Induction Cooking Explained

The nontechnical technical guide to induction cooking solutions



Induction cooking has been around for decades, making its first debut at the Chicago World's Fair in 1933. However, despite its age, it's still considered by many to be a relatively "new" or "emerging" innovation. As such, many foodservice operators are hesitant to make the leap from the familiarity of a gas or electric solution to induction.

And this makes sense. People don't like to change how they do things. They also don't want to invest in equipment that feels like more of a mystery than a solution. And with all the confusion and misinformation circulating, buyers aren't really getting the answers they need. There are explanations out there, but unless you're a scientist, they are next to impossible to decipher.

With that said, we're setting out on a somewhat noble mission: to explain the ins and outs of induction without all the sciency, technical jargon. Ready? **Here we go!**

What's on the menu?

How Induction Cooking Works	02
Translating Science to Benefits	04
The Truth (and Rumors) About Induction	06
Needs Assessment Exercise	07

Under the Lid: How Induction Cooking Works

When it comes to understanding how cooktops work, gas and electric are more straightforward than induction. For starters, the heating process is very visual. Turn on a gas-powered range, and there you have it — fire. Turn on an electric cooktop and you can see the red burner (or the heat) beneath the surface.

Induction is different. There's no fire or red heating elements. In fact, without the presence of a pan, induction cooktops won't even burn you if you touch them.

But there's more to it. Induction produces heat differently. Instead of using a heating element like a burner or flame, induction uses magnetism to generate energy that's released as heat. The result is a more direct, efficient way of cooking.

Are induction and electric cooktops identical twins?

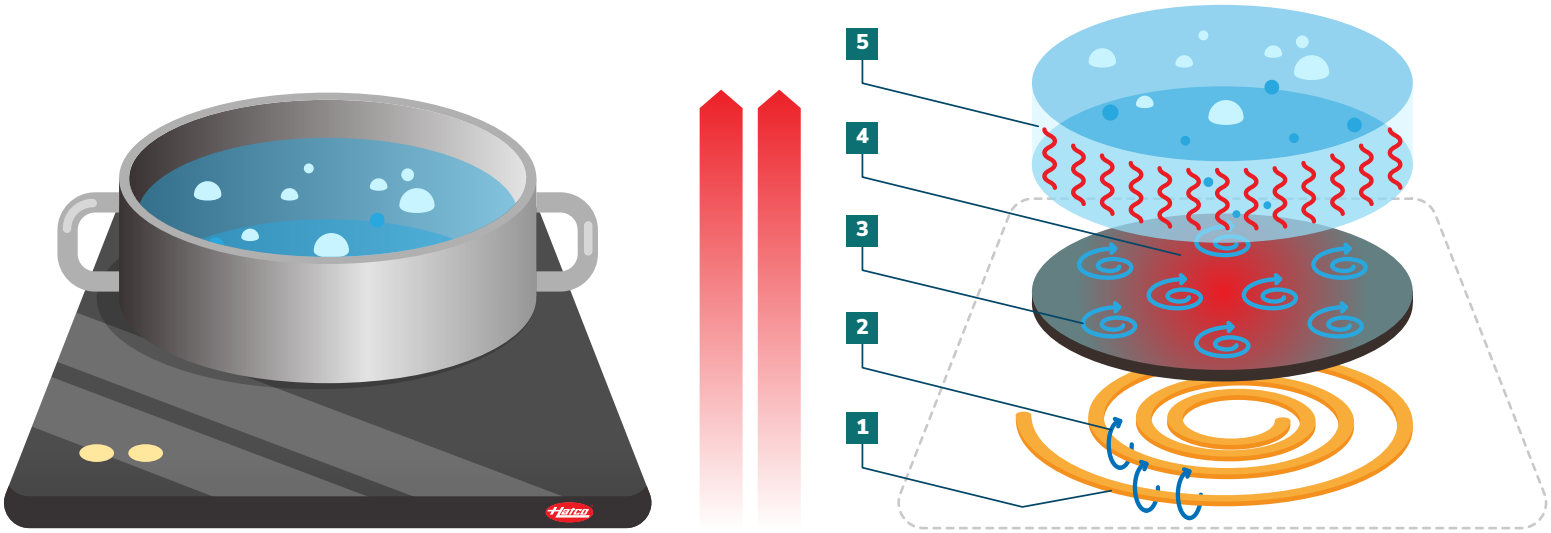
At first glance, it's easy to assume electric and induction cooktops are one in the same. After all, both have smooth, flat cooking surfaces.

Despite similar appearances, it's important to remember that induction and electric cooktops utilize entirely different cooking technologies. Electric solutions actually have heating elements or burners below their tops that produce heat. Induction solutions do not.

Word to the wise: If you come across an induction cooktop with faux burners that turn red or purple when the unit is on, this is just a lighting feature used for sensory appeal.



