



# Ceiling Fans

## Only 1 out of these justifies the five-star rating

It's telling that 5 out of the 6 brands tested did not meet the requirement of BEE's five-star rating, especially in service value – this being a basic determinant of energy efficacy (higher the 'service value', better the energy efficiency and air delivered). This finding may come as a surprise to most of us, considering that the ceiling fan seems to be a very basic, standard sort of product—one that doesn't warrant much thought or research. Any model of one of the known brands would do, isn't it? Keeping this general perception in mind, we have in this report put the spotlight on energy efficiency (and energy efficiency is very important in the case of a product used so widely and that collectively consume a huge amount of electricity). With the millions of ceiling fans sold annually in India and the huge amount of electricity being consumed, think of the potential savings in electrical energy that can be realised with energy-efficient motors. So here we are, comparing seven ceiling-fan brands with five stars (energy-efficiency rating assigned by Bureau of Energy Efficiency, BEE, as per which five stars denote highest efficiency and one star the least) on not just their energy efficiency but also their performance, quality and safety aspects.

*A Consumer Voice Report*

**W**e tested the brands on parameters such as air delivery, service value, power input, power factor, voltage, leakage current, temperature rise, creepage distance and clearances, insulation resistance, earthing connection, design and general construction, suspension system, starting and fan speed.

The tests were conducted at an NABL-accredited laboratory. It should be noted that the Havells ceiling fan got jammed and further tests could not be conducted on it.

The samples were tested as per specifications in Indian Standard 374-2018 (electric ceiling-type fans and regulators). The standard sizes of ceiling fans covered in the standard are 900 mm, 1,050 mm, 1,200 mm, 1,400 mm and 1,500 mm. This *Consumer Voice* report focuses on 1,200 mm fans – which also happen to be the most commonly used – with BEE rating of five stars. These fans are the regular, non-decorative models with three blades.

## BRANDS TESTED

Rank	Total Score out of 100 (rounded off)	Brand	Model	Rated Power Input (watts)	Guarantee/Warranty (G/W)	BEE Star Rating	Standard Mark	Retail Price/MRP (Rs)	Manufactured/Marketed by
1	93	Crompton	Star 220	50	2W	5 stars		1,170/1,615	Crompton Greaves Consumer Electricals Ltd
Not complying in key parameters and hence not recommended		V Guard	Corona VX	50	2W	5 stars	ISI	2,020/2,050	V-Guard Industries Ltd
		Bajaj	Kassels 50	50	2W	5 stars	ISI	1,675/1,725	Bajaj Electrical Ltd
		Luminous	Marc Star	50	2W	5 stars	ISI	1,790/2,090	Shree Balaji Enterprises
		Usha	Energia	50	2W	5 stars		1,314/1,920	Usha International Ltd
		Orient	Smart Saver 50	50	2W	5 stars		1,449/1,870	Orient Electricals
Tests not conducted as the ceiling fan was jammed		Havells	ES Neo	50	2G	5 stars		1,653/2,560	Havells India Ltd

Score Rating: >90: excellent\*\*\*\*\*, 71-90: very good\*\*\*\*, 51-70: good\*\*\*, 31-50: average\*\*, up to 30: poor\*

## Comparative Test

**CV RECOMMENDATION | TOP PERFORMER |  
VALUE FOR MONEY**

**Crompton**



### **BEE star rating**

For compliance with the requirements of this standard, the values of service factor and air delivery are given here for 1,200 mm fans operating at rated voltage and rated frequency at full speed.

1 Star  $\geq 3.2$  to  $< 3.4$

2 Star  $\geq 3.4$  to  $< 3.6$

3 Star  $\geq 3.6$  to  $< 3.8$

4 Star  $\geq 3.8$  to  $< 4.0$

5 Star  $\geq 4.0$

All ceiling fans covered under this standard are required to comply with minimum air delivery requirement of 210 m<sup>3</sup>/min.

Higher the 'air delivery', better the breeze.

Higher the 'service value', better the energy efficiency and air delivered.

Lower the 'power input', less the electricity bill.

