

AddUp releases a new material to enable tooling manufacturers to develop more complex, efficient injection molds.

The AddUp group, a global metal additive manufacturing OEM, releases a recipe for shaping AISI 420 steel. This material, commonly used in the field of plastic injection, can now be used for additive manufacturing. AISI 420 steel will enable tooling manufacturers to develop new, more complex, and more efficient molds. This material is now available for all FormUp® 350 New Generation Powder Bed Fusion (PBF) machines.

AddUp is committed to continued development of materials for the tooling market. The company, a joint venture created by Michelin and Fives, becomes one of the first players in the metal 3D printing sector to offer a recipe for implementing AISI 420 steel. Also referred to in the German standard as 1.4021 or 1.2083, this stainless steel is commonly used to manufacture molds for plastic injection molding, as it has both high mechanical strength and good corrosion resistance. This development for AISI 420 adds to an already broad portfolio of materials AddUp offers for the tooling sector including 316L stainless steel and Maraging 300 (M300) steel. AddUp's has decades of experience with these materials having enabled the production millions of parts for tire molds.

Compatible with Existing Post-Processing Solutions

By proposing a recipe for AISI 420 steel, a grade that has proven itself in the production of plastic injection molds, AddUp is betting on rapid adoption by industrialists in the tooling field. "Unlike alloys specially designed for additive manufacturing, which require users to invest in developing suitable post-processing, we offer here a widely used grade," explains Frédéric Sar, Materials Manager at AddUp. "With AISI 420, the post-printing operations are identical to those of parts produced by forging. Existing solutions in heat treatments, surface treatments, machining settings, and insert grades are directly applicable to printed parts.»



3D printed injection mold with AISI 420 steel



FormUp 350 New Generation

Thus, manufacturers have a wide range of treatments at their disposal, enabling them to target specific properties for each application. For example, the «quenching/tempering» type heat treatments already available for raw 420 steel allow printed parts to display tensile strength characteristics in the range of 1350 to 1980 MPa, with elongation at break values of 2 to 10%, depending on the tempering temperature. And, standard surface treatments, such as nitriding, can significantly increase the surface hardness of parts after machining. Finally, the AISI 420 alloy does not contain cobalt or nickel, making it compatible with the requirements of the REACH directive.

AISI 420 Steel at the Disposal of the WBA Tooling Academy

AddUp has recently installed a FormUp 350 New Generation PBF machine at the WBA (Aachener Werkzeugbau Akademie GmbH), Germany's leading technical center for tooling. The machine is equipped with AISI 420 stainless steel powder and the newly developed recipe, capable of printing parts with meager porosity rates (less than 0.05%, which guarantees durability for molds subjected to high stress).

With this new industrial production tool, German tool manufacturers can submit their application cases and will be supported at all stages of their projects, from assistance in designing optimized molds to printing parts and studying the feasibility of mass production. Significant gains are expected, both in terms of productivity and part quality, as demonstrated by a project already completed with AISI 420 for the Siebenwurst Group.

With this link you can read the Siebenwurts case study:

<https://addupsolutions.com/wp-content/uploads/2022/11/CS-Siebenwurts-FX22-11.pdf>

About AddUp:

AddUp, a joint venture created by Michelin and Fives, is a global metal additive manufacturing OEM offering multi-technology production systems, including the FormUp® range of robust and open-architecture Powder Bed Fusion (PBF) machines, as well as the BeAM Modulo and Magic lines of industrial Directed Energy Deposition (DED) machines.

The combination of these processes allows AddUp customers the flexibility to choose the technology best suited for their specific application while also offering a unique ability to meet technical challenges, such as manufacturing parts combining these complementary technologies. AddUp's FormUp 350 PBF range is modular and scalable to provide the highest productivity while ensuring user safety. The DED machines are designed for industrial production and equipped with in-house designed and developed nozzles to provide maximum precision and very high productivity. To provide customers with a true Industry 4.0 solution, AddUp also provides a complete monitoring solution providing quality assurances after each and every build.

AddUp is headquartered in Cébazat, France, with its North American subsidiary based out of Cincinnati, Ohio. In addition to the machine design and manufacturing, the AddUp group also offers part production, POC production, metal AM consulting services, AM training, and design for AM, making AddUp your one-stop for metal AM.

To learn more visit:

www.addupsolutions.com

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