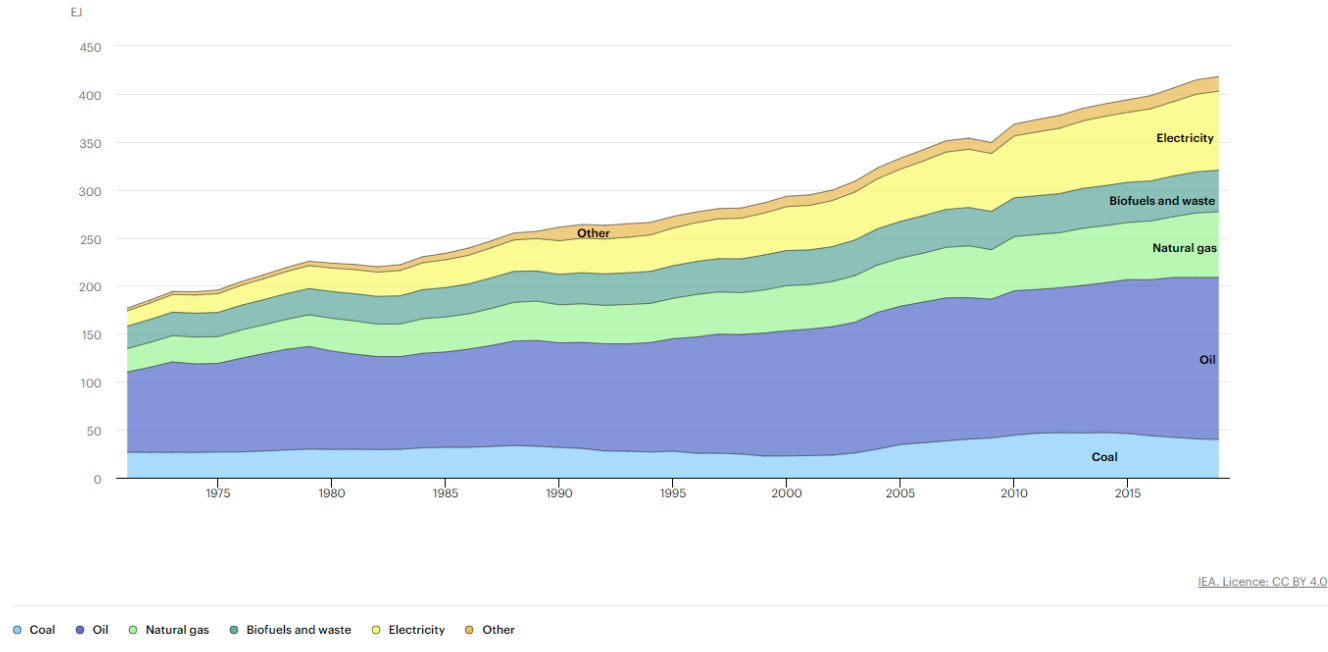
Andrea Medina, EOS



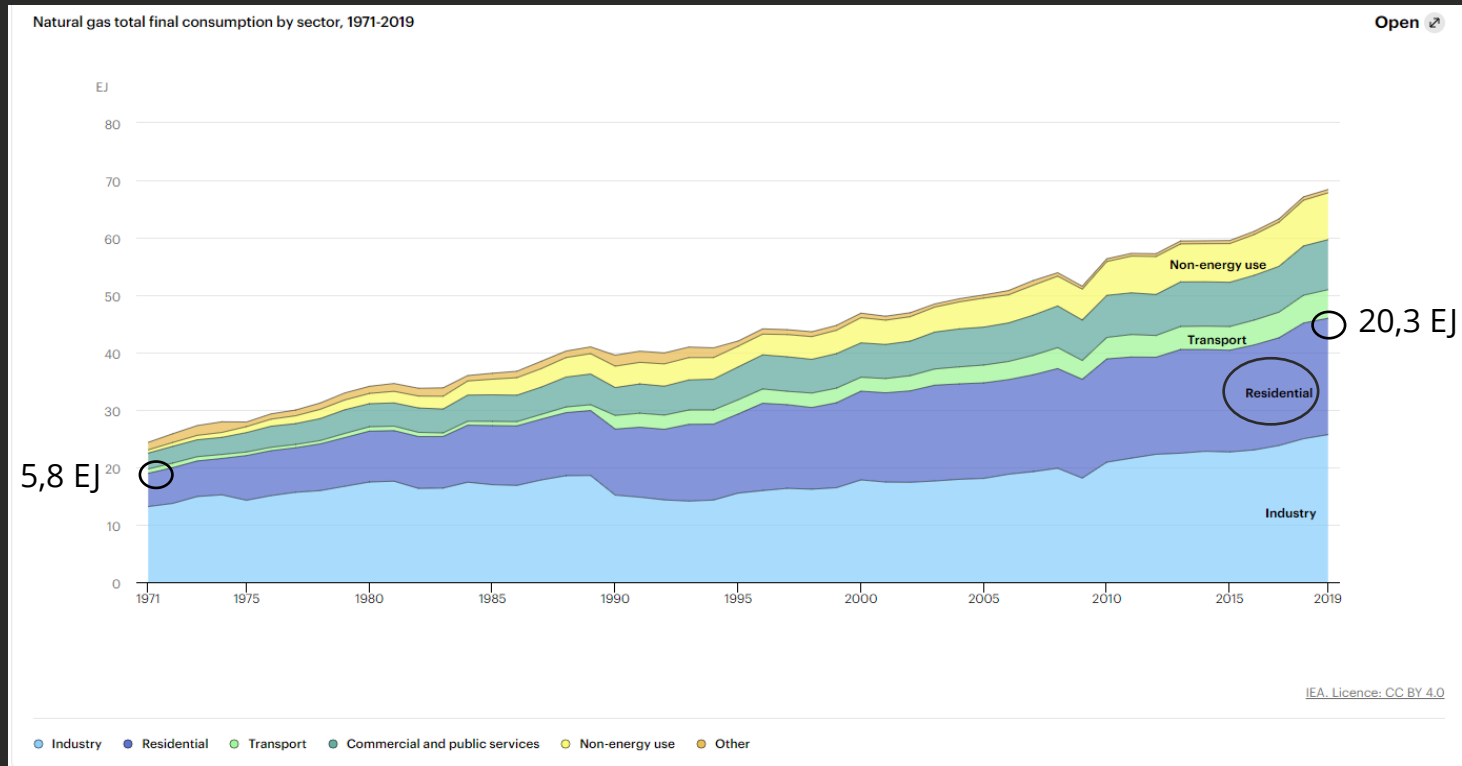
World Energy Consumption

World total final consumption by source, 1971-2019

Open 



Total final consumption by sector: natural gas



Topics

01 EOS Company Overview

02 EOS Solutions Addressing Customer Challenges

03 Application Examples

EOS – A Growing Global Company

Founded in 1989

Headquarters: Krailing, Germany

1 392 employees globally

Global EOS installed base
> 4 909 systems

56 % metal systems,

44 % polymer systems

EOS Sales & Service offices
in 15 countries

