

GUIDE ON MINIMUM ENERGY PERFORMANCE STANDARDS FOR MICROWAVE OVEN

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1. OBJECTIVE

- 1.1. This Guide is developed by the Commission to specify the MEPS and energy labelling requirements for microwave oven that can be connected to mains power and for household use.

2. SCOPE

- 2.1. This Guide shall apply to the following function of microwave oven with size up to or equal to 32 Litre:
- (a) solo;
 - (b) combination;
 - (c) convection;
 - (d) any other microwave oven with similar function; and
 - (e) exclude any type of built-in microwave oven which its power supplied direct from power source.
- 2.2. This Guide does not specify the procedure for the application of a COA. For further information regarding the application of a COA, please visit <https://www.st.gov.my/web/application/details/5/5>
- 2.3. This Guide is not intended in any way to circumvent the application of and obligations or requirements under any other written law or standards. Parties relying on this Guide are advised to obtain independent advice on the applicability of the same to their equipment.

3. DEFINITIONS AND INTERPRETATION

- 3.1. In this Guide, the following terms shall bear the following meanings:

“Act”	means the Electricity Supply Act 1990 [Act 447], as amended, modified or supplemented from time to time;
“CAB”	means a Conformity Assessment Body recognised by the Commission;

“COA”	means the Certificate of Approval issued in accordance with Regulation 97 of the Electricity Regulations 1994, as amended, modified or supplemented from time to time;
“Combination”	means a microwave ovens with more than one function;
“Convection”	means a microwave ovens using fan to force the air movement and heat up the full interior of the microwave ovens;
“Commission”	means Suruhanjaya Tenaga;
“Energy Laws”	means the Act and all subsidiary legislations made thereunder;
“MEPS”	means minimum energy performance standards, which is the minimum level of energy efficiency which has to be met by an equipment;
“On Mode”	means the microwave oven set is connected to an external power source and provides display;
“Solo”	means microwave with one function only;
“Standby Mode”	means an any microwave oven that connected to main power source and offer one or more of the function as prescribed in the MS IEC 62301:2012;
“test report”	means a test report issued by a CAB;
“$\eta_{\text{lowest2-Stars model}}$”	means the energy efficiency factor for 2-star microwave models determined through local market survey and is a value that is determined and published by the Commission from time to time; and
“η_{tested}”	means the energy efficiency factor for each individual microwave model and is a value obtained from the relevant test report;

3.2. Subject to paragraph 3.1 and unless expressly indicated to the contrary or unless the context otherwise requires, terms adopted and used in this Guide shall bear the same meaning as they are defined in the Energy Laws.

3.3. If there are any conflict between the provisions of this Guide and of those contained in the Energy Laws, the provisions in the Energy Laws shall prevail.

4. TESTING STANDARD

4.1. The following testing standard references are indispensable for the application of this Guide. For dated references, only the edition cited applies:

- (i) MS IEC 62301:2012, Household electrical appliances - Measurement of standby power.
- (ii) IEC 60705:2010, Household microwave ovens- Methods for measuring performance.

5. EFFICIENCY

5.1. The efficiency shall be calculated in accordance with the following formula:

$$\eta = \left[\frac{Pt}{W_{in}} \right] \times 100\%$$

Where:

η = is the efficiency in percentage

t = is the heating time in seconds

W_{in} = is including the magnetron filament heating up energy consumption

P = is the calculated microwave power output (in Watt)

6. MEASUREMENT CONDITIONS

- 6.1. Testing of power measurement shall be carried out under following conditions:
- (a) Power measurement at a time when the device is on On Mode; and
 - (b) Power measurement at a time when the device is on Standby Mode.
- 6.2. The On Mode power consumption shall have the following specific conditions:
- (a) Supply voltage and frequency: 230V, 50Hz.
 - (b) Magnetron filament heating-up time shall be provided by the manufacturers.
- 6.3. The Standby Mode power consumption shall be measured according to MS IEC 62301:2012.
- 6.4. Any modifications made to the device after measurement has been completed, other than cosmetic modifications which do not in any way affect the functionality of the device, would require the device to be retested.

7. STAR RATING

- 7.1. The star rating shall be in accordance with Table 1 below:

Star Rating	η
5	$65\% \leq \eta$
4	$58\% \leq \eta < 65\%$
3	$53\% \leq \eta < 58\%$
2	$45\% \leq \eta < 53\%$
1	$\eta < 45\%$

Table 1: Star Rating

8. MEPS REQUIREMENT

A COA will only be issued upon fulfilment of all the following requirements:

- 8.1. The MEPS rating to be achieved shall be 2-Star.
- 8.2. The maximum power consumption during Standby Mode shall be 1 W.

9. ENERGY EFFICIENCY LABEL

- 9.1. In accordance with the Energy Laws, any equipment that meets all the requirements of efficient use of electricity shall be affixed with an efficiency rating label. It shall be the responsibility of the manufacturer or importer to affix such label.
- 9.2. Information to be included in the label is as per Figure 1.

