Process description

A thin layer of metal powder is selectively melted by an electron beam. The parts are built up layer by layer the in the powder bed. Read more

Advantages / disadvantages

Parts can be manufactured in some standard metals with high density by electron beam melting. However, the availability of materials is limited and the process is rather slow and expensive. Read more

Application areas

- **Small series parts** down to one of a kind are produced directly by electron beam melting (post-processing to achieve better tolerances and surface finish might be required)
- **Prototypes** are produced for form / fit and functional testing
- **Support parts** (jigs, fixtures, helps) are produced directly by EBM

Characteristics / restrictions

- Maximal build envelope: 350 x 350 x 380mm^3
- Minimum feature size: 0.1 mm
- Typical tolerance: +/- 0.2 mm (can be improved through machining)
- Minimum layer thickness: 0.05 mm
- Typical surface finish: 20.3 – 25.4microns RA (can be improved through post-processing)
- Density: Up to 99.9%

Characteristics are only indicative, as there are different types of machines available.

Process chain

When planning an EBM build, critical tolerances, surface finishes and overhangs need to be taken into consideration. After the build, parts often need to be thermally processed and support structure needs to be mechanically removed. Electron beam melting parts can be further post-processed as any welding part. Read more