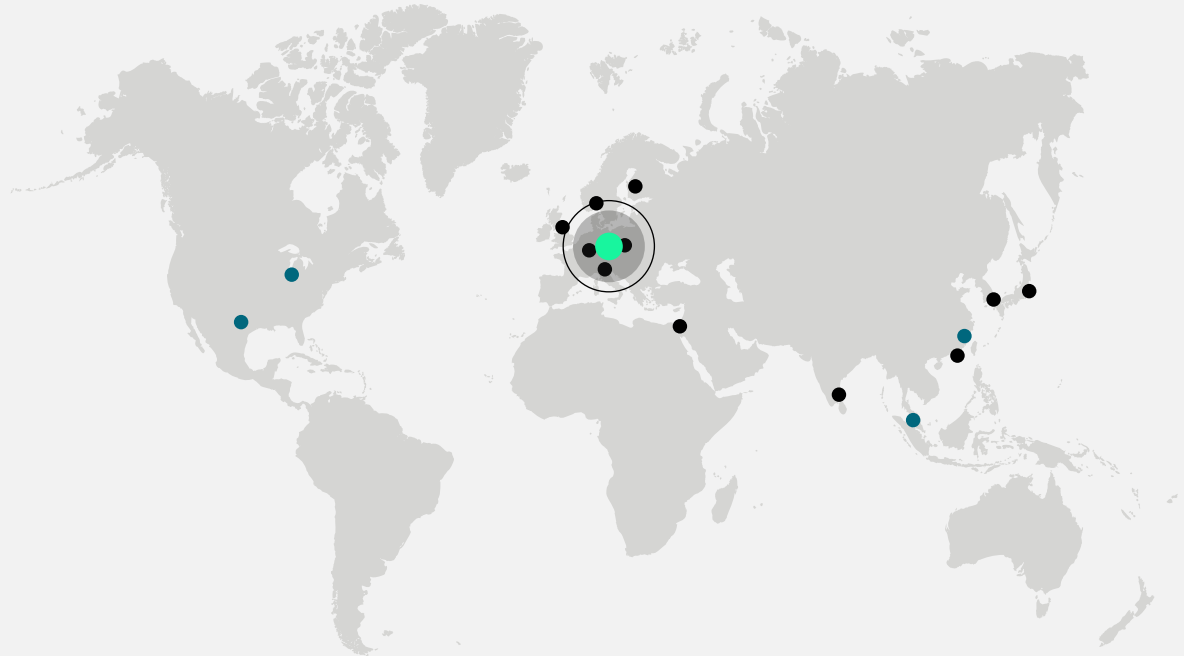
75 distribution partners in 50 countries

Gross sales in FY 22/23: **374,6 m€**



Source: EOS. Installed base (includes purchased and rented systems) and staff figures as per 12/2023.

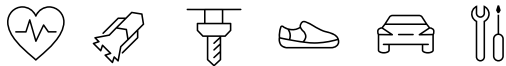
Powered by its platform-driven digital value network of machines and a holistic portfolio of services, materials and processes, EOS is deeply committed to fulfilling its customers' needs and acting responsibly for our planet.



EOS Mission

EOS is the leading provider of additive manufacturing solutions.

Our systems and services are essential to the digital factories of the future.



EOS Vision & Purpose

Additive manufacturing is a key technology for advanced industrial production.

We exist to accelerate the world's transition to responsible manufacturing with industrial 3D printing.



Responsible
Manufacturing

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Additive Manufacturing Offers Unique Solutions

Challenges of Industrial Companies



Faster **time-to-market** combined with **shorter lifecycle**



Productivity increase
Need for cost reduction



Flexible production
"factory around the corner"



