

# GLOBAL ADDITIVE MANUFACTURING SERVICES OIL & GAS, CHEMICAL PROCESSING INDUSTRIES, AND RENEWABLES

Offering End-to-End Additive Manufacturing Services - from concept to commercialization.  
Global footprint in North America, Europe and Asia

## Feedstock Production (Powder & Wire)

- » Long standing expertise in metallurgy
- » **Ni-Based Alloys, such as:**
  - » BÖHLER L718 API & AMS (IN718, UNS N07718) [PBF-LB / DMD-Powder]
  - » BÖHLER L625 (IN625, UNS N06625) [PBF-LB / DMD-Powder]
  - » Hastelloy X (UNS N06002) [DMD-Powder]
- » **Co-Based Alloys:**
  - » BÖHLER L175 (UNS R31538) [PBF-LB / DMD-Powder]
  - » Stellite 6 (UNS R30006) [DMD-Powder]
- » **Fe-Based Alloys, such as:**
  - » BÖHLER W722 (maraging steel, UNS K93120) [PBF-LB]
  - » BÖHLER N700 (17-4PH UNS S17400) [PBF-LB / DMD-Powder]
  - » BÖHLER E185 (low alloy Ni-Cr case-hardening steel) [PBF-LB / DMD-Powder]
  - » 316L (UNS S31603) [PBF-LB / DMD-Powder]
  - » AISI 1045 (UNS G10450) [DMD-Powder]
  - » Super Duplex (UNS S32750) [DMD-Powder]
- » Others such as Ti-Based Alloys [PBF-LB], Carbide [DMD-Powder]



PRODUCED  
WITH 100%  
GREEN  
NITROGEN

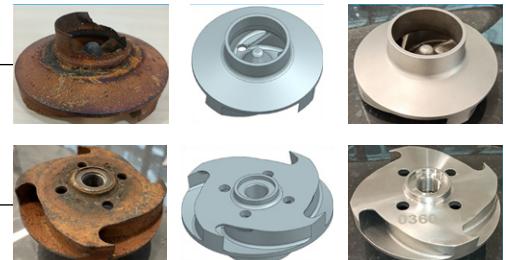
Additive  
Manufacturing Powder

Böhler Powder: [Click Here](#)

Böhler Welding: [Click Here](#)

## Reverse Engineering / Digital Warehousing / Digital Passport

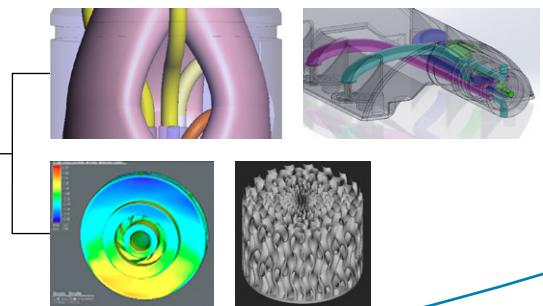
- » Utilizing advanced scanning technologies to re-create 3D CAD and detailed drawings for legacy components, **develop digital passport for digital warehousing approach** (cost and lead time reduction)
- » Evaluate the most suitable manufacturing method such as: AM, machining, casting, etc.
- » Rapid response to **minimize production downtime**



## Design for AM

AM-specific design expertise aided by **process simulation software** to ensure successful printing, offering design consultation to customer's engineering teams.

Supporting customer with **Design for Additive Manufacturing** (part unitization, topology optimization, minimize material usage and support structure) from conventional to AM on components such as downhole motor, wireline, pumps, sensor housing, nozzles, BOP, impeller, heat exchanger...



## Additive Manufacturing

- » **Prototyping & serial production** with multiple technologies: PBF-LB, DED
- » AM process qualified per **API20S (AMSL 1, 2, 3)** and **DNVGL-ST-B203**
- » **Post processing** capabilities: automated de-powdering, wire-EDM, etc.



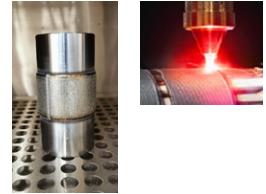
## Thermal Processing

- » **Hot Isostatic Pressing**
- » **Stress Relieving**
- » **Normalizing**
- » **Vacuum Hardening**
- » **Solution Annealing**
- » **Aging/Precipitation Hardening**
- » **Case Nitriding**
- » **Cryogenic Treatment**



## Machining & Surface Treatment

- » **Final machining** to deliver **turnkey solutions**, such as: turning, milling, grinding, polishing, balancing and overspeed testing
- » Hard facing, HVOF, PVD coating
- » Electro-polishing, Tumbling



## Quality

### Quality Management Systems:

- » **AS 9100 D & ISO 9001:2015**
- » **DNVGL-ST-B203**: Additive manufacturing of metallic parts
- » **API 20S** Compliant
- » **ISO13485:2016**
- » **NADCAP** Certification: Specific for Additive Manufacturing (AC 7131)

Powder Feedstock Control, such as Chemical Analysis, Powder Density, Flowability, PSD, Morphology, Humidity.

Metallurgical Analysis and Mechanical Testing, such as Chemical Analysis, Density, Microstructure, Surface Roughness Characterization, Tensile Testing, Impact Testing, Hardness Testing.

Non-destructive Examinations: Surface NDE via Liquid penetrant testing (LPT), Volumetric NDE via CT or RT.

Dimensional Inspection: FaroArm 3D scanning, CONTURA 7 CMM.