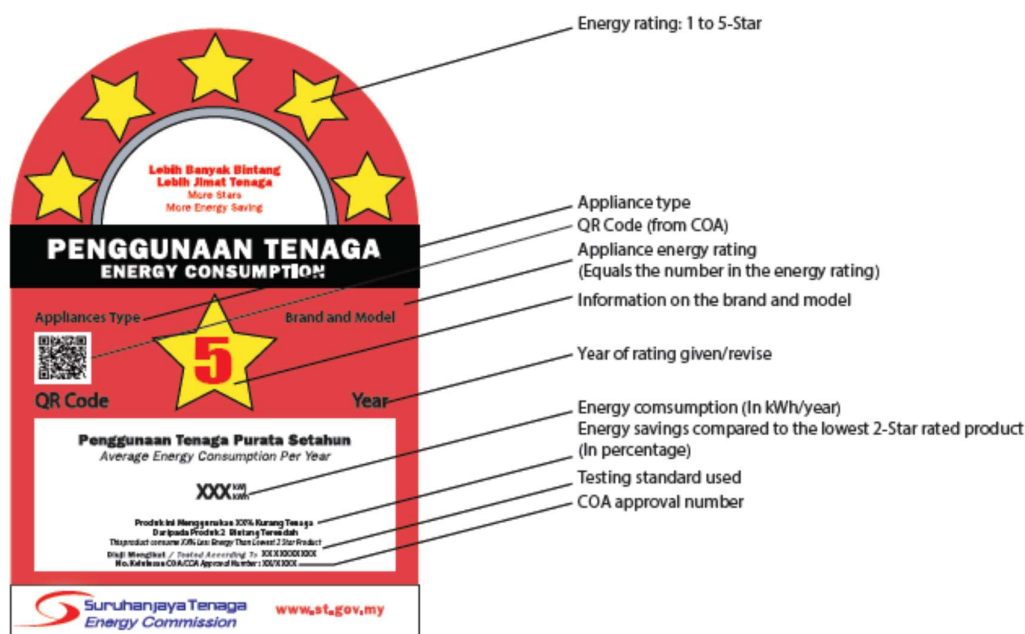


Figure 1

9.3. Calculation Method

In order to obtain the value of “energy savings compared to the lowest 2-Star rated product (in percentage)”, the following formula shall be applied:

Annual Energy Consumption (kWh)

$$= 0.365 \times 3 \times \frac{W_{in}}{3600}$$

Where 3 is referring to 3 times usage per day

Percentage energy saving compared to the lowest 2 star rating model

$$100 \% - \left[100 \times \left(\frac{\eta_{\text{lowest2-Stars model}}}{\eta_{\text{tested}}} \right) \right]$$

For the avoidance of doubt, the word “product” on the energy efficient label refers to an equipment as defined in the Energy Laws.

9.4. Size Specification: The size of the energy efficiency label is as per Figure 2.



Figure 2

- 9.5. Font Specification: The type and minimum size of the font for the energy efficiency label is as per Figure 3.

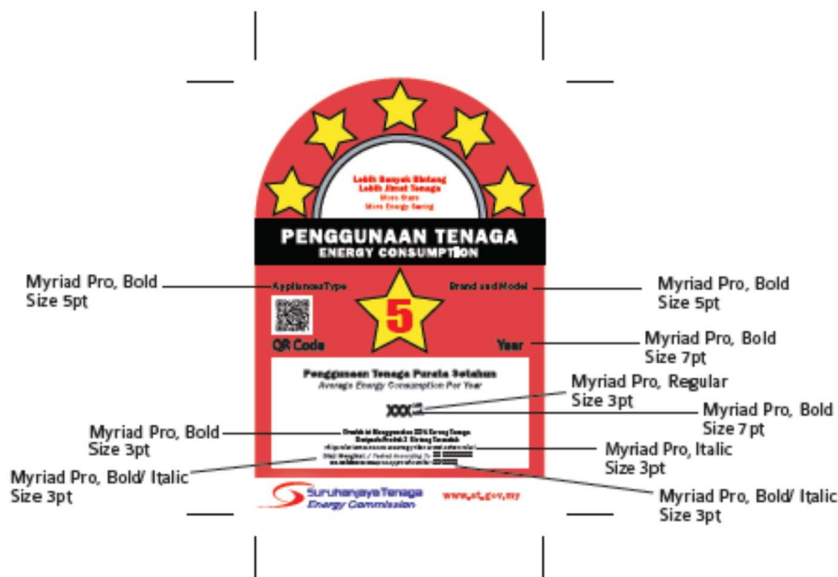


Figure 3

- 9.6. Colour Specifications: The energy efficiency label shall be printed according to the colour specifications in Figure 4.



Figure 4

- 9.7. Design Specification: The designs for the energy efficiency label for each star rating is as per Figure 5.



Figure 5

A softcopy of energy efficiency label in AI format can be obtained from the Commission by emailing meps@st.gov.my with a request.