From 3D Print to Industrial Component

The Final Layer Makes the Difference

Milling, sandblasting and vibratory grinding ensure smooth, assembly-ready surfaces, even in multi-material parts. Plasma treatments improve adhesion and surface cleanliness – ideal for hybrid polymer-metal components. Laser structuring creates functional micro-patterns to control friction, liquid transport or anti-reflection properties.

The showcased technologies include various post-processing methods that transform additively manufactured parts into robust, application-specific components. These methods encompass machining processes like milling, sandblasting, and vibratory grinding to achieve smooth, assembly-ready surfaces, even in multi-material parts. Plasma treatments clean and polish while improving adhesion and wettability, which is particularly beneficial for hybrid polymer-metal bonding. Laser structuring creates functional micro-patterns that control friction, liquid transport, or anti-reflection properties.

Selective coating and painting techniques add targeted properties such as conductivity, chemical resistance, or optical effects. These post-processing techniques not only enhance the performance of additively manufactured parts but also contribute to circular manufacturing by enabling repairs of worn components and the use of recycled materials, thus extending product life and reducing resource consumption.

To scale up additive manufacturing for industrial applications, automation is key. The Fraunhofer Group will showcase robotic systems designed for automated support removal, promoting consistent and efficient workflows. Additionally, internal features such as cooling channels present unique challenges, which can be addressed through abrasive flow machining and electrochemical removal for precise inner surface finishing, even in hard-to-reach geometries. A tactile turtle exhibit will demonstrate these diverse technologies, with each segment treated using different refinement processes, showcasing how the final layer adds measurable value by transforming a printed shell into a functional, industrial-grade part.

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exhibit overview