

## PRODUCT SURVEY

### Refrigerators: Which is the 'Coolest One'?

*The leaders of the competitive refrigerator market are here. Whirlpool predictably comes out at the top but it is given a run for its money by Videocon, an Indian brand that is highly energy-efficient and also cools the fastest - setting an example for all other brands. Allwyn, the trusted veteran bags the third position, says Consumer VOICE, which conducted tests on the popular brands of refrigerators in the markets and gives you tips on buying the ideal refrigerator*

Our weightage methodology has accorded high importance to tests like the 'pull-down test' (how fast a refrigerator cools), the 'ice-making time' and 'energy consumption' of refrigerators, which really are the main features that a consumer looks for in a refrigerator. It is surprising how energy consumption is still such a low priority area for refrigerator manufacturers even when most parts of India are going through an energy crisis this year, and when the whole world is moving towards maximising energy conservation and efficiency. What we found even more baffling was that not only do the manufacturers not impress upon these important features but BIS standards also do not specify optimal energy consumption, cooling time, or ice-making time for refrigerators. It has been left to the manufacturers to declare the above-mentioned points and conform to their self-declared values.

Consumer VOICE takes a serious note of these discrepancies and dichotomies, since 'cooling time', 'ice-making time' and 'energy consumption' are the most important features in a refrigerator and, currently, no refrigerator declares any of these values. Consumers only have advertising claims to go by when a decision has to be taken about which refrigerator one should buy (see page 10), and more often than not, these advertising claims just turn out to be hot air. Kelvinator, for example, has for decades called itself the 'coolest one', but our tests reveal that Kelvinator lags behind all other brands in cooling, and while every other refrigerator tested manages to stay within the maximum energy consumption limit, Kelvinator's power input shoots past the maximum consumption mark. Thus, it not only takes the most time to cool but also does a double whammy by costing consumers most amount of money in energy bills.

#### **The Missing ISI Mark**

Once again, no refrigerator bears the elementary ISI (Indian Standards Institution, but now Bureau of Indian Standards) mark of standardisation. This is a persistent trend that

we have noticed in most consumer products we have tested lately. From ceiling fans to toothpastes to refrigerators, most manufacturers do not bother to take up any standardisation if it is not mandatory for them to do so. In the case of refrigerators, none of the eight brands had the ISI mark.

### **Is Your Refrigerator Actually the 'Coolest One'?**

In hot climates like India, it is the 'cooling' quality which most of us consider the most important in a refrigerator. We maintained the temperatures (called 'ambient temperatures') of all refrigerators at 43 °C and then tested how much time it takes for each refrigerator to bring down the temperature (called the 'pull-down' test) to 7 °C. The manufacturers don't declare any 'pull-down' time on their refrigerators but we found that Kelvinator took the maximum time (202 minutes to be exact) for cooling. Allwyn, Godrej and LG took 135, 147 and 117 minutes, respectively, and LG's compressor got jammed during the test. We had to get it replaced by the LG service centre to continue with the testing of the refrigerator, just two months after the refrigerator was bought by us.

### **The Best**

Videocon turned out to be the best in the 'pull-down' test, bringing down temperatures from 43 °C to 7 °C in just about 78 minutes. BPL took 82 minutes, Samsung 87 and Whirlpool 88 minutes.

### **Maintaining Temperatures**

It is not just important for a refrigerator to cool quickly but also to maintain optimal temperatures. There are various levels or tiers in the refrigerator and it is no good if food in the upper shelves remains warm and the bottom tray turns icy. In the refrigerator cabinet, the mean temperatures should never exceed 7 °C, while in the freezer, it should always be below -5 °C. We tested refrigerators at high ambient temperature conditions of 43 °C and also at 18 °C. The test results of high ambient temperatures are as follows:

- Allwyn had the coldest freezer, with its freezer temperature reaching "20.4 °C and Samsung the least cold with "8.9 °C.
- The best mean cabinet temperatures were that of Videocon, followed by BPL and Whirlpool, under high ambient temperature conditions of 43 °C.

We conducted the same test under low ambient temperatures of 18 °C. This time all brands performed well but at one level, Samsung's cabinet temperatures touched a lowly 0.2 °C. This is not desirable since it is very close to freezing point and can turn food items icy.

### **Ice-Ice Baby**

Many refrigerators have poised their advertising campaigns on their product's quick ice-making capabilities. However, none of the eight brands tested declared exactly how much time it takes for their refrigerators to make ice. Also, none of them provides ice trays of 300 ml size, a standard size that has been specified by the BIS. We find it difficult to understand why manufacturers find it hard to conform to even the simplest of BIS specifications, such as the size of ice trays or declaration of ice-making time, in this

instance. The violations range from the most serious (high energy consumption) to the most trivial (irregular ice tray sizes).