How It Works: Induction Boiled Down in 5 Steps



STEP 1

When the unit is turned on, an "alternating" electrical current, or one that changes directions, is supplied to the copper coils located beneath the cooktop surface.

STEP 2

The electrical current creates an alternating magnetic field (or invisible magnetic force) around and directly above the coils.

STEP 3

When a pan with magnetic material (like iron) is placed on the cooktop, the magnetic field reacts with the metal of the pan. This is the same phenomenon at play when a magnet is used to hang a photo on a refrigerator — the magnetic field cuts through the paper and into the metal surface of the fridge.

STEP 4

The alternating magnetic field causes — or induces — a flow of energy through the metal base of the pan. This energy has nowhere to go, causing molecules to rub against each other and produce heat.

STEP 5

Only the pan is heated, not the cooktop. Furthermore, the entire base of the pan is heated all the way through — instantly. No waiting for heat to conduct through to food like with gas or electric.



Rub your hands together.

This action is similar to what's happening inside the pan's metal. The back-and-forth motion of your hands generates friction between the molecules in your skin, which produces heat.

Connecting the Dots: Translating the Science to the Benefits

The science behind induction — or the technology and processes that make it work — is actually the reason that induction has many benefits over gas and electric alternatives.

As we learned, induction works by heating your pots and pans directly. Unlike gas and electric cooktops, it doesn't waste time or energy heating a burner or other heating element first. It skips that step, making the pan — not the cooktop — the source of heat. This direct, rather than indirect method of cooking, has its perks.

For starters, it's super fast. Induction delivers 85% to 95% of the energy it produces to the food in the pan. This means that there's barely any wasted energy. The pan gets hot faster. And, as a result, operators can do it all — boil, cook, simmer, sauté and more — with impressive speed.

To put it into perspective, think about gas and electric ranges. Gas solutions lose a whopping 35% to 65% of the energy they produce to the atmosphere. Electric options are just as inefficient, sending 40% to 50% of what they produce into the air.

This is why operators using induction can complete cooking tasks at a fraction of the time it takes with gas or electric. Take a simple task such as boiling water, for example. Using an induction cooktop, you can boil six cups of water in less than three minutes. This same task would take, on average, close to six minutes with electric and over eight and a half minutes with gas. And, with a busy foodservice, a few minutes can make all the difference between keeping customers happy and turning more tables (and profits).

What does gas and electric cooking have in common with a campfire?

If you've ever cooked dinner over the open flame, it's not exactly speedy. Just like with gas and electric ranges, you lose a lot of the energy you produce into the atmosphere, which slows the whole process down.



Wasted energy also means wasted money. If you're sending all your hard-earned energy into the atmosphere, it's going to also bring the temperature in the kitchen up. Aside from a sweaty (and potentially cranky) staff, this gets expensive. Induction cooking helps with this. Since you're sending less wasted energy into the air, you can keep ambient temperatures down. This translates to savings — more specifically, around 10% to 20% in air conditioning costs. Also, since induction doesn't rely on butane or propane fuel like gas alternatives, you can save another 25% on top of this. Win, win!

But there's more. The magnetic fields produced during the induction process cause an instantaneous reaction in the cookware, making heat appear or disappear on demand. As a result, you can turn the power and temperature up, down, on or off with zero lag.

This helps you move faster, but it also provides more control and precision. Go from zero to 100 at the drop of a hat. Maintain a controlled simmer with the gentlest of heat. Or, crank up the power and bring a pot of broth to boil in mere minutes. Whatever the case — no ifs, ands or buts — induction is the king of quick change, temperature control and precision cooking.

Plus, depending on the manufacturer or model, many induction solutions come with handy features like programmable presets that help operators deliver consistent, repeatable results. This kind of automation is super helpful at a single-location operation, but just think of the quality control you could achieve across an entire chain of restaurants or stores!

★★★★★

"These [induction cooktops] may seem pricey, but they are so worth it. Very consistent with the heating and quick to get up to temperature. They last forever, so this is a true investment."

— **Courtney H.**
Hatco customer

Did you say quality control? There's nothing worse in the foodservice business than inconsistent results. From a perfectly seared steak to a flawless veggie sauté, customers expect the same level of quality from you each and every time they dine with you.

Induction cooking makes this easier to achieve. Thanks to that direct heating process we discussed, you get more even and steady heat across the bottom of the pan. This means you're less likely to have unevenly cooked food or hot spots in your pan that scorch your food. This translates to consistent output and less waste from burned or poorly prepared food.

With that said, keep in mind that induction is a different way of cooking. Its direct heating process means more power and speed. Because of this, some operators need to get used to cooking with it. For example, pans don't need time to heat up, so the kitchen may need to adjust their timing on things to avoid accidentally burning menu items. But, like with any new form of cooking, it just takes a few times before it's second nature.



The Truth About Induction: Putting Rumors to Rest

Despite the numerous benefits of induction cooking, many foodservice operators are still hesitant to make the switch because of a few common misconceptions. While only you can decide what's right for your foodservice operation, it's certainly helpful to have all the facts before deciding on a solution.

Top 6 Induction Myths

1 **Induction isn't as powerful as gas.** There's a common misunderstanding that gas delivers more power — and consequently more speed — than induction solutions. However, despite its "powerful" looking flames, gas can't compete with induction. Since induction technology heats the pan directly (as opposed to indirectly), it heats the cookware and the food or liquid in it faster.



2 **You have to spend a lot of money on special pans.** Sometimes the phrase "induction compatible" is used by cookware manufacturers to command a premium. In truth, any magnetic pan will work. Look for pans made of steel, cast iron or aluminum with a steel core (all-aluminum or copper pans will not work). The higher the ferrous (iron) content the better. A great compatibility test is a fridge magnet — the stronger the attraction to the bottom of the pan, the better it will work.

3 **The glass cooktops used for induction are not strong.** While the word "glass" doesn't exactly call to mind images of durability, the glass tops used on induction cooktops are incredibly strong. They undergo stringent testing where they must withstand the impact of a 1.2-pound steel ball that's dropped from 21 inches, and a 4-pound pan dropped 10 times from 8 inches. Just look for induction solutions that use ceramic glass, as tempered glass can bow at high temperatures.

4 **Induction is like cooking with a microwave.** Although microwave and induction cooking were discovered around the same time, they are not one and the same. Microwaves heat the food, whereas induction heats the pan. By heating the pan — which then heats the food — you get a crisp sear and evenly cooked food that's impossible to achieve with a microwave.

5 **Induction is more expensive.** While you may pay more for an induction cooktop up front, you'll save in the long run. Since induction solutions are more energy efficient, you'll have lower utility bills. As a general guide, you'll typically spend 25% less on fuel and 10% to 20% less on air conditioning. Plus, induction is an investment that should stand the test of time.

6 **Induction isn't as safe.** Induction surfaces only get hot when a pan is present, so you're less likely to burn yourself (or your kitchen). There's also no gas flame, which decreases the chance of harmful PCBs getting into the kitchen. Lastly, you may have heard rumblings about induction being dangerous for operators with a pacemaker. This isn't the case. The magnetic wave only extends an inch or so above the cooktop surface, and is fully captured by the pan in place. Even without a pan, there's no risk because the unit only "pings" looking for a pan; it does not fully energize. In fact, the American Heart Association lists a number of everyday devices and appliances (including mobile phones) that should be avoided by people with a pacemaker. Induction cooktops are not listed among them.



Assessment: What are your cooktop needs?

Whether you decide on electric, gas or induction, cooktops aren't one-size-fits-all. To ensure you invest in the right solution, take a moment to understand the unique needs of your foodservice operation. Only then can you prioritize the most important capabilities and land on a solution that meets your needs. Just remember — induction or otherwise — all solutions and *suppliers* are not created equal. Do you homework!

Needs Assessment Exercise

Check all that apply or are a priority for your foodservice operation.

KITCHEN
OBJECTIVE
☐ Hold hot or warm foods/liquids at temperature (no cooking)
☐ Perform all cooking tasks (e.g., boil, simmer, sear, sauté, reheat)
POWER/SPEED
☐ Typically work with low to moderate volumes (under 2 gallons/8 liters)
☐ Typically work with high volumes (2 gallons/8 liters or more)
☐ Speed, efficiency and reduced cook times
CONTROLS
☐ Precise temperature controls
☐ Precise and responsive power controls
☐ Time controls
☐ Heating and end-product consistency
☐ Programmable modes for automation and efficiency
☐ Memory retention for repeat cooking tasks
STAFF
☐ Safety features (e.g., grease filters, sealed tops, automatic on/off)
☐ Easy to clean
☐ Easy to use (minimal training required)
☐ Ability to program cook settings in advance
ENVIRONMENT
☐ Front-of-the-house use
☐ Middle-of-the-house use
☐ Back-of-the-house use
☐ Permanent built-in unit
☐ Portable unit
☐ Color options to fit with decor
☐ Low, sleek profile
☐ Cooler, more comfortable room temperature
☐ Quiet operating noise (fan volume)
☐ Durable (e.g., scratch friendly, impact protection, metal housing)
COSTS
☐ Lower utility costs
☐ Up-front budget less than $5,000
☐ Up-front budget between $500 - $1,000
☐ Up-front budget $1,000 or more



Next steps

Now that you've completed the Needs Assessment Exercise and have a better understanding of what you need out of a cooktop solution, it's time to boil down your options. Whether gas, electric or induction, you have a lot of choices. We're happy to help you navigate. **Just share your assessment with your Hatco rep or find a local rep near you!**

FIND A HATCO REP

Hatco Corporation
P.O. Box 340500
Milwaukee, WI 53234-0500 USA
414-671-6350
support@hatcocorp.com