

ArcelorMittal Powders

AdamiQ™ algorithm cuts printing time of M300 Maraging Steel by 10%



ArcelorMittal



Plotting the path to productivity. Productivity is the most significant issue in Additive Manufacturing. The machines are expensive and depreciation costs are the major factor in the cost of parts produced. Maximising the output of the equipment is the best way to drive down costs per part. As part costs come down, the range of applications addressable with Additive Manufacturing increases.

Addimen has previously beta-tested the AdamiQ™ algorithm to print parts in 316L. This time, the material used was M300. This Maraging Steel is typically used for conformal-cooling mould inserts for use in Plastic Injection Moulding, Hot Stamping, and High Pressure Die Casting.

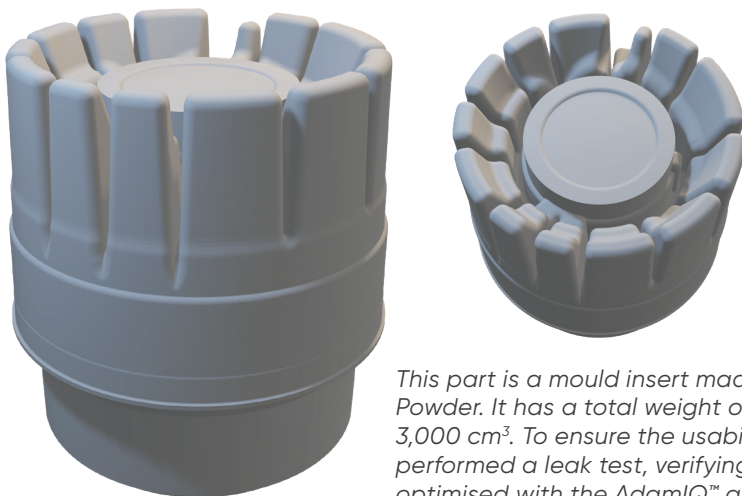
The result confirms the effectiveness of the AdamiQ™ algorithm on a large, complex part that takes more than a week to print.

Printing specifications

Customer	Addimen (Gonvarri)
Material	AdamiQ™ M300
Machine	Renishaw RenAM500S
Build height	187.01 mm
Number of layers	3,116
Total part volume	2,997.18 cm ³
Total support volume	18.049 cm ³

Build job parameters

Layer thickness	60 µm
Power	1 laser, 300 W
Speed	1 m/s
Hatch distance	0.09 mm
Focus diameter	80 µm
Printing strategy	Stripes (original)
Layer rotation	67 °
Inert gas	Argon
Preheating	None
Contour	2 border



This part is a mould insert made from AdamiQ™ M300 Steel Powder. It has a total weight of 24 kg and a volume of almost 3,000 cm³. To ensure the usability of the part, Addimen performed a leak test, verifying that the insert after being optimised with the AdamiQ™ algorithm is still leak-proof.



Results

In this case study, Addimen completed their standard build job preparation and, for their parameters and single laser, calculated a build time of 187 hours and 55 minutes. They then applied ArcelorMittal's AdamiQ™ productivity algorithm in one-click on the build job and the build time was reduced to 169 hours and 8 minutes. A reduction of 18 hours and 47 minutes.

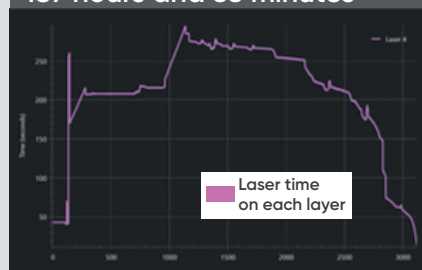
This productivity increase means that Addimen saved almost 19 hours of printing time, using a single-laser machine. This allows them to be competitive when comparing with more modern multi-laser printers.

ArcelorMittal Powders is working to make this algorithm available as a service in the cloud. If you own a Renishaw 3D-printer and want to test this out, contact us directly.

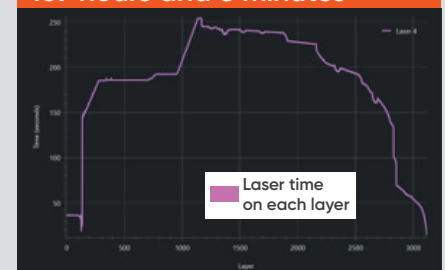
Saving in total print time

19hr = 10%

Original job:
187 hours and 55 minutes



ArcelorMittal optimised job:
169 hours and 8 minutes



The graphs show the time it takes for the laser to print each layer.