Smart, Flat, Smooth Induction cookers are here to stay

Back then, the necessity was fire, and hence it was discovered. Today, for sustainability, the necessity is the 'controlled use of fire', and ways to achieve this have been invented as well. One of these improvisations is the induction cooker – an invention that is modernizing the traditional Indian kitchen and, of course, playing its part in assuring us of a relatively sustainable future. Here, *Consumer Voice* brings to its readers the lab-tested findings on 12 brands of induction cooker available in the Indian market. By a fortuitous coming together of circumstances, it does appear that more and more Indian kitchens are going to flaunt this very contemporary and timely appliance.

To be precise, all of us today are being advised to efficiently burn minimum energy for maximum output and to reserve, if not preserve, our natural resources, while also doing our bit for the environment. From efficient vehicles to efficient lights, to efficient electronics and efficient home appliances, we are getting enough choices to choose from. And though not one of the latest entrants in the list, the induction cooker has lately become an object of much curiosity and compelling second and third thoughts on its utility value.

Steadily, induction cookers are dethroning the gas stoves from Indian kitchens – in much the same way as the gas stoves replaced oil-filled stoves or coal and wood stoves about a couple of decades ago. Gas stoves were bought for being efficient, economical and non-polluting, and today the characteristics of the induction cooker are the same, just that it scores several times better on all counts than LPG gas stoves and is also a safer alternative.

Mainly due to their increasing demand, specifically among the urban households who have limited time and space for cooking, and are certainly not helped by the shortage of LPG supply, the comparative testing of induction cookers was undertaken by team *Consumer Voice*. Since there are no relevant Indian/ international standards readily available, the selection

of test parameters was a big challenge. Based on in-house experience as well as recommended cooking selections/options given in the operating manuals of induction cookers, the test parameters were finalized. These parameters could be easily validated and justified, and helped the testing team in selecting the best overall performer.

Apart from the test and expert observations, the testing team also identified regular users of induction cookers, and their experience was taken into consideration. For instance, to find out the frying capacity as well as the durability aspects, the team spoke to pakoda and samosa vendors at railway stations who used induction cookers for about 20 hours of frying on a daily basis.

Design and function

In an induction cooker, a coil (spiral) of copper wire is mounted underneath the cooking surface plate where the pot or the vessel is placed. An alternating electric current flows through the coil, which produces an oscillating magnetic field. This magnetic field induces an electric current in the vessel. The current flowing in the metal pot or vessel, through the surface plate, produces resistive heating that heats the food in it with minimum heat loss.

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Brands tested and ranking

Rank	Brand	Model	Warranty/ Guarantee (in years)
1	Inalsa	Easy Cook LX	1
2	Kenwood	IH350	1
3	Bajaj	Platini PX130K	1
3	Morphy Richards	Chef xpress 100	2
4	Westinghouse	WKICLBC20	3
4	Philips	HD4907	1
5	Havells	Insta Cooks	2
5	Prestige	PIC3.0V2	1
6	Usha	Cookjoy	1
7	Glen	GL3070	1
8	Sunflame	SF1C01	1
9	Khaitan	KIC4095	1

Best buy Inalsa	Value for money Inalsa and Bajaj	Energy-efficient and cheaper to operate Westinghouse

PERFORMANCE TESTS

➤ Boiling time

The first challenge that all brands faced was to justify their warming-up time. To find out the exact warming-up time (min:sec), one litre of potable water with an initial temperature of 30 °C was raised to 100 °C in a recommended pan at boil mode (at maximum power), and the time taken by each cooker was recorded.

The testing team found that the warming-up time was lowest in case of Inalsa and highest for Glen because of high and low rating of wattage. Hence, it means heating time is inversely proportional to actual wattage of the product.

After water, the testing team measured the time taken to bring milk to boil. A litre of milk initially taken at room temperature (around 27 °C) was raised to 100 °C in a recommended pan at boil mode and the time taken by each cooker was recorded. In this test, too, Inalsa took the lowest time (2.31 minutes)

and Glen (3.59 minutes) the maximum time to bring milk to boil.

