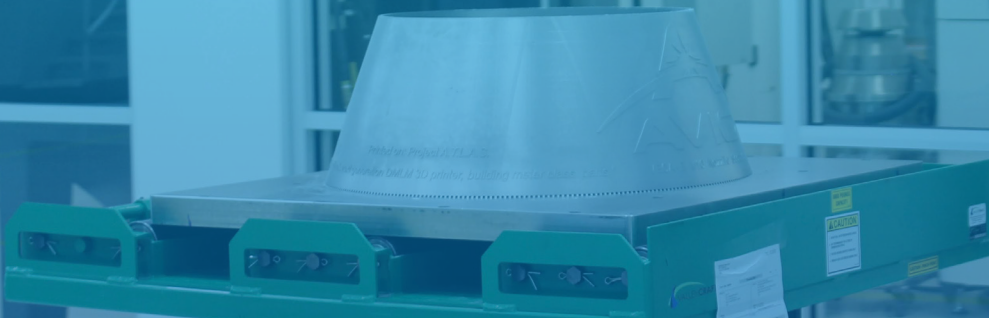


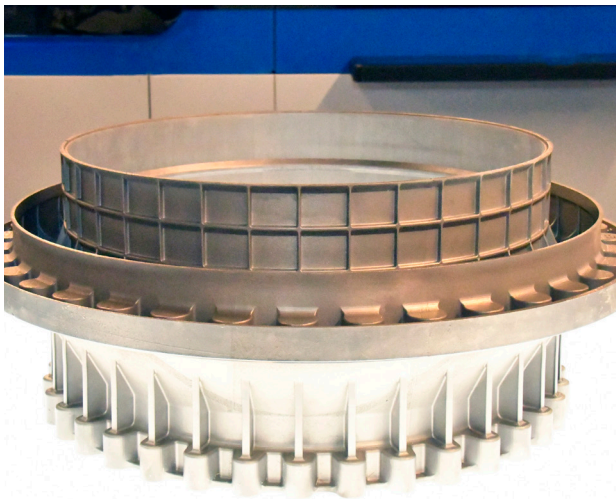


GE Additive



## GE Additive's Print Services

We're engineers, just like you, so we know printing parts additively is an art and a science. Through our own experience in additive manufacturing we're able to print large metal parts and handle post processing. And now, we offer our customers the ability to print their large metal parts with some of the worlds' largest metal additive printers.



### WE CAN PRINT YOUR LARGE METAL PARTS

We have the right experience and equipment to print parts that meet product requirements. Print your large, metal prototype parts, without compromising resolution or quality.

### THE BENEFITS

- Accelerate the prototype and testing processes to improve overall speed to market
- Design and produce multiple product versions simultaneously
- Eliminate the need for expensive tooling and molds which can have long lead-times
- Drastically reduce the waste associated with milling and machining

### READY TO GET STARTED?

Contact us at [ge.com/additive/contact](https://www.ge.com/additive/contact) and we'll connect you to a sales associate in your region.

## CASE STUDY

# United Launch Alliance

## Leveraging additive manufacturing

### THE CHALLENGE

United Launch Alliance (ULA) was in its beginning stages of designing the new Vulcan Rocket. As with previous rockets, there were some inherent lead-time challenges in the sourcing and manufacturing of some of these parts. One part in particular, the bellows feedline housing, had a typical lead-time between 9 to 12 months.

Additionally, the traditionally manufactured part starts with a large cylindrical block of Alloy 718 that weighs over 1,000 lbs. After the milling process was complete, the final part weighed 173 lbs – which required a crane and operator to move the part safely.

The ULA engineering team was researching the uses of Additive Manufacturing (AM) – and felt leveraging additive technology could greatly reduce the lead-time and reduce the overall weight of the part.

**50%**  
LEAD TIME  
REDUCTION

### THE SOLUTION

ULA approached GE Additive about printing the bellows feedline housing on their recently developed Project A.T.L.A.S. (Additive Technology Large Area System). This machine has a build volume of 950 mm x 810 mm x 300 mm (x,y,z).

The ULA design team provided the initial design, and GE Additive's AddWorks team helped provide design and support strategies to ensure the part would print successfully.

The printed part has provided ULA profound data that will help improve their production of this rocket in the future.

The traditionally sourced part takes anywhere from 9-12 months for order to delivery. The additive production part resulted in a lead-time reduction of 50%.

The resulting data showed that the additive part will be less than 70 lbs. compared to the traditional part of 173 lbs. That's a 60% weight reduction that will positively impact the overall performance and payload delivery capability for the rocket!

**60%**  
WEIGHT  
REDUCTION



GE Additive

