

# Unlock the Value of Metal Additive Manufacturing for Critical Applications



## Benefits of Metal Additive Manufacturing

The design and fabrication freedoms of additive manufacturing (AM) technology unlock new opportunities for companies and organizations. Metal AM is a high value-add process that can pay off big in the long run, yet due to its relative novelty, a general lack of experience in AM design and manufacturing is inhibiting implementation.

## Producing Critical Parts in Regulated Industries

The freedom from conventional design and manufacturing limitations AM enables offers new opportunities to achieve superior performance parts, lighter weights, and increased efficiency.

Metal AM is increasingly being used to produce complex parts and assemblies in regulated industries such as Healthcare, Aerospace, Energy, Transportation and Motorsports.



FUEL INJECTORS



HEAT EXCHANGERS



SATELLITE BRACKETS



INTERBODY FUSION DEVICES



MOTOSPORTS

## How to Overcome the Knowledge Gap

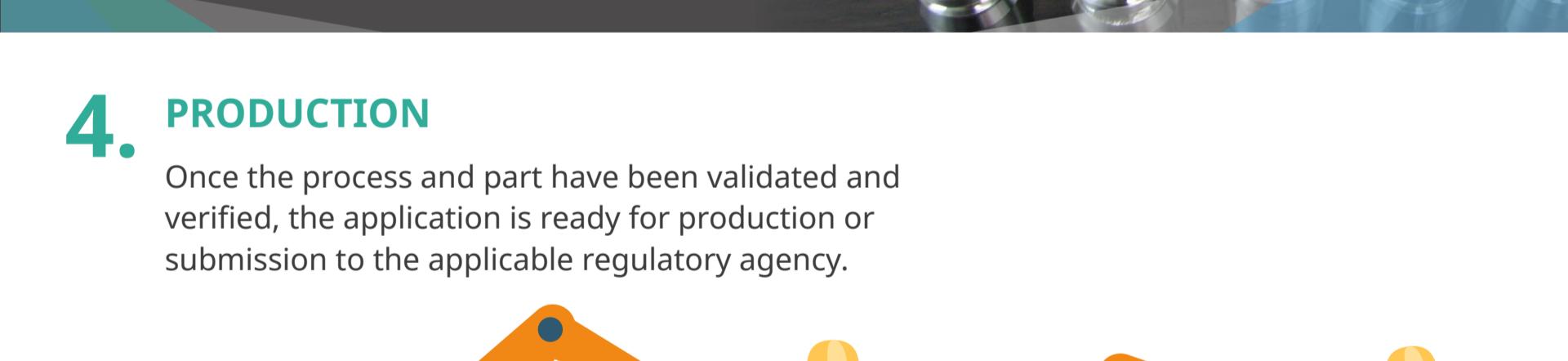
Many feel that before investing in a new technology, they need to know it will work for them. **This creates a tricky Catch-22:**



Fortunately, there is a systematized way to onboard this technology and reduce the friction of implementation.

This is through knowledge and technology transfer.

**ACCELERATE THE PATH TO INNOVATION BY BRIDGING THE GAP BETWEEN INTEREST AND CAPABILITY**



## Partnering to Establish and Qualify a Production AM Workflow

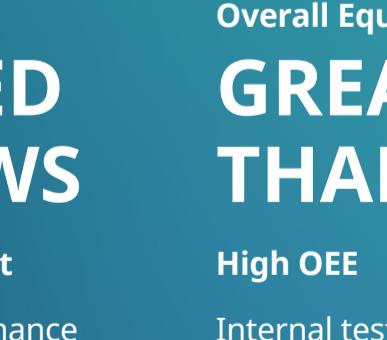
Setting up an AM process that can be validated is far faster and more straightforward when you can leverage data captured over a decade plus of full-scale metal additive manufacturing.

3D Systems' team of additive manufacturing experts and application engineers help customers develop and produce metal printed parts for critical applications.

A defined and proven production protocol removes the guesswork and facilitates a streamlined path to qualified AM parts. **The protocol exists in the following phases:**

### 1. DEVELOPING & CONTROLLING A PROCESS FLOW

During the initial implementation phase with 3D Systems, our team of experts work with you to establish and control your process.



### 2. VALIDATE YOUR METAL AM WORKFLOW FOR PRODUCTION

We take a methodical, phased approach to get your workforce and facilities where they need to be in order for you to bring your streamlined AM workflow in-house.

#### Installation Qualification

- Ensure proper machine installation to pass site and factory acceptance tests
- Confirm site readiness in terms of training, work instructions and maintenance

#### Operational Qualification

- Confirm results are as-expected with thorough challenging of process
- Identify and control impact of different process parameters through process characterization following a risk-based approach

#### Performance Qualification

- Ensure repeatability of expected result over a series of unique builds

#### Product-Specific Validation

- Verify that the established AM process delivers a usable part based on the application requirements.

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#### Production

- Once the process and part have been validated and verified, the application is ready for production or submission to the applicable regulatory agency.

#### Testing

- Testing performed on 3D Systems ProX DMP 320

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**3D SYSTEMS**  
Additive Manufacturing Solutions

Executive Brief  
How to Bring on Metal AM as a Validated Process for Certified Parts in Highly Regulated Industries

Add modules for SCALABLE CAPACITY

Modular Machine Architecture

The DMP Factory 500 offers function-specific modules that integrate with traditional manufacturing to enable a productive mixed factory environment.

Merge with traditional for INTEGRATED WORKFLOWS

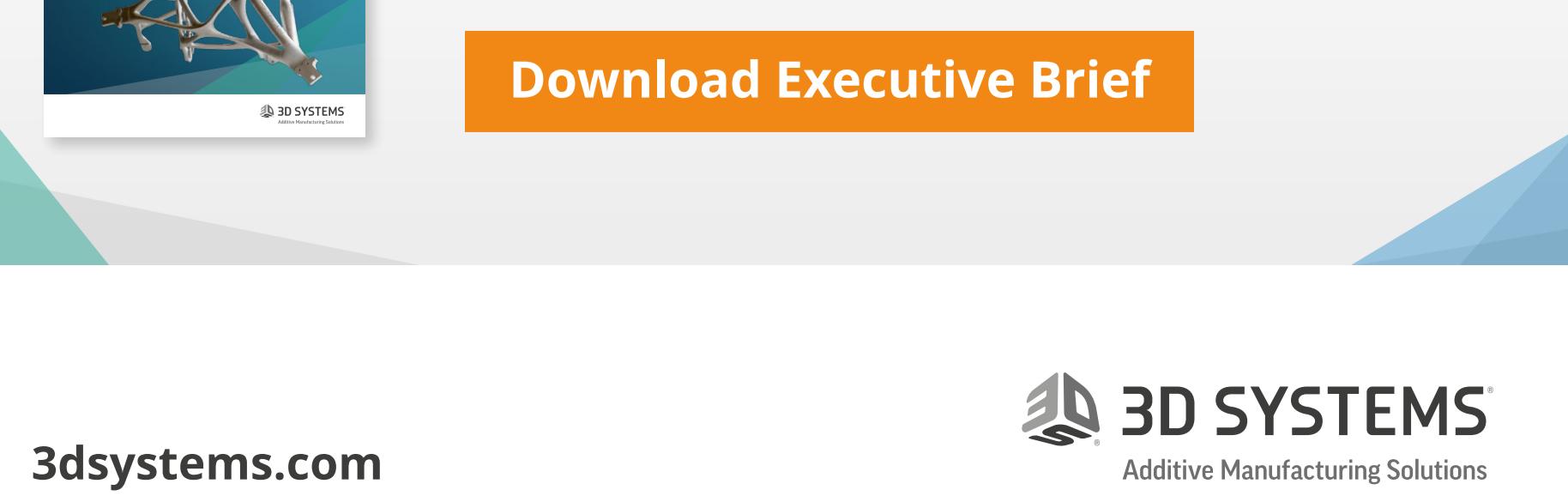
Mixed Factory Environment

Reduce set-up times and enhance flexibility with integrated solutions that enable quick transitions from additive to subtractive operations.

Overall Equipment Effectiveness GREATER THAN 80%

High OEE

Internal testing of 3D Systems' DMP machines\* revealed high productivity and reliability with overall equipment effectiveness exceeding 80%.



Interested in supercharging your experience with AM?

Learn more about how 3D Systems' can accelerate your innovation

[Download Executive Brief](#)