SOLUTIONS

Kennametal Additive Manufacturing

kennametal.com

KENNAMETAL®

A History of Materials Innovation and Close Attention to the Customer

Kennametal was founded on the strength of materials innovation when, in 1938, metallurgist Philip M. McKenna created a tungsten-titanium carbide alloy for cutting tools and wear components. With his invention, Philip started the McKenna Metals Company in Latrobe, Pennsylvania. Later renamed Kennametal, the corporation has become a world leader in metalworking tools and wear- and corrosion-resistant materials.

Kennametal Additive Manufacturing successfully combines our recognized expertise in Tungsten Carbide & Stellite™ material families with the advantages of 3D printing.

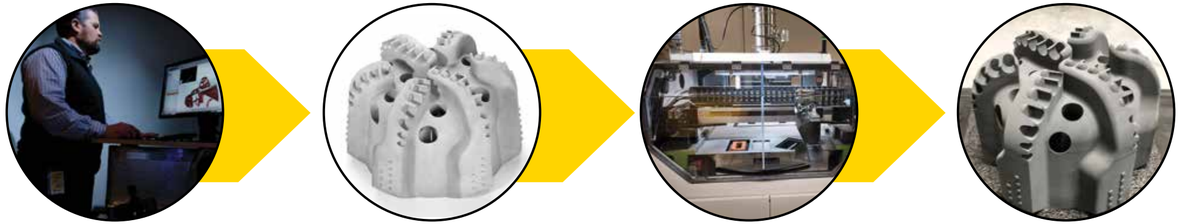
The company leverages its broad experience in materials science, application engineering, and manufacturing excellence with AM technologies to supply high-performance metal powders and finished AM components for wear, erosion, corrosion, and high-temperature applications.

Philip McKenna

Metal AM Is Recognized as the Most Significant Next-Gen Manufacturing Technology

Metal additive manufacturing processes (Metal 3D Printing) represent the next generation in design freedom, manufacturing flexibility, and supply chain optimization. These proven processes are being leveraged across a variety of industries and applications to develop and deploy high-performing parts both quickly and efficiently.

Kennametal is focused on adapting its high-performing wear- and corrosion-resistant material families to multiple 3D print platforms to produce complex, fully finished components and tooling with shorter lead times and improved performance.



Design **3D Model** **Print** **Finish**

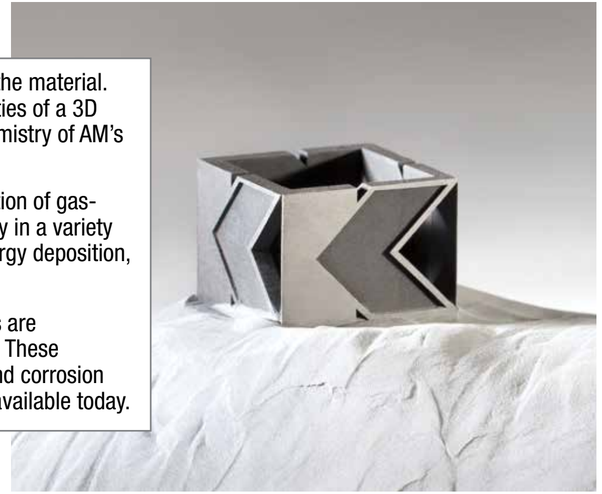
Delivering End-to-End Solutions

Enabling High Wear- and Corrosion-Resistant Solutions for Metal AM Printing

The success of additive manufacturing begins and ends with the material. The printability, post processing, and ultimate physical properties of a 3D printed part are reliant on the quality, characteristics, and chemistry of AM's feedstock.

Kennametal is a global leader in the development and production of gas-atomized AM materials, which have demonstrated functionality in a variety of additive processes, including powder bed fusion, direct energy deposition, and binder jetting.

Kennametal's Tungsten Carbide and Stellite™ material families are the first and only of their kind being offered via AM processes. These patented material systems offer a stepwise change in wear and corrosion performance compared to other metal 3D materials systems available today.

