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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