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PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN
MINISTRY OF ENERGY
(Power Division)
[NATIONAL ENERGY EFFICIENCY AND
CONSERVATION AUTHORITY]

NOTIFICATION

Islamabad, the 14th March, 2024

S. R. O. 414(I)/2024.—In exercise of the powers conferred by section 21 read with sub-section (3) of section 4 and clause (u) of section 7 of the National Energy Efficiency and Conservation Act, 2016 (XXX of 2016), the National Energy Efficiency and Conservation Board, in consultation with the National Energy Efficiency and Conservation Authority, makes the following regulations, namely:-

PART-I

DEFINITIONS

1. **Short title and commencement.**—(1) These regulations shall be called the National Energy Efficiency and Conservation (Pakistan Energy Labels for House Hold Refrigerating Appliances) Regulations, 2023.

1013 (1—20)

Price : Rs. 40.00

[7377 (2024)/Ex. Gaz.]

(2) These regulations shall come into force at once.

2. Definitions.—(1) In these regulations, unless there is anything repugnant in the subject or context,—

- (i) "Act" means the National Energy Efficiency and Conservation Act, 2016 (XXX of 2016);
- (ii) "adjusted volume (V_{adj})" means a volume metric where the volume of each compartment is adjusted to compensate for heat loadings on compartment types that at temperatures other than that of fresh food compartment in an ambient (test room) temperature of 32° C;
- (iii) "applicant" means any local manufacturer, assembler, or importer of house hold refrigerating appliances;
- (iv) "application" means an application made by an applicant, in hard or electronic form, in accordance with the provisions of these regulations and shall, where the context so permits, include the documents in support of such application;
- (v) "authorization" means an authorization granted by the Authority for the use of Pakistan energy labels for house hold refrigerating appliances;
- (vi) "comparative energy consumption (CEC)" means the nominal energy consumption of a model of refrigerating appliance (Units: kWh/year). It is based on the average of PAEC of the model;
- (vii) "designated officer" means any officer of the authority designated as such by the Managing Director of the Authority from time to time to perform certain functions as per these regulations;
- (viii) "direct cool refrigerating appliance" means the refrigerating appliance which is not cooled by internal forced air circulation. Cooling is primarily obtained by natural convection only;
- (ix) "energy efficient" means product is compliant to minimum energy performance standards and bearing Pakistan energy label;
- (x) "freezer" means the refrigerating appliance with only frozen compartments;
- (xi) "frost free refrigerating appliance" means the refrigerating appliance in which all compartments are automatically defrosted by a frost free system. In a frost free system:-

- (a) cooling is provided by forced air circulation;
- (b) the system is automatically operated to prevent permanent formation of frost on all refrigerating surfaces; and
- (c) no accumulation of ice or frost forms on stored food;
- (xii) "house hold refrigerating appliances" means house hold two door refrigerator or freezer that can be connected to mains power and which are within the scope of PS:IEC62552-1;
- (xiii) "importer" means any person who is authorized to make import of house hold refrigerating appliances;
- (xiv) "manufacturer" means any person who is involved in manufacturing or assembling of house hold refrigerating appliances;
- (xv) "minimum energy performance standards (MEPS)" means the minimum energy performance standards as approved by the Authority and endorsed and adopted by PSQCA;
- (xvi) "model" means the model or range of one model for the product of one particular brand, to which a single set of test report is applicable and where each of the models has the same physical characteristics, energy consumption or efficiency and performance characteristics;
- (xvii) "NEECA" means National Energy Efficiency and Conservation Authority established under the National Energy Efficiency and Conservation Act, 2016 (XXX of 2016);
- (xviii) "Pakistan energy label" means a sticker as defined and approved by the Authority as per Schedule-IV and generated through the product registration system or issued by the Authority on the basis of the star rating commonly known as energy star rating. The star rating is calculated from the star rating band as per the Schedule-III;
- (xix) "product" means the house hold refrigerating appliances to be registered under these regulations;
- (xx) "projected annual energy consumption (PAEC)" means the estimate of energy consumption by a single unit during one year. It combines data from several different measurement (Units: kWh/year);

- (xxi) "PSQCA" means the Pakistan Standards and Quality Control Authority established under the Pakistan Standards and Quality Control Authority Act, 1996 (VI of 1996);
- (xxii) "refrigerator" means refrigerating appliance having at least one fresh food compartment and at least one freezer compartment;
- (xiii) "schedule" means schedule to these regulations; and
- (xiv) "seller" means a person who sells the product to any person within Pakistan whether directly or through some online process.

(2) All other terms, words and expressions used, but not defined in these regulations, shall have the same meanings as are assigned to them in the Act or any other enabling rules and regulations.

PART-II

GRANT OF AUTHORIZATION OR REGISTRATION

3. (1) No person, manufacturer or importer shall sell or purchase any house hold refrigerating appliance which is not energy efficient and not compliant of MEPS.

(2) In order to ensure that only energy efficient house hold refrigerating appliances are sold in the market, these house hold refrigerating appliances shall bear Pakistan energy label for house hold refrigerating appliances.

