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Polishing Additively Manufactured Surfaces

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Abstract

The Additive Manufacturing process is an excellent means by which to quickly to fabricate prototypes and other low volume manufactured products but exhibits an important shortcoming. Almost all "AM" surfaces are too rough to be immediately suitable for immediate use and the surface textures needs to be improved in some way first. With simple prismatic surfaces this can be easily achieved but on more complex surfaces (and the greatest advantage of AM is as a means for fabricating complex surfaces and structures quickly) this can be more difficult. On these complex parts the process of improving the finish is almost certain to involve hand processes.

The researchers at Zeeko Innovations have been working on the Zephyr "Shape Adaptive Grinding Process" or "SAG" and this process is showing great promise. Initially developed on high cost 7 axis machine, the same process has now been successfully applied to low cost platforms such as robots and 5 axis machining centres. It is now close to being deployed as a commercial process.

This paper illustrates the capabilities of the Zephyr process on different AM materials and technologies with illustrations of its effectiveness on applications that include complex geometries formed from both metal and resin substrates. A particular feature of the process is that the surface texture can be improved without degrading of the form accuracy.