



Geysers They are becoming better

'Do not forget to switch off the geyser.' Each one of us—sometime or the other—have either said or heard this line. Come winters, and we take stock of our keep-us-cosy gear, beginning from quilts to woollens to electric heating devices including room and water heaters, the latter being the most essential for those who dare not mingle with freezing waters. This report is a result of our efforts to find out the best storage water heater – the geyser as most of us call it. By best we mean the one that is not only efficient in terms of electricity consumption or heating capabilities, but is also the safest and, while at it, looks good too.

A Consumer Voice Report

As we always do, we bought the top selling brands – 11 in this case, sent them to an NABL-certified laboratory to test their technical efficiencies, and also appointed an expert panel to adjudge them on other physical features and aesthetics.

CV Recommendation | Best Buy Based on Performance

Venus

followed by Racold and Crompton Greaves

Energy-Efficient

BAJAJ

All brands we tested are energy-efficient and rated 5 stars; however, Bajaj is comparatively more energy-efficient.

Value for Money

Khaitan – Rs 5,000

What price is right?

Understanding the pricing of the 25 litres range is quite tricky. While a locally made heater with BEE rating between '1 star' and '3 star' can be bought for as low as Rs 2,500, a branded one in the same star category may cost anything between Rs 4,000 and Rs 5,000. However, all branded heaters with '5 star' rating cost above Rs 5,000, with some costing as much as Rs 12,000.

CV advice

The sensible price to pay for a '5 star' rated 25 litres storage water heater should be between Rs 5,000 and Rs 7,000. The 'energy saved and price paid' ratio for more expensive heaters mismatch – you end up paying more than what you would save on power consumption. Also, most features in exorbitantly priced heaters are not worth the price charged.

Heater type we tested

India heats its winter bathing water in many ways. While some prefer immersion water heaters (also known as heating rods), some use instant heaters that run on electricity or gas. In most homes where the need is to store water for longer durations, storage water heaters (SWH) are the most preferred appliance. The normal storage capacity starts from 10 litres and may go over 50 litres.

The most sold geysers have storage capacity of 25 litres, and this is the category we chose to test. Considering the significance of BEE star ratings, we decided to test those with the 5 star rating.

Under Capacity

Maharaja Whiteline – its capacity was 23.3 litres against the claimed 25 litres

KEY FINDINGS

- In performance tests, Racold and Venus scored highest, followed by Khaitan, Inalsa and Crompton Greaves.
- In safety tests, Venus topped the chart followed by Racold.
- In quality tests, Venus topped the chart followed by Bajaj and Crompton Greaves.
- Capacity of Maharaja Whiteline geyser is less than the rated capacity – at 23.3 litres against 25 litres.
- Havells, Kenstar, Maharaja and Usha are found to be slightly higher than their claims for standing loss, but remain within the 5 stars rating limit.
- Reheating time is lowest in Racold.
- At 14.1 kg, Venus is the heaviest geyser; Inalsa at 8.8 kg is the lightest.
- Venus gives warranty of 3 years on product and 7 years on tank.
- Inalsa, Kenstar, Khaitan and Thermoking carry the ISI mark.
- Only Thermoking and Khaitan have provided a copper tank.



Comparative Test

BRANDS TESTED

Rank	Overall Score out of 100 (rounded off)	Brand	Model	Manufactured/Marketed by
1	89	Venus	025GLV-T	Venus Home Appliances
2	87	Crompton Greaves	SWH825	Crompton Greaves
2	87	Usha	VERVE	Usha International
2	87	Racold	ALTRO 21/0	Racold Thermo
3	86	Inalsa	PSG25N	Inalsa Tuareg Marketing
3	86	Bajaj	SHAKTI GL	Bajaj Electricals
3	86	Khaitan	Not Marked	Khaitan Electricals
4	85	Thermoking	IKE25	Thermo King
5	84	Maharaja Whiteline	VICTOR/WH-3125W	Maharaja Whiteline
5	84	Havells	BELL025	Havells India
5	84	Kenstar	KGS25W5P	Videocon

Score Rating: >90: very good*****, 71–90: good****, 51–70: average***, 30–50: poor**, <30: very poor*

A Decade of Change

The good news is that since the first time – in 2002 – we tested storage water heaters, there has been a remarkable improvement in the ‘standing loss’. Back then, the standing loss of 10 popular brands ranged between 0.79 kWh and 1.447 kWh. At present, thanks to the BEE star ratings, the standing loss of all heaters is below 0.693 kWh, which makes them quite efficient. This has been due to improved insulation material. All the tested brands now use PUF material, which has replaced the inefficient glass wool.

Another improvement factor has been on the manufacturing cost. Most brands now use steel tanks

that are cheaper as compared to copper. Thermoking is the only brand among the tested lot that continues to use copper tanks (it does not cost high, though).



Warranty/Guarantee*	Special Features (as Claimed)
3 years on product 7 years on tank	• Porcelain-enamelled tank • Unique ceramic cartridge • Heating element • Magnesium anode • Outer body made of ABS • Multi-function valve
2 years on product 5 years on tank	• Heavy gauge EDD hot-rolled steel sheet with single-line welding • Magnesium anode • Pressure pump-compatible • PUF insulation
2 years on product 5 years on tank	• High pressure resistance • Special enamel-coated inner tank • Incoloy 800 coated heating element • Water tubes with whirlflow technology • Magnesium anode • ABS material body • Pre-set thermal cut-out with CE mark • Four-in-one multi-function safety valve (MFV) • 16 amperes power plug • Dry heating protection
2 years guarantee on product 5 years on tank 3 years on heating element	PUF insulation • Rust-proof polypropylene top • Thermal cut-out • Four-in-one multifunction safety valve • Drip-proof construction
2 years on product 5 years on tank	Automatic thermal cut-out • Pressure relief valve • Siphon hole for low water pressure • Fusible plug • Two U heating elements • Nonagonal tank protection
*2 years guarantee on product 5 years on tank	Enamelled inner container • Heating element with low thermal load • PUF insulation • Temperature controllers
*2 years guarantee on product 5 years on tank	Inner tank built with 99.85 per cent pure cooper • Thermal cut-out
*1 year guarantee on product 5 years on tank	Pressure release valve • Fusible plug, non-return device
2 years on product 5 years on tank	Magnesium core guard • Large drain hole • External temperature control device • Stainless heating elements
2 years on product 5 years on tank	Vitreous enamel-coated tank with single weld line design • Heavy-duty anode rod • Incoloy heating element • PUF insulation Whirlflow technology • Thermal cut-out
2 years on product 6 years on tank	Operating manual not found

Test Parameters

The national standards for storage water heaters have over three dozen parameters and a majority of these are observations. For overall ratings and evaluation, we touched upon mainly the key performance and related tests from where a reasonable conclusion could be drawn on 'value for money'. The key test parameters included: a) BEE star ratings (based on standing loss in 24 hours), b) hot water output, c) reheating time, d) water storage capacity, e) mixing factor, f) deviation from the dial calibration, g) cyclic temperature, h) power cord length and quality, i) safety, j) packaging, k) marking, l) aesthetics, m) design, and n) workmanship and finish.



Comparative Test

Brand →	Venus	Crompton Greaves	Usha	Racold	
Retail price (Rs)	8,900	7,625	7,800	7,950	

PERFORMANCE TESTS

◆ Standing Loss/24 Hours

Water heater was operated until 'steady-state conditions' were established. When operated for 48 hours, the standing loss should not exceed 1.386 kWh per 24 hours. Lower the standing loss, higher the energy efficiency.

- Bajaj topped this test.
- Havells, Kenstar, Maharaja and Usha slightly deviated from their claims of BEE 5 star ratings.
- All brands fall well within the standard limits.