(3) These regulations shall not be applicable for the following, namely:-

- (i) products that cool using technologies other than the vapour compression cycles;
- (ii) products that are designated exclusively for built-in in house; and
- (iii) French door or side by side door.

4. **Application for grant of registration or authorization.**—(1) An applicant desiring registration shall make application to the Authority for registration or authorization to use or affix the Pakistan energy labels on the product.

(2) The applicant shall sign-up and login through the product registration system, link to which has been given on the Authority's website or an

applicant can submit an application as per format provided in the Schedule-I. The contents and format of application form provided in the Schedule-I may be updated by the Authority on as and when required basis.

(3) The application with one time company registration fee, product registration fee, product model registration or renewal and label fee shall be submitted in the form of a non-refundable payee account demand draft in favor of the Authority or online payment channels as prescribe in the Schedule-II.

(4) For registration, the product shall meet the MEPS as prescribed by the Authority.

(5) The online or downloaded application form shall be duly filled in by giving correct and appropriate information, list of retailers or dealers with their contact details and addresses for the labelled products in different cities and required supporting documents as mentioned in the application form as prescribed in Schedule-I.

(6) The contents of the application with the required set of information as set out in Schedule-I, submitted by the applicant, shall be reviewed by the Authority's technical evaluation committee and thereafter as per the recommendation of the said committee, the decision as to the registration or otherwise of the product shall be given by the Authority.

(7) The applicant shall be solely responsible for ensuring the accuracy of the information displayed on the label or any public claim for label level and quality of product and use of label only for approved product's model.

(8) The house hold refrigerating appliances sought to be registered should conform to the testing conditions and parameters as set out in Schedule-VI.

(9) PSQCA shall provide test report issued by an accredited laboratory or labs enlisted by the Authority for the particular models of the product for which grant of Pakistan energy label is required.

(10) The test reports shall be reviewed by the technical section or officials nominated by the Authority to ensure its compliance with the energy performance or star rating classification specified in the Schedule-III and accordingly star rating for the particular model of the product would be endorsed and registered manually or through the product registration system.

(11) In case there are changes in the energy efficiency parameters of the product or any other information on the label, then a fresh application shall be submitted and it will be processed accordingly.

(12) The liability of applicant for the authenticity of label will continue till those labeled products are available in the market.

(13) The result of evaluation shall be communicated to the applicant within fifteen working days after the approval or rejection by the Authority's technical evaluation committee nominated by the Authority and an authorization certificate to use the Pakistan energy label stickers shall be issued accordingly for the respective models through the product registration system or manual mode. In case of rejection, reasons for such rejection shall also be communicated to the applicant.

(14) The validity of the registration of model shall be for two years (from the date of registration) and thereafter, the applicant shall be required to get the registration re-issued in the manner provided herein for new registration.

5. **Design and specifications of Pakistan energy label.**—(1) The design and related information regarding Pakistan energy labels for the product shall be as per Schedule-IV. The design of the label as provided in the Schedule-IV may be updated from time to time as and when required by the Authority.

(2) The Authority shall embed security features in the label to enable verification of the authenticity of the labelled product. The security features shall be verifiable through modern technologies such as QR Code scanning.

PART-III

MONITORING

6. (1) For the purposes of monitoring, the Authority may seek information regarding all the registered products including the details of production, import and sales of the registered product.

(2) The Authority may, from time to time, either through its designated officers or third party firm or any designated agency shall carry out random monitoring to verify the compliance in using the Pakistan energy labels for the registered products by the manufacturers, assemblers, or importers.

(3) The following may be the considerations for the verification or monitoring of the registered products, namely:-

- (i) pattern or design of label;
- (ii) validity of authorization of label users;
- (iii) label contents; and

(iv) manner of display of label.

(4) In case, during the course of monitoring, any contravention of the provisions of the Act or other rules and regulations is observed, further action into the matter shall be taken in accordance with the provisions of Part IV of these regulations.

PART-IV

CANCELLATION OF REGISTRATION OR PENALTIES

7. Non-conformance of Pakistan energy label use.—(1) If Pakistan energy label used or affixed on the product is found to be not conforming to the pattern or design, the way of use as approved by the Authority or the label is found misleading to the consumers or retailers or violation of energy consumption against notified standards, the Authority shall within fifteen days of coming to know of the violation, cause the designated officer to seek an explanation from such person (herein after referred to as the said person).

(2) The designated officer shall issue an explanation to the said person to explain the occurrence of the violation within a period of fifteen days from the receipt of the explanation.

(3) Where the said person admits the violation without offering an excuse, the registration of the product in question shall be cancelled and the said product shall be prohibited from sale in the market.

(4) Where the said person admits the violation but maintains that there were valid reasons for such violation, he shall submit a written and reasonably detailed explanation of the reasons for such violation within a period of fifteen days.

(5) The Authority shall examine the explanation referred to in sub-regulation (4) within fifteen days of receipt thereof and shall, if so requested, allow the said person an opportunity of being heard in person or through his authorised representative.

(6) If the Authority accepts the explanation, it shall record the reