



Juicer Mixer Grinder

Efficiency and safety matters

The domestic electric food juicer/mixer/grinder has become an integral fixture in the typical modern kitchen. Generally functional as liquidizers, grinders and juicers, this paraphernalia comes in handy for grinding/pulverizing/powdering dry foodstuffs either raw or roasted (cereals, grains, masalas, coffee seeds, etc.), for mixing liquids and for converting food—with or without the presence of water (or vegetable oils)—into forms of slurry or pulps. It is also used for extracting juice from fruits or vegetables. Basically, whether the purpose is to whip up a chunky chutney or blend a cool lassi, the JMG is the thing to go to. Here, the *Consumer Voice* team checks out various brands of food juicers/mixers/grinders to assess how equal they are to various operational, efficiency and safety parameters.

A Consumer Voice Report

The comparative testing carried out in an NABL-accredited laboratory was mainly based on Indian Standard IS 4250: 1980, covering rated input not exceeding 600 watts. Relevant

provisions of IS: 302-1: 2008 were also referred to. While electric food juicers/mixers/grinders are manufactured in both the organized and unorganized sectors, we focussed on the former for the comparative testing.

Juicer Mixer Grinder

CV Recommendation | Top Performer

Philips

Value for Money

Philips

Cheapest

Maharaja Whiteline | Kenstar



Costliest

Havells

BRANDS TESTED

The 10 shortlisted brands went through a gamut of tests on parameters covering construction, operation, performance, electrical and mechanical safety, and endurance, among others.

Rank	Total Score out of 100 (Rounded off)	Brand	Model	Rating (Watts)	Guarantee/Warranty (Years)	MRP/Retail Price (Rs)	Manufacturer/Marketer
1	88	Philips	HL 1631	500	W (2)	3,495/3,000	Philips Electronic India Ltd
2	86	Morphy Richards	Aristo 2 Jar	500	G (2) – product G (5) – motor	3,695/2,900	Bajaj Electrical Ltd
2	86	Havells	Endura-II	500	W (2) – product W (2) – motor	4,045/3,400	Havells India Ltd
2	86	Kenstar	KJY50W3P-DBB	500	W (2)	3,445/2,500	Videocon Industries Ltd
3	85	Usha	JMG 2744	450	Manual not supplied	3,395/3,050	Usha International Ltd
4	84	Inalsa	JMG-Gloria	450	W (2) – product W (2) – motor	3,895/2,800	Tarang Marketing Pvt. Ltd
4	84	Glen	GL-4013	450	W (1)	3,490/2,600	Glen Appliances Pvt. Ltd
4	84	Bajaj	JX5	450	G (2) – product G (5) – motor	3,460/2,650	Bajaj Electricals Ltd
4	84	Prestige	V-2	500	W (1)	3,345/2,900	TKK Prestige Ltd
4	84	Maharaja Whiteline	Regal (JX-207-A)	450	W (1)	3,795/2,400	Maharaja Whiteline Industries Pvt. Ltd

Comparative Test



KEY FINDINGS

- Based on the overall test findings, Philips is the topper.
- Philips is our choice for 'value for money' on the basis of its performance and cost.
- Morphy Richards has topped in performance tests, followed by Kenstar.
- Morphy Richards, Philips and Kenstar topped in 'other operational tests', covering tests for abnormal operation, temperature rise, and controls.
- Noise level was lowest in Philips and highest in Usha.
- Inalsa consumed the lowest power (370 W) as compared to other brands (415 W–510W).
- Maharaja Whiteline and Kenstar failed in 'resistance to fire' test.
- Juice extraction in all the brands was low, ranging from 53.5 per cent to 56 per cent against the required 65 per cent minimum.
- Two brands, Havells and Kenstar, met the requirement for cross-sectional area of conductors of service cord. In conductor resistance tests, four brands – Havells, Kenstar, Usha and Philips – met the requirement.
- Morphy Richards and Bajaj have given two-year guarantee for product and 5 years for motor. All other brands have warranty for one year to two years.

TEST RESULTS FOR PERFORMANCE

The brands were tested for their performance on these tasks: grinding coffee, whisking egg whites, making idli batter, grinding rice and juice extraction.



a) **Grinding coffee:** As per IS, the recommended quantity of roasted coffee beans is taken for grinding and filtered in the three sieves of different microns.



The material retained on each of the first two sieves shall not be more than 20 per cent of the weight obtained at the end of the test. The material passing through the third sieve shall not be less than 30 per cent of the same weight.

b) **Whisking egg whites:** In this test, the material shall remain in the bowl when inverted for five seconds.

c) **Making idli batter:** This test indicates uniform performance in making a batter of rice and black gram. This requires grinding and mixing of the material in water to make a uniform, smooth and homogeneous

batter for further cooking. The mixture shall be smooth and frothy, and no lumps shall be detected.

d) Grinding rice: The material retained on 1.4 mm sieve shall be 10 per cent maximum; on 1.0 mm sieve, 15 per cent maximum; and on 0.5 mm sieve, 70 per cent maximum.

e) Juice extraction: Carrots were chosen and operated as per the guidelines of the manual. The observation was mainly for smooth and uniform/homogeneous juice. Juice pouring out of the vent should have an even flow. The rate of juice extraction shall not be less than 500 gm/minute and the amount of juice extracted shall not be less than 65 per cent.

Finally, the juicer shall be dismantled, cleaned and inspected. There shall be no spillage/leakage.

PERFORMANCE TESTS

Brand	Score out of 30
Morphy Richards	23.93
Kenstar	23.85
Usha	23.72
Havells	23.42
Maharaja Whiteline	23.42
Prestige	23.38
Bajaj	23.31
Philips	23.28
Glen	23.22
Inalsa	23.10

- *Morphy Richards topped in performance tests, followed by Kenstar.*
- *The rate of juice extraction was more than the specified limit 500 gm/minute. However, the juice extracted*



was between 53.5 per cent and 56 per cent, which was less than the specified requirement of 65 per cent. Highest extraction was in Kenstar (56 per cent) and lowest in Philips (53.5 per cent).

FOR CONSTRUCTION

Construction | Internal wiring | Components | Supply connections and external flexible cables and cords | Screws and connections | Creepage distance and clearance | Resistance to heat and fire | Resistance to rusting

◆ Construction

It shall satisfy the requirements of Indian standard.

- *All brands passed this test.*
- *Havells, Philips and Usha scored highest in this parameter.*

◆ Internal wiring

Wireways shall be smooth and free of sharp edges. Wire shall be protected from coming in contact with burrs, cooling fins or similar edges. Holes in



Comparative Test



metal through which insulated wires pass shall have a smooth, well-rounded surface or be provided with bushings. Wiring shall be effectively prevented from coming into contact with moving parts. Internal wiring and electrical connections between different parts shall be adequately protected or enclosed.

Beads and similar ceramic insulators on live wires shall be fixed or located so that they cannot change their position or rest on sharp edges. Compliance is checked by inspection and by manual test.

- All brands passed this test.

◆ Components

- Components complied with the safety requirements specified in the relevant Indian standard.

◆ Supply connections and external flexible cables and cords

a) **Cross-sectional area of conductors of supply cords:** Conductors of supply cords shall have nominal cross-sectional area of not less than 0.50 mm².

- Only Havells and Kenstar met this requirement. The cross-section area of the conductor in all other brands was of less than the required 0.50 mm².

b) **Conductor's resistance for supply cord:** Conductor resistance for the supply cord shall be 39.0 Ω/km maximum.

- Only Philips, Havells, Kenstar, Maharaja Whiteline and Usha passed this test.

◆ Resistance to heat and fire

External parts of non-metallic material, parts of insulating material supporting live parts including connections, and parts of thermoplastic material providing supplementary or reinforced insulation shall be sufficiently resistant to heat. Parts of non-

metallic material shall be resistant to ignition and spread of fire.

- Maharaja Whiteline and Kenstar failed in this test for parts of non-metallic material.
- All other brands passed this test.

No Provision of Earthing

All the tested brands had only two-pin plugs for mains supply and did not have any provision for earthing, which can pose a safety hazard, especially when operated with hands.

FOR OTHER OPERATIONAL ASPECTS

Abnormal operation | Temperature rise | Controls

◆ Abnormal operation

In order to find out how well a JMG machine would stand the risk of fire or mechanical damage, the motor of each brand was stalled by locking its moving parts. Safety devices like OLP, fuses, thermal cutouts, or any other motor-protection device must operate and the temperature of the windings should not go beyond the specified limit.

During the tests, appliances shall not emit flames or molten metal; enclosures shall not deform to such an extent as would impair compliance with this specification. After the tests, the appliance shall withstand electric strength test.

- All brands passed this test.





◆ Temperature rise

a) The temperature rise of rubber or polyvinyl chloride insulation of internal wiring can be 50K maximum, and that of external wiring 35K maximum.

- All brands were well within the required limit of the standard.

b) For surfaces of handles, knobs, grips and similar parts of metal, the limit is 35K maximum.

- Maharaja Whiteline and Bajaj did not meet the requirement of the standard.

c) For external enclosure of motor-operated appliances (except handles held in normal use), the limit is 60K maximum.

- All the brands were well within the required limit of the standard.

d) For winding of Class B insulation, the limit is 95K maximum.

- All the brands were within the required limit of the standard.

All Brands Cleared These Tests

- Screws and connections
- Creepage distance and clearance
- Resistance to rusting
- Controls (controlling switches shall be capable of breaking the stalled motor current at the maximum rated voltage six times without failure)
- Endurance (the food mixer shall withstand electric strength test)



Comparative Test

Noise-Level Measurement during Operation

Noise (dB) was measured in normal loading condition with paper pulp load at rated voltage.

Lowest noise was observed in Philips and highest in Usha.

FOR ELECTRICAL AND MECHANICAL SAFETY

Protection against electric shock | Electric insulation and leakage current at operating temperature | Moisture resistance | Insulation resistance and electric strength | Stability and mechanical hazards | Mechanical strength | Temperature withstand test for bowl | Strength of assembly

◆ Protection against electric shock

Appliances shall be so constructed and enclosed that there is adequate protection against accidental contact with live parts.

- *All brands passed this test.*

◆ Electrical insulation and leakage current at operating temperature

Leakage current in appliance shall be within the required limit of the standard.

The appliance shall withstand 1,000 volts for one minute and no breakdown shall occur during the test.

- *Leakage current in all brands was within the specified limit.*
- *All brands passed thigh-voltage test.*

Input Power

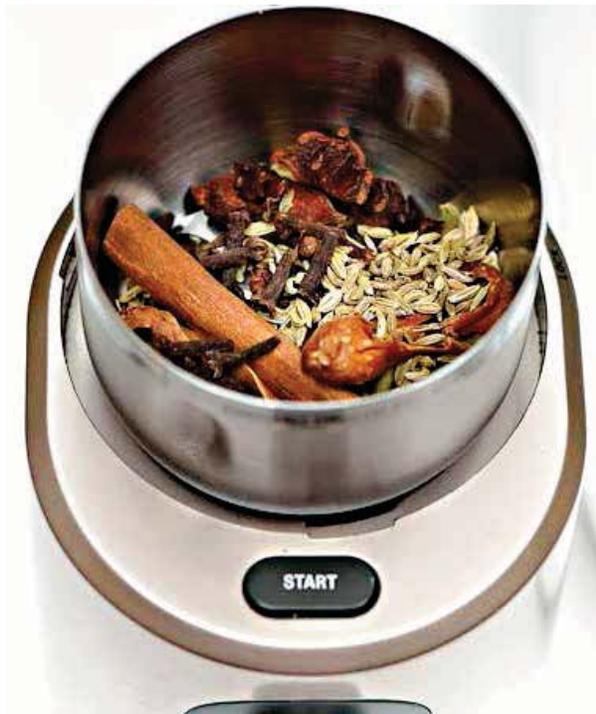
The appliance shall not deviate from the rated power input by +15 per cent or 60 W, whichever is greater.

In our tests, the declared wattage in some brands was deviating from the measured value. However, all were within the requirement of the standard.

◆ Moisture resistance

The enclosure of appliance shall provide the necessary degree of protection against moisture. The





test is carried out for 48 hours in humidity not less than 90 per cent.

The appliance shall withstand the humidity treatment.

- *All brands passed this test.*

◆ Insulation resistance and electric strength

This covers two aspects:

a) **Leakage current and electric strength at operating temperature**

b) **High voltage:** Appliance shall withstand 1,250 volts for one minute.

No breakdown shall occur during the test.

