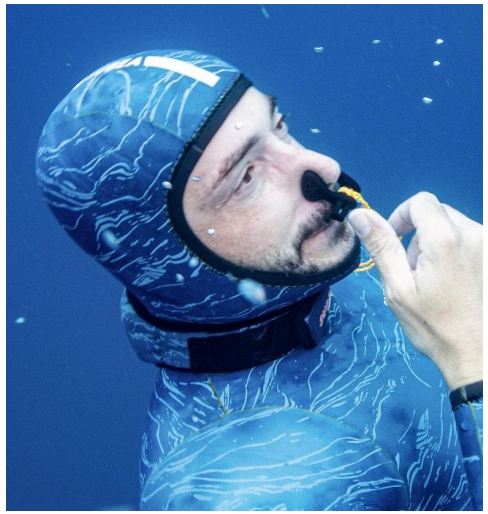
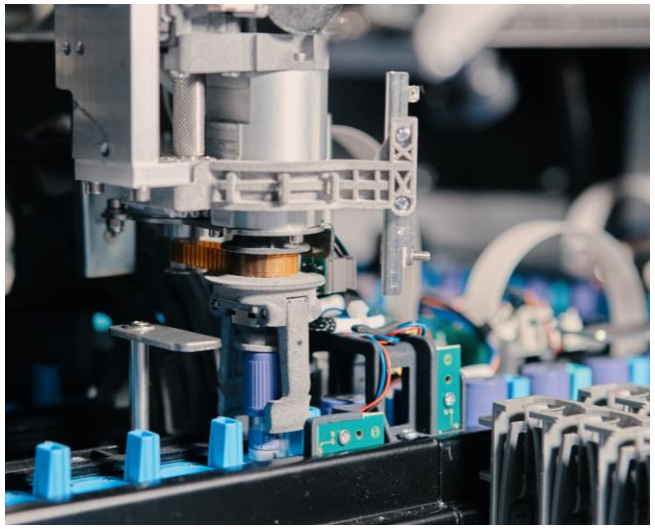
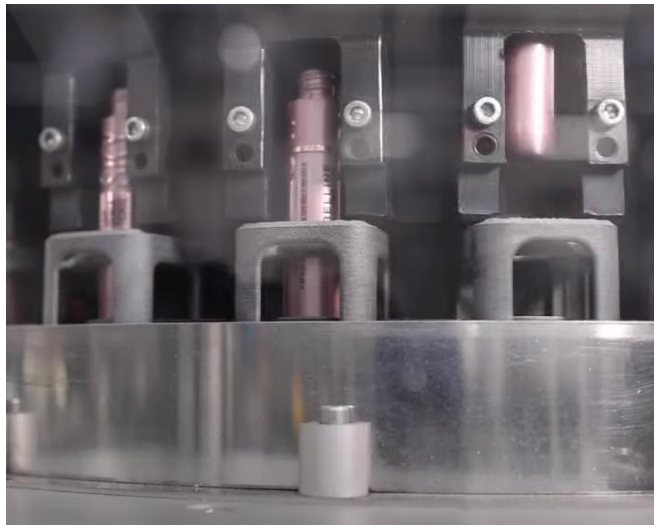
HP 3D Printing

Multi Jet Fusion

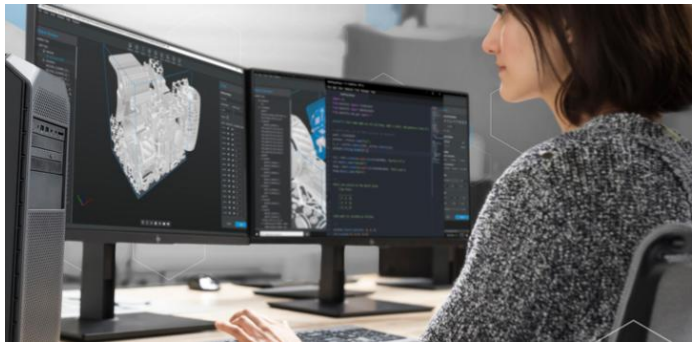
Final production with HP 3D MJF technology

