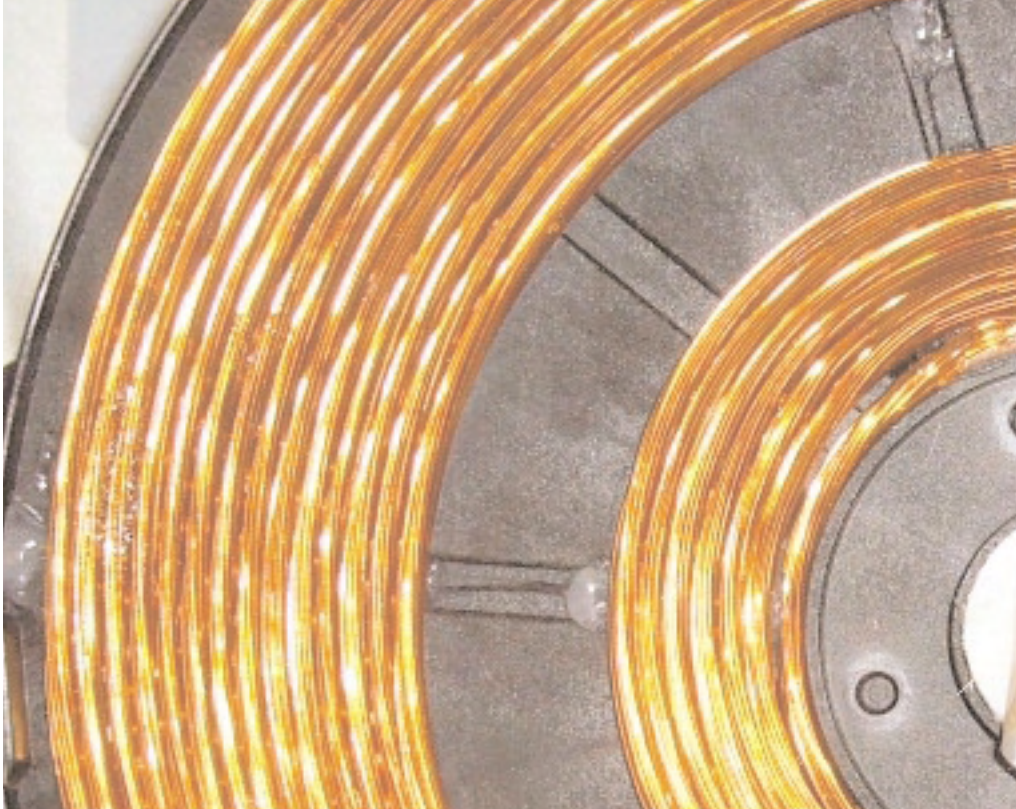


Safe and energy-efficient cooking



A black cover made of Zytel® HTN protects components of the cooking range from heat radiated by the coil rings.

of coil rings has been increased by 30 percent versus previous models, despite a more compact design.

The coils are covered with DuPont™ Zytel® HTN semi-aromatic polyamide, chosen for its high heat deflection temperature (up to 283°C or 541°F) and retention of dielectric strength over a wide temperature range. "The higher the thermal energy generated, the greater the high temperature performance required of the material used to protect components from the radiated heat," explains Mr. Otomo, senior engineer at Hitachi Appliances Inc.. "In contrast to the thermoset materials previously used, Zytel® HTN is exceptionally easy to injection-mold to our requirements, and thus it received an excellent rating from us for this application." A further benefit to be gained from the switch to thermoplastics from DuPont is the elimination of burr-removal – an operation required after pressing with thermosets – from the manufacturing process, and thus a reduction in production costs.

For the first time, heat-resistant DuPont™ Zytel® HTN semi-aromatic polyamide has been used to cover the induction heating coils of a new IH cooking range from Hitachi Appliances, Inc. in Japan. The revolutionary range responds to most types of metal cooking vessels by producing high levels of heat for safe, reliable and energy-efficient cooking.

By Ryuta Sato, DuPont Engineering Polymers, Japan

Cooking with induction heat (IH) has caught the attention of Japanese consumers, as well as others around the world, in a big way. They are attracted to the appliances for the perceived environmental benefits of using electricity over gas, for the safety benefits of the less intensely hot cooking surfaces and for the substantial increase in heating efficiency versus gas stoves.

The primary element of an induction range is a powerful, high-frequency electromagnetic coil, powered by sophisticated electronics in the element under the unit's glass-ceramic surface.

When electric current passes through the coil, a magnetic field produces an eddy current in the cookware. The cookware's internal resistance against these eddy currents produces heat, which is generated in the cookware and not on the range itself. A previous limitation of earlier induction ranges, however, was that the low electrical resistance of aluminum and copper cookware had prevented their use.

Hence Hitachi Appliances in Japan focused its technical expertise on manufacturing IH cooking ranges that could handle pots and pans made from alternative metal substrates. It was discovered that resistance increases when an electric current is focused on the surface of the cookware and the current's path is narrowed. The solution, therefore, was to increase the power of the coils. The new series of IH cooking heaters has three newly-designed elements, capable of producing 2.6 kW of thermal energy – higher than the rating of many gas-cooker burners. In order to increase power output, the number

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