

INTERVIEW

Introducing ADDMAN, the additive-enabled production partner

We speak to CEO Joe Calmese about ADDMAN's recent acquisitions, its unique capabilities with refractory metals and its overall vision for AM.





Joe Calmese, CEO of ADDMAN Group.

Founded just over a year ago, ADDMAN has come out of the gate running. The US-based industrial additive manufacturing service—or, more accurately, "additive-enabled service"-offers industrial product development services that span R&D and design to high-volume production, and works with American clients in the defense, aerospace, medical and soon energy sectors.

ADDMAN Group is owned by American Industrial Partners (AIP), a private equity company that invests in industrial businesses. Though young, ADDMAN is backed by years of experience and has undergone incredible growth since launching, with three major acquisitions in a 10-month period. With facilities and offices around the US, it also has an impressive capacity, including industrial-grade metal and polymer additive manufacturing, precision machining and metallurgy. To learn more about the ambitious industrial manufacturing service we caught up with ADDMAN CEO Joe Calmese, who has shared with us the company's mission and the various ways it is pursuing its goals.

An additive-enabled partner

"I joined the ADDMAN group in April 2021 to commercialize an idea born out of the internal AIP engineering team," Joe Calmese tells us, adding that he already had over a decade-long relationship with AIP. The concept for ADDMAN, he continues, started off as an engineering team within AIP that was dedicated to bringing additive manufacturing solutions to the other companies owned by the firm.

"As they were really starting to help companies through their additive journeys, some of the partners thought 'hey, this is such a good idea, we should

make this venture external market facing and add it to our portfolio.' It was at that point that they reached out to me—at the time I was working at Honeywell-and asked if I was interested in coming back to the AIP family to commercialize ADDMAN."

But what is ADDMAN? If you ask Calmese, he explains that ADDMAN is an "engineering-centric, additive-enabled manufacturing partner". With more engineers than any other position within the company, the description seems more than accurate. "We use additive to push boundaries in manufacturing, but we don't approach problems as though additive is the only solution. We know that AM, depending on the phase of the part or the product design, has a very specific role and our goal is to find the best solution, whatever it is."

ADDMAN, the additive-enabled manufacturing service, has grown rapidly with three major acquisitions in a 10-month period.



Calmese goes on to emphasize ADDMAN's role as "partner". "We're not what we consider to be a highly transactional company. Our focus is specifically on partnerships that span years and that go through product life cycles. The concept for us is to be a strong partner to our customers and to help them solve complex product development problems."

The ADDMAN Companies

It is important to know that ADDMAN did not start from scratch. As we said, it is backed by decades of experience. Not only through its highly skilled team, but through the companies it has acquired. "ADDMAN is composed of three companies, but I like to think of it as five companies," Calmese

explains. This is because one of the key companies it acquired early on, Domaille Group, is itself made up of three companies.

"Our first acquisition was a company called 3rd Dimension from Westfield, Indiana, whose expertise had started about eight years prior to our investment. 3rd Dimension was specifically focused on additive manufacturing and was led by Bob Markley, who is now Executive Vice President of ADDMAN. This acquisition helped us to get going on the metal AM side: they had production machines and we invested several million dollars in new equipment, brought in more team members and really set up their facility to be a high-volume, high-class location. The best of the best right now is at our Westfield facility."

The second company ADDMAN invested in was Domaille Group, itself made up of Domaille Engineering (based in Rochester, Minnesota), Tech Manufacturing (based in St Louis, Missouri) and Stanley Engineering (based just outside of Baltimore, Maryland). "The three of them have been

Dr. Youping Gao, a pioneer of metal AM, joined ADDMAN Group in late 2021, following the acquisition of his company Castheon Inc.



Image: ADDMAN Group

focused specifically on the aerospace and defense market," Calmese says. "They all have overlapping capabilities in terms of precision machining but have different specialties. For instance, we do really high-precision, high-tolerance national security projects at our facility in Rochester, while in St Louis the focus is more on large-scale aeroframe structures and critical assemblies. In Baltimore, we do a lot of highly automated machining of small parts in high batch volumes, we're talking batches of 5,000 to 10,000 parts. Most of our customers need services from all those facilities, so we're able to use the different capabilities to meet customer needs."

ADDMAN's most recent acquisition, which was finalized on the last day of 2021, is Castheon Inc. The company was founded in 2016 by Dr. Youping Gao and specializes in additive manufacturing for mission-critical space applications. Castheon also stands out for its deep knowledge of metallurgy, particularly refractory metals.

"Some people would consider Dr. Youping Gao one of the godfathers of metal AM," Calmese tells us. And he's not exaggerating. Before founding Castheon, Dr. Gao was a technical fellow at various companies, including Boeing and United Technologies, and worked for over two decades at Aerojet Rocketdyne helping to build its advanced manufacturing capabilities. "Castheon started in his garage and he built it into one of the most sophisticated metal AM companies specializing in propulsion," Calmese adds. "Dr. Gao is now our Chief Scientist & EVP of Technology, and a key enabler in thought leadership. We really value him on our team."

Under the ADDMAN banner, the subsidiaries work in tandem. "A client should approach us any way that they choose and it's on us to create a seamless customer experience," he says. "If a part needs to be printed and then sent to our machining shops to be finished, that should all be invisible to the



ADDMAN has various AM technologies at its facilities, including different polymer and metal AM systems.

customer. We recently launched a new web portal that is great in terms of quality management and transparency. You'll actually be able to see the individual layers of your printed part—not in real time—but after so that you can inspect every layer."

The production capabilities

If we zoom in further, we get a clearer picture of what's inside ADDMAN's various facilities, particularly in regard to AM processes and systems. "From a production standpoint, we have a broad range of metal AM systems, from OEMs like VELO3D, EOS, Additive Industries and 3D Systems," Calmese reveals. "We also have a few large-format metal systems on order that will give us a bigger envelope size.

Image: ADDMAN Group

"From a contract manufacturing perspective, we've taken the approach that if we're going to solve problems, we can't be focused on one technology. We're here to solve customer problems, and some machines are better than others at solving specific issues. We've also hired engineers that have long histories with these different platforms and they give us the ability to make the most out of them."

In terms of materials, ADDMAN works with many metals, including Inconel, stainless steels, aluminums and coppers. But perhaps the most exciting thing to mention is its work with refractory metals such as niobium. "We have a world class solution in refractory metal 3D printing," Calmese states. "Niobium is a material needed in the defense and aerospace industries, as well as the commercial "We use additive to push boundaries in manufacturing, but we don't approach problems as though it is the only solution. We know that AM has a very specific role and our goal is to find the best solution, whatever it is."

space sector and potentially even power generation. The solution was developed by Dr. Gao and it solves problems no one has before. We can print niobium better than a machined part. And that's a profound statement. You can buy a brick of niobium and if we print that brick with our 3D process, our print will be better. We can now also print it faster than you can machine it." Dr. Gao's production recipe with refractories reportedly demonstrates two orders of magnitude creep resistance improvement over wrought. Additionally, the stable temperature of these parts and damage tolerance has been tested to be more favorable in terms of temperature stability and damage tolerance.

When looking at the polymer side of the business, ADDMAN operates a couple of large-format machines, as well as smaller industrial systems, ranging from FDM to SLS to MJF. It also has its own engineering design approach. "CAAM, or Computer Aided Additive Manufacturing, is how we are branding our patented approach to engineering design. It was coined by Mark Saberton, our CTO, to illustrate how we make our parts stronger. Synergistic with the work the Castheon team is doing with Niobium, its an absolute game changer for polymer production," he says. "Our CAAM methodology is powering a software we are about to release that offsets the bead height of FDM parts to increase shear strength significantly—by as much as 50-60%."

