Tera 250vx Case Study: The Technology House

TTH Expands Its Customer Offerings Thanks to Tera 250vx

Clients

The Technology House (TTH) is an Ohio-based advanced contract manufacturer dedicated to providing their services across a wide range of industries such as aerospace, medical, defense, and consumer goods. They develop high-quality products with premier manufacturing techniques that merge traditional processes with cutting-edge technology. TTH's integrated approach to design, prototyping, and production allows you to bring your concept to market faster and more cost-effectively than virtually anyone else.

In January of 2022, TTH acquired its Nano Dimension Tera 250vx micro-additive manufacturing system, serving as an early beta test site for the machine. Over the past 2 years, the company has worked to deepen their footprint in the microprinting world and grow their capabilities to expand their micro-manufacturing offerings to their customer base.

Challenge

Since acquiring the Tera 250vx, TTH has embarked on a mission to investigate the viability and benefits of plating plastic parts as an alternative to solid metal parts (e.g., copper, nickel, gold) to expand their offerings to their customer base. With the high costs and long timelines associated with the machining or printing and post-processing of solid metal parts on the micro-scale, an alternative is deeply desired. The challenges identified during this process were mainly related to the size of the parts, with features ranging from 40 um to 20 mm , including retaining dimensional accuracies and, mainly, the handling of such small parts (and their microscopic features) during the plating application process.

The Solution

The technology behind the Tera 250vx allowed TTH to manufacture the plastic microparts that provided the foundation for this project. The quick iteration cycles allowed parts to be modified and reprinted as needed to develop the project further without extending timelines drastically. The precision of the Tera 250vx allowed TTH to meet or exceed dimensional requirements expected of traditionally manufactured metal microparts giving them a competitive advantage in the rapidly expanding micro-metal manufacturing marketspace. After printing the parts in-house using the Tera 250vx, the parts were then plated in 24 karat gold using a multilayer application process. This process applied coatings measuring 2.5 microns thick that allowed the fine details of the parts to retain dimensional accuracy on features as small as 40 microns.

The Results

This combination of using the Tera 250vx to print the core of the part and then applying a plating to the exterior yielded metal plated parts that were both lighter in weight and more cost-effective than traditional micromachined parts, without sacrificing the abrasion resistance, ductility, and strength desired. This plating also demonstrates the ability to give these plastic parts conductive properties selectively. Pairing these advantages with Nano Dimension's current and upcoming sets of materials, including a high temperature material, allows for the combination of materials and coatings to be tailored to the specific end-use application.

> "Nano Dimension's system of materials has exceeded our expectations. The P900 ceramic-filled material has great mechanical properties that have helped our customers realize micro-designs that require high-temperature applications. …We are very excited to begin using Nano Dimension's newest materials that will provide even better mechanical properties to enable us to further expand the capabilities of our business and help open the doors for additional applications for our customers.
>
> *Chip Gear | President of The Technology House*

As the future of micro-plated parts unfolds, TTH will continue to employ Nano Dimension's Tera 250vx technology to provide customers the option to utilize this technology for their own applications. Additionally, TTH is continuing to develop all aspects of their microprinting capabilities using the Tera 250vx and continuously pushing their design boundaries further to expand their offerings to their customer base. The past two years have more than exceeded TTH's expectations, and they look forward to being a key player in the evolving microprinting industry.

For more information or inquiries please visit: Micro DLP 3D Printing | The Technology House (tth.com)

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