



Case study - 3d metal printing using custom made P2000 powder

Objective:

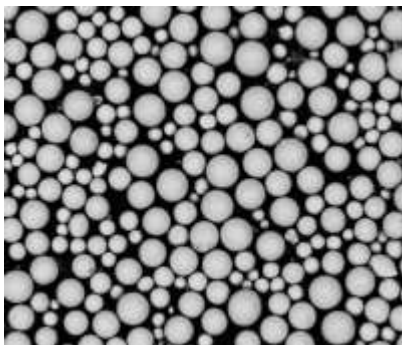
Is it possible to 3d print a Ni-free watch case from a custom made P2000 (1.4452) metal powder?

Hempel Special Metals, solution:

The technology of interest was chosen to be selective laser melting (SLM) also known as laser powder bed fusion (LPBF). In a first step a suitable metal powder was atomized by consuming a metal bar. For this Hempel made use of its international network to identify a suitable powder producer and developed in close collaboration a suitable metal powder. The size distribution of the metal powder was adopted to the process and was chosen to be 15-45 μm . In collaboration with the Swiss federal laboratories for materials science and technology (Empa) watch cases were 3d printed. Conventional processing of P2000 by means of punching is difficult due to high work hardening. Here 3d metal printing shows a solution. By using 3d metal printing, complex structures can be realized that would otherwise be difficult to produce.

Conclusion:

Conventional processing of P2000 by means of punching is difficult due to high work hardening. Here, 3d metal printing shows a way out. Using 3d metal printing, structures can be printed that could otherwise only be produced with a great deal of effort using punching and milling. It was also shown that powder made from bar material can be printed in 3d.



Left: P2000 metal powder, center: printed watch casees on build plate, right: freestanding watch case