This table indicates time taken by each cooker to boil water and milk

Brand	Actual input power (watts)	For water (in minutes)	For milk (in minutes)
Bajaj	1,928	3:49	3:10
Glen	1,630	4:44	3:59
Havells	1,790	4:05	3:29
Inalsa	2,126	2:58	2:31
Westinghouse	1,710	3:32	2:59
Kenwood	1,840	3:53	3:18
Khaitan	1,501	4:41	3:58
Morphy Richards	1,830	3:59	3:23
Philips	1,921	3:48	3:41
Prestige	1,831	3:33	3:02
Usha	1,725	4:27	3:45
Sunflame	1,612	4:08	3:34

➤ Deep frying

To test the frying capability of induction cookers, a deep-frying test was conducted.

✔ All the brands cleared this test. The pakodas from each cooker were evenly fried and substantially crisp.

➤ Chapatti/Roti baking

Arguably, the most common usage of the gas burner in the house has been to make traditional Indian rotis. To find out if the induction cooker has the prowess to replace gas burners, this test was conducted.

✔ All brands passed this test – the chapattis baked were perfect.

➤ Tomato soup preparation

The soup was assessed to find out if a uniform mixture was obtained after a fixed duration of boiling.

✔ All brands performed satisfactorily during the test – each cooker produced a proper mixture of soup.

➤ Chila making (substituted for omelette)

The next test was to test the cooker's capacity to cook a chila of gram flour. The test was substituted for omelette-making test since the procedure is similar for both.

✔ All the brands passed in this test as well.

➤ Temperature distribution

A fixed quantity of portable water was boiled in a recommended pan and the temperature was measured at 17 points. The observations were assessed for any significant deviation of temperature between the points.

✔ All brands passed this test as no significant difference was observed

➤ Power input

Power input was measured using a fixed quantity of water as load. Appliances were run at maximum power input mode with water placed for heating in the recommended pan.

Bajaj, Morphy Richards and Inalsa exceeded the power consumption from their rated power by 28 watts, 30 watts and 126 watts, respectively.

On the other hand, the remaining nine brands were found to have overrated their appliances. The tests found that actual input wattage of all these brands was lesser than what they claimed. The difference found was between 60 watts and 399 watts. Consumers are most likely to be misled by the declared/rated wattages of the induction cookers. Since most of the brands were rated for around 2,000 watts, we feel this would

be the ideal rating for the cookers which consumer can bear in mind while buying this appliance.

The maximum variation in terms of rating/claim and the result was found in Khaitan, Westinghouse and Sunflame, while the lowest variation was in Bajaj and Morphy Richards.

Power consumption

There are certain key factors that reflect the heating performance as well as the economy of operation – namely effective surface plate area, input power, internal design of induction coil and the materials as well as quality of utensils.

BRAND	Power consumption of tested induction cookers versus a LPG stove using base reference of a specific food item: water (operating cost in Rs per day for using 10 times a day)				
	Per day*	Per month	Per year	Overspend in a year w.r.t. Westinghouse#	Annual difference b/w induction cookers and a LPG stove @ Rs 6.76 per day**
WESTINGHOUSE	5.94	178.2	2,138.4	-	-295.2
INALSA	6.24	187.2	2,246.4	108	-187.2
PRESTIGE	6.48	194.4	2,332.8	194.4	-100.8
SUNFLAME	6.57	197.1	2,365.2	226.8	-68.4
KENWOOD	7.02	210.6	2,527.2	388.8	+93.6
KHAITAN	7.02	210.6	2,527.2	388.8	+93.6
MORPHY RICHARDS	7.2	216	2,592	453.6	+158.4
PHILIPS	7.26	217.8	2,613.6	475.2	180
HAVELLS	7.26	217.8	2,613.6	475.2	+180
BAJAJ	7.26	217.8	2,613.6	475.2	+180
GLEN	7.62	228.6	2,743.2	604.8	+309.6
USHA	7.62	228.6	2,743.2	604.8	+309.6