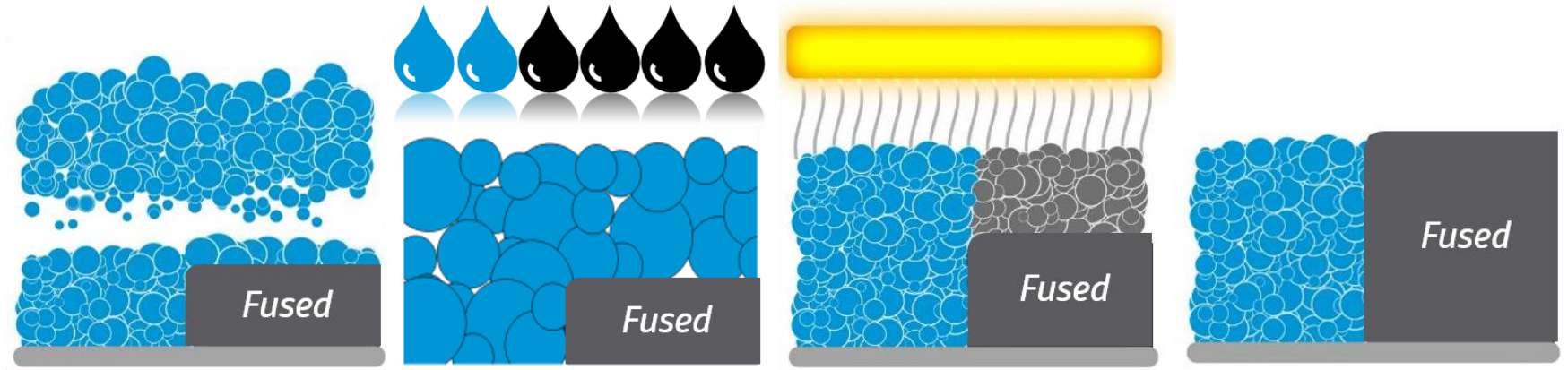


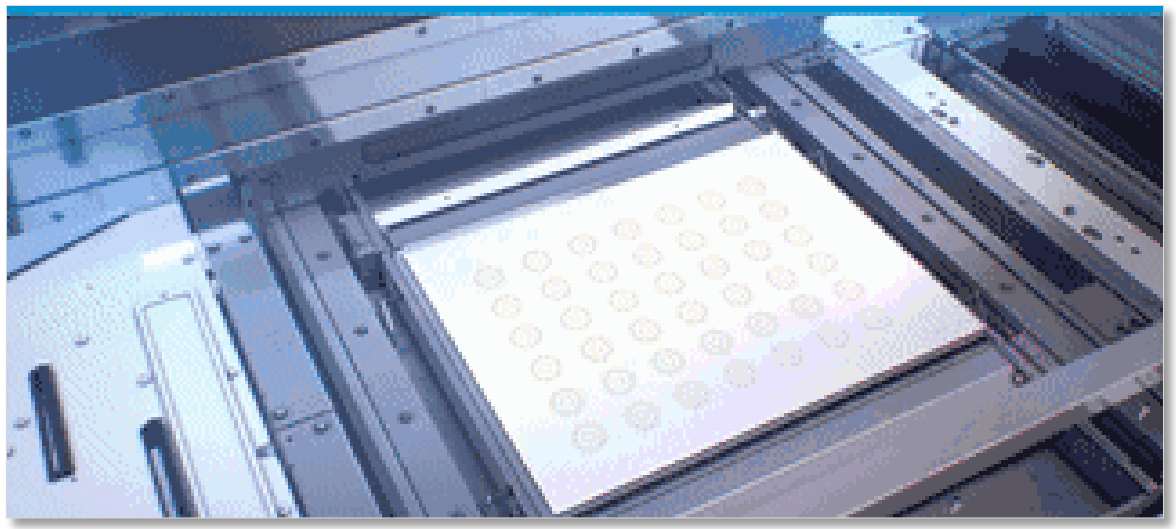




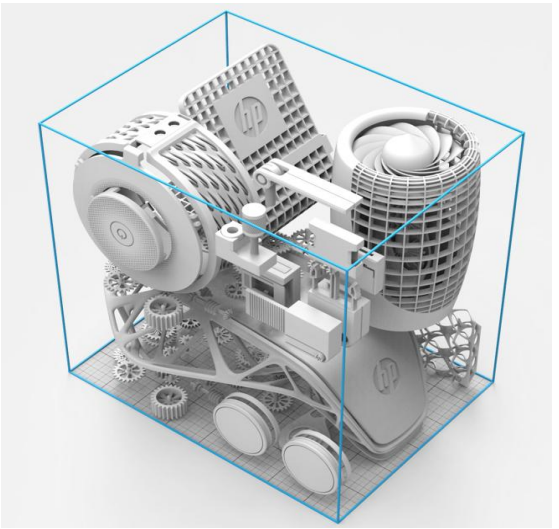

