



AMT Metal innovates standard manufacturing practices using Tritone's MoldJet® Additive Manufacturing technology

KEY HIGHLIGHTS

INDUSTRY

Aerospace

THE CHALLENGE

Manufacturing 120 pieces of a unique stainless steel 15-5PH "T adaptor" for a high-pressure hydraulic pump with a short delivery time

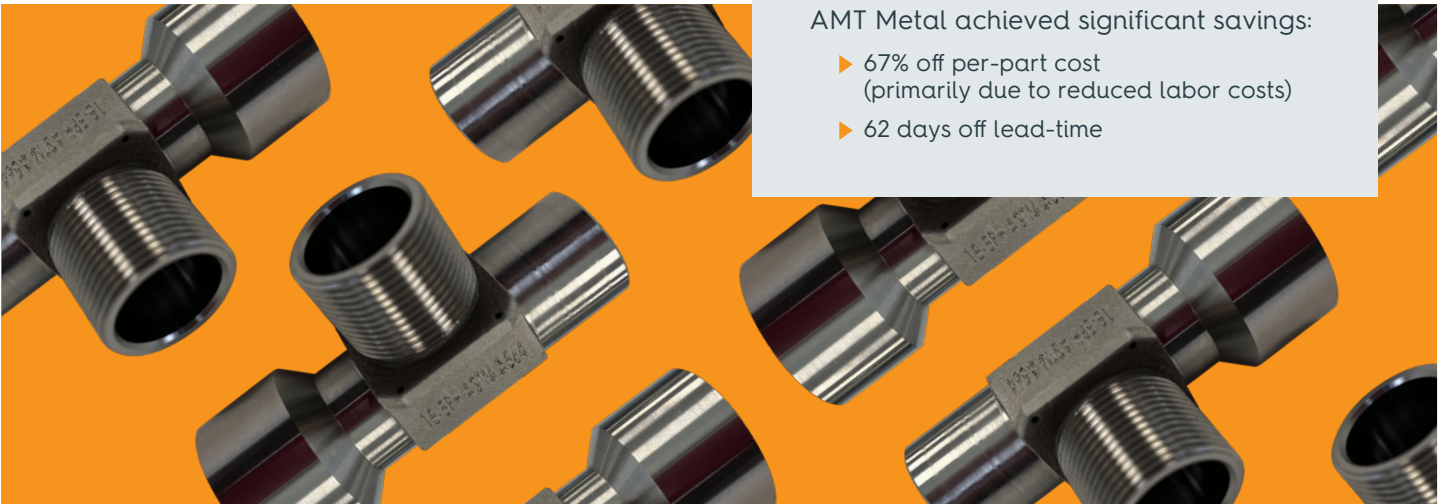
THE SOLUTION

After comparing manufacturing options, AMT Metal decided to manufacture the part using Tritone's MoldJet® Additive Manufacturing (AM) technology with light finish machining

SUCCESS

AMT Metal achieved significant savings:

- ▶ 67% off per-part cost (primarily due to reduced labor costs)
- ▶ 62 days off lead-time



ABOUT AMT METAL

AMT Metal Ltd is a subsidiary of RUNOUT LTD (www.runout.co.il), a high-end leading, CNC Tier 2 Aerospace-standard machining technology service provider. Combined with MICBAIM LTD, the organization has over 40 years of High-Tech, Industrial, Medical, and Aerospace experience. By offering advanced additive manufacturing (AM) technology, AMT Metal offers industrial throughput of accurate parts with a range of metal materials using MoldJet® technology developed by Tritone® Technologies.



WHY ADDITIVE MANUFACTURING (AM)

AMT Metal, like many in its industry, is facing a combination of high labor costs and skilled labor shortages, making it difficult to hire enough qualified CNC technicians to keep up with the growing workload. To alleviate those bottlenecks, it has explored AM as a synergistic production method to reduce costs and lead time.

In June 2020, AMT Metal became the first company to adopt the Tritone Dominant and MoldJet technology.

As a subsidiary of a CNC-focused manufacturing operation, the contribution of AMT Metal and its new AM capabilities to the group's overall business efficiency has been profound.

In the AM realm, the choice of MoldJet was mostly based on the following considerations:

- ▶ Operating Environment: MoldJet is the only industrial AM process that does not involve exposed metal powder. All Tritone systems can be installed close to the CNC machines with no special requirements for clean rooms, advanced filtration, or humidity control.
- ▶ Industrial throughput of top-quality end-parts: complying with the most demanding Aerospace customer requirements (including strength, density, accuracy, repeatability, and more).
- ▶ High mix - High volume: allowing for the manufacturing of different part geometries side-by-side and simultaneously. Quick (10-15 minutes) changeover between materials.



