FIVES LANDIS CORP. GRINDING SYSTEM COOLANT NOZZLE



HISTORY

Fives is an international industrial engineering group with over 200+ years of experience, and has grown through various industrial revolutions to offer innovative solutions and products boosting the performance of major industry leaders worldwide.

Fives Landis Corp., known worldwide for their leading-edge precision grinding systems, and AddUp, a joint venture between Fives group and Michelin specializing in metal additive, worked together to design and metal 3D printed custom coolant nozzle.

CHALLENGES

Using traditional production processes, fabricating this complex part is difficult and requires multiple pieces and ideal interior geometries are impossible to create. Metal additive manufacturing allows this type of nozzle component to be realized from the 3D digital design to the final metal part in only a few steps and in a matter of days, not weeks.

The custom nozzle design allows the flow position and shape to precisely match the challenging wheel geometry with less components in the assembly, while also providing optimum flow to the metal cutting zone in the grinding machine. This increases the machines performance and optimizes the grind cycle.



INDUSTRY

Tooling & Molding

CHALLENGE

Traditional manufacturing of this nozzle is difficult and requires impossible internal geometries.

KEY BENEFITS

- Optimal flow provided to cutting zone
- Time saved Printed in days rather than weeks
- Monolithic for maximum strength
- Corrosion resistance in wet nozzle application



CUSTOM



I FAD

TIME



INTEGRATED FEATURES PERFORMANCE

SOLUTION

AddUp teams first started by laying out the part in the 3D build preparation software, AddUp Manager[™], then developed the best manufacturing recipe for the print, including melt strategy and build orientation, before transferring the file to the AddUp FormUp[®] 350 Powder Bed Fusion machine.

The nozzle is printed in stainless steel, using the AddUp FormUp[®] 350 Powder Bed Fusion machine in only a few hours. In this machine, parts are made in successive horizontal layers. For each layer, metal powder is spread across the build plate and a laser melts the areas that need to be solidified.

Lastly, post processing operations including stress relief, wire EDM and bead blasting complete the part, making it ready for assembly on the grinding machine.

The FormUp® ensures accurate and repeatable part performance with:

- resolution down to 0.1mm features
- 99.99% material density
- shallow overhangs as low as 15 degrees
- surface finish as low as 4 Ra µm, as printed



The completed nozzles installed and highlighted on the Landis LT2 grinding machine.



The completed nozzles installed and tested on the Landis LT2 grinding machine.

RESULTS

The final result was a one-piece optimized coolant nozzle that accurately delivers coolant flow into precise locations. The nozzle was officially installed on a rebuilt Landis LT2 grinding machine, optimizing the machines's performance.

The nozzles were able to deliver coolant precisely to the grind zone for applications with complex wheel shapes. They were proved to have the required strength and integrity to withstand operating in mass production for now over 1 year with no failure. Examination of nozzles shows no signs of fatigue or corrosion.

> Click here to watch a video about the Fives coolant nozzle

CONNECT WITH US

AddUp - North America 5101 Creek Rd Cincinnati, OH 45242 ↓ +1 (513) 745-4510 ☑ usa.contact@addupsolutions.com AddUp - Headquarters 13-33 Rue Verte ZI de Ladoux, 63118 Cebazat \$\$\\$+334 73 15 25 00 \$\$\\$ contact@addupsolutions.com