#Reference taken for calculation w.r.t. the table of water and milk boiling time and actual energy consumed

**Calculated based on the actual consumed in the time taken w.r.t. Westinghouse as reference*

***Calculated based on a LPG cylinder cost @ Rs 600 and usage equal to the induction cookers' usage. Gas consumption @ 16.1gm/1 litre of water boiling in 5.36 minutes calculated @ Rs 6.76/day.*

➤ It is quite clear from the test findings that the 12 brands consume less time in heating up a reference food item (water), consuming a minimum 2.58 minutes to a maximum 4.04 minutes, whereas LPG stove takes about 5.36 minutes to boil same quantity of water.

➤ With regard to operating cost, the power consumed by induction cookers was between 1,501 watts and 2,126 watts. Since the energy-efficient and smart cooker turned out to be Westinghouse, it has been taken as a reference to arrive at the economical operation estimate in electricity and LPG.

➤ Westinghouse (Rs 295), Inalsa (Rs 187), Prestige (Rs100) and Sunflame (Rs 68) were cheaper to operate in a year on electricity vis-ṁ-vis an LPG stove. The remaining 8 brands proved to be more expensive in comparison to LPG. The models of Glen and Usha were the most expensive, costing Rs 309 each on a yearly basis. Overall, induction cookers still present a good option – they are a better and smart substitute, especially in these times of LPG shortage.

➤ SAFETY TESTS

Safety tests – that is, insulation resistance, electrical strength and protection against electric shock – were conducted as per relevant Indian Standards applicable to appliances.

✔ All the brands passed the safety tests as they were rightly insulated, withstood the electrical strength, and had protection against electric shock.

ENDURANCE TEST AT RATED VOLTAGE (48 hours continuous at maximum power)

The appliances were operated at a maximum power setting with portable water used as the test load, for a continuous period of 48 hours. The samples were visually checked for any sign of deterioration and breakdown as well as proper functionality after the test.

✔ All the brands passed in this test as no damage/ breakdown was observed.

➤ GENERAL AND PHYSICAL TESTS

As much as the performance and safety considerations, the design and overall look of the product also matter to the consumer while buying a product. The appliance should not have an odd shape or design, or sharp edges that may cause any inconvenience to the user. All the brands were rated on the basis of their design as well as ease of use and convenience..

To assess convenience and ease of use, the tested products were operated through built-in 6-8 soft-press switches where a selection of recipes as well as temperature and time was given. One of the brands tested had only one soft-touch system, which made it convenient to handle. In two brands, there were 2-3 soft-press switches and they made selection easier. These brands were rated higher compared to others.

Length of cord and power plug

Most of the brands have given a power cable measuring up to 1.25 metres, except for Westinghouse and Prestige (1.5 metres). Since all the tested induction cookers have been rated between 1,800 watts and 2,000 watts except one (2,100 watts), using high input power, the power plug is expected to be of higher ratings as well. Kenwood, Westinghouse, Prestige, Havells and Usha had 15 amps power plugs, while the rest all had plugs of 5 amps, which may not be safe for longer use in the case of induction cookers with 2,000 watts ratings.

For the purpose of overall ratings, *Consumer Voice* has considered a cord of 1.5 metres for full score as it provided 25 centimetres of extra cable, making it convenient. Prestige and Westinghouse provide longer power cable, of about 1.5 metres.

In the case of power plug, 5 amps may not be safe for longer use in induction cookers with 2,000 watts ratings

Dimension

The diameter of the circle (for effective hotspot areas) marked on top plate was measured. In case of two or more concentric circles, the diameter of the outermost circle was reported. These enable users to use utensils on the effective surface area where larger appliances may also be used for cooking a larger quantity of food. Accordingly, the appliances have been rated.