Ice trays of the eight brands ranged from the 200 ml to 270 ml sizes. It was a tricky exercise for us deciding which brand makes ice fastest given the varying tray sizes. However, Whirlpool came out tops with ice-making time of 38 minutes for a 270 ml tray. Godrej came second with a time of 38 minutes for a 250 ml tray, and BPL third with ice-making time of 40 minutes for a 260 ml tray. Allwyn turned out to be the slowest, taking 45 minutes to make ice in a 200 ml tray. It should be noted that bigger the tray size, more the time taken to make ice. Also, the water temperature should be normal, at 30 °C, to determine actual ice-making time. We recorded the ice-making time from the refrigerator cabinet temperature of 7 °C.

### **Energy Consumption on the Higher Side**

None of the brands mentioned the energy consumption of their products, even when refrigerators are required to do so. The energy consumed should not exceed 15% of what the manufacturer states.

At the maximum, the energy consumption should be 1.1 kWh/24 hr (kWh/24 hr denotes energy in kilowatts consumed in one day) for a 66-165L refrigerator, and 1.4 kWh/24 hr for a 166-240L capacity refrigerator. Once again, Videocon topped the test with lowest energy consumption of 0.60 kWh/24 hr for its 165L refrigerator, thus getting the highest score of 10 in our energy consumption ratings. All refrigerators except for Kelvinator managed to stay within limits of the maximum energy consumption mark but Kelvinator stood out with a very high 1.44 kWh/24 hr energy consumption value.

### **Towards Energy Efficiency and Labelling**

While India is only now adopting energy labelling for refrigerators, other countries of the world have had energy labelling and standards for refrigerators since as early as 1966. Countries like France, US, Canada, Japan, Taipei-China, Australia, Korea, Jamaica, the Philippines, Hungary, Switzerland, Mexico, and the European Union have either mandatory labels or mandatory standards, or both, for refrigerators. Consumer Reports of the US recommends buying a highly energy-efficient model even if it costs more than the energy in-efficient one, since refrigerators account for up to one-fifth of the annual electricity costs in the US. With an energy-efficient model, savings can be substantial.

### **Important Mandatory Marking Missing**

All refrigerators should have some basic information clearly marked, and should come packed in good packaging. The following information should be marked:

- Model name
- Serial No
- Manufacturer's name or trade mark
- Rated storage volume
- Refrigerant used and quantity
- Voltage range and supply characteristics
- Wiring diagram

- Rated current consumption
- Ice-making time
- Overall dimensions

On examination, we were surprised to find that even such basic information was not marked on some refrigerators.

- Godrej did not declare its Model No., and Kelvinator did not declare the Compressor No. This is a serious lapse on the part of manufacturers because in case of a fault, a Compressor No. and Chassis No. help in location of the place of manufacture, and speedy redress of the complaint.
- BPL, Godrej, Samsung and Videocon did not mark their Gross Volume in Litres, and Videocon did not declare the name and quantity of refrigerant used. This means that once a compressor runs out of the refrigerant and needs a refill, the owner of the refrigerator and the mechanic can be in a fix about what refrigerant or what quantity to use.

### **Refrigerators Withstand High Voltage: The Silver Lining**

All refrigerators were subjected to high voltage of 1000 V AC for one minute and all of them withstood the test well. All brands were also found to have good insulation, which protects against electric shocks. Insulation resistance of all brands remained adequate even after the refrigerators were subjected to high humidity conditions for a period of seven days. This is an important quality under Indian conditions where humidity gets very high in most parts of the country.

The brands appliances performed well in the moisture resistance test. They were also found to be offering adequate protection against electric shock under test conditions.

### **Brands Tested**

- Allwyn-Durocool
- Godrej-Star
- LG-GR 1711 ASX
- Videocon-S 161 PP
- Samsung-SRA 18N F8
- Kelvinator-Master Cool
- BPL-C161
- Whirlpool-Master (DX)

### **Highlights of the 'Cooling' Test**

- LG's compressor conks out during the test and has to be replaced.
- Videocon has the best cooling time - 78 minutes.
- Kelvinator is the 'uncoolest one'. Takes 202 minutes to cool. That is two-and-a-half times that of Videocon.

## The Quickest Ice-Makers

- Whirlpool
- Godrej
- BPL
- Samsung
- LG
- Videocon
- Kelvinator
- Allwyn

## Refrigerators are Energy Guzzlers

- All brands, except for Videocon, Allwyn and Samsung have energy consumption levels which are on the higher side.
- BIS does not specify any optimal energy consumption level.
- No brand declares its energy consumption value even when it is mandatory to do so.

