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## Life Cycle Assessment Injection Mold Inserts: Additively Manufactured, in Brass, and in Steel

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3D printing applied to Manufacturing Engineering is known as Additive Manufacturing (AM) Polymer AM can be used to produce soft tooling inserts for injection molding. As life time of such inserts is significantly shorter than the life time of traditional brass, aluminum, or steel inserts, soft inserts are mainly used for pilot production and prototyping. The short lived nature of these molds renders little allowance for run-in errors, and as such, a Life Cycle Assessment study has been carried out in order to provide for the maximum yield throughout the development and pilot phase. Spite a short life-span, and depending on the insert geometry, AM inserts can be made cheaper and quicker than traditional pre-production tooling, which is particularly advantageous for pilot production and small production sizes.

In this research, Life Cycle Assessment (LCA) is used to compare the environmental impact Soft Tooling by AM to two traditional methods for the manufacture of inserts for injection molds during the pre-production phase:

- 3D printing of a photopolymer using Digital Light Processing (DLP)
- Milling of a brass insert
- Milling of a steel insert

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