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BLDRmetal™ Binder Jet Powders Provide Custom Tool with 5x Increase in Life

CASE STUDY | Binder Jet Additive Manufacturing

Challenge

On Demand Affordable Security Tool Produced in Small Lots

The “In-Flight Entertainment” system (IFE) is fundamental to the airline customer experience. To maintain uptime for these electronics units, the technology must be scheduled for maintenance over the course of the product’s lifetime. The servicing process to upgrade and replace IFEs requires quick turnaround to minimize both aircraft and system downtime.

Typically, to access the IFEs, technicians use a proprietary screwdriver bit to open and close the access panels. This proprietary bit must be optimized for both security, using a detailed tool head design that is not easily duplicated, and the ability to reliably withstand repeated usage. The avionics service team initially used a traditionally manufactured solution to meet the requirements of this service operation, but these bits were expensive and proved ineffective as the tool wore out quickly, impacting productivity. The team then turned to the 3D printing process looking for fast, affordable, security tools in small lots. NanoSteel materials improve wear resistance in the end parts.

Solution

NanoSteel Binder Jet 3D Printed Wear Parts

NanoSteel has engineered new steels, BLDRmetal™ J-10 and J-11, designed for the binder jet additive manufacturing process, that provide high hardness and wear resistance in the final parts. The benefit of using a 3D printing process is the ability to custom design parts at smaller runs like these security tools that are difficult to manufacture through traditional methods.

In the binder jet process, spherical BLDRmetal steel powders are printed and then infiltrated with bronze to create near net shape parts. This avionics customer selected BLDRmetal™ J-10 for its proprietary 3D printed tools because of its greater wear resistance and impact toughness compared to previous solutions.

Wear Resistant Avionics Security Tool

Tamper Resistant Screwdriver Bit

(proprietary features hidden)

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Results

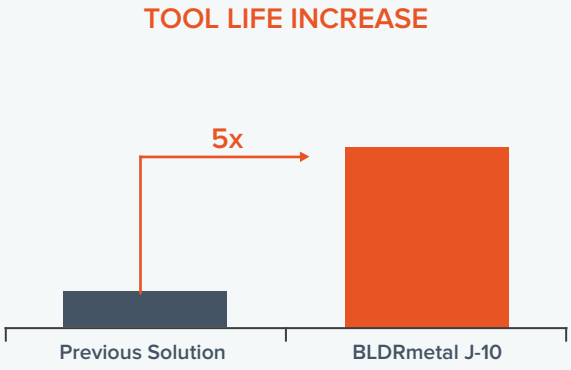
BLDRmetal J-10 Extends Tool Life Compared to Other Solutions

BLDRmetal™ J-10 was used to create a 3D printed custom security tool with a significant increase in lifetime. The new security tools lasted a minimum of **5X longer** than the previous solutions increasing technician productivity and substantially lowering the risk of downtime in servicing the aircraft. The service crew was so pleased by the product reliability that a few of them soldered the previously 'disposable' bits into the handle, converting it into a more permanent tool. This tamper resistant proprietary screwdriver bit is currently used at seven of this customer's nine global repair service stations with further expansion planned.

Benefits of 3D Printing:

Design and Manufacturing Freedom

- Full customization capability
- On demand just-in-time production
- Fast turnaround; Allows rapid design iteration
- Reduce tooling lead time and cost
- Enable parts consolidation



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NanoSteelco.com
info@nanosteelco.com
Toll Free USA & Canada 1-877-293-6266
International Calls +1 401 270 3549

272 West Exchange St. Ste 300 Providence, Rhode Island 02903