Innovation
Increase of customer value-add



Customization of products



Focus on **sustainability**

Advantages of Additive Manufacturing



Freedom of design
Lightweight enables highly complex structures



Customization
Customer-specific adaptations, cost-efficient small series



Functional integration
Embedded functionality without assembly



Increased productivity
Rapid prototyping and serial applications

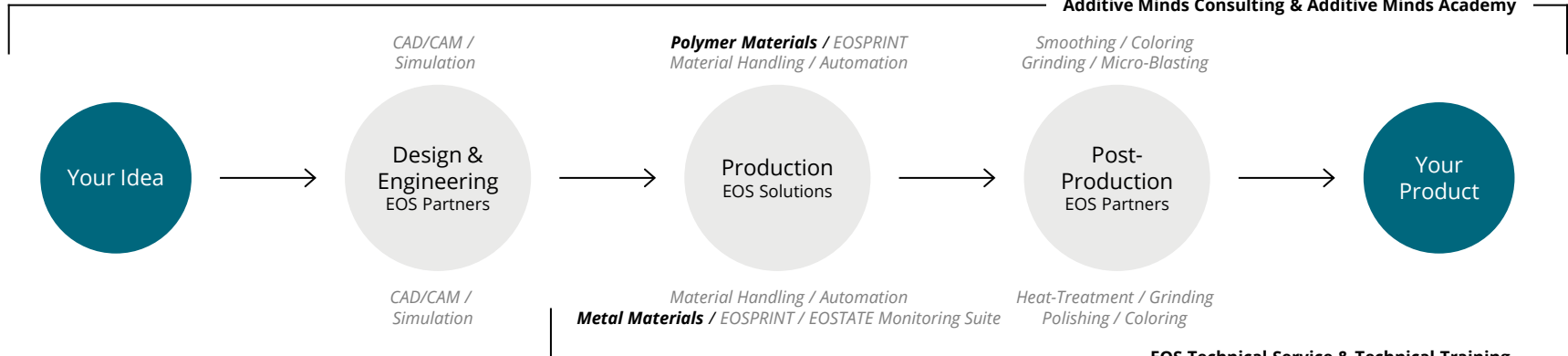
From Idea to Product with EOS

Polymer Systems



FORMIGA P 110 Velocis EOS P 396 EOS P 500 EOS P 770

Additive Minds Consulting & Additive Minds Academy



Metal Systems

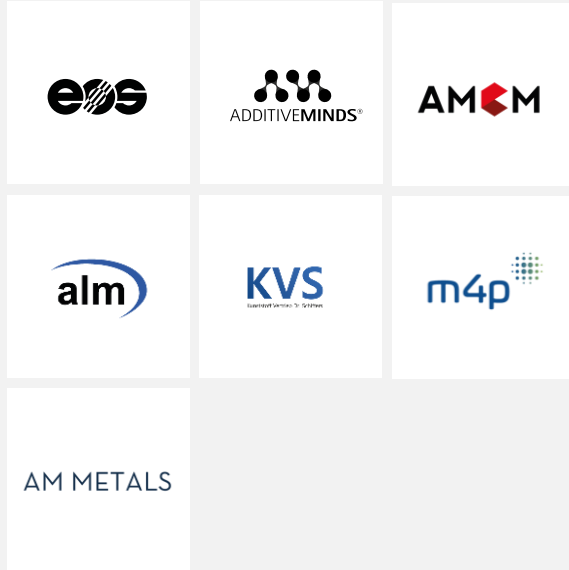


EOS M 290 EOS M 400 EOS M 400-4 EOS M 300-4

EOS Technical Service & Technical Training

An EOS Network: Joint Expertise in Additive Manufacturing

EOS Group



EOS Ecosystem

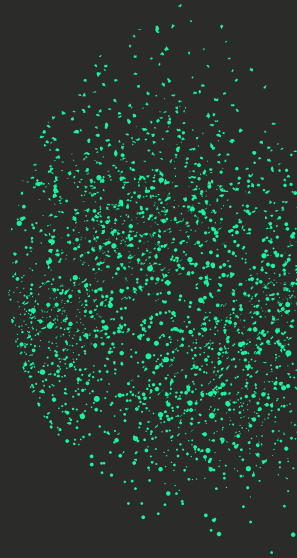


Topics

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chillAir Is the First Product from justairtech