HP Multi Jet Fusion Technology



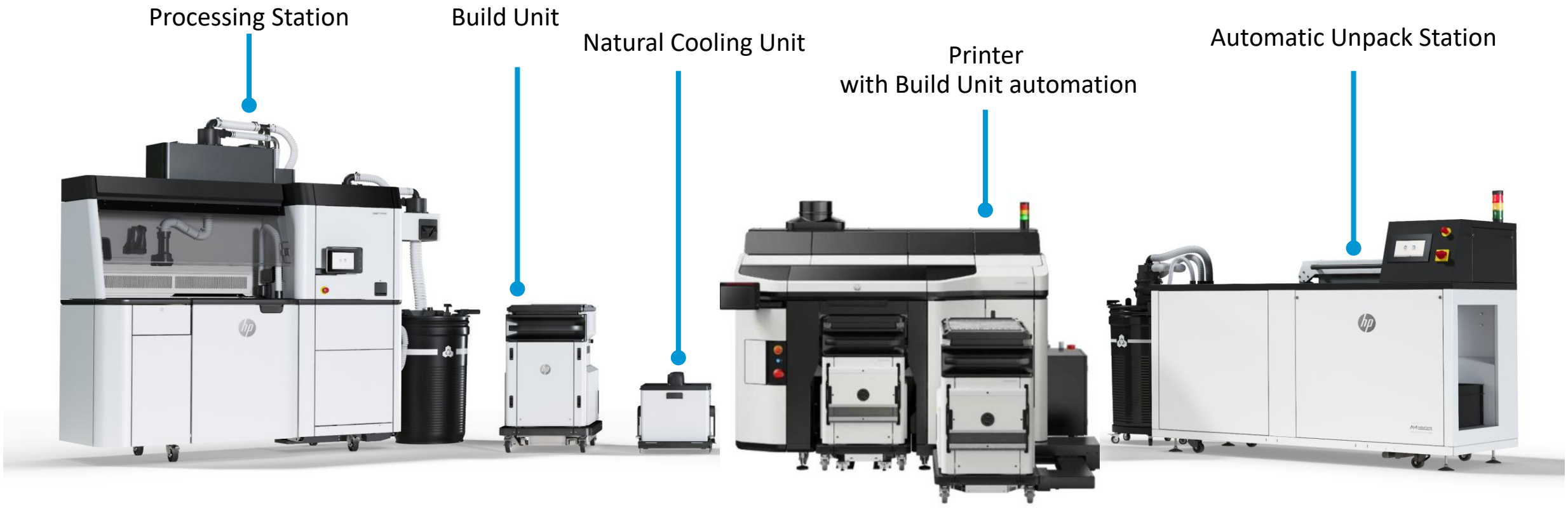
Material coating | Apply agents | Apply energy | Fusion







