PART 2 : REFRIGERATOR

2.1 Scope

2.1.1 The refrigerator which is classified as energy-using product shall have the following criteria:

(a) one door or two door as shown in Figure 1;

(b) can be connected to main power; and

(c) within the scope of MS IEC 62552-1:2016 or equivalent standard IEC 62552-1:2015



Figure 1: Example of refrigerators classified as energy-using product

2.1.2 The following products are excluded as energy-using product:

(a) mini bar or mini refrigerator which have a total volume of less than 60 litres;

(b) products that are designed exclusively for use in vehicles (e.g. mobile homes, campervans and/or rail cars) or boats and which have a total volume of less than 60 litres;

(c) products that have refrigeration function as secondary (e.g. boiling or cooled water dispensers);

(d) products that have no options for connection to a 230V to 400V, 50Hz mains electricity supply;

(e) products that cool using technologies other than the vapour compression cycle;

(f) products that are designed exclusively for built-in in house; and

(g) French door or side by side door or more than 2-door refrigerator.

2.2 Interpretation

In this part, the following terms shall have the following meanings:

Energy efficiency factor (EEF)	the ratio between the adjusted volume (in litres) and the daily energy consumption (in kWh), determined using the test methods specified in MS IEC 62552-1 and MS IEC 62552-3
$EEF_{Average}$	means the energy efficiency factor as determined by the Commission
Star rating index (SRI)	means the indication of the claimed energy efficiency of a model, where a higher SRI represents greater energy efficiency. It is calculated based on the energy efficiency factor (EEF).

2.3 Testing Methodology

2.3.1 The refrigerator shall be tested according to the testing methodology as follows:

National Standard	Equivalent International Standard
MS IEC 62552-1:2016, Household Refrigerating Appliances -	IEC 62552-1:2015 Household refrigerating appliances -

Characteristics and Test Methods – Part 1: General Requirements (Second Revision) (IEC 62552-1:2015, IDT)	Characteristics and test methods - Part 1: General requirements
MS IEC 62552-3:2016, Household Refrigerating Appliances - Characteristics and Test Methods – Part 3: Energy Consumption and Volumes (Second Revision) (IEC 62552-3:2015, IDT)	IEC 62552-3:2015 Household refrigerating appliances - Characteristics and test methods - Part 3: Energy consumption and volume

2.3.2 The testing methodology shall meet the following requirements:

(a) the energy consumption shall be determined by interpolation from the results of two tests:

(i) one giving a temperature warmer than, and
(ii) the other a temperature colder than,

the target temperature as in accordance with MS IEC 62552- 3;

(b) the refrigerating appliance shall be tested at the 230V, 50Hz;

(c) the ambient temperature of 32 ºC with humidity less than 75%;

(d) the specified auxiliaries value is determined by ambient controlled anti-condensation heaters only. Probability for temperature and humidity data are shown in Table 3.

Relative Humidity (RH)	**RH band mid-point**	**Probability at 16 ºC**	**Probability at 22 ºC**	**Probability at 32 ºC**
0 to 10 %	5 %	0.0	0.0	0.0
10 to 20 %	15 %	0.0	0.0	0.0
20 to 30 %	25 %	0.8	0.4	0.0
30 to 40 %	35 %	3.3	3.4	0.3
40 to 50 %	45 %	6.4	10.7	2.1
50 to 60 %	55 %	8.0	14.2	7.8
60 to 70 %	65 %	5.8	9.0	11.3
70 to 80 %	75 %	2.5	3.9	6.3
80 to 90 %	85 %	0.8	0.9	1.8
90 to 100 %	95 %	0.0	0.0	0.3

Table 3 : Probability for temperature and humidity data – ambient controlled anti condensation heater

(e) the load processing efficiency value is determined by using equation (57) of Annex G of MS IEC62552-3. This value is determined at ambient temperature of 32 ºC only. A regional factor to scale processing load used is 1; and

(f) the determination method for number of valid defrost and recovery period are using both option 1 and 2 of C.4 of MS IEC62552-3.

2.3.3 The test report shall include any component that may be determined by the Commission from time to time. *Pin. 1/2026*

2.4 Calculation of energy efficiency *Pin. 2/2026*

(a) Calculation of Star Rating Index (SRI)

The Star Rating Index (SRI) is determined based on daily energy consumption obtained from test conducted in accordance with MS IEC 62552-1 and MS IEC 62552-3.

Star rating index is determined by the following equation:

$$Star\ Rating\ Index = \left[\frac{EEF_{Tested}}{EEF_{Average}} - 1\right] \times 100\%$$

Where,

$$EEF_{Average(1door)} = 1.4159 \times V_{adjusted} + 101.512$$

$$EEF_{Average(2doors)} = 0.8825 \times V_{adjusted} + 88.8436$$

$$EEF_{Tested} = \frac{V_{adjusted}\ (L)}{Energy\ consumptioned\ per\ day\ (kWh)}$$

Where,

$$Energy\ consumption\ per\ day = \frac{E_{Total}}{365}$$

Where,

$$E_{Total} = E_{daily32C} \times 365 + E_{aux} + \Delta E_{processing32C} \times 365$$

The adjusted volume ($V_{adjusted}$) of a refrigerating appliance is calculated by summing the adjusted volume for each compartment as per equation below:

$$V_{adj} = \sum_{i=1}^{n} K_{ci} \times V_i$$

Where,

n is number of compartments in the refrigerating appliance;

V_i is volume of compartment *i* (litres);

K_{ci} is adjustment volume factor for compartment *i* as determined in accordance with the following equation:

$$K_{ci} = \frac{[T_{ka} - T_{ti}]}{[T_{ka} - T_{tff}]}$$

Where,

T_{ka} is the environment test temperature (set at + 32 ºC);

T_{ti} is the target temperature of compartment *i* (°C) from Table 2

T_{tff} is the target temperature of a fresh food compartment (4 °C)

The volume adjustment factor (K_{ci}) for each compartment type is specified in Table 4 below.

Compartment type	Target temperature (°C)	Volume adjustment factor (K_{ci})
Pantry	17	0.54
Wine storage	12	0.71
Cellar	12	0.71
Fresh food	4	1.00
Chill	2	1.07
Zero star	0	1.14
1 star	-6	1.36
2 star	-12	1.57
3 star and 4 star	-18	1.79

Table 4 : Volume adjustment factor by compartment type

(b) Calculations for Annual Energy Consumption (kWh),A

Annual Energy Consumption (kwh)= E_{Total} (Obtained From the Test Report)

(c) Calculations for Percentage energy saving compared to the lowest 2-star rating,B *Pin. 2/2026*

$$B=100\%-\left(\frac{EEF_{Lowest\ 2\text{-}Star}}{EEF_{Tested}} \times 100\right)$$

Where,

$\mathrm{EEF}_{\text{Lowest 2-Star}} = 1.0619 \text{ x } \mathrm{V}_{\text{adjusted}} + 76.134$ (1-Door)

$\mathrm{EEF}_{\text{Lowest 2-Star}} = 0.6619 \text{ x } \mathrm{V}_{\text{adjusted}} + 66.6327$ (2-Door)

EEF_{Tested} can be obtained from the report.

$\mathrm{V}_{\text{adjusted}}$ can be obtained from the report.

2.5 Energy efficiency rating

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The energy efficiency rating in the form of star rating shall be in accordance with Table 5.

Star rating	Star index value
5	+ 5 % ≤ Star index
4	- 5 % ≤ Star index < + 5 %
3	- 15 % ≤ Star index < - 5 %
2	- 25 % ≤ Star index < - 15 %
1	Star index < - 25 %

Table 5 : Star rating index value

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