

from Bodine Electric Company

## ■ Special Winding Design for Extended Speed Range



Pizza Conveyor Oven / Food Equipment

### Bodine Gearmotors Drive Pizza to Perfection

The next time you pick up a pizza-to-go at your local pizza parlor, look behind the counter at the shiny stainless steel ovens in the kitchen. It's pretty common for those ovens to have conveyors sticking out of each side. The raw pizza is set on the metal mesh conveyor belt on the input side of the oven. It slowly moves into the cooking zone, and emerges fully cooked on the other side.

One of our OEM customers who makes conveyor pizza ovens posed a challenge to the Bodine engineers. Rather than building ovens driven by different gearmotors with different speed ratios, they wanted one gearmotor with a very wide speed range.

Permanent magnet DC or brushless DC motors don't turn as smoothly at low speeds. Below 100 rpm the steps in the commutation sequence become less frequent, causing a "stepping" or "cogging" motion. The obvious solution is to use a higher gear ratio to keep the motor armature or rotor turning faster than 100 rpm. Unfortunately, while this solves the performance problem at low speeds, the high end of the speed range is cut short.

Bodine engineers solved the design challenge by developing a winding that allowed the motor to run at higher speeds. The faster winding, in combination with a high gear ratio, allowed the motor to turn smoothly at low speeds without sacrificing the high speed performance. A recipe for success!

**Bodine brings over 100 years of problem solving experience to a wide range of applications in industries as diverse as food processing, medical, packaging, industrial automation, farm/agriculture, and solar powered outdoors equipment. We look forward to working with you on your next fractional-horsepower gearmotor design challenge.**

### application insights

#### The Design Requirement

An OEM customer that manufactures pizza ovens needed a DC drive system that would run smoothly at low speeds without sacrificing higher speed performance or adding cost.

#### The Solution

Bodine engineers designed special motor windings to make the motor turn faster than normal. The faster winding, in combination with a high gear ratio, allowed the motor to operate smoothly at low speeds without sacrificing the high speed performance.



**A Bodine type 24A-3RD permanent magnet DC gearmotor with special high-speed windings was used in this application ([click here](#) for more information about our PMDC products)**