HP JF 5600



Materials

Rigid Materials

HP 3D HR PA 12 enabled by Evonik

HP 3D HR PA12S enabled by Arkema

HP 3D HR PA12 W

Data courtesy of Castomade

HP 3D HR PA12 GB

Data courtesy of Prometal

HP 3D HR PA12FR enabled by Evonik

HP 3D HR PA 11

Data courtesy of OT4

HP 3D HR PP enabled by BASF

Elastomeric Materials

HP 3D HR TPA enabled by Evonik

Data courtesy of GoProto

BASF Ultrasint® TPU01

Data courtesy of Kupol

ESTANE® 3D TPU M95A

ESTANE® 3D TPU M88A

Data courtesy of Posedla

HP 3D HR PA12 Flame Retardant, enabled by Evonik

Flame Retardant

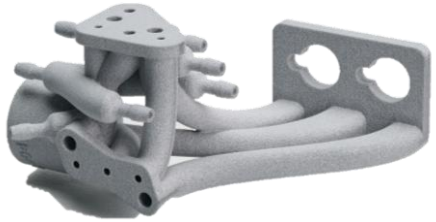
- Halogen-free
- UL94 V0 at 2.5mm: blue card
- Homogenous flammability (encapsulated)

60% reusability

- Disruptive cost per part
- Reduced environmental impact
- Manufactured with renewable energy sources

Premium Part Quality

- Smooth surface
- Fine details
- Isotropic mechanical properties and dimensional accuracy



Industrial

Electronics

Railway

HP Materials Driving Sustainability

High reusability

Industry-leading surplus powder reusability of up to 90%[1].

Bio-based materials

HP 3D High Reusability PA 11 powder is made with 100% renewable carbon content[2] derived from castor plants grown without GMOs in arid areas that do not compete with food crops.

Sustainable alternatives

Engaging with material suppliers to further reduce carbon footprint – switch to renewable energy, bio sourced materials.

Recyclability programs

Parts printed with HP HR PA 12 & PA11 are recyclable enabling the circular economy3.

Note: 1. Based on using recommended packing densities and compared to selective laser sintering (SLS) technology, offers excellent reusability without sacrificing mechanical performance. Tested according to ASTM D638, ASTM D256, ASTM D790, and ASTM D648 and using a 3D scanner. Testing monitored using statistical process controls; 2. Based on material manufacturer data, a renewable resource is a natural organic resource that can be renewed at the same speed in which it is consumed. Renewable stands for the number of carbon atoms in the chain coming from renewable sources (in this case, castor seeds) according to ASTM D6866, based on material manufacturer claims; 3. Subject to Virtucycle recyclability program conditions https://hpp.arkema.com/en/sustainability/virtucycle/

Post-processes


Tumbling


Dyeing

Chemical polishing


Coatings


Hydrographics

Paintings

Metalization


Others...

Process Development – Fine tune your application

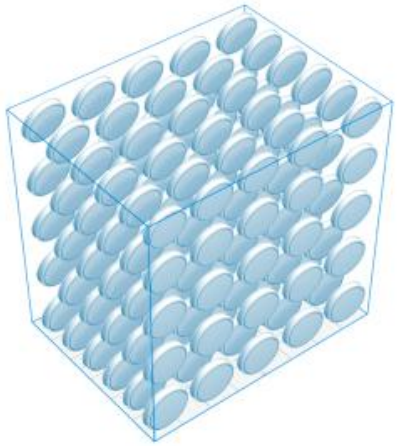
Process Parameters

- Thermal Adjustments — G Z
- Dimensional Adjustments — G R P
- Agents Adjustments — G R
- Cooling Adjustments — G
- Layering Adjustments — G
- Other Adjustments — G

Regions of influence of the different Process Parameters

General (G)

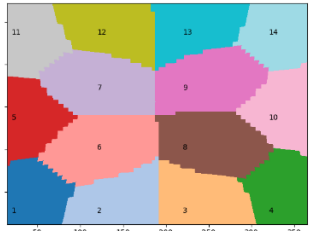
Settings are applied to the entire build.