Net weight

The total weight of the induction cooker indicates its robustness, for it to withstand the utensil's weight as well as the food mass (load) in the utensil. A higher total weight has been considered to be better. Havells (2,272 gm) was the heaviest, followed by Prestige (2,199 gm) and Kenwood (2,166 gm). The lightest were Khaitan (1,654 gm) and Glen (1,754 gm).

Markings

All the brands provided adequate marking information except for Kenwood, Khaitan and Prestige, which did not provide technical information. Sunflame did not give details of the kind of utensils to use.

THE VERDICT

The tests results matched the hypothesis. The contemporary induction cooker can easily replace the gas burner as it can do all the tasks that the gas burner does, and in a more efficient, economical and eco-friendly manner. If the recommended type of steel utensils (ferro-magnetic) with a flat bottom is used, the induction cooker performs much better than any traditional type of stove. The testing team used three

different utensils to conduct five tests and found all the results of all induction cookers quite satisfactory.

The only hitch was the claims on the wattage and then disparities in ampere capacity of power plugs and the length of power cord. Some brands claimed lower wattage than actual usage, while others had overrated their wattage.

In overall performance, brand Inalsa came on top followed by Kenwood and Bajaj. In terms of value for money, Inalsa and Bajaj emerged on top as intelligent buys, as they were better performers costing Rs 2,550 and Rs 2,700, respectively. Westinghouse is quite energy-efficient and cheaper to operate among the brands tested.

KEY FINDINGS

- Inalsa has emerged on top, followed by Kenwood and Bajaj in overall performance. Brand Westinghouse is quite energy-efficient and cheaper to operate, followed by Inalsa in the long run, as against Glen and Usha, costing Rs 605 extra annually.
- In value for money, Inalsa and Bajaj are rated as good buys, costing Rs 2,550 and Rs 2,700 as purchase price, respectively.
- All the brands performed quite satisfactorily and users can rest assured about the cooking results provided the right types of utensils are used as recommended.
- The results of the cooking tests were quite satisfactory – uniform cooking results were found in all the brands.
- There was no oil burning and no smoke coming out of the oil while deep frying of *pakoda* – this ensured clean surroundings and least oil stains in the kitchens.
- Brands Westinghouse (Rs 295), Inalsa (Rs 187), Prestige (Rs 100) and Sunflame (Rs 68) were cheaper to operate in a year on electricity, as compared to LPG. The remaining eight brands were more expensive vis-ṁ-vis LPG, going up to Rs 310 on nominal usages. The models of Glen and Usha were the most expensive to operate, costing additionally about Rs 310 each on a yearly basis.
- Overall, induction cookers still present a good option – they are a better and smart substitute, especially in these times of LPG shortage.

Interesting facts

Apart from performance capacities of induction cookers, several interesting facts that give this appliance an edge were also highlighted.

➤ **Safe:** There are no hotspots on the heating surface plate (made of toughened glass/ceramic) of any of the tested induction cookers, making them the safest cooking appliance. Since there are no open flames and no gas leakages, the cooking top stays cool – so cooking is safer and there is very low risk of catching fire or burning one's hands or fingers. Moreover, gas stoves release nitrogen oxide resulting in inferior air quality while cooking, due to which one needs better ventilated kitchens. On the other hand, the heat in induction cookers does not react with the atmospheric gases.

➤ **Economical:** This aspect becomes evident if the average cooking time and electricity consumption are measured and compared to existing LPG prices. Thermal efficiency of induction cookers is 84 per cent as compared to the 36 per cent of gas stoves. It consumes half the amount of electricity as compared to traditional electric heaters.

➤ **Smokeless:** There is no oil burning on the induction cooker as it does not produce any smoke. While deep frying of pakodas, no smoke was produced from the oil – hence, the surroundings remained clean and the oil left no stain either.

➤ **Oil quality:** The quality of the oil in which pakodas were made remained good even after repeated deep frying, and it could easily be reused.

