



4TH OCTOBER 2024

## BUREAU OF ENERGY EFFICIENCY

# BUREAU OF ENERGY EFFICIENCY VOLUNTARY PROGRAMME FOR ENERGY EFFICIENCY LABELLING OF MICROWAVE OVENS, 2023

### SCHEDULE 22

VERSION 2.0

+91-23-456-7890

## MAJOR UPDATES IN VERSION 2.0

S. No	Details
1	Revised Star Rating Table
2	Labeling Fees for BEE's S&L program
3	Revision in Labeling Fee from ₹20/- to ₹9/- Per Label
4	Detailing of Check Testing Procedure
5	Addition in Label Design a) Energy Saving b) CO <sub>2</sub> Emission Reduction/Year (KgCO <sub>2</sub> )

# **INDEX**

<b>Sr. No.</b>	<b>Title</b>	<b>Page Number</b>
1	SCOPE	03
2	NORMATIVE REFERENCES	03
3	TERMS & DEFINITIONS	03
4	ELIGIBILITY FOR PARTICIPATION	04
5	TESTING GUIDELINES	04
6	TEST REPORT	04
7	STAR RATING PLAN	05
8	BRAND & MODEL REGISTRATION	05
9	FEES	05
10	CHECK TESTING	06
11	LABEL DESIGN AND MANNER OF DISPLAY	07
12	ANNEXURE – A	11
13	ANNEXURE – B	15

## 1. SCOPE

- (i) This schedule outlines the requirements for participation in the energy-labelling program for all types of microwave ovens, including combination models, intended for household or similar use. This applies to ovens with or without grill or convection functions that are manufactured, imported, or sold in India.
- (ii) This schedule applies to all types of countertop microwave ovens covered under IS 302-2-25 and IEC 60705. From a technological perspective, any additional features integrated into the oven are included within the scope of the standard, as long as they do not affect the requirements outlined in this schedule.
- (iii) This schedule specifies the requirements for the following performance parameters for microwave ovens:
  - a. Microwave Function Efficiency
  - b. Energy Consumption
  - c. Power Consumption in Standby Mode

**NOTE:** For this schedule, the star rating will be based on energy consumption per cooking cycle (Wh/cooking cycle). Energy consumption will be measured according to the methodology outlined in the latest version of IEC 60705, including any amendments from time to time.

## 2. NORMATIVE REFERENCES

This schedule should be read in conjunction with the following standards, including all amendments, for star labeling:

Reference Standard	Title of the Standard
IEC 60705: Amendment 1, 2010 and Amendment 2, 2018	Household microwave ovens – Methods for measuring performance
IEC 62301	Household electrical appliances – measurement of standby power
IS 302-2-25	Safety of household and similar electrical appliances

## 3. TERMS & DEFINITIONS

For the purposes of this schedule, the following definitions, in addition to those provided in IEC 60705 and IS 302-2-25 (including any amendments from time to time), shall apply:

- (i) **Models or Family of Models:** Model or range of models of one particular brand, to which a single set of test reports is applicable and where each of the models has the same physical characteristics, microwave function efficiency, standby power, energy efficiency rating and other performance characteristics;
- (ii) **Label:** Any written, printed, marked, stamped, or graphic information attached to or displayed on the microwave oven;
- (iii) **Label Period:** The validity period of the energy consumption norms under the energy labeling plan specified in this Schedule;

- (iv) **Permittee:** A person or agency authorized to affix labels under this Schedule;
- (v) **Trader or Seller:** In relation to any labeled microwave oven, this refers to a person who sells or distributes such an oven. This includes traders, manufacturers, and permittees authorized to affix labels on the microwave oven;
- (vi) **Microwave Oven:** An appliance as specified in the Schedule.

**4. ELIGIBILITY FOR PARTICIPATION**

- (i) The product must be BIS certified for safety in accordance with IS 302-2-25 (as amended from time to time);
- (ii) The manufacturer must ensure the following benchmarks, supported by relevant test reports (with testing conditions according to the applicable IEC standards and their latest amendments):

Parameter	Minimum Requirement
<b>Microwave Function Efficiency</b>	≥ 54%
<b>Power Consumption in Standby Mode</b>	≤ 0.6 W

- (iii) The above parameters will be additional factors verified, apart from energy consumption, during the BEE check/challenge testing of the selected sample.