### **Key Findings**

- Based on the overall test findings, Crompton is the only top performer among the brands tested. It is also the 'value for money' brand.
- Crompton complied with all the requirements specified in Indian Standard for ceiling fans as well as BEE's five-star rating. It scored the highest marks in air delivery and service value and was second in input power. However, it fell short of its claims on air delivery (215 m<sup>3</sup>/min against the claim of 220 m<sup>3</sup>/min), service value (4.0 against 4.4), and power input (52.6 against 50 watt).
- It may be noted that higher the 'service value', better the energy efficiency and air delivered. Also, lower the 'power input', less the electricity bill.
- Input power of all tested brands was found to be higher than their declared value (50 watts), consuming between 51.9 and 59.7 watts, though all were rated five stars claiming 50 watts.
- Five brands did not comply with key requirements of Indian Standard in terms of service value and air delivery. They did not fulfil all criteria of five-star rating as their service values were lower than the minimum requirement of 4.0.
- Luminous, Bajaj and V Guard were ISI-marked but did not meet the key requirements of Indian Standard as well as BEE five-star rating.
- None of the brands provided regulators along with the ceiling fans as a package. Consumers have to buy and pay extra for the regulator.

## TEST RESULTS FOR PERFORMANCE AND SAFETY

**Air delivery | Service value | Power input | Design and general construction | Temperature rise | Suspension system | Fan speed | Creepage distance and clearances | Power factor | Starting | High voltage | Insulation resistance | Leakage current | Earthing connection**

### PERFORMANCE

#### ◆ Air delivery

Minimum air delivery of a 1,200 mm ceiling fan should be 210 m<sup>3</sup>/min.

- Only Crompton fulfilled this requirement.

Air delivery essentially defines the amount of air a fan delivers – a crucial parameter since it translates into how comfortable you feel under a running fan, and whether sufficient air is being delivered or not.

#### ◆ Service value

For a BEE star-rated fan, as all the tested brands are, minimum service value should be 4.0 m<sup>3</sup>/min/W for a 1,200 mm size fan.

- Only Crompton met the requirement of service value.

Service value denotes the air delivery in metre cube/min, divided by electrical power input to the fan in watts (W) at test voltage and at full speed. In simple terms, service value means the amount of air delivered per minute per wattage of electricity.

#### ◆ Power input

Power input shall be +20% of declared value.

- Input power of all the brands was higher than their declared values. All the brands were found to be consuming between 51.9 watts and 59.7 watts.
- Bajaj scored highest on this parameter, followed by Crompton. Orient scored the lowest.

The 'power input' test defines the energy consumption of a fan.

#### ◆ Power factor

Power factor shall not be less than 0.90 for ceiling fans. The tolerance limits are a minimum 0.02 and a maximum 0.07.

- All brands passed the test.

In AC circuits, the power factor is the ratio of the real power that is used to do work and the apparent power that is supplied to the circuit.

#### ◆ Fan speed

Fan speed shall not exceed +\_ 10% of marked value.

- Crompton, V Guard and Bajaj scored highest on this parameter.

### SAFETY

#### ◆ Temperature rise

The winding temperature of motor shall not exceed 85 degrees C.

- Temperature rise in all the brands was well within the specified limit.

Temperature rise is the change within a motor when operating at full load. Thus, if a motor operates continuously at full load, the winding temperature will rise. The difference between its starting temperature and its final elevated temperature is the motor's temperature rise.



## Comparative Test

All brands cleared the tests for leakage current, insulation resistance, earthing resistance of exposed metal parts, and withstanding high voltage. Creepage distance and clearance are important determinants of safety of ceiling fans and these were as per the requirements of the standard in all brands.

### ◆ Starting

The fan shall be capable of starting from rest when 85 per cent of rated voltage is applied with regulator at lowest speed step.

- *The performance of all brands was satisfactory on this count.*

### Will it fall off the ceiling?

The 'suspension system' test checks if the ceiling fan will break and drop to the ground when subjected to a tensile load of 1,000 kg and a torsion load of 500 kg-cm.

All brands withstood the loads, so you know you are safe when standing directly under these fans.

### ◆ Design and general construction

We tested the brands with regard to their enclosures and blades, heat resistance, corrosion resistance, protection against direct/accidental contact with live parts, and earthing provision/reinforced insulation.

- *All tested fans met the requirements for design and general construction.*

The Indian Standard requires that the design and general construction of a fan be such that the blades are securely fixed, the material used in fan and regulator are heat- and corrosion-resistant, and there is protection against direct contact with live parts, among other things.