➤ **Availability:** Induction cooker is a one-time investment and is dependent mainly on power supply – unlike gas stoves, wherein the cylinder has to be refilled at regular intervals. With the new law that translates into rationing on LPG cylinders per household, the induction cooker offers itself as a practical alternative.

COMPARATIVE PERFORMANCE RATINGS OF INDUCTION COOKERS

Brand → → Test Parameters	Weight-Age (%)	Inalsa	Kenwood	Bajaj	Morphy Richards	Westing-House	Philips	Havells	Prestige	Usha	Glen	Sunflame	Khaitan
Actual/Rated Wattage		2,126/2,000	1,840/1,900	1,938/1,900	1,830/1,800	1,710/2,000	1,921/2,000	1,790/2,100	1,831/2,000	1,725/2,000	1,630/1,800	1,612/1,900	1,501/1,900
Retail price/MRP (in Rs)		2,550/3,195	3,050/4,290	2,700/3,095*	2,900/3,595	3,650/3,990*	2,800/3,195	3,150/3,150*	4,200/4,395*	3,050/3,495*	2,450/3,590	2,400/3,890	1,650/1,990
PERFORMANCE TEST	51	45.64	44.05	44.64	44.01	43.49	42.54	40.91	44.16	40.06	39.98	40.42	38.05
Warming-up time	8	7.86	5.89	6.03	5.67	6.65	6.07	5.45	6.61	4.65	4.03	5.34	4.14
Milk boiling time	8	7.94	5.44	5.86	5.17	6.45	4.21	4.85	6.29	4.00	3.25	4.58	3.30
Tomato soup making	4	4	4	4	4	4	4	4	4	4	4	4	4
Deep frying test	4	4	4	4	4	4	4	4	4	4	4	4	4
Chapati making	4	4	4	4	4	4	4	4	4	4	4	4	4
Chila making	4	4	4	4	4	4	4	4	4	4	4	4	4
Temp. distribution	3	3	3	3	3	3	3	3	3	3	3	3	3
Power input	8	6.74	7.37	7.70	7.68	5.10	7.21	5.04	6.31	5.25	6.12	4.36	3.80
Energy performance	8	4.10	6.35	6.05	6.49	6.29	6.05	6.57	5.95	7.16	7.58	7.14	7.81
SAFETY TEST	13	12	12.5	12	12	13	12	12.5	13	12.5	12	12	12
Insulation resistance and electrical strength	4	4	4	4	4	4	4	4	4	4	4	4	4
Endurance test	4	4	4	4	4	4	4	4	4	4	4	4	4
Protection against electric shock	2	2	2	2	2	2	2	2	2	2	2	2	2
Length of service / cord and plug	3	2.0	2.5	2.0	2.0	3.0	2.0	2.5	3.0	2.5	2.0	2.0	2.0
GENERAL & PHYSICAL TEST	36	32.73	31.01	30.75	31.23	29.65	31.53	31.7	27.72	31.03	30.17	28.35	25.58
Convenience & ease of use	13	12.23	10.4	10.40	10.40	10.4	10.4	10.4	7.80	10.4	10.4	10.4	7.80
Workmanship and finish	3	2.40	3.0	2.40	3.0	3.0	3.0	2.40	2.40	2.40	2.40	2.0	2.40
Dimension	5	4.45	4.21	4.55	4.40	3.60	4.45	4.92	4.49	4.57	4.36	4.03	3.89
Weight	5	4.60	4.70	4.50	4.38	4.10	4.48	4.93	4.78	4.61	3.81	4.17	3.59
Packing, marking and instruction manual	10	9.05	8.7	8.9	9.05	8.55	9.2	9.05	8.25	9.05	9.2	7.75	7.9
Overall score (%) rounded off	100	90	88	87	87	86	86	85	85	84	82	81	76

Rating: >90: very good *****, 71-90: good****, 51-70: fair ***, 31-50: poor **, <30: very poor*

*Price includes utensil supplied with induction cooker like kadai and frying pan