A component journey

Adding value – 3D printed metal part

Almost all metal parts built by the additive manufacturing process require secondary treatments to make them suitable for their intended use.

Bodycote provides a complete post-manufacture service solution including hot isostatic pressing to remove micro-porosity and reduce the extent of segregation in the built structure, heat treatment to improve material properties, and associated quality assurance testing.

The metal part is 'built' onto a plate in a 3D printing machine by depositing metal powder in layers which are then consolidated, for example using lasers.

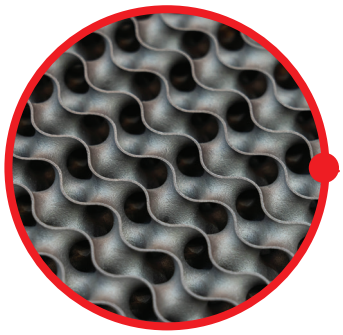
The part is stress relieved in a vacuum furnace to minimise any distortion.

Hot Isostatic Pressing (HIP) ensures that any porosity within the part is removed, thereby reducing the variation in mechanical properties when compared with the as-built part, and improving ductility and fatigue strength.

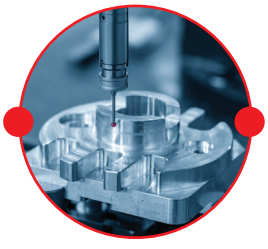
The component is then removed from its build plate by electrical discharge machining (EDM) to prepare for HIP and heat treatment.

The part next undergoes heat treatment to achieve full material properties and improve the microstructural characteristics of the component if needed.

Various testing methods are used to check that the part meets specification – these may include radiography, tensile testing, and metallography.



End application,
3D printing is creating components in a range of industries including aerospace, medical, and power generation.



The component will undergo any necessary finish machining and dimensional inspection.

Denotes the parts of the component journey undertaken by Bodycote

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