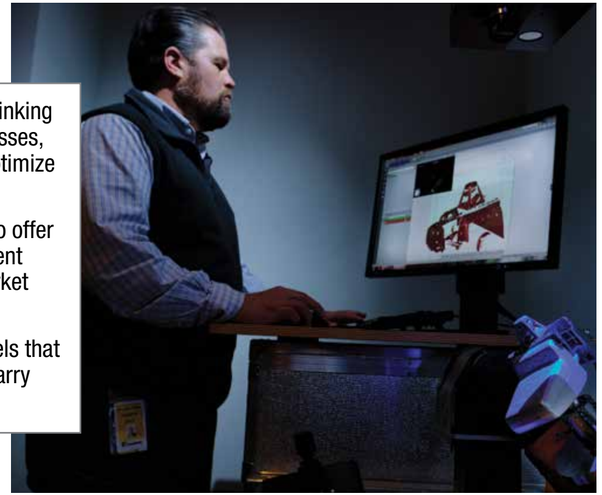


Supporting Full Design Freedom for Additive and Rapid Deployment of Functional Components

Because Additive Manufacturing requires a different way of thinking about design than traditional subtractive manufacturing processes, Kennametal works in close collaboration with customers to optimize their design concepts and unlock the full value of AM.

Kennametal leverages more than 80 years of manufacturing to offer functional metal parts made via AM with shortened development cycles and design iterations, so you can bring products to market faster, easier, and with the potential to be more cost efficient.

Additionally, Kennametal can deliver pre-qualified digital models that enable a print-on-demand approach—reducing the need to carry expensive inventory and simplifying your supply chain.



Cutting-Edge Technologies and Proprietary Print Recipes across Multiple Platforms

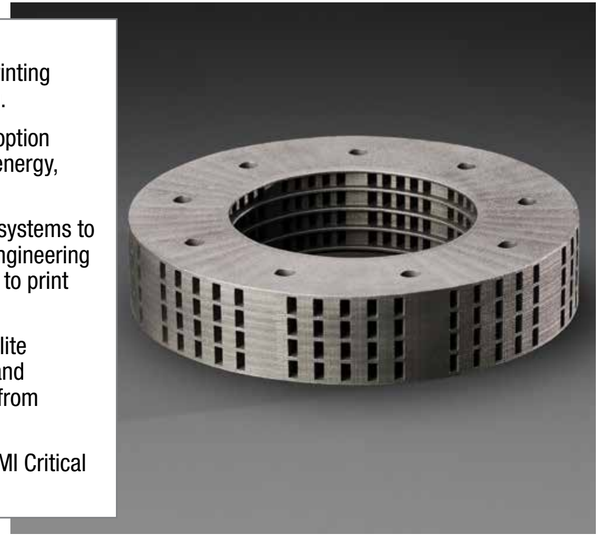
Kennametal combines our differentiated metal powders with manufacturing expertise in binder jet and laser powder bed printing technologies to produce fully finished components and tooling.

The company's 3D printed parts have already gained wide adoption across a variety of industries, such as metalworking, tooling, energy, and industrial processing.

As a leading global supplier of highly engineered flow control systems to the major energy and industrial process sectors, IMI Critical Engineering is leveraging Kennametal Additive's Stellite™ 6-AM-K material to print complex valve cages.

"The AM components supplied by Kennametal using their Stellite 6-AM-K powder were tested in a highly erosive environment and performed to the same high standards we've come to expect from traditionally manufactured parts."

Ajitkumar Sreekumar, Vice President Business Development, IMI Critical Engineering



Maximizing Performance while Minimizing Cost

When it comes to additive manufacturing, the importance of proper post processing is often lost, even though it can account for more than half of the cost associated with production and have a critical impact on the performance characteristics of the part.

Kennametal's proprietary post-processing treatments ensure that the full value and maximum performance of your AM parts are delivered, owing to a variety of finishing capabilities (depowdering, sintering, green processing, heat treating, HIP, cutting, machining, and grinding) and proprietary treatments at the company's disposal.

Kennametal truly offers full end-to-end AM solutions, all which help to keep you up and running with no surprises.

Kennametal is your ideal partner for the development of next-generation AM solutions.

Kennametal brings nearly a century of materials and manufacturing expertise to every layer of the AM process—from raw material to finished part—helping you unlock the full value of 3D printing for applications demanding wear, erosion, corrosion, and high-temperature performance.

Contact us today so we can help find the right solution for your application: Tel: +1 574 534-2585 | Fax: +1 574 534-3417 K-gshn.service@kennametal.com

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