



CASE STUDY



ColdWork saves Time and Money while Improving Aerospace Tooling Part Performance with GoProto's Additive Manufacturing and AMT's PostPro3D Surface Finishing Technology

Industry: Aerospace

amtechnologies.com

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Coldwork, an innovative aircraft and aerospace tooling manufacturing company, has been finding solutions for durable aerospace tooling for over 20 years. This case study highlights the performance achieved on a complex handle of a portable machine used to drill high-precision holes in highly loaded aircraft structures. GoProto's additive manufacturing capabilities and PostPro3D set a new record of performance for ColdWork.

Challenge:

The portable tool ColdWork uses is powered by a 25HP air compressor and all the compressed air moves through the metal handle. The metal handle became an issue for the operator's hands due to the temperature. In addition, these tools are frequently dropped, and due to the material and shape of the handle, they became very expensive to replace. Each time a handle is broken there is also a significant amount of downtime and delays in throughput as it can take several hours or days to get replacement. The fragility of the parts became a major issue in their production chain, so ColdWork was looking for a solution to replace this handle with a design and a material that met the following criteria:

- Ability to achieve complex external shape
- Ability to have complex internal geometries
- Low thermal conductivity
- Durability passing their destructive tests

Solution:

ColdWork collaborated with GoProto, a product development and custom manufacturing firm in San Diego, California, to find a solution to produce durable parts. GoProto printed a pneumatic handle to go onto their machine using glass-filled nylon material with HP's MJF 4200 technology. This resolved the temperature issue, however, the raw part (left part in photo) still did not meet the impact strength requirements. GoProto then post-processed the handle using AMT's PostPro3D technology (right part in photo), and the parts passed the impact strength test. PostPro3D does not increase the weight of parts and it allows for the retention of tight dimensional tolerance. Other unintended value-added benefits also included the improved aesthetics of the parts, the ease of cleaning and reduced costs of maintaining spare parts.



Results:

After post-processing, they put the parts through a series of impact tests. AMT demonstrates the increased durability of parts treated with PostPro3D over 3D printed raw parts. This test visibly illustrates how PostPro3D enhances the mechanical properties of parts, which is critical for many aerospace tooling applications in terms of increasing part durability.



Raw part after impact test



Post-Processed part after impact test

Overall, the results were exactly the solution ColdWork were looking for: durable, airtight, watertight, functional, end-use parts that are produced sustainably and repeatably, therefore reducing overall costs, and enabling their ability to scale production.

Watch this video to see the impact test results:

