AM Metal Powders Buyers Guide

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Making our world more productive

8 QUESTIONS FOR YOUR METAL POWDER SUPPLIER

Metal Additive Manufacturing (AM) is a rapidly growing technology. As AM capabilities grow more sophisticated and efficient, aerospace, automotive, and other industries are starting to close in on the dream of large-scale metal AM.

While much of the emphasis in the industry has been on machine technology, metal powders are getting more attention, as parts manufacturers recognize that powder supply, quality, and composition can make a deciding difference in their metal AM operations. Whether your organization is working in prototypes or mass production of metal AM parts, here are eight important qualities to consider in any AM metal powders supplier. We'll also share how Praxair Surface Technologies is positioned in each of these areas to help your operation meet the demands of metal AM.

1 Capacity

CAN YOUR METAL POWDER SUPPLIER POUR THOUSANDS OF POUNDS IN ONE MELT?

Whether you need a large or small supply of metal powders, a high melt capacity means your supplier can meet your demand. If you require a large order, capability to produce larger lots reduces your sampling and QC time at delivery. If you order smaller lots at a time, high-capacity melt means more supply on-hand and likely means your supplier has more than adequate processes and procedures in place to continue meeting your supply chain needs. If your supplier can melt in high quantities, you should make sure that also translates into high yield. As yield falls, waste and cost go up. A supplier that can deliver high yield in both coarse and fine particles ensures maximum value for you, whatever technology platform you're using.

Praxair Surface Technologies (PST) has the capacity to produce large lot sizes while maintaining a high yield percentage in both coarse and fine grain particles.

2 Flexibility

CAN YOUR SUPPLIER TAILOR IT'S POWDERS TO YOUR PROJECTS?

In the burgeoning field of metal Additive Manufacturing (AM), the ability to continuously experiment with materials, and design is key to refining your products. AM metal powder suppliers with the capability to deliver specialty compositions, smaller lots and custom-sizing options will help keep your project timelines on-track. When customization is called for, delivery should be measured in weeks, not months. Flexibility should also extend to the platform you're using. Make sure your supplier can reliably deliver powders optimized to your production system.

Praxair Surface Technologies (PST) manufactures both large and small lots, delivering powders in quantities as low as 10 lbs. We make metal powders optimized for all additive platforms and we can also customize composition and sizing to your precise parameters. PST stocks standard products in large inventories for fast delivery. Customized products can be delivered in as little as a few weeks.

3 Range of Portfolio

DOES YOUR SUPPLIER SPECIALIZE IN ONLY A FEW COMPOSITIONS?

As your metal AM expertise grows, so may your needs for different materials. In addition to titanium alloys, a supplier that can also deliver copper, iron, nickel and cobalt powders will maximize your options as business demands change.

Praxair Surface Technologies (PST) is the only manufacturer that can supply cobalt, copper, iron, nickel and titanium AM powders at a mass-production scale.

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4 Technology

WHAT TECHNOLOGY DOES YOUR SUPPLIER USE TO MANUFACTURE ITS POWDERS?

High-purity, low-gas content atomized powders are the preferred choice for metal AM parts that must meet special industry demands, such as those for aerospace. Understanding the quality of the powders you work with begins with understanding the technology your supplier uses to make them. Make sure your powders are made using vacuum induction melting, combined with argon gas atomization. Vacuum induction melting minimizes oxygen content, maximizes flow-ability and ensures proper morphology. This translates into better integrity and performance of the finished part with less production waste.

Praxair Surface Technologies (PST) only produces AM metal powders using vacuum induction melting with argon gas atomization. In 2015, PST built the world's largest titanium gas atomizer for high-volume production. Our close-coupled atomization technology delivers up to 10x more yield vs. older methods.

5 Safety

DOES YOUR SUPPLIER HAVE A PROVEN TRACK RECORD IN METAL POWDER MANUFACTURING SAFETY?

Like most manufacturing operations, AM metal powder production can be dangerous if not done correctly. A safe manufacturer not only protects its employees but your supply chain as well. A visit to your supplier's facility can reveal a lot about the value they place on safety. The facility should be clean and organized, and safety processes should be meticulously documented and followed. If your supplier has proven safety procedures, they should also be willing to share their best practices with you, to help your organization ensure safe handling throughout your production process.