Key industries

ADDMAN is today largely focused on serving clients in three industries: defense and aerospace, commercial space and medical. "About two-thirds of our company is aimed at defense and aerospace," Calmese specifies. "We have a small but very important medical angle to our business, both in additive and traditional manufacturing. There is also a fourth vertical that we're openly contemplating: the energy sector, and particularly power generation. We think about the need for power generation solutions: this is an area where new materials are needed, and there are opportunities especially when you think about our refractory metal expertise. When we look at new sustainable solutions being developed for the future, we think we can and should participate."

Overall, ADDMAN aims to take on clients with highly complex and highly technical product development projects. "We want to help solve the problems that don't have obvious solutions," he adds. Beyond that, ADDMAN wants to work deeply with its clients and forge long-lasting relationships.

Calmese gives an overview of one of its ideal clients from the space industry. "This customer of ours needs some help defining what materials they should use for their product, so they've engaged with the ADDMAN team in California to define materials and material properties that could be used for their next phase of vehicle. That same customer also uses our services to do production volumes for existing materials. They give us files and we print those parts. And that same customer again has traditional machined parts that they need for existing projects and R&D programs, so we can support them with our traditional manufacturing capability. That's the ideal customer scenario for us: we're interfacing with multiple groups within the company, we have solutions for the early stages like R&D as well as high volume additive and traditional production.

"A customer comes to us because they appreciate our technology. They appreciate the fact that we are focused on supporting their product development. We don't have products ourselves and we are not trying to sell them on machines. The only thing we are here to do is make their product successful and to shorten the lead times for their product development cycles as much as possible."

The future is additive and ADDMAN is on board

ADDMAN's recent entry into the additive manufacturing sector is strategic, and it aims to become a key partner for industrial clients across the United States. Ultimately, its mission is two-pronged: it wants to be a strong proponent for additive manufacturing, and it wants to solve complex product development problems for its clients.

"There's a substantial upward trend in additive manufacturing, and we're really excited to be a part of it. We want to help people make the right decisions when it comes to using and implementing AM. In fact, our team actively encourages our customers to invest in their own AM machines. We don't see that as cannibalizing our business: if we can make them smarter and help them in their additive journey, that just creates more opportunities for us in the long-run."

Another angle to its promotion of AM is education. ADDMAN has a strong university outreach program spearheaded by Executive VP Bob Markley. "His top priority is being a really good partner and thought leader in the AM space, as well as giving back to the community to help develop the next wave of talent for the industry," Calmese explains. "We're preparing to open a new headquarters in Fort Myers, Florida. And we've constructed a specific section of the building that we're calling ADDMAN University (or ADDMAN U). We expect to be co-sponsored on our curriculum through one of the well known additive universities."

ADDMAN's goal is to solve complex product development problems for its clients.



Image: ADDMAN Group



"We want to help people make the right decisions when it comes to using and implementing AM" - Joe Calmese, ADDMAN CEO.

ADDMAN University, he continues, will essentially be a space where customers, prospective customers and anyone interested can learn about and be trained in AM. "It's going to take not just us, but a lot of people like us, to look at the big picture and help shape the next wave of people who can carry the industry forward," Calmese says. "We're excited and humbled to be a part of this and work with this next wave of people."

The second part of ADDMAN's mission—to be a company that helps its customers solve complex problems—is a simple one (and one that is already being realized). "I've been part of many product development projects, and typically at some point

in the process you get into a room with a bunch of engineering and management team members. At some point, something will be put up on the board and people will inevitably say 'that's too hard, we don't know how to do that.' There are often issues that arise between product timeline and design that create uneasiness. Our vision is that when this happens, multiple people around the table will think, 'Let's call the team at ADDMAN, they can help.'"

The day I spoke to Calmese, the exact scenario had just taken place. And we expect it will continue to. "We want to be good partners and we take a lot of pride in supporting our customers' projects," he concludes.

Messe Frankfurt Group

Make the impossible possible!

We know that Additive Manufacturing offers undreamed-of potential. In addition to the printer, however you also need the upstream and downstream processes plus the experts, who have mastered the technology. You'll only find all this at Formnext!

formnext.com

Where ideas take shape.

Content partner Honorary sponsor



tct

mesago



formnext

15 - 18 NOVEMBER 2022 FRANKFURT / GERMANY