

# Induction Cooking

## An Overview

### Induction Cooking

When a new technology in consumer products is introduced, there are always a few consumers who are eager to purchase and use it. This initial excitement is usually followed by a gradual adoption phase before the new technology is widely accepted, and the purchase of such items becomes common place. Such is the case of induction surface cooking.

Experiments with induction cooking began as early as 1890. Induction cooking was first introduced to consumers in the United States in the late 1970's. Because the initial purchase price of an induction cooktop was too high for most consumers, it disappeared from the marketplace in the United States.



Fast forward to the 21st Century... with the need for energy conservation, induction cooking is making a new appearance in the appliance market. Induction cooking has been used for some time in European countries, but it made a reappearance in this country in 2006. Now, every major cooking appliance manufacturer is offering induction cooking in built-in cooktops. Single portable induction cooking units are also available.

### Technology

Induction cooking uses an electro-magnetic field under a ceramic glass surface on an appliance. When the appliance is turned on, the electricity in the coils under the glass surface converts the energy to a high frequency magnetic field that alternates direction. When magnetic reacting cookware is placed over this magnetic field, the alternating direction of the magnetic field causes the molecules in the cookware to move and bump into each other. Thus, heat is generated within the utensil.

Because the magnetic reaction occurs in the pan, the ceramic glass surface remains cool. It may become slightly warm from heat that is conducted back to it from the utensil, but that is minimal.

If there is no cookware on the induction cooking unit when the element is turned on, no cooking takes place. In fact, if you place raw food directly on the cooking unit, nothing will happen. Some units will actually turn themselves off when the unit is left without a magnetic pan.

### Types of Utensils for Induction Cooking

Grandma's cast iron skillet is back in style! Since induction cooking generates heat through materials that react with a magnetic field, cookware made with iron or steel content will work on an induction cooking surface.

Only cookware made of cast iron, three ply stainless steel that contains a carbon steel core, enameled steel, and enamel coated cast iron will work on an induction cooking surface. Keep in mind that not all stainless steel pans will react to a magnetic field. Test the pan with a magnet to be sure.

### **Advantages of Induction Cooking**

One big advantage of induction cooking is speed of heating. Until now, a gas range has given cooks the fastest heating time. Induction cooking produces heat very fast in the cooking utensil. Thus, the contents in the pan receive heat much faster than with other methods of surface cooking.

Another large advantage of induction cooking is the instant and precise heat control. When the control is set at a lower level, the cooking utensil immediately begins to cool and the cooking process slows. In this way, induction surface cooking is very similar to gas surface cooking.

Since the heat with induction cooking is generated in the cooking utensil, the area around the cooking surface is much cooler than with gas or other electric surface cooking. Most consumers are surprised about this the first time they witness induction cooking. They can touch the ceramic glass top right next to the cooking utensil and it is cool to the touch. The coolness is a real asset when cooking in warm weather. In addition, the room where the cooking is done will not become warmer from the cooking process.

A cooler cooking surface means that food spills are easier to clean from the surface. They are not burned onto the surface as they are in gas and other electric surface cooking.

There is a safety advantage for everyone, but especially children and the elderly. There is less risk of burns if the unit is left in the on position. Without a magnetic pan, no heat will be present.

Probably the best advantage of induction cooking is the energy savings. Gas cooking is 45 to 55 percent efficient. Most electric cooking is 55 to 65 percent efficient. Induction cooking is 90 to 95 percent efficient. This means that 90 to 95 percent of the energy consumed in generating the magnetic field for cooking is transferred to the pan and only 5 to 10 percent of the energy is lost into the surrounding area.

The energy savings puts induction cooking into the popular “green living” category. Purchasing an induction cooking unit helps conserve the environment due to the efficiency of the cooking method. Using less energy means that this is an environmentally friendly form of cooking by using less fossil fuel.

### **Disadvantages of Induction Cooking**

The biggest disadvantage is the cost of the induction cooking appliance. As more consumers purchase induction cooking appliances, the price should come down. A new product is usually more expensive because only about thirteen percent of consumers are early adopters of new technology. Costs of production per unit are reduced as more units are sold.

Another initial disadvantage to induction cooking is the limited cookware available that will work with this technology. Most consumers currently use cookware made with aluminum, stainless steel or stainless steel with a copper or aluminum bottom. Of these only some stainless steel cooking utensils work on an induction cooking unit. Be sure to take a magnet to the store to test any possible purchase for iron content. If a magnet is attracted to the bottom of the pan, it will work on an induction cooking unit. If the magnet is not attracted to the bottom of the pan, it will not work on an induction cooking unit. Be sure that the magnetic attraction is strong.

Some of the cookware that works with induction cooktops is very expensive. As more consumers purchase induction cooking appliances, the availability and cost of compatible cookware should improve.

Depending on the former cooking appliance in the area where a new induction cooking appliance is installed, there may be a need for a new electrical circuit. Built-in induction cooktops and electric ranges with induction cooktops require 220-volt circuits. Most portable induction cooking units work with a regular 110-volt circuit.

*A word of caution:*

Some electrical circuits do not have enough amperage for a portable induction cooktop. Use it with a circuit for small appliances and not circuits for lighting. Circuits for lighting have lower amperage than appliance circuits.

### **Models Available**

Most manufacturers of gas and electric ranges now offer an induction cooktop as a separate built-in appliance. The separate cooktop models come in 30-inch and 36-inch widths. The number of units generating the magnetic field on the cooktop varies. Many of the units have two or three sizes of magnetic generating units within the same cooking unit to accommodate different size cooking utensils on the same unit. The arrangement of the cooking units will vary from one manufacturer to another.

Several brands of portable induction cooking units are available. The wattage rating for each portable appliance is different. The lower wattage units will be slightly slower in heating the cookware since there is less power generating the magnetic field.

In the future, you may see induction cooking appliances that accommodate all sizes of cookware, including griddles and grills. This feature is in the developmental stage and uses several small magnetic generating units under the ceramic glass surface. When a piece of cookware is set on the cooktop, the many small units under the cookware supply the magnetic force to generate the heat in the cookware. At the present time, this concept is being tested in Europe.

### **Care of Ceramic Glass Surfaces**

The glass surface on induction cooktops and other glass smooth-top ranges is a ceramic glass. The surfaces are easy to keep clean. There are special ceramic cooktop creamy cleaners available at general discount and some appliance stores. The special creamy cleaners provide a wax like coating on the glass surface. Most manufacturers recommend daily use of such a cleaner.

Depending on cooking habits, this might be done less frequently. Be sure to use it often enough to keep the glass cooktop looking like new. Failure to clean between cooking sessions may leave permanent discoloration or other marks difficult to remove.

Scrubbing pads and other abrasive cleaners should never be used on a ceramic glass cooktop. Be careful with metal cookware. When metal cookware slides on the glass surface, it can scratch the glass. When the glass is scratched, it cannot be repaired.

Sugar spills or food spills with a high sugar content left on a ceramic glass surface can “pit” or leave indentations in the glass surface. If such spills occur, be sure to clean them up immediately or as soon as the surface is cool enough to clean it. Do not leave them to clean up later. Be sure the surface is cool before you clean it. Using a razor blade with caution can be helpful in removing burned on spills.

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