Metallography of 3D Printed 1.2709 Tool Steel

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3D printing is a new and advanced technology of material processing, which belongs to additive manufacturing process. Products with complex geometries can be produced quickly with high precision from powder materials on the base of a CAD-model. Layers of powder particles are successively molten by laser beam. There are several metallographic issues connected with 3D printed microstructures. Laser beam processing is usually accompanied with high heating and cooling rates and therefore also with high thermal gradients. This is the reason why non-equilibrium phases and structural components can occur in the final microstructure. The microstructure could be also finer in comparison with the one produced by standard manufacturing methods. Porosity of the final microstructure is also an important factor, as it might deteriorate mechanical properties of the product. Thorough metallographic analysis of 3D printed materials is therefore necessary to ensure high quality of final components.

Keywords: 3D print, metallography, tool steel

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