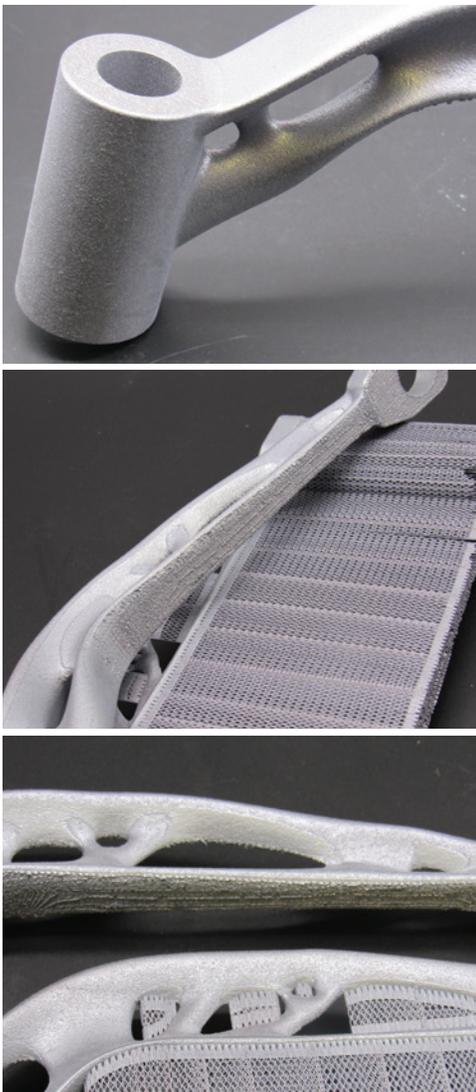


AS-PRINTED



SUPPORT STRUCTURE REMOVAL AND SURFACE FINISHING OF ALUMINUM

Aluminum alloys have been and continue to be widely used in additive manufacturing (AM) due to their desirable strength to weight ratios as well as their advantageous cost and printability characteristics. AlSi10Mg is the most prevalent Aluminum alloy in L-PBF. While many applications may only require a simple post-processing surface finishing operation such as shot blasting, for more critical applications where improved fatigue, surface cleanliness, and/or corrosion resistance are required, REM's Extreme ISF[®] Process is an excellent solution to improve as-printed material properties. Further, support structure removal for L-PBF components remains one of the most costly and challenging operation steps on the AM process sequence with many parts being scrapped due to manual processing efforts.

These brackets, manufactured by Additive in AlSi10Mg are demonstrating the excellent printability and printing capabilities of AlSi10Mg and Additive respectively. Additionally, they are demonstrating both the potential for REM's Extreme ISF[®] Process technologies to remove support structures in a machine-controlled process, and to drastically improve surface roughness in



AS-PRINTED 50X



SUPPORT STRUCTURE REMOVAL AND SURFACE FINISHING OF ALUMINUM

REM's CP process is capable of removing support structures without operator interaction while simultaneously removing any loosely attached powder, eliminating granular roughness, and reducing as-printed surface waviness. CP is capable of maintaining fine feature geometries, tight component tolerances ($\pm 25 \mu\text{m}$), and accessing complex, non-line-of-sight surfaces such as channels and lattices.

REM's CMP process is able to further reduce roughness from the surface quality generated by CP by reducing or eliminating surface waviness while maintaining component geometry to a higher degree than traditional abrasive-only process or electro-chemical processes.

REM processed aluminum components have displayed improved thin-wall tensile strength, high cycle fatigue, and corrosion resistant properties while also eliminating all particle shedding (FOD) issues associated with powder-based AM processes.



Additive

Is a leading UK-based additive manufacturing company, focused on demystifying additive manufacturing, and helping companies to implement this revolutionary technology appropriately.

REM Surface Engineering

REM is a leading surface finishing/polishing technology supplier to both traditional and metal additive manufacturing markets. REM is a supplier to NASA MSFC, NASA JPL, the US Army, the US Air Force, the US Navy, and dozens of premier commercial customers who require the highest degree of surface finishing and quality control.

AFTER



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