heat exchanger
air/air

air inlet

heat exchanger
air/glycol

compressor

raptor blades

motor

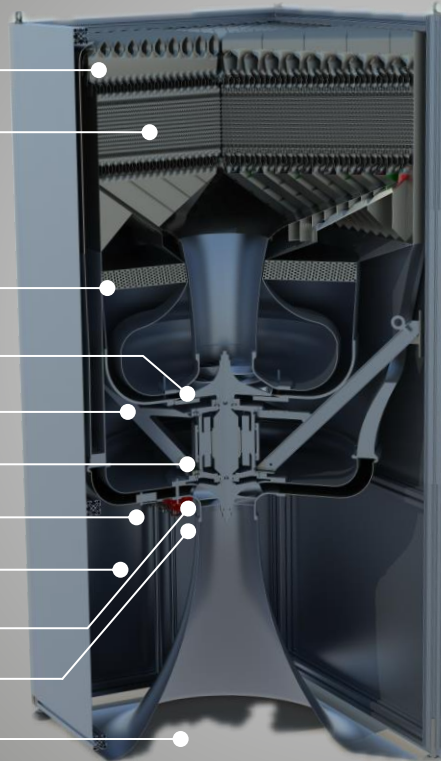
circulating pump

glycol cycle

turbine

eagle blades

air outlet



- Objective: ultra efficient cooling