Brand	Declared	Result (kWh/day)	Score out of 15
Bajaj	0.693	0.634	14.73
Racold	0.693	0.693	13.48
Khaitan	0.693	0.693	13.48
Thermoking	0.693	0.6933	13.48
Maharaja Whiteline	0.683	0.6932	13.48
Venus	0.693	0.6937	13.45
Crompton Greaves	0.693	0.6938	13.45
Inalsa	0.693	0.6938	13.45
Usha	0.685	0.6905	13.26
Havells	0.680	0.6931	12.05
Kenstar	0.628	0.6931	10.66



◆ Hot Water Output

The geysers were operated for 48 hours and were switched off together after automatic cut-out (fully heated) of the thermostat. The water was then drawn at a rate of three litres per minute to test the hot water output, which should not be less than the manufacturer's declared value. The declared hot water output ranged from 40 °C to 50 °C for all brands except Havells, which declared it as 70 °C, and Usha, which claimed it to be 75 °C.

- Hot water output of all brands barring two – Havells and Usha – was more than the declared value.
- Highest mean hot water output was of Crompton Greaves.

Brand	Result (°C)	Score out of 8
Crompton Greaves	57.4	7.68
Venus	56.86	7.48
Inalsa	54.78	7.42
Thermoking	54.56	7.39
Khaitan	55.8	7.35
Racold	57	7.33
Maharaja Whiteline	55.43	7.12
Kenstar	56.98	7.5
Bajaj	54.79	7.03
Havells	54.77	6.59
Usha	55	6.54

◆ Reheating Time

The reheating time required for heating the water from 22 °C to 72 °C shall not exceed the time declared by the manufacturer. The lower the reheating time, the better were our ratings.

- Racold scored the highest as its reheating time was a mere 32 minutes. Thermoking reheated in 33.39 minutes.

	Inalsa	Bajaj	Khaitan	Thermoking	Maharaja Whiteline	Havells	Kenstar
	7,240	6,250	5,000	5,500	6,716	9,985	5,200

- All other brands took more than 34 minutes to reheat.

Brand	Result (Minutes)	Score out of 10
Racold	32	9.38
Thermoking	33.39	9.01
Venus	34.15	8.78
Inalsa	34.15	8.78
Crompton Greaves	34.20	8.77
Usha	34.47	8.7
Havells	34.50	8.69
Khaitan	34.63	8.66
Kenstar	35.17	8.53
Bajaj	35.17	8.52
Maharaja Whiteline	35.20	8.52

◆ Mixing Factor

The mixing factor is determined by comparing the mean water temperature with and without cold water flowing into the water-heater.

- Kenstar topped the table, followed by Venus, Racold and Khaitan.
- Havells was the lowest scorer, with Thermoking and Usha slightly above it with same scores.



◆ Cyclic Temperature Variation

As per the standards, the cyclic variation of thermostat control should not exceed 10 °C.

- All brands showed variation between 2.3 °C and 6.5 °C, which is within the specified limit of 10 °C. Hence, all the brands passed this test.



Lab testing in progress

SAFETY TESTS

◆ Endurance

This is to test the insulation of water heater – it should not get damaged. The test also verifies that the contacts and connections do not go loose.

- All the brands passed the endurance test with full scores.

◆ Protection against Access to Live Parts

All appliances are expected to be constructed in a manner that they protect against accidental contact with live parts.

- All brands passed this test with full scores.

◆ Power Input

Appliance should not deviate from the rated power input by more than the limit specified in the Indian Standard, which allows +5 %–10 % deviation (limiting the variable range to 1,800W–2,100W).

- All the storage water heaters in the tests were rated for 2,000W input power and fell within the permitted limit. They are all energy-efficient.

Comparative Test

PERFORMANCE TEST SCORES

Brand → Parameter ↓	Weightage	Racold	Venus	Khaitan	Inalsa
Performance Tests	46	38.21	38.2	37.87	37.85
Standing loss (energy consumption)	15	13.48	13.45	13.48	13.45
Hot water output	8	7.33	7.48	7.35	7.42
Reheating time	10	9.38	8.78	8.66	8.78
Mixing factor	8	6.42	6.46	6.42	5.26
Cyclic temperature variation	5	1.60	2.03	1.96	2.94

◆ Temperature Rise

The temperature of insulation of internal wiring, walls and ceiling should not, at any time, rise above the standard values.

- All brands passed this test.

◆ Leakage Current at Operating Temperature

At operating temperature, the leakage current of appliance shall not be excessive and its electric strength shall be adequate. (Leakage current 0.21 milliamperes [mA], maximum)

- All brands passed this test.

◆ Electrical Strength at Operating Temperature

Water heater should withstand 1,000 volts for one

minute. No breakdown should occur during the test.

- All the brands passed the test

◆ Moisture Resistance

The enclosure of appliance shall provide the degree of protection against moisture in accordance with classification of the appliance.

- All the brands passed the test

◆ Mechanical Strength

Appliances should have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use.

- All the brands passed the test

SAFETY TEST SCORES

Brand → Parameter ↓	Weightage	Venus	Racold	Usha
Safety Tests	30	28.34	28.14	28
Endurance	5	5	5	5
Protection against access to live parts	2	2	2	2
Power input	4	3.64	3.64	3.88
Heating	3	2.69	2.47	2.13
Leakage current and electrical strength at operating temperature	4	3.51	3.61	3.42
Moisture resistance	2	2	2	2
Leakage current and electrical strength after humidity test	4	3.5	3.42	3.57
Construction and mechanical strength	4	4	4	4
Internal wiring	2	2	2	2

	Crompton Greaves	Bajaj	Maharaja Whiteline	Usha	Thermoking	Kenstar	Havells
	37.83	36.78	36.67	36.5	36.55	34.89	33.81
	13.45	14.73	13.48	13.26	13.48	10.66	12.05
	7.68	7.03	7.12	6.54	7.39	7.5	6.59
	8.77	8.52	8.52	8.7	9.01	8.53	8.69
	6.24	4.78	5.53	3.65	4.65	6.66	4.63
	1.69	1.72	2.02	4.35	2.02	1.54	1.85

◆ Internal Wiring

Wireways shall be smooth and free from sharp edges. Wires shall be effectively prevented from coming into contact with moving parts. Internal wiring and electrical connections between different parts of the appliance shall be adequately protected or enclosed.

- All the brands passed the test

OTHER QUALITY AND COMPONENTS TESTS

◆ Three-Pin Plug

- Crompton Greaves, Inalsa, Kenstar, Khaitan and Thermoking did not provide the plug.

◆ Supply Cord Length and Net Weight

- All brands except Thermoking (with 1,680 mm)

had supply cord length between 1,100 mm and 1,400 mm

- Venus was the heaviest geyser at 14.1 kilograms and Inalsa was lightest at 8.8 kilograms.

◆ Storage Capacity

- Actual storage capacity should not be less than 95 per cent of the rated capacity.

- Capacity of Maharaja Whiteline geyser was less than the rated capacity, at 23.3 litres as against 25 litres.



	Maharaja Whiteline	Kenstar	Havells	Bajaj	Inalsa	Crompton Greaves	Khaitan	Thermoking
	27.96	27.94	27.92	27.74	27.64	27.14	27.04	27.03
	5	5	5	5	5	5	5	5
	2	2	2	2	2	2	2	2
	3.85	3.35	3.97	3.84	3.67	3.77	3.36	3.83
	2.34	1.94	1.77	1.91	2.0	2.04	1.51	1.99
	3.31	3.78	3.56	3.42	3.51	3.08	3.51	3.04
	2	2	2	2	2	2	2	2
	3.46	3.87	3.62	3.57	3.46	3.25	3.66	3.17
	4	4	4	4	4	4	4	4
	2	2	2	2	2	2	2	2