



FUNCTIONAL PROTOTYPES

LARGE-FORMAT, DENSE CANISTERS OF PP

Polypropylene was for a long time regarded as impossible to print, especially in the case of larger components. Washtec uses the HAGE3D 140L to manufacture large-format, leaktight polypropylene canisters, operating equipment and functional components.

As the leading global provider of vehicle washing system, Washtec uses innovative technologies such as additive manufacturing. At the beginning, the company relied on 3D printing service providers, but the lengthy lead times for large-volume components and data confidentiality were of particular concern. Added to this was the size restriction in the SLS process. Dr Andreas Sattler and DI Stefan Mayer of Washtec started looking to purchase their own machines. They finally found what they were looking for at HAGE3D. According to Mayer, the reasons for choosing HAGE3D were as follows: 'HAGE3D is one of the few manufacturers to manufacture machines with large, temperature-controlled installation spaces. [...] But, the mechanical engineering design too clearly differs from the manufacturer scene. It is not just a small printer that has been scaled up. The solid mechanical engineering is also evident in the surface of the components. It's genuine mechanical engineering.'

A customisable, solvent-resistant and liquid-tight canister made of PP (polypropylene) was produced as part of a feasibility study. 'Components made of PP are difficult to break; the high elongation at break should not be underestimated. In terms of cost and chemical resistan-

ce, PP is the ideal material for us,' explains Dr Andreas Sattler. In addition to the impermeability and chemical resistance of the plastic, the print bed adhesion, uniform temperature control of the installation space and suitable process parameters were essential. As an example, the issue of support structures was very complex – and despite the divergent and high demands, these were solved with the HAGE3D machine after only a few print tests. Only minimal design changes to the tightness and warpage needed to be made for optimisation. Users at Washtec were able to operate the machine themselves and print the first parts as soon as the two-day commissioning, including training by a HAGE3D expert, was completed.

In addition to the production of canisters, the HAGE3D 140L is also used for a range of other in-house applications, as Mayer explains: 'Apart from PP, the HAGE3D machine is also used for a number of components such as vacuum grippers with integrated channels, supports for the joining process, auxiliary fixtures, covers and covering parts, i.e. in the production technology and production aids areas.'