- Capacity: 25kW
- Refrigerant: Air

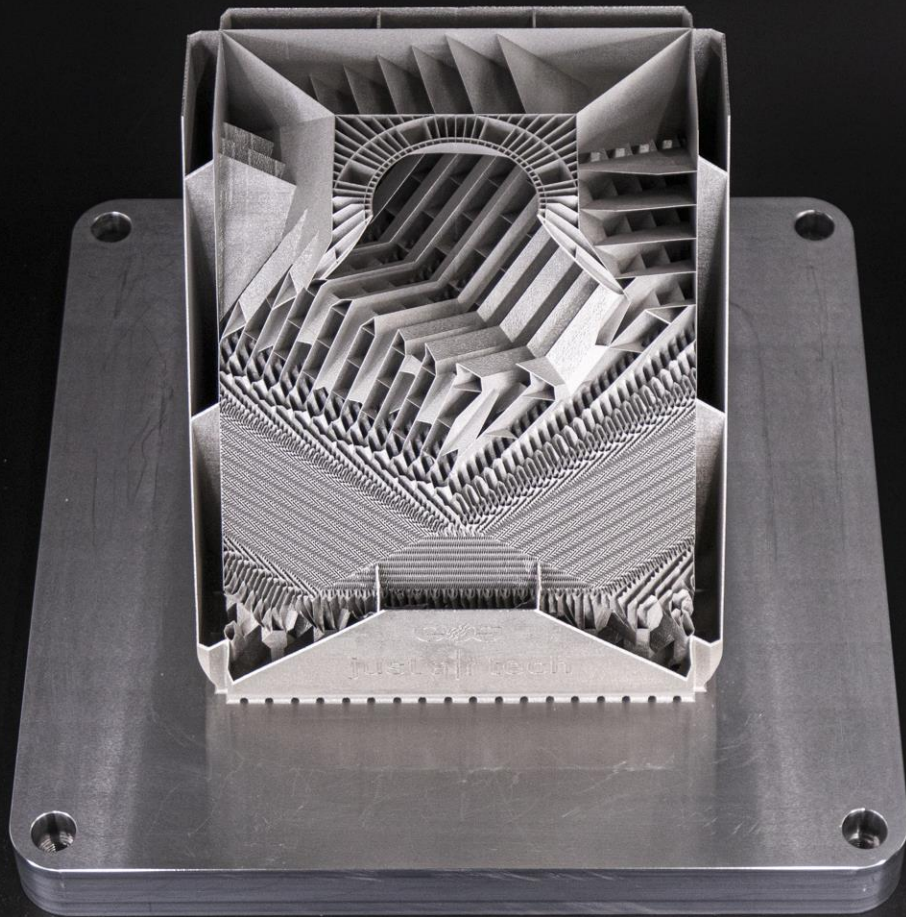
Efficiency: ≈ 10

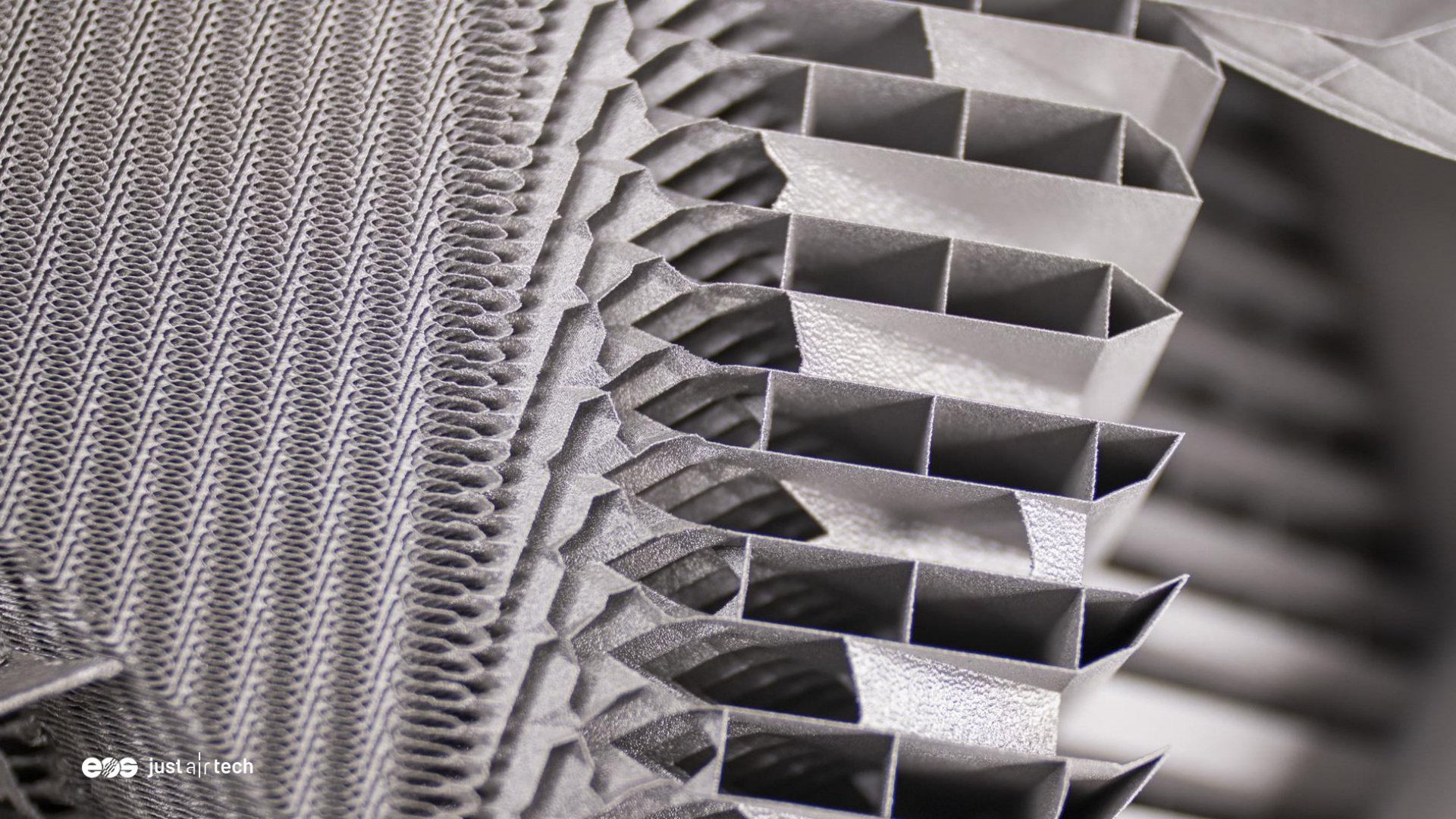
- Protection: 3 patents granted, 8 pending
- First market: data centres
- Market entry: 2026

