



## Criteria for 3D printable spare parts

1.	<b>Application</b> <ul style="list-style-type: none"> <li>■ Obsolete components</li> <li>■ Low volume with high costs</li> <li>■ Accident repair</li> <li>■ Tooling</li> <li>■ Prototype</li> </ul>	4.	<b>Specification</b> <ul style="list-style-type: none"> <li>■ According to manufacturer specifications</li> <li>■ Including reverse engineering</li> <li>■ Optimized parts</li> </ul>
2.	<b>Requirements</b> <ul style="list-style-type: none"> <li>■ Regardless of security relevance</li> <li>■ Simple or complex geometry</li> <li>■ Conventional production is cost intensive</li> </ul>	5.	<b>Materials</b> <ul style="list-style-type: none"> <li>■ Tool &amp; stainless steels, aluminum (Titanium, Inconel, CoCr)</li> <li>■ Polyamide, ABS, PEEK, Ultem (flame retardant)</li> </ul>
3.	<b>Availability</b> <ul style="list-style-type: none"> <li>■ Danger of system failure (train, locomotive, etc.)</li> <li>■ Components with long delivery times</li> </ul>	6.	<b>Maximum size</b> <ul style="list-style-type: none"> <li>■ 914 x 610 x 914 mm plastic</li> <li>■ 630 x 400 x 500 mm aluminum</li> <li>■ 250 x 250 x 300 mm steel</li> </ul>

## Contact

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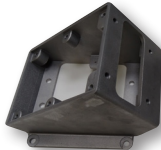
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## Examples



Junction box for ICE 1 / 2 traction motor



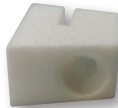
Sand casting mould for lever in brake system



Dust cover for brake system coupler



Fan guard for air conditioner in locomotive



Mount for sun blind

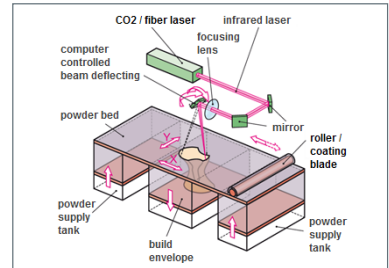


Coat hook



Housing for driver terminal in locomotive

## Basic principles of 3D printing powder bed fusion for metal and plastic parts



Source: Berger et al., Additive Fertigungsverfahren, 1. Aufl. 2013