Fiber Optics

Applying *fiber optic* technology to photoelectric sensors means applications with space restrictions are not a problem. A fiber optic cable can detect objects in locations too jammed for a standard sensor. **Fiber optic cable is available in sizes as small as .002 inches in diameter.**

FIGURE 81: A GLASS FIBER OPTIC CABLE

A glass fiber optic cable is made up of a large number of individual glass fibers, sheathed for protection against damage and excess flexing. Plastic fiber optic cables include a single plastic fiber in a protective coating. Neither type of cable contains electronics.

Since light — rather than current — travels down these cables, **the signal is unaffected by electromagnetic interference (EMI) and vibration**. The design also has built-in immunity to electrical noise and the inaccurate readings regular sensors can get.

Fiber optics can withstand high temperatures; plastic up to 158°F, standard glass up to 480°F, and specialized high temperature versions up to 900°F. Glass fibers can stand up to the harsh wash-down chemicals used in many food, beverage and pharmaceutical applications.

However, fiber optics have their disadvantages. They have a limited sensing distance, so they can be used only in tight areas. The maximum distance for the thru-beam design is just 15 inches. Also, these sensors have a small sensing area. A small drop of water or piece of dirt can easily fool fiber optics.

IN THE WORKPLACE

In this cookie kitchen, fiber optic photoelectric sensors are placed in a hot oven. As long as the sensors detect motion as the trays of cookies move by, the oven stays on.

If the conveyor stops, the sensors will detect light or dark for too long, and the output device will shut down the oven.

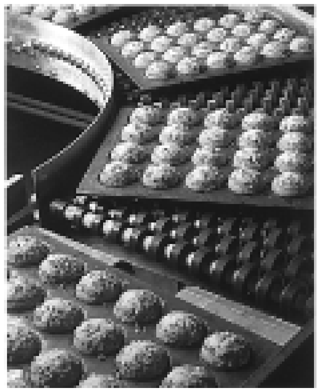

FIGURE 82: A PHOTOELECTRIC SENSOR PREVENTS COOKIES FROM BEING BURNED