THE CHALLENGE

- ▶ AMT Metal's customer: a large manufacturer in the aerospace industry
- ▶ Part: a unique 15-5PH stainless steel "T adaptor" for a high-pressure hydraulic system
- ▶ Order size: 120 pieces
- ▶ Each part required a unique serial number
- ▶ Lead time: 30 days
- ▶ High machining cost

The conventional approach for manufacturing this part has been via CNC machining. However, given the elaborate features of the part - three different thread sizes and a small draining hole - this has historically been a highly complex, time-consuming, and costly process. Given the strict quality and lead time requirements, AMT Metal searched for an alternative manufacturing method.



OBJECTIVES

- ▶ Meet demanding customer requirements i.e., repeatability, accuracy, strength, etc.
- ▶ Lead time reduction
- ▶ Cost savings



SOLUTION

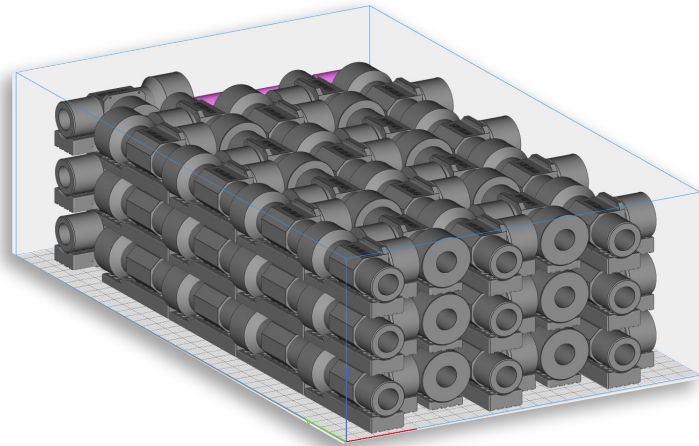
Rather than rely on conventional CNC machining, the new solution for producing the “T adaptor” included an AM step which was to be complemented by a final conventional machining ‘touch up’.

The integration of MoldJet manufacturing would eliminate the greater part of the machining process, which in the case of 15-5PH steel incurs both high wear on tools and equipment, as well as being time consuming.

The additively manufactured parts would then be finalized in the same standard post-processing steps as machined parts: H925 Heat treatment and Passivation in this case.

▶ **OVERALL, THE INTEGRATED AM SOLUTION PROVIDED SIGNIFICANT ADVANTAGES IN TERMS OF EFFICIENCY, COST SAVINGS, AND LEAD-TIME**

HIGH MANUFACTURING EFFICIENCY





PRICING

The cost of the combined AM and CNC workflow was 33% of that cost of the traditional CNC process, saving on materials and substantially on labor. Additionally, the lead time was also 31% of the length of the pure CNC route.

	CNC	MoldJet & CNC
PRICING (PER PART)		
Raw material & post processes	\$93	\$61
Total Labor	\$350	\$88
Total customer cost	\$443	\$149
LEAD-TIME		
Lead-time	90 days	28 days



SUCCESS

By deploying Tritone's MoldJet technology, AMT Metal managed to save 67% of the cost of manufacture, which dropped from \$443 to \$149 per-part compared to the originally 100% conventional machining process.

In addition to the reduction of per-part cost, AMT Metal also managed to expedite delivery and comply with its customer requirements by manufacturing the parts more efficiently - **reducing the lead time from 90 days to 28 days.**

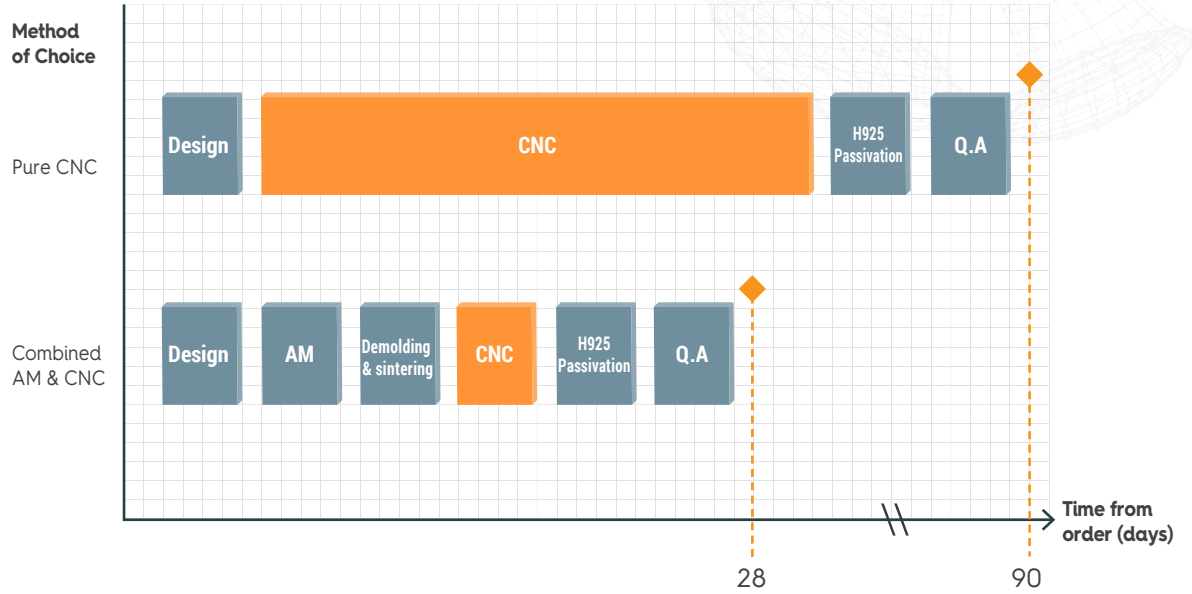
The synergistic Tritone Dominant & CNC process facilitated higher yield and lower cost manufacturing of the parts, without compromising the final quality.

This outcome benefited both AMT Metal and their customer.

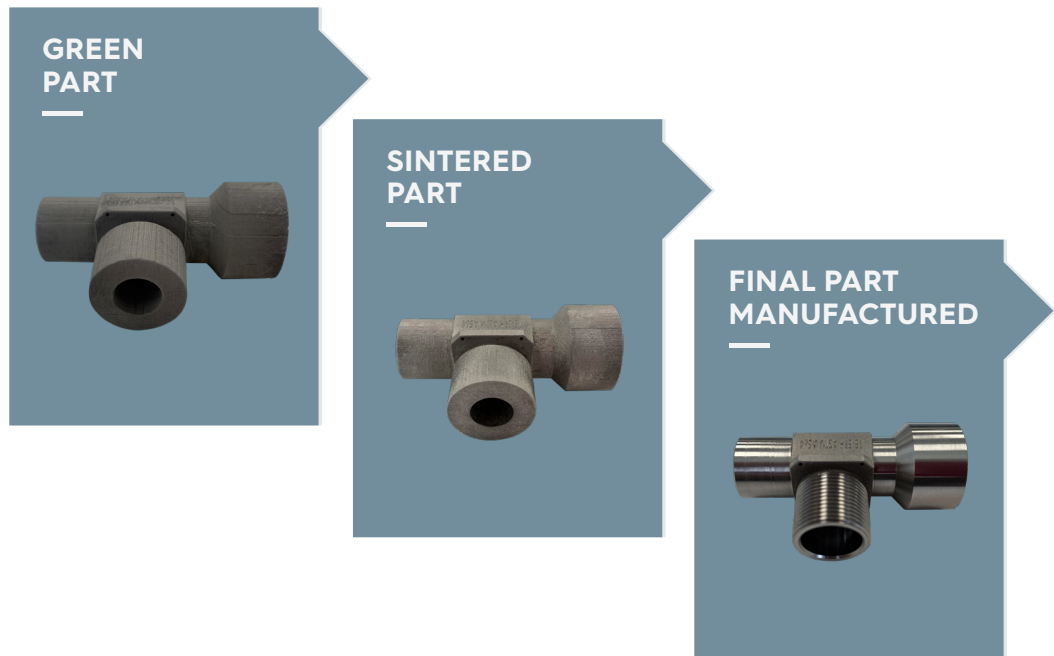
► **COST SAVING 67%**
LEAD TIME SAVING 70%



TRITONE'S MOLDJET TECHNOLOGY & CNC



After comparing both options, CNC, and a combined AM & CNC approach, AMT Metal concluded that the combined AM & CNC method offered a quicker and more cost-effective solution.





CUSTOMER TESTIMONIAL



Our decision to deploy AM capabilities side-by-side with our CNC operation has been disruptive to the conventional approach to capacity build-up in the CNC market. Typically, capacity build-up based on straightforward measures such as expanding the machinery arsenal, workforce, and introducing automation. Combining the Tritone Dominant AM system with our conventional processes, is forecasted to replace roughly 80% of the machining that we use in combined projects, thereby enhancing our overall capacity by 400%, to the CNC machining and workforce. Our Dominant system is expected to become a key factor in our ability to compete in this aggressive global market, especially due to the high cost of labor.

Arnon Langevitz, CEO, AMT Metal



TRITONE DOMINANT SYSTEM



About Tritone®

Tritone® technologies transform metal Additive Manufacturing to address the demanding standards and needs of industrial production. The company's innovative technology enables industrial throughput of accurate parts with a range of metal and ceramic materials, suitable for the Automotive, Aerospace,

Medical and Consumer Electronics industries.

Founded in 2017, Tritone is led by an experienced team of experts with a track record in driving technology and business growth.

Backed by private equity firm Fortissimo, Tritone is a global company and is based in Israel.