**5. TESTING GUIDELINES**

- (i) **Testing Procedure:** The tests outlined in this Schedule shall be conducted according to IEC 60705 and IEC 62301, including all their amendments. The testing guidelines for each performance parameter are provided below:
- (ii) **Testing Parameters:**
  - (a) **Microwave Power Output:** The test for measuring microwave power output shall be conducted according to IEC 60705 (Amendment 1 and Amendment 2) and as amended from time to time. The microwave power output value shall be reported in Watts;
  - (b) **Microwave Function Efficiency:** The test for measuring the microwave function efficiency of the microwave oven shall be conducted according to IEC 60705 (Amendment 1 and Amendment 2), and as amended from time to time. The microwave function efficiency value shall be expressed as a percentage;
  - (c) **Energy Consumption (per cooking cycle):** The per-cooking-cycle energy consumption of the microwave oven shall be calculated according to IEC 60705 (Amendment 1 and Amendment 2, as amended from time to time). The energy consumption will be reported in Wh per cooking cycle;
  - (d) **Power Consumption in Standby Mode:** The standby power of the microwave oven shall be calculated according to IEC 62301 (including any amendments from time to time);
  - (e) **Testing Conditions:** According to the methods prescribed in IEC 60705 and IEC 62301 (including any amendments).

**6. TEST REPORT**

- (i) The test results shall be reported in the prescribed format provided in **Annexure – A** of this schedule;
- (ii) A test report for 03 numbers of samples of each microwave oven model is required for registration;

- (iii) All three tests — standby power, microwave function efficiency, and energy consumption — must be conducted for each of the three samples.

## 7. STAR RATING PLAN

Label Period: 1st March 2019 to 31st December 2025	
Star Rating	Energy Consumption Per Cooking Cycle (E) (Wh)
1-star	$56 < E \leq 60$
2-star	$52 < E \leq 56$
3-star	$48 < E \leq 52$
4-star	$44 < E \leq 48$
5-star	$E \leq 44$

There is no negative tolerance for the Star rating bands. All tested products must meet the minimum threshold for each Star rating band. The manufacturer or permittee must account for manufacturing tolerances and other variations when determining the Star rating of a particular model.

## 8. BRAND & MODEL REGISTRATION

To participate in the Microwave Oven Star Rating program and register models, manufacturers must submit the required documents to BEE as outlined in the S&L operational guidelines, DISHA (Disseminating Star Labeling in Household Appliances) manual.

## 9. FEES

- (i) **Brand Registration:** To get permission from the Bureau for brand registration, each brand must be registered separately and pay a label security fee of ₹1.00 Lacs electronically. However, for small-scale industries, the fee is ₹25,000/-. The fee is refundable upon withdrawal of the brand, provided there are no outstanding dues;
- (ii) **Model Registration:** Every application of the permittee shall be accompanied by a non-refundable application fee of ₹2000.00 per model, payable by any electronic mode of payment;
- (iii) **Model Renewal:** If the Star rating table is revised, the permittee must submit a non-refundable application fee of ₹1000.00, payable through any electronic payment method;
- (iv) **Labeling Fees:** The labeling fee for affixing a label on each unit of the registered microwave oven is ₹9.00 (₹Nine only);
- (v) The permittee must submit the labeling fees through the online portal, within one month of the closure of the financial year. If the label fee is not paid within the specified period, the Bureau may impose a penalty of 10% per annum on the accrued label fees. Additionally, if the full labeling fees are not recovered within one year of the submission deadline, the Bureau may cancel all labels granted to the permittee;
- (vi) The permittee shall furnish to the Bureau a statement containing details of the production of labelled equipment within the following month of the close of each quarter of the financial year.

## 10. CHECK TESTING

- (i) The Bureau or its designated agency may, either suo motu, or on a complaint received by it, carry out verification through an accredited laboratory to ensure that the registered model of the Microwave Oven conforms to the star level and other particulars displayed on its label and that it complies with the other terms and conditions of permission;
- (ii) The detailed process of check testing is as follows:
  - (a) The sample will be randomly picked from the manufacturer's authorized dealer, retailer, or e-market platform for first check testing;
  - (b) If the sample drawn during the first check testing fails, the Bureau or its designated agency will conduct a second check testing by purchasing twice the number of samples for the same model. The second check testing will only occur if the first set of samples fails;
  - (c) The permittee will be informed about the failure of the first check testing and will be advised to deposit/pay the costs for the samples, testing costs, and transportation for the second check testing in advance;
  - (d) If the permittee fails to deposit/pay the required expenses, the Bureau will proceed with the verification through check testing but will halt any further processing of applications for new appliances or equipment from the respective permittee;
  - (e) The second set of samples will be randomly selected from the market for the second check testing;
  - (f) BEE or its designated agency will inform the permittee of the date for the second check testing, allowing them to witness the process. If the permittee is unable to attend, the Bureau will proceed with the testing in the presence of BEE or designated agency personnel, and the test results will be binding on the permittee;
  - (g) If either one or both samples of microwave oven collected for the second check testing, the Bureau or its designated agency shall:
    - (1) Direct the permittee, under intimation to all the State Designated Agencies, that the permittee shall, within two months, -
      - (i) Correct the star level displayed on the label of the microwave oven or remove the defects and deficiencies identified during testing;
      - (ii) Withdraw all stocks from the market to comply with the Bureau's directives; and
      - (iii) Change the information displayed on advertising materials;
    - (2) Publish, for the benefit of consumers, the name of the permittee, brand name, model name or number, logo, and other specifications in any national or regional daily newspaper, through electronic means, or in any other manner deemed appropriate, within two months;
  - (h) The permittee shall within ten days of the conclusion of the period of two months referred to in Clause 10(g)(1):
    - (a) send the compliance report in in prescribed format (**Annexure - B**) to the Bureau with respect to action taken in compliance with the direction; and

(b) in case the compliance report referred to in Clause (a) is not received or received without complying with any of the directions within the specified period, it shall be deemed as non-compliance with the direction issued and orders to that effect shall be passed by the Bureau.

- (i) If the permittee fails to comply with the directions issued by the Bureau of its designated agency in Clause (g) (1) & (h) (a), the Bureau, with notification to all other State Designated Agencies, shall:
- (a) Withdraw the permission granted to the permittee;
- (b) Notify the concerned State Designated Agency to initiate further adjudication proceedings against the permittee under Section 27 of the Act.

## **11. LABEL DESIGN AND MANNER OF DISPLAY**

### **(i) Label Content:**

The content of the label shall include the following information:

- Electricity consumption per cooking cycle (Wh)
- Label period
- Appliance type (solo /convection /grill)
- Brand
- Model no. /year of manufacturing
- Capacity (Litres)
- Rated Power Output (Watts)
- Energy Saving
- CO<sub>2</sub> Emission Reduction/Year(KgCO<sub>2</sub>)

### **(ii) Placement of label and QR Code**

- To authenticate the star rating approval issued for each model of the microwave oven, BEE will provide manufacturers with a printable/readable version of a dedicated QR code along with the approval letter. It is recommended that the QR code be placed directly below the star label affixed to each unit of the microwave oven. The QR code will contain the information specified in Clause 11.1 along with any other details as decided by Bureau.
- The label, along with the QR code, must be displayed at the point of sale on every microwave oven and should be affixed in the following manner:
  - a. A self-adhesive label with the QR code should be affixed to the front side of the microwave oven.
  - b. A self-adhesive label with the QR code should be affixed to the front side of the carton box.

### **(iii) Material, Dimension and Shape:**

The label must be made of durable material and should adhere to the dimensions, design, and color scheme specified below:



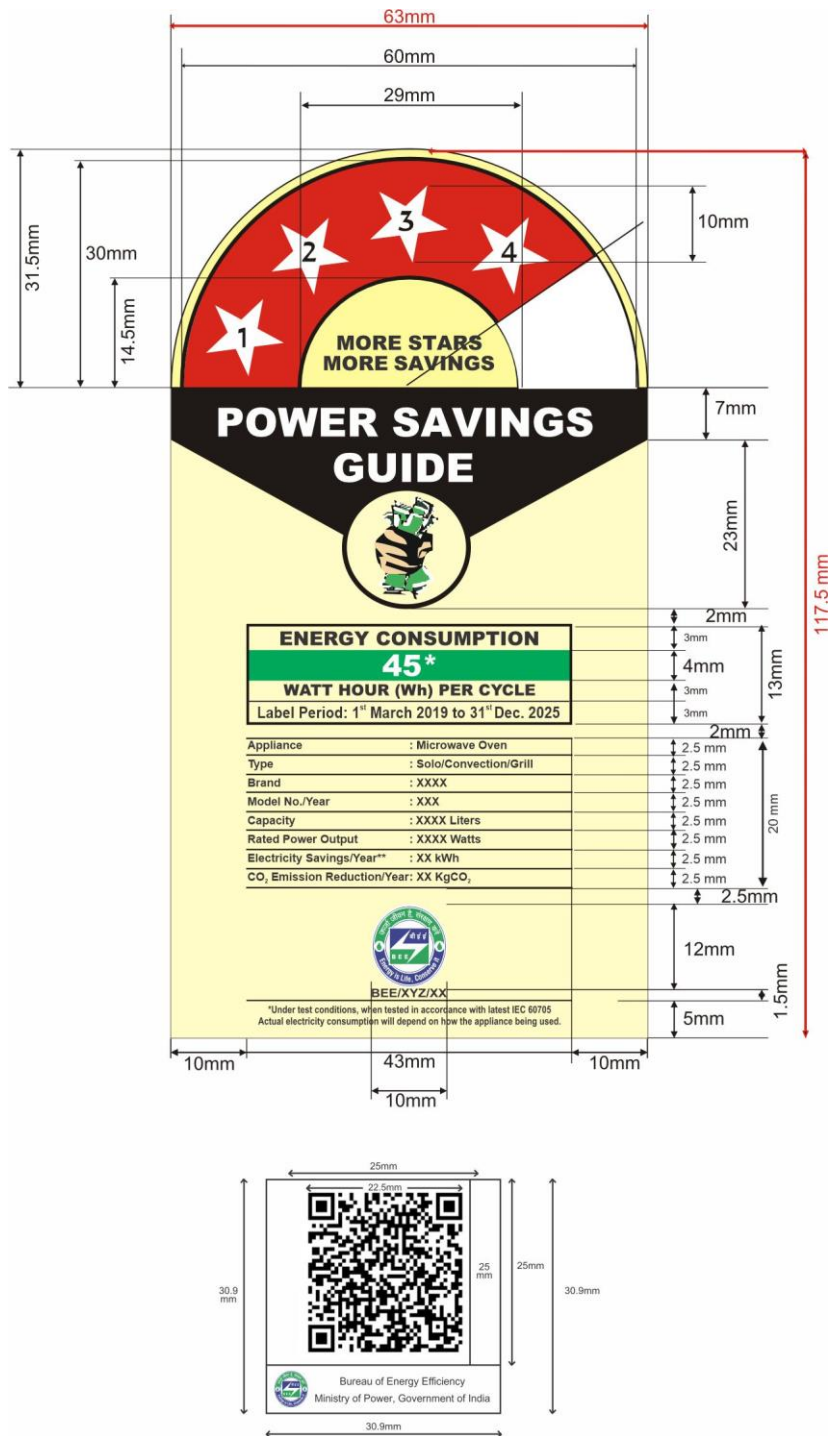


Figure 1: Dimension of the Label

(iv) **Color Scheme:**

The label shall be printed as per the color scheme given in Figure 2.

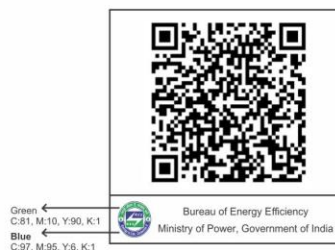
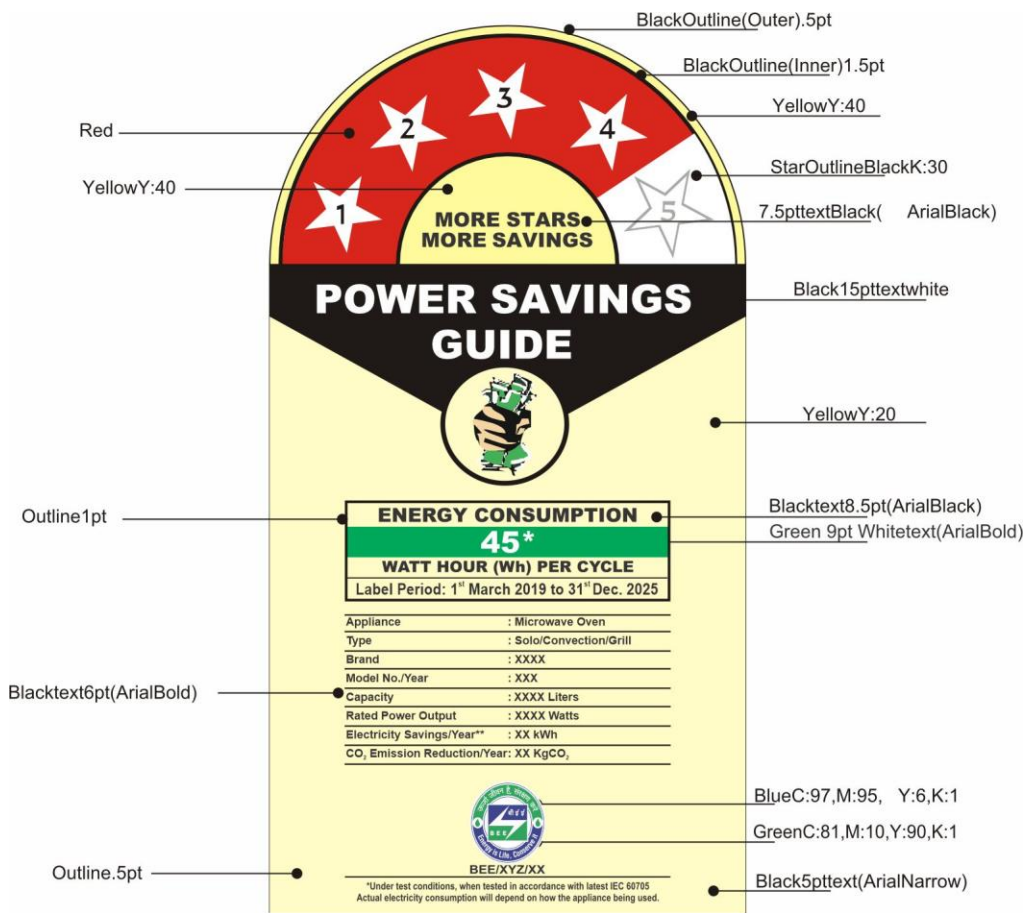
**BLUE –**

Hue (H)- 239° Saturation(S):64% Brightness (B):59% Luminance or lightness (L):28, chromatic components -a: 24 b: 54

Red(R):54 Green (G):55 Blue (B):151 Cyan(C):97% Magenta (M):95% Yellow(Y):6% Black (K):1% Web color code - #363797

**GREEN –**

Hue (H)-150° Saturation(S):10% Brightness (B):67% Luminance or lightness (L):61, chromatic components -a: 53 b: 32 Red(R):0 Green (G):170 Blue (B):87 Cyan(C):81% Magenta (M):10% Yellow(Y):90% Black (K):1% Web color code - #00AA56;



Green ← Bureau of Energy Efficiency  
C:81, M:10, Y:90, K:1  
Blue ← Ministry of Power, Government of India  
C:97, M:95, Y:6, K:1

Figure 2: Color Scheme for the Label

- (v) **Sample Label:**  
 An example of a star label to be affixed on the model is shown in Figure 3.