E.g.: Cooling time

By Zone (Z)

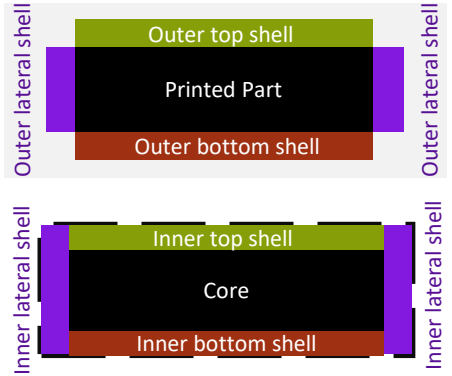
Settings applied to one or multiple bed zones. (14 in total)



White Temp Offset

By Part Region (R)

Settings are applied to specific regions of all parts in the build.



Part Core Detailing Agent

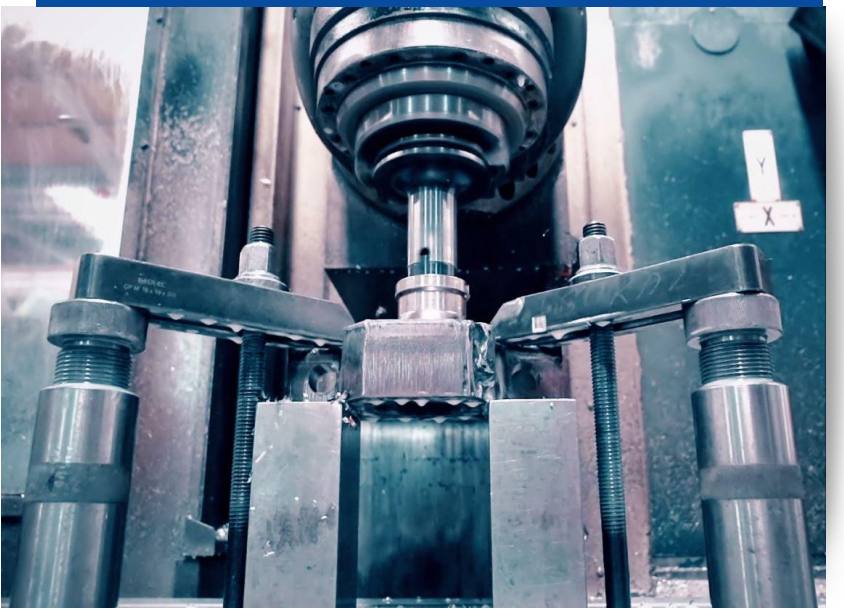
By Part (P)

Settings are applied to a specific part in the build.