Praxair Surface Technologies (PST) regularly consults with customers to help them improve and refine their safety procedures, building from best practices we've developed over decades of metal powder manufacturing. One example is our proprietary titanium process that allows customers to better handle these highly reactive powders.

6 Qualification & Certifications

DOES YOUR SUPPLIER CARRY THE NECESSARY CERTIFICATIONS FOR YOUR END-USE?

For aerospace and other specialized industries, it's important for your AM metal powder supplier to understand the requirements of your industry and carry the appropriate certifications. Suppliers will be audited regularly by most OEM's, and must hold specific regulatory approvals. Your supplier's production system should be set up to meet any specified requirements, including comprehensive traceability, purity of raw materials, and documenting the precise composition of the powders you receive for a reliable, consistent supply chain backed by confirmatory data you can easily access.

Praxair Surface Technologies (PST) works with aerospace-grade raw materials which undergo thorough testing at our on-site lab. We carry AS 9100, ISO 9001, and Nadcap certifications. Every lot we produce is fully traceable. Lot reference samples are kept on file and we share final product quality control data with our customers as a matter of routine. Through our on-site testing lab, PST can supply additional, or customized quality control testing to meet your specific documentation requirements.

CAPACITY

Our scalable capacity means we can supply both high volumes for large-scale production and small lots for R&D. Praxair Surface Technologies is the only manufacturer that can supply cobalt, copper, iron, nickel, and titanium powders at a mass-production scale.

7 Productivity & Continuous Improvement

DOES YOUR SUPPLIER IMPLEMENT FORMAL PROCESS IMPROVEMENT METHODOLOGIES?

With the fast growth and rapid changes in metal AM, it's important that your supplier is actively engaged in continuous process improvements for AM materials. A supplier that uses proven methodologies like Six Sigma and Lean Manufacturing will be better able to keep up with a demonstrated commitment to continuous improvement to product quality, consistency, and process efficiency.

Praxair Surface Technologies (PST) employs Six Sigma, TPM, Lean Manufacturing, 5S, and other continuous improvement methodologies to keep our processes up-to-speed with the metal AM industry and devises process improvement projects specific to metal AM. PST also has an on-site metal AM lab, where we are able to design and produce metal parts. This capability helps us learn how our metal powders work in real-world applications - providing insights to continuously improve formulations, efficiency, and quality.

8 Financial Backing & Investment

IS YOUR SUPPLIER COMMITTED TO KEEPING PACE WITH METAL AM GROWTH?

Your powder supplier should be prepared to work with your company for the long-term, and that means investing in technology and infrastructure to support the evolution of metal AM. Atomization systems, comprehensive QC capabilities, and regulated processes take years and millions of dollars to bring on-line, and must advance alongside the industry. Only suppliers with substantial resources will be able to keep up with the predicted growth of metal AM.

Praxair Surface Technologies (PST) has been an industry leader and innovator since 1946. With this backing, PST has made substantial, ongoing investments in metal AM. Significant additions to our infrastructure include our on-site metal AM lab, complete with design and AM part production machinery. Additional capital improvements include our high-capacity titanium atomizer, which enables Praxair to produce high-quality powders while constantly improving and innovating both products and processes.

PST | AM METAL POWDERS

Print the future with proven metal powders

Praxair Surface Technologies has served the aerospace industry since 1946. At any given moment, millions of pounds of PST made powders are in the air, meeting the strict demands of our aerospace customers. We know metal AM will be part of our customers' future, and we have made a commitment to make it part of our future, too.

SERVICE

We believe in understanding, and fulfilling what our customers need for the growing metal AM industry. We are committed to delivering consistent supply of standard powders as well as customized products. Our team is ready to work with you, consulting on products, processes, and safety to help your metal AM operations run smoothly.

QUALITY

With traceability from raw materials through final product delivery, Praxair Surface Technologies' (PST) TruForm™ metal AM powders provide consistent product composition, morphology, and particle size to meet even the most stringent industry demands.

EXPERIENCE

With over 50 years of experience in metal powder production, Praxair Surface Technologies (PST) has the capability and expertise to meet the demands of metal AM, from product development to process innovation.

TruForm™ Metal Powders

PRINT THE FUTURE WITH PROVEN METAL POWDERS

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