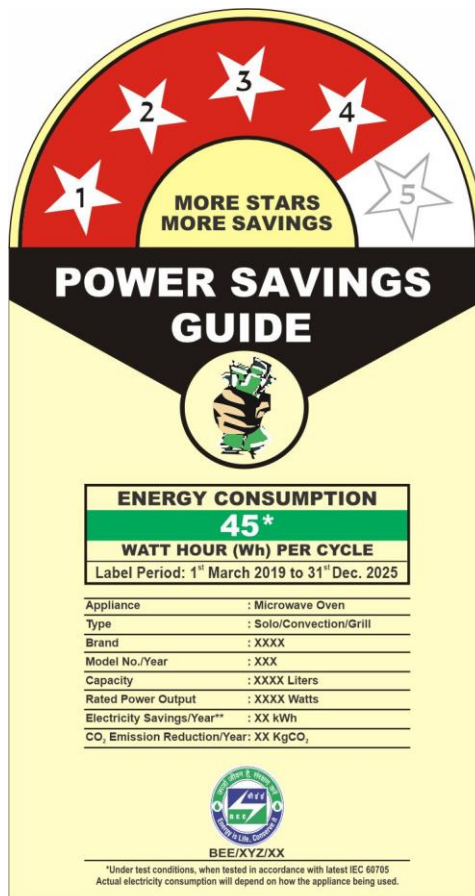


Figure 3: Sample Label

**Note: CDR File is available on BEE Website ([www.beestarlabel.com](http://www.beestarlabel.com))**

## ANNEXURE - A

### TEST REPORT FORMAT FOR MANUFACTURERS LAB & INDEPENDENT LAB

#### 1. General Information /sample details

Name of Manufacturer			
Test Lab Name, address and contact details			
Rated power output Rated voltage/voltage range Rated microwave frequency Rated capacity/Volume Serial number of the sample			
Model number			
Family of models' details			
Condition of unit under testing on receipt			
Date of receipt of samples			
Applicable standard		IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06 & AMD2:2018	
		IEC 62301, Edition 2.0: 2011-01	
Date of Testing	(Start date)	End Date	
General ambient condition		Temperature in °C	23 ± 2°C
		Relative humidity in %	45-70 %
Date of Reporting			

#### 2. Details of the Sample tested

S. No.	Test Parameter	Standard & Clause Number	Result (Observed values)
1.	Microwave Power Output	Clause 8 of IEC 60705	
2.	Microwave Function Efficiency	Clause No. 9 of IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06 and AMD:2 in 2018	
3.	Energy consumption for the microwave function	Clause No. 14 of IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06 and AMD2: 2018	
4.	Standby Power Consumption	Clause 15 of IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06 and Clause No. 5 of IEC 62301, Edition 2.0: 2011-01	

#### 3. Details of each test conducted

Test No.1- Microwave power input as per clause 8 of IEC 60705

Test methodology adopted: The microwave power output is calculated from the formula:

$$P = [4.187 \times m_w(T_1 - T_0) + 0.55 \times m_c(T_1 - T_A)]/t$$

The following data is to be recorded:

Sr. No	Symbols	Parameters	Observed values
1	P	is the microwave power output (W);	
2	m <sub>w</sub>	is the mass of the water (g);	
3	m <sub>c</sub>	is the mass of the container (g);	
4	T <sub>A</sub>	is the ambient temperature (°C);	
5	T <sub>0</sub>	is the initial temperature of the water (°C);	
6	T <sub>1</sub>	is the final temperature of the water (°C);	
7	t	is the heating time (s), excluding the magnetron filament heating-up time.	

#### Test No.2- Efficiency as per Clause 9 of IEC 60705

Test methodology adopted: The energy consumed during the test as per clause 8 is used to determine the Efficiency. The efficiency of the oven is calculated from the formula:

$$\eta = 100 \frac{Pt}{W_{in}}$$

The efficiency is expressed in percentage.

The following data is to be recorded:

S.No	Symbol	Parameters	Observed values
1.	η	Efficiency (%)	
2.	P	Microwave Power(W) output	
3.	t	heating time(s), excluding the magnetron filament heating up time	
4.	W <sub>in</sub>	Input Energy(Wh) including the magnetron filament heating-up energy consumption	

#### Test No.3- Energy Consumption for the Microwave Function as per Clause 14 of IEC 60705

Test methodology adopted: The test Load was used as per Table 4 of clause 14.2 of IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06. The measurement of energy

consumption has been performed as per clause 14.5 of IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06

The final energy consumption  $W_{\text{final}}$  was calculated from the formula:

$$W_{\text{final, cooking cycle}} = \frac{3 \cdot W_{50,s} + 6 \cdot W_{50,m} + 2 \cdot W_{50,l}}{11}$$

The following data is to be recorded:

A. Measurement of energy consumption for a cooking cycle

S. No.	Parameter	Observed value
1.	Heating time $t_{\text{low}}$ and $t_{\text{high}}$ (s); including the magnetron filament heating-up time	
2.	Initial temperature $T_0$ (°C)	
3.	Final temperature $T_{\text{low}}$ and $T_{\text{high}}$ (°C)	
4.	Energy consumption $W_{\text{low}}$ and $W_{\text{high}}$ (Wh)	
5.	Test voltage (V)	
6.	Energy Consumption for small load ( $W_{50,s}$ ) (Wh)	
7.	Energy Consumption for medium load ( $W_{50,m}$ ) (Wh)	
8.	Energy Consumption for large load ( $W_{50,l}$ ) (Wh)	
9.	Heating time $t_{\text{low}}$ and $t_{\text{high}}$ (s); including the magnetron filament heating-up time	
10.	Initial temperature $T_0$ (°C)	
11.	Final temperature $T_{\text{low}}$ and $T_{\text{high}}$ (°C)	
12.	Energy consumption $W_{\text{low}}$ and $W_{\text{high}}$ (Wh)	
13.	Ambient temperature (°C) at the start of the test (when the water is positioned in the appliance)	
14.	Actual and nominal mass of water (g)	
15.	Actual mass of the water (g); ( $mw$ )	
16.	Nominal mass of water (275 g, 350 g, 1 000 g); ( $mw,n$ )	
17.	Actual mass of the container (g); ( $mc$ )	
18.	Initial temperature of the water (°C); ( $T_0$ )	
19.	Final temperature of the water for the low temperature range (°C); ( $T_{\text{low}}$ )	
20.	Final temperature of the water for the high temperature range (°C); ( $T_{\text{high}}$ )	

B. Calculation for the energy consumption of a cooking cycle

S. No.	Parameter	Observed value
1.	Microwave power output measured according to Clause 8	
2.	Type of the appliance, available heating function(s)	
3.	Type of the appliance, available heating function(s)	
4.	Fitted with turntable or reciprocating tray	
5.	Position of the loads	
6.	Supply voltage at which the measurements were made	

7.	energy consumption in Wh rounded to one decimal according to 14.6 for each load	
8.	final result per cooking cycle, $W_{final}$ , in Wh rounded to one decimal according to 14.7	

**Test No.4- Standby Power Consumption as per Clause 15 of IEC 60705 + Clause 5.3 of IEC 62301**

Test methodology adopted: The Product Standby power was measured as per Clause 15 of IEC 60705:2010 + AMD1:2014, Edition 4.1: 2014-06 and the clause 5.3 of IEC 62301, Edition 2.0: 2011-01. The product was configured for standby mode.

**Test observations:**

S. No.	Parameter	Observed values
1.	Product Mode	
2.	Average Power (W)	
3.	Uncertainty of the result due to the measuring instrument (%)	
4.	Measurement method use	
5.	Sampling interval	
6.	Total duration of measurement (min)	
7.	Stability Period (min)	
8.	Energy (Wh)	
9.	Ambient conditions (temp.) (°C)	
10.	Total harmonic distortion	
11.	Accumulated energy and period of measurement (s/m/hr)	
12.	Description of how the appliance mode selected and programmed.	
13.	Sequence of events to reach the mode where equipment automatically changes mode, if any	

**ANNEXURE - B**

**Action Taken Report on failure of check testing from Permittee to BEE**

**Action Taken Report**

(To be furnished on Company's letterhead)

To,

Dated.....

THE SECRETARY,  
BUREAU OF ENERGY EFFICIENCY  
(MINISTRY OF POWER, GOVT. OF INDIA)  
4TH FLOOR, SEWA BHAWAN,  
SECTOR 1, R.K. PURAM,  
NEW DELHI-110 066  
INDIA.

Pursuant to the provisions of Schedule No. 22 of the Bureau of Energy Efficiency, we M/s....., the manufacturer of the microwave oven, were permitted to affix the label on the microwave oven conforming to the energy consumption standard of ..... star level vide BEE letter No.....dated.....for the model number.....

Pursuant to the provisions of the schedule for failure of the model in check testing, we were giving directions vide BEE letter number.....dated.... to take necessary corrective action. In the light of directive issued by the Bureau, we hereby declare that the following actions have been taken at our end:

	Action Directed	Status	Action Taken
(i)	Correct the star level displayed on the label of the microwave oven to comply with the directions of the Bureau	Yes/No/NA	The star level has been corrected from.....star to.....star with effect from (Date)
(ii)	Withdraw all the stocks from the market to comply with the directions of the Bureau. and	Yes/No/NA	All the stocks from the market have been withdrawn to comply with the directions of the Bureau.
(iii)	Change the particulars displayed on advertising material.	Yes/No/NA	Yes/No/NA

The above declaration is true to the best of our knowledge and belief.

Signature:

Name:

Designation:

For and on behalf of:

Name of the Company/Firm, etc.:

Seal of the Firm/Company: