

METHOD FOR PATTERN GENERATION IN TEMPERATURE-DEPENDENT VISCOSITY FLUIDS UTILIZING LOCALIZED CONVECTIVE CELLS

[Jain, Chhavi, Solomatov, Viatcheslav](#)

[Maland, Brett](#)

T-021221

Technology Description

Researchers at Washington University in St. Louis have developed a process for manufacturing molten materials, such as molten polymers, to create patterns. By controlling the temperature of a molten polymer and applying targeted heat pulses from lasers or other sources, this technology creates stable convective circulations that are spatially localized within dome-shaped regions, each with a consistent diameter ranging from millimeters to centimeters, depending on the properties of the polymer layer. The stable convective circulations generate dynamic shapes within the polymer, which can modify optical properties (such as refractive index) to create microlenses, affect mechanical properties to change the friction coefficient on the polymer surface, or influence physical properties like thermal conductivity.

Stage of Research

Theoretical

Applications

- Polymer manufacturing

Key Advantages

- Can modify optical properties (such as refractive index) to create microlenses
- Changes the friction coefficient on the polymer surface
- Influences thermal conductivity

Patents

Patent application filed