EOS and justairtech

Results of the Joined Development

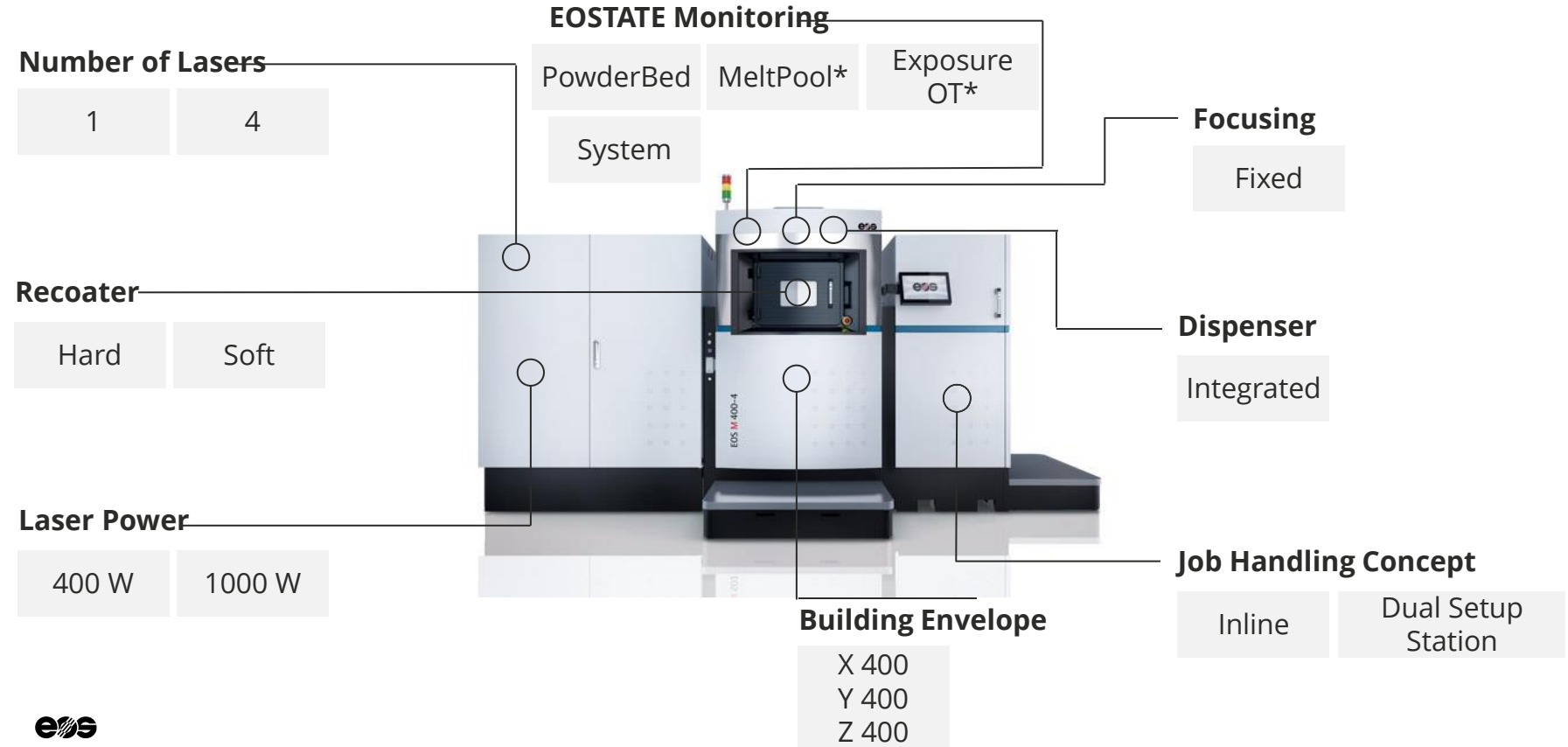
- Power consumption reduced by **80%** for heating, cooling and air conditioning
- Carbon footprint reduced by **80%** for heating, cooling and air conditioning
- Potential of **80 Mt** each year saving of CO2 in Germany
- Potential of **4 Gt** each year saving of CO2 for planet earth