- *All brands withstood this test.*

◆ Stability and mechanical hazards

Appliances intended to be used on a surface such



as the floor or a table shall have adequate stability.

- *All brands passed this test.*

◆ Mechanical strength

The appliance shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use. Accessible parts of solid insulation shall have sufficient strength to prevent penetration by sharp implements.

The test was carried out as per Indian standard. After the test the appliance shall show no damage that can impair compliance with this standard.

- *All brands passed the test.*

◆ Temperature withstand test for bowl

Boiling water shall be poured into the bowl at room temperature, rapidly enough to fill it to its capacity. After the test, the bowl shall be emptied and brought back to room temperature. The test shall be repeated five times.

The bowl shall not show any sign of cracks and deformation, and shall properly fit into the holder after the test.

- *All brands passed this test.*

◆ Strength of assembly

Food mixer shall be so constructed that in course of normal use there will be no electrical or mechanical failure. The insulation shall not be damaged and contacts and connections shall not work loose as a result of heating, vibration, etc.

After the test, there shall be no chipping, cracking or visible denting on the mating surface.

- *All brands passed this test.*



Comparative Test

Workmanship and Finish

The appliance and accessories shall have no rugged and sharp edges. Different position of controls shall be indicated on the appliance.

All brands were satisfactory on these counts. Philips and Morphy Richards secured full marks.

Packing and Marking

- All the brands were in suitable packaging.
- Marking was checked on appliance as well as on control switch. All the brands fared satisfactorily.
- Morphy Richards, Philips, Havells and Kenstar had high scores.

COMPARATIVE

Brand → Parameter ↓	Weightage (%)	Philips	Morphy Richards	Havells	
Performance tests*	30	23.28	23.93	23.42	
Construction-related tests**	15	13.95	12.61	14.35	
Electrical and mechanical safety tests***	12	11.2	11.3	11.28	
Other operational tests****	15	14.14	14.17	13.73	
Packing and marking	9	8.05	8.5	8.05	
Input (power consumption)	6	4.6	3.46	3.52	
Endurance test	6	6	6	6	
Noise	4	3.58	3.34	3.15	
Workmanship and finish	3	3	3	2.8	

Rating: >90: very good*****, 71–90: good****, 51–70: average***, 31–50: poor**, up to 30: very poor*

***Performance tests:** Grinding coffee, whisking egg whites, idli batter, grinding of rice and juice extraction

****Construction-related tests:** Construction, internal wiring, components, supply connections and external flexible cables and cords, terminals for external conductors, screws and connections, creepage distance and clearance, resistance to heat and fire, resistance to rusting

*****Electrical and mechanical safety tests:** Protection against electric shock, electric insulation and leakage current at operating temperature, moisture resistance, insulation resistance and electric strength, stability and mechanical hazards, mechanical strength, temperature withstand test for bowl, strength of assembly

******Other operational tests:** Abnormal operation, temperature rise, controls

Instruction Manual

The instruction manual is expected to contain the following information:

- Precautions while positioning appliance and before switching on appliance
- Warning about parts not to be brought into contact with liquids, keeping away from moving parts, and running empty, if necessary
- Instructions for i) assembling and dismantling the bowl for cleaning and servicing, ii) electrical connection and type of supply, iii) pouring of a little amount of hot water into bowl to remove leftovers after every use, and iv) overhauling at least once a year to increase its useful life, if required
- Directions to switch off when motor stalls or smoke emanates
- Guidance for operation giving maximum quantity per loading

Usha did not provide instruction manual.

PERFORMANCE CHART

	Kenstar	Usha	Inalsa	Glen	Bajaj	Prestige	Maharaja
	23.85	23.72	23.1	23.22	23.31	23.38	23.42
	12.81	13.9	11.93	12.07	12.47	12.24	11.85
	11.2	11.26	11.17	11.2	11.15	11.39	11.13
	14.07	13.69	12.89	14.05	13.2	13.78	13.52
	8.05	6.75	7.45	7	7.8	7.8	6.9
	4.29	4.64	6	5.37	4.31	3.27	4.92
	6	6	6	6	6	6	6
	2.77	2.53	3.22	2.9	3.36	3.52	3.17
	2.8	2.8	2.6	2.5	2.7	2.6	2.6

