

## The Induction Cooktop

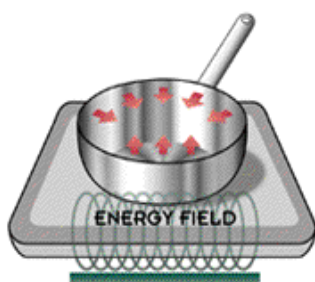
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One of the many applications of induction heating is cooking. The induction cooktop, while not yet a part of most households, is becoming increasingly accepted as a useful, energy efficient method of preparing food. They come in a variety of forms, from full-sized four-hob ranges to one-hob hot plates. The portable cooktops are very popular with catering businesses, as they are much cheaper and safer to operate than comparable butane units. They cook food quickly, are easy to use, and are easy to clean. Induction cooktops can be used with any type of food, and will cook as thoroughly and evenly as any electric or gas range.

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### How Does an Induction Cooktop Work?

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**Figure 3: Diagram of an Induction Cooktop**

Induction cooktops have many advantages over other cooking methods, including efficiency, controllability, and safety. These advantages are easily explained by discussing how they work. Each hob contains one or more coils made of ferromagnetic material. When an alternating current is passed through these coils, a magnetic field of the same frequency is produced. If a magnetic-based pan is placed on the hob, the magnetic field induces a current in the pan. The internal resistance of the pan causes heat to be dissipated, following the Joule effect. Thus it is the pan itself, and not the cooktop, that heats up and cooks the food. Once the pan is removed from the cooktop, the energy transfer stops. The result is a flame-less method of cooking in which it is nearly impossible to start a fire by forgetting to turn off the stove. Parents won't have to worry about their child touching a hot burner because the cooktop surface remains cool. Changing cooking temperatures is achieved quickly because there is no wait for the hob to heat up, only the pan. Since there is no transfer of heat energy between the hob and the pan, less heat is lost into the air, resulting in a more efficient means of cooking, not to mention a more agreeable cooking environment.

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### How Does an Induction Cooktop Compare to Other Cooktops?

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According to CEG Electric Glass Company, a producer of induction cooktops, "power savings of 40-70% are realistically achievable in comparison to conventional cooktops." The following statistics are taken from CookTek Online. For the reasons discussed above, it is not surprising that induction heating results in the highest efficiency.

<b>Cooking Method</b>	<b>Efficiency</b>
Induction	90%
Halogen	58%
Electric	47%
Gas	40%

This shows that using an induction cooktop can result in greatly reduced power bills. Other tests show that induction cooking is faster than using gas, halogen, or a microwave. As mentioned above, the induction cooktop is extremely safe. There is no risk of fire if food or grease overflows from the pan, no risk of burns from touching the cooktop surface, and no worry about dangerous fumes from gas or other cooking fuels. The ceramic glass surface can be cleaned by simply wiping off the surface with a damp towel. Although induction ranges are currently more expensive than their electric or gas counterparts, when all of these advantages are taken into account, the induction cooktop will definitely pay for itself.

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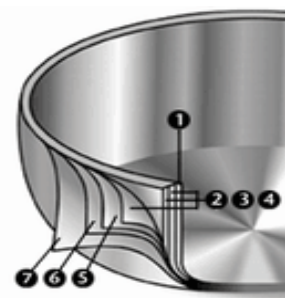
## Will I Have to Buy Special Cookware?

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Induction cooking can be used with any type of cookware from frying pans to woks. However, the induction cooktop only works when used with magnetic-based materials, such as iron and steel, that will allow an induced current to flow within them. A simple way to find out if a pan is induction compatible is to use the "magnet test;" if a magnet will stick to the surface of the pan, it will work. Many companies produce special cookware specifically for induction cooking. These pans are designed to absorb magnetic energy and spread the heat quickly and evenly, resulting in higher efficiency and reduction of "hot spots," which can cause food to be burned in some areas while still uncooked in others. Figure 4 below contains a detailed drawing of a CookTek Induction-Efficient Pan.

### Components of an Induction-Efficient Pan

- 1) 18/10 stainless steel is non-reactive to food and easy to clean.
- 2,3,4) 1145 aluminum with a layer of 3004 aluminum between for even heat distribution.
- 5) 18/10 stainless steel for superior bond.
- 6) Magnetic stainless steel for efficient induction.
- 7) 18/10 stainless steel resists pitting and rusting.



**Figure 4: CookTek Induction-Efficient Cookware (Image from Cooktek Online)**

## **Summary**

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The induction cooktop is a very practical device and can be used for any cooking application. It cooks food just as well as any comparable system but in a safer, more energy efficient manner. Protecting the world's environment and conserving resources is currently an important concern, and the induction cooktop is probably the most environmentally sound cooking device on the market, as it releases no fumes or chemicals into the air and uses no irreplaceable fossil fuels. Anyone thinking of purchasing a new stove should consider investing in an induction cooktop.

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