EOS M 400 Series

Most Versatile System for Qualifying and Production



CuCrZr gas-liquid heat exchanger by Delva

Heat transfer capacity from gas to liquid: 20 kW



1/3 of the size of the closest commercial heat exchanger of similar performance



Optimized heat transfer efficiency and minimized part dimensions



EOS M 290

Modular machine architecture for highest flexibility

Filter System

Recirculating Filter System

EOSTATE Monitoring

PowderBed

MeltPool
**

Exposure
OT

Focusing

Fixed

Flex
(Ring)*

Laser Power

400 W

1 kW

2x 400 W

2x 1 kW*

Powder Handling

Manual

Semi-
Automated

Recoater

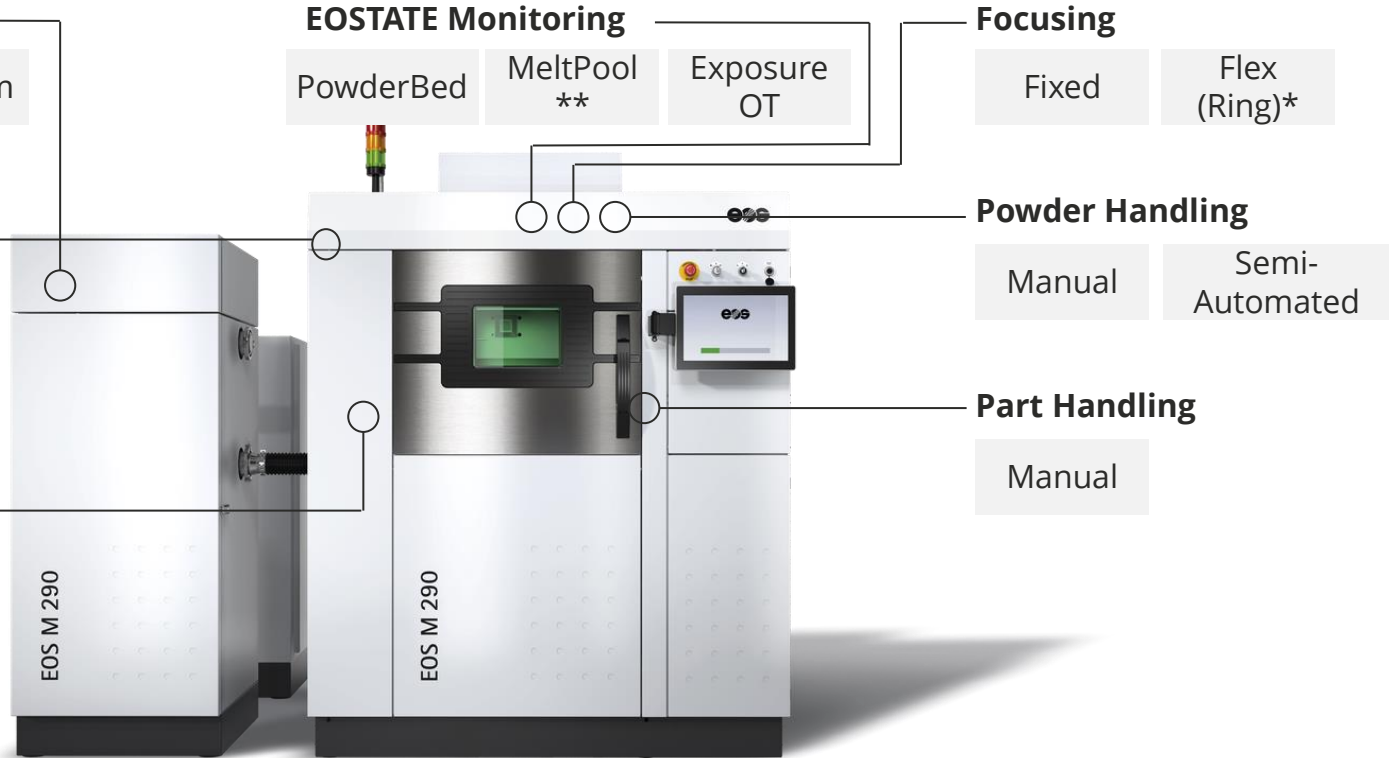
Hard

Brush

Silicon

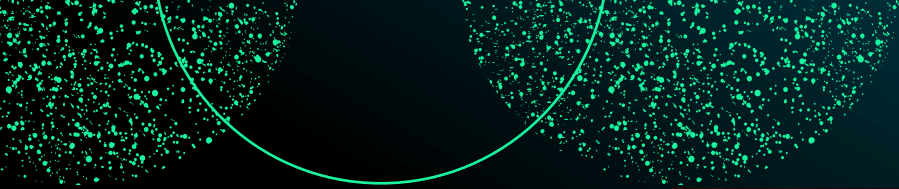
Part Handling

Manual



available through AMCM

** MPM not available for M290-2 400 W and M290-2 1 kW



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