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What does running a refrigerator cost you?

Brand	Energy Consumption in a Day (kWh/24 hr)	Actual Cost of Running for a Day (@ Rs 4 per unit)	Actual Cost of Running for a Year (@ Rs 4 per unit)	What you Over-spend in a Year on Energy Bills (0.60 kWh as standard)
Videocon	0.60s (Best)	2.40	876	—
Allwyn	0.64 (Best)	2.56	934.4	Rs 58.4
Samsung	0.80 (Average)	3.2	1,168	Rs 292
Godrej	0.92 (Average)	3.68	1,343	Rs 467
LG	0.96 (Average)	3.84	1,402	Rs 526
Whirlpool	0.96 (Average)	3.84	1,402	Rs 526
BPL	1.00 (Average)	4.0	1,460	Rs 584
Kelvinator	1.44 (Poor)	5.76	2,102	Rs 1,226

*Note: The above-mentioned values are under no load and stable conditions, i.e. with an empty refrigerator.*

## Are you buying a refrigerator?

- A household refrigerator has a typical life of around 15 years and is run continuously everyday. Thus naturally it consumes a lot of electricity and has a high operating cost. Energy efficiency becomes an even more important deciding factor since nowadays all models offer some standard qualities and the energy

consumption of the refrigerator helps in deciding which brand to buy. So, it makes sense to choose one, which is most energy-efficient. With energy efficiency labelling being introduced for refrigerators, it will be a good idea to buy a refrigerator that supports this label. Among the brands and models tested by Consumer VOICE, we would recommend 'Videocon' as the best among all in terms of energy efficiency and cooling time.

- Keeping your family size and food habits in mind, decide on the right refrigerator size. Refrigerator sizes range from 165L to 680L and all are either 'direct cool' or 'frost-free'. It is important to note that bigger the refrigerator size, higher the energy consumption, so buying the right size becomes all the more significant. If you are the kinds who hates to do the regular ritual of defrosting the refrigerator and then cleaning it, it would be a good idea to go for a 'frost-free', even though its market penetration is still rather low.
- Make a tally of your needs and specific requirements. For instance, if you like to stack big two-litre bottles, then one of LG's 165L model offers good utilisation of the door space for accommodating large bottles. Similarly, if you or anybody in your home is likely to leave the refrigerator door open, then Videocon's direct cool range refrigerators offer door chimes for this purpose. Also, decide on your 'crisper' needs. You can get one that has a single compartment and also two half-width crispers.
- Most retailers sell refrigerators at less than the listed price and it is a good idea to do a brief survey of the market before zeroing in on the most economical buy, but be careful to keep the refrigerator brand and model you have chosen in mind while doing the survey because if purchase decisions are made on price comparisons alone, then one may end up buying a model or a brand which doesn't cater to one's specific needs.
- Pay close attention to the guarantees and warranties. There is a lot of fine print involved in the warranties and a consumer can lose out on after-sales service if instructions are not followed. Some companies do not include glassware and light bulbs under free of charge repair. The replacement or return of the refrigerator as a whole is also excluded from the warranty. If you live in an area which is not within the limits of the company's branch offices or authorised representatives' offices, the servicemen may charge you for travel and other expenses. Don't attempt to do any repairs yourself or get them done by any other mechanic because that may nullify the warranty. The 'Optional Service Contract' is generally available at a payment of Rs 200-300.
- A consumer can avail of instalment purchase facilities for a refrigerator. A 165-200L refrigerator normally costs between Rs 7,000 and 8,000. The general practice for instalment purchase is that a consumer has to pay at least one-third price of the selling price at the time of purchase and the remaining amount can be paid back in 6 to 8 to 12 months. However, an additional payment of around Rs 300 will have to be made to the dealer for a 6-month pay-back period, around Rs 500 for a 8-month period, and Rs 600 for a 12-month period. The dealer would also ask you for a salary slip or proof of income, and perhaps also seek your guarantee from a government employee. The best strategy is to bargain for as low a price as possible from a dealer.

Estimated Selling Price	On-the Spot Payment	6-month Payment	8-month Payment	12-month Payment
Rs 7,500	Rs 2,500 (1/3 <sup>rd</sup> of the selling price)	A monthly instalment of around Rs 833 + Rs 300 over the 6-month period. So the refrigerator costs you around Rs 7,800	Monthly instalment of around Rs 625 + Rs 500 over 8 months. The refrigerator would now cost you Rs 8,000	Monthly instalment of around Rs 416 + Rs 600 over 12 months. The total cost of the refrigerator would be Rs 8,100