Dimensional Offset X

Today’s Manufacturing scenario

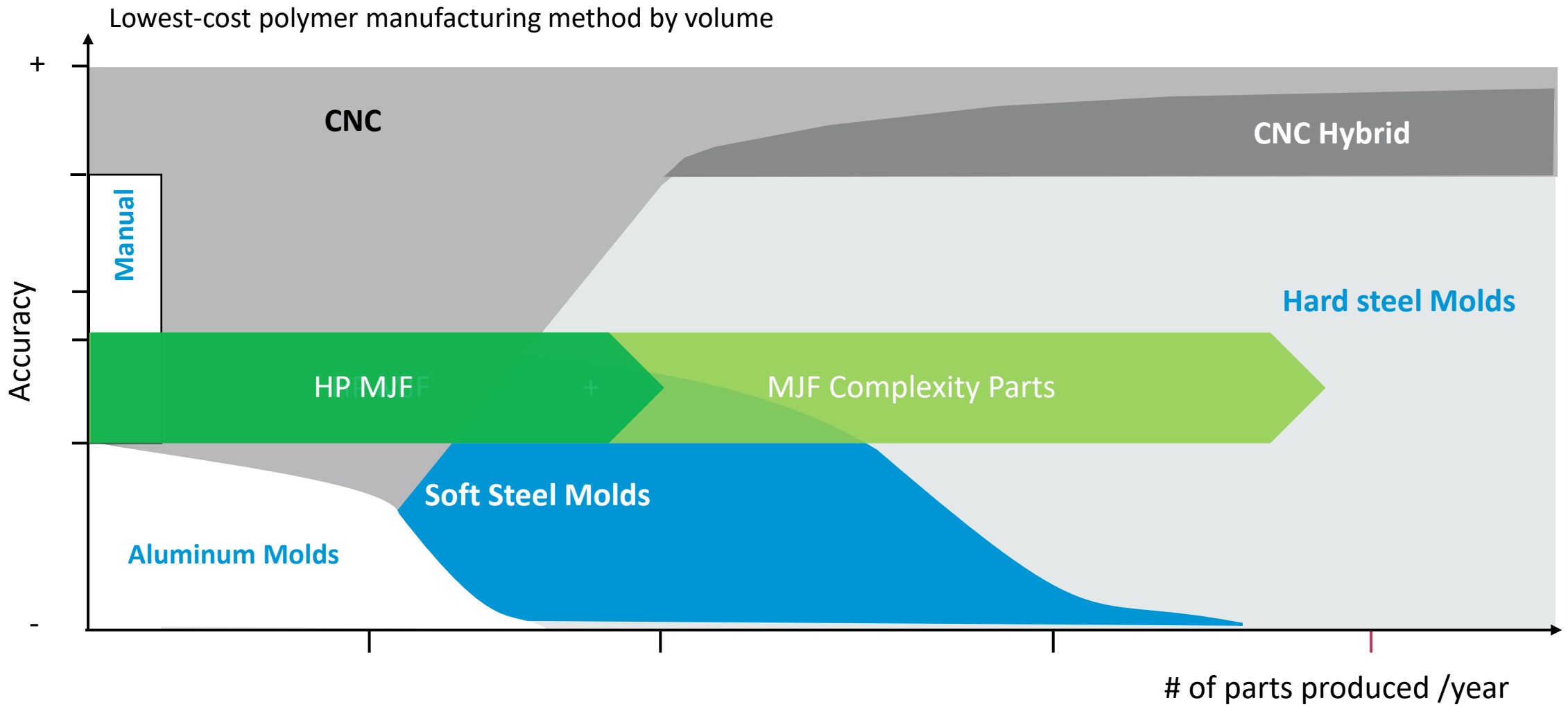
Subtractive Manufacturing



Formative Manufacturing (FM)

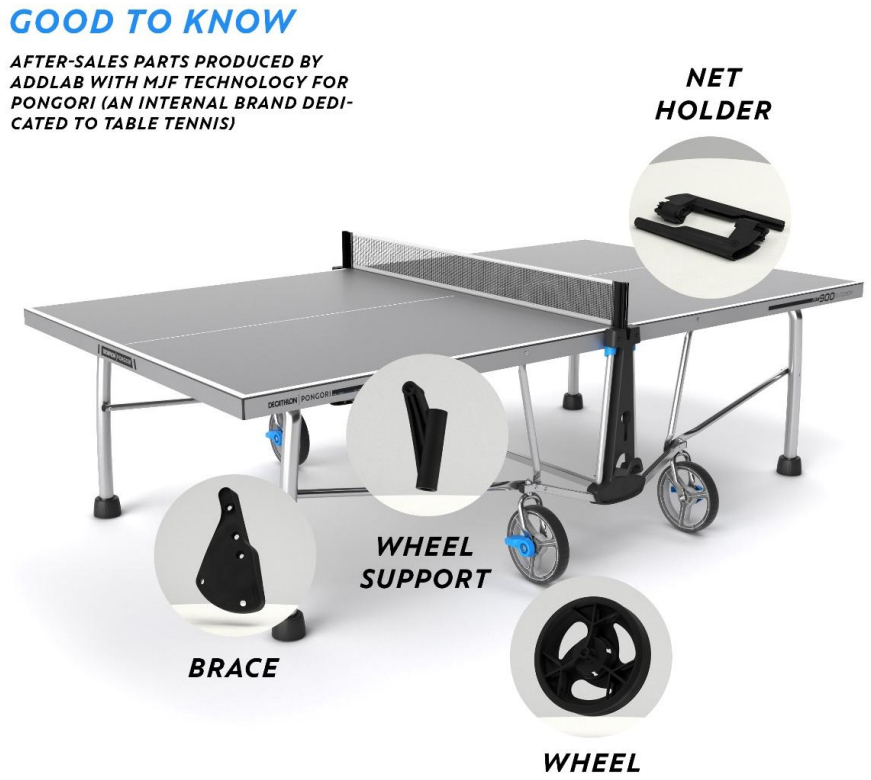
Additive Manufacturing (AM)

