

3-D Printing and Plastic Gears

THE QUESTION

Regarding 3-D printing of gears and machine tools, etc. — does plastic gearing have a future in 3-D printing/additive manufacturing?

Expert response provided by Rod Kleiss, president Kleiss Gears Inc.

To date, 3-D printing seems to be good enough only for look and feel ideas for plastic-geared transmissions. The accuracies required for a plastic gear and the material requirements are not currently possible with that approach. Arburg, a German-based injection-molding equipment manufacturer, is introducing a 3-D printer that shows some promise in using engineering polymers, but so far has not demonstrated the necessary accuracies of 25-50 microns. For

quick and more accurate modelling, precision SLA is the preferred method presently.

Eventually 3-D printing is bound to improve in all regards, but plastic gearing will be one of the ultimate tests of its capabilities. The integrity of the plastic material is of paramount importance for proper function and service life. Building up beads of polymer on each other will create quite a challenge for material integrity as well as precision dimensional control.

Rod Kleiss's career in plastic gearing — with stops at Hewlett-Packard and Bell Aerospace along the way — began about 10 years past Graduation Day (master's degree in Mechanical Engineering from Michigan Technological University). That was when, as he tells it — "After designing some molded bevel gears for a Whirlpool self-propelled vacuum cleaner, I then began my focus on molded plastic gearing." And Kleiss has been at it ever since.