## Maintain Your Refrigerator the Right Way

- One must ensure that there is adequate airflow over the coils on the back of the refrigerator. Restricting ventilation can add to overloading and increase in energy consumption by 15%! Don't suffocate the refrigerator by enclosing it tightly in cabinets or against the wall. Manufacturers recommend that at least 4 inches of space at the back, and 12 inches on the sides and tops should be allowed to the refrigerator for clearance of air. Regularly brush off or vacuum the refrigerator coils on the back or bottom of the unit. Read User Manual provided by the manufacturer for exact instructions. If there are no clear guidelines, contact the service centre.
- Place the refrigerator in a cool place. Putting it near the oven, for example, can result in increased energy consumption.
- Allow food to cool before putting it in the refrigerator, but don't put the food out at room temperature for more than 30 minutes as that can jeopardise food safety.
- Ice in the freezer tends to accumulate layer by layer and acts as an insulator, reducing the cooling capacity of refrigerators. Whenever frost gets around 5 mm thick, it is time to defrost the refrigerator. If you want to make ice quickly, wet the bottom of the tray as well while putting it in the refrigerator.
- To ensure proper cooling of its contents, don't crowd food items. Too many dishes obstruct air circulation. Cover liquids and wrap foods stored in the refrigerator. Uncovered foods release moisture and make the compressor work harder.
- Don't open the door too many times or for any longer than you actually need to. Don't leave the refrigerator door open for more than 30 seconds. Clean the door seal regularly and ensure that it is tight. If you plan to go away from home for more than a week, give your refrigerator a break by emptying it of its contents, switching it off, cleaning and drying it and leaving it at that till you come back.
- Set the 'temperature control' at optimal temperature. If the temperature is set at the lower or lowest position, it can increase energy consumption.

### How to Check if Refrigerator Door Seal has Sagged

Often ordinary snags like a damaged or loose door seal can result in loss of cooling and increased energy consumption. If you want to check if the door seal of your refrigerator is working fine, you can take a paper slip (preferably of around 50 mm width and 0.08 mm thickness) and put in between the door seal. If it slides freely, it means that the door seal is improper.

## Comparative Performance

Brands (Ltr)	Weightage	Videocon (165L)	Allwyn (165L)	Samsung (175L)	BPL (165L)	Godrej (170L)	LG (175L)	Kelvinator (165L)
Mechanical strength	3	*****	*****	*****	*****	*****	*****	*****
Temperature rise	5	****	****	*****	*****	*****	***	***
No load adjustment	8	****	***	****	**	****	****	****
Low ambient test at 18 °C		*****	***	*****	**	*****	*****	*****
High ambient test at 43 °C		****	****	****	***	****	***	***
No load performance	10	****	*****	***	*****	****	***	***
Thermal insulation	3	*****	*****	*****	*****	*****	*****	*****
Rated energy consumption (kWh/24 hr)	10	****	*****	*****	****	***	***	***
Electric insulation and leakage current at operating temp	4	****	****	*****	****	****	****	*****
Insulation resistance and electric strength (after humidity test)	5	****	****	*****	****	****	****	*****
Starting of motor operated appliance	3	*****	*****	*****	*****	*****	*****	*****
Rank		1	2	3	4	5	6	7
Overall grading		****	****	****	****	****	****	****

\*\*\*\*\* Very Good \*\*\*\* Good \*\*\* Average \*\* Poor \*Very Poor

### VOICE Choice: Videocon is the best

Even though Whirlpool comes out top with an overall score of 89.54, Videocon S 161 PP loses by a mere whisker by scoring 89.50. We would recommend Videocon as the "best buy" because not only does it have the cheapest competitive price of Rs 7,200 but also outperforms every other brand in cooling time and energy efficiency. At a time when most manufacturers have gone slow on energy efficiency, Videocon does well by offering consumers a highly energy-efficient model and giving them good returns for their money.

Whirlpool Master (DX) has a 170L capacity and is the fastest ice-maker of the eight brands. Thus Whirlpool's claims of being the fastest ice-maker seem to be justified. It has a competitive price of Rs 7,400 and gives a one-year warranty as well as an optional six-year service contract. Whirlpool does well in the 'pull-down' test with a cooling time of 88 minutes but is a little tardy insofar as energy consumption is concerned where it stands sixth. So, if you don't mind electricity bills, which are on the higher side, go for a Whirlpool by all means.

Allwyn has been one of the oldest brands of refrigerators around. Priced at around Rs 7,300, it provides an optional service contract of four years and has the best energy efficiency after Videocon. Its 'pull-down time' (cooling time) and 'ice-making time' are, however, on the higher side and this makes it the third best buy after Videocon and Whirlpool.

All eight brands that we tested provide the standard one-year warranty as well as optional service contracts. BPL, Godrej, LG, Kelvinator and Samsung provide optional service contracts of four years.