

Machining of metal AM parts in an Industry 4.0 environment – design, process control and inspection techniques

Stuart Jackson
Renishaw Inc
West Dundee, IL 60118

ABSTRACT

Additive Manufacturing (AM) has opened many new possibilities in component design. Reduced weight, increased thermal performance, consolidation of assemblies into single parts and the ability to create geometries that are impossible to create using subtractive (machining) methods, all make AM ideal for many new applications. But additive is not an island; the new designs produced using AM, in most cases, must still be further processed to create and ensure a usable final part. Machining can be complicated by the organic shapes of AM parts which may not have clearly defined prismatic features for fixturing and alignment. Light weight structures also tend to be more flexible and will deflect during traditional machining operations.

AM produced parts benefit significantly from the use of Industry 4.0 techniques for automated manufacturing process control, which overcome many of the challenges faced in this exciting new industry.

We will discuss:

- Metal Additive Manufacturing design to accommodate final machining and inspection
- Automated Process Control used during processing of Additively Manufactured parts
- I4.0 technologies in AM production, Process Control and Final Inspection