

technology focus

This section was
written by
Associate Editor
Paul Sharke.

Power Transmission and Motion Control

Technology Focus part 1

EDM R_x

To slice through metal finely as its makers intend, electric discharge machining equipment demands slow tool motion that's free of the shakes. Also, the ability to back away the EDM tool quickly from a finished cut keeps the machine laboring honestly rather than slacking while retracting.

A slotless, brushless permanent magnet motor from Ventura, Calif.-based G&G Technology Inc., called ThinGap because of its unique construction, produces not low-cogging, but no-cogging, motion, in deference to requirement A. A high turndown ratio—meaning the motor can roll up on command from a slow-as-paint-drying rate of one revolution per day to a comparatively snappy 2,000 rpm, according to G&G president Jerry Yankie—makes good on part B.

It's "cogless" because the stator has no slots, Yankie said, so the rotor doesn't hunt between poles during the slow roll. The stator coil, made not in the ordinary method of winding round copper wire over stacked iron laminates, instead takes shape through the careful placement of machined copper sheet. A square cross-section in the shape of the copper maximizes the density of metal in the coil, filling in any air pockets that permeate round-wire windings.

At the moment, a manufacturer with nearly a hundred EDM machines is evaluating the ThinGap motor as a replacement for a motor and gear reducer that had been turning a spindle drive screw. Eliminating the gears has stopped productivity headaches brought on by gear teeth backlash, G&G reported. It's also said to have smoothed cutting and quickened the rate at which the tool pulls back in preparation for another cut.