## PERFORMANCE AND SAFETY SCORES

Brand →	Weightage (%)	Crompton	V Guard	Bajaj	Luminous	Usha	Orient	Havells
Model →		Star 220	Corona VX	Kassels 50	Marc Star	Energia	Smart Saver 50	ES Neo
Air delivery	20	18.60	15.80	12.16	12.72	8.80	10.20	TNC*
Service value	15	13.50	12.00	11.25	9.75	8.25	6.75	TNC
Power input	12	9.84	9.56	10.75	8.94	8.82	2.76	TNC
Design and general construction	10	9.25	9.40	9.70	9.70	9.25	9.70	8.80
Temperature rise	8	7.76	7.92	7.70	7.76	8.00	6.44	TNC
Suspension system	5	5	5	5	5	5	5	5
Fan speed	4	3.82	3.82	3.82	2.20	3.52	2.32	TNC
Creepage distance and clearances	4	4	4	4	4	4	4	4
Power factor	3	2.52	2.64	2.52	2.76	2.88	2.64	TNC
Starting	3	3	3	3	3	3	3	TNC
High voltage	3	3	3	3	3	3	3	3
Insulation resistance	3	3	3	3	3	3	3	TNC
Leakage current	2	1.99	1.94	1.83	2.00	1.85	1.91	TNC
Earthing connection	2	1.8	2.0	1.6	1.8	1.8	2.0	TNC

\*TNC – tests not conducted

### FOR GENERAL QUALITIES

#### ◆ Marking/Labelling

The container of ceiling fan shall be marked with the following particulars:

- Manufacturer's name, trade name (if any) and number
- Rated voltage(s)/voltage range
- Type of fan, AC or DC
- Frequency/frequency range of power supply
- Input in watts
- Air delivery

- Size of fan
- Country of manufacture
- BEE's star rating

In addition, the manufacturer should provide information regarding MRP, manufacturing/packing date, any standard mark, and warranty/guarantee and customer-care details.

- All brands provide the required information.

All ceiling fans were packed in hard carton boxes with thermocol/cardboard supports, thereby fulfilling the conditions specified in Indian Standard.

## Comparative Test

### Manufacturers' Comments

As a matter of policy, before publication the test results of the brands tested are shared with their respective manufacturers/marketers inviting their views/comments. We reproduce here the reactions:

Manufacturer (Brand Name)	Manufacturer's Comment	Consumer Voice
<b>Havells</b>	The Havells ceiling fan that you picked up for testing might have got jammed due to mishandling in the transit. You are requested to pick up another Havells five-star sample from the market or we can deliver the sample.	The Havells ceiling fan was purchased from an authorised retailer of Delhi and delivered to a reputed NABL-accredited laboratory for testing. The fan motor was jammed and hence further tests could not be carried out. Since this is a time-bound programme, it is not possible for us to collect a new sample and get it tested at the lab.
<b>Luminous</b>	As per your tests, air delivery of Luminous fan is 194 m <sup>3</sup> /min and power input is 54.2 watts – please share the lab test report before we respond to the same.	The lab reports were reproduced in a simple format and sent to concerned manufacturers for their comments. As a policy, we don't reveal laboratory name at this stage, essentially to prevent any possible external influence. In any case, we had requested the NABL lab to retest the parameters mentioned and they informed that there was no change in results.
<b>Bajaj</b>	Air delivery as reported by your test is 192 m <sup>3</sup> /min, as against our rated value of 220 m <sup>3</sup> /min. We tested this model in an NABL lab last year, and the results ranged between 228 m <sup>3</sup> /min and 232 m <sup>3</sup> /min.	We carried out a retest and there was no deviation in the results.
<b>V-Guard</b>	As per our internal test data as well as tests conducted from outside agencies including an NABL-accredited laboratory, air delivery of the Corona VX is 210 m <sup>3</sup> /min +/- 2%, yielding service value between 4.2 and 4.3. As per your report, the values are lower and we need to physically examine the tested product to find the actual reason for deviation.	Our designated lab conducted a retest on the sample and there was no deviation in the results. The lab further confirmed that there was no physical damage in the motor and blades.
<b>Crompton</b>	While most of the report corroborates our observations, there are certain deviations with regard to air delivery, input power, speed and service value.	Our designated lab conducted retests on the samples and no deviation in results was observed.

### CV's Recommendations

- 1) Indian manufacturers need to put in extra efforts to improve air delivery and service value in order to enable consumers to get optimal energy savings. Overall, only one brand, Crompton, qualified for BEE's five-star rating. The other tested brands were found lower on air delivery and energy efficiency.
- 2) A regulator should be capable of reducing the speed of fan to at least 50 per cent. However, none of the 7 brands provided a standard speed regulator compatible with the fan, often leading to usage of sub-standard regulators by users and thereby possibly affecting the fan's performance.

Dear readers: We are open to hearing your suggestions on products and services that you believe should be reviewed/tested by Team Consumer Voice. You may write to [cpt@consumer-voice.org](mailto:cpt@consumer-voice.org)