When to use MJF



Spare parts, New products

Decathlon



- No need for warehouse stock with on-deman production.
- Cost savings by avoiding remaking an injection mold.
- Fast go-to-market to respond very quickly to a need and produce in very small quantities, locally, without having to open an expensive mold.
- Part consolidation to avoid assembly and injecting several components.

Bridge to production parts

GM - Spoiler Closeout Seals

Solution: HP Jet Fusion 3D Printing Solution

Material: BASF Ultrasint® TPU01

Post-processing: Raw part, blasted, vapor polished

Chevrolet engineers needed to make a last-minute change to the 2022 Tahoe's design, resulting in the need for the creation of an additional part—a flexible "spoiler closeout seal" to fill the gap at the rear of the SUV.

Speed
Chevrolet needed 60,000 units to complete the SUVs. A number that GKN Additive / Forecast 3D delivered in just five weeks— half the time compared to injection molding manufacturing

Scale
One of the largest-scale deployments of AM in the world of production cars

Source

Prosthetics and Orthotics production with HP MJF

Data Courtesy of iOrthotics

https://www.iorthotics.com.au/

Data courtesy of Invent Medical

https://www.inventmedical.com/products/

Data courtesy of Crispin Orthotics

https://www.crispinorthotics.com/3d-printed-orthotics/

https://prosfit.com/products

Data courtesy of Chabloz Orthopédie, group Ottobock

https://chabloz-plagio.com/fr/

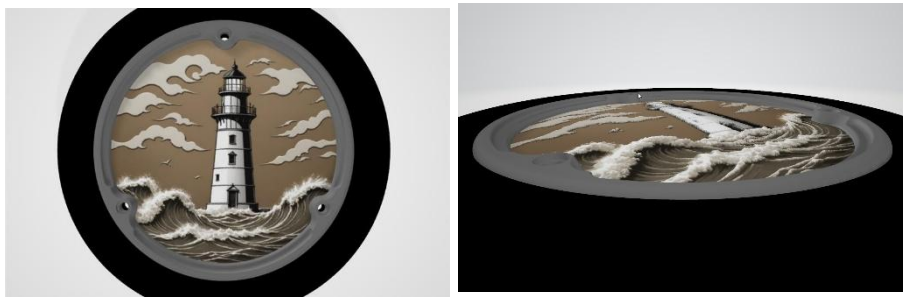
https://glazeprosthetics.com/

Dynamic co-creation with hybrid AI models

Editable region: Full centerpiece area

1) Text Prompt:

"Make me a lighthouse in an ocean"



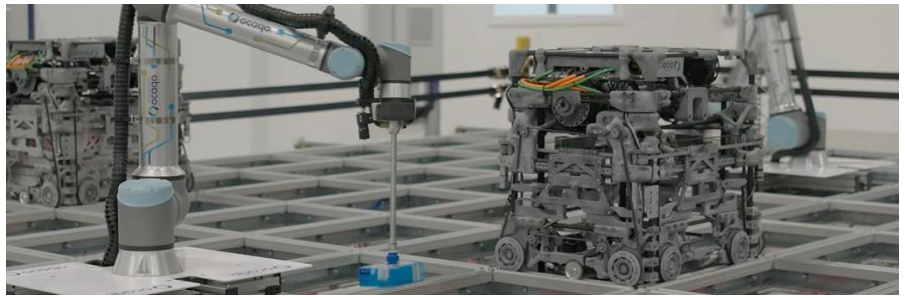
2) Text Prompt:

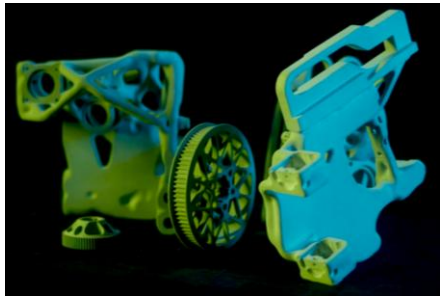
"A Greco-Roman Style Women in a Toga"

3) Text Prompt:

……

Ocado Group - 600 Series Bot





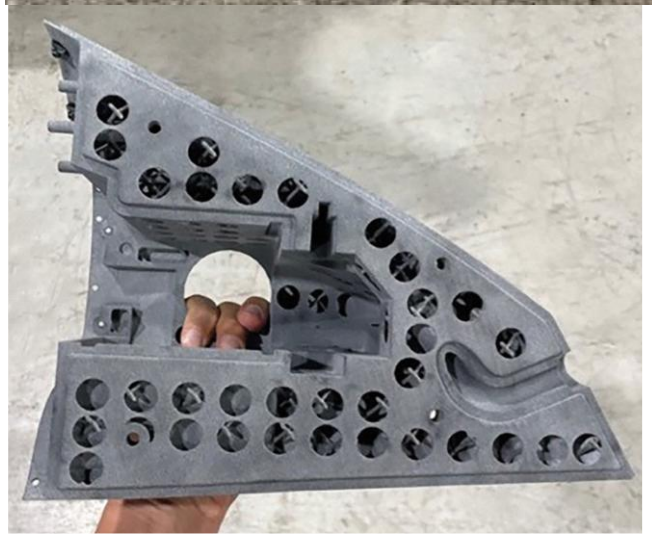
IAs true pioneers of the online grocery market, the Ocado Group blazed a trail through an increasingly digital world, both leading and benefiting from the fast-increasing consumer shift to online shopping.

In Ocado Group's highly automated warehouses, hundreds of bots whizz around the top of a giant crate storage bin, arranged in stacks. It's called the "hive". Ocado Group's new generation of bots, the 600 Series bot, is energy-efficient, high-performing and 5 times lighter than its predecessor, setting new benchmarks for flexibility, productivity and cost. All bots are orchestrated by AI, collaborating to pick a 50-items customer order in just 5 minutes, and up to 150 orders simultaneously.

- Lightweighting – topology optimization of more than 300 parts requires less energy and power to achieve the same throughput.
- Reliability & performance - most efficient shapes to provide optimal mechanical functionality and sustain the structural demand.
- Design freedom - ability to print most complex shapes and structures for speed and agility.

ocado INTELLIGENT AUTOMATION

Blueflite - Cobalt® and Slate® UAS



Blueflite is an UAS manufacturer focused on producing a last-mile UAS delivery platform. They offer a cargo UAS with an enclosed payload area and four tilting motor arms, eliminating the need to pitch the fuselage during flight. Their tilt rotor technology enhances control in adverse weather and protects sensitive payloads. Blueflite primarily focuses on delivering consumer goods, medical products, and industrial supplies. Traditional 3D printing methods comes with limitations in strength, geometry or weight, which restrict viable solutions. HP's MJF technology has effectively addressed these constraints for blueflite.

- Weight optimization: The combination of print resolution and part configurations has enabled them to reduce UAS weight without compromising performance
- Part quality: Fine resolution, an impressive strength-to-weight ratio, and consistent repeatability
- Freedom of design: In both structural, functional and aesthetic components of our cargo UAS platform. Utilizing lattices and octagonal ribbing in our fuselage, landing gear, battery cases, and more