

Docket #: S19-493

Direct Machining of Metal Molds for Gecko-Inspired Adhesives

Stanford researchers at the Cutkosky Lab have developed a fast process for directly machining into metal to create wedge-shaped geometries. The machined mold is then used to cast gecko-inspired adhesives multiple times without damaging the mold. The process of creating the mold requires few operations and is automated using a CNC milling machine. The machining operation is tailored to generate desired geometries in metal, expanding the material range of this micromachining technique.

Stage of Development:

- Prototype

Applications

- High volume casting of gecko adhesive samples without damaging the mold
- The adhesive can be used for robot gripping applications in setting such as manufacturing

Advantages

- **Durable and reusable** - can be used to cast high volumes without damaging the mold
- Moves towards **mass manufacturing** of gecko adhesives
- **Faster curing times** since the metal mold can be exposed to higher temperatures that accelerate the curing of the cast
- **Direct machining method is easier and more simple** compared to other manufacturing techniques like indirect manufacturing of the mold. The mold is one solid block of metal and so does not have a layer of softer material like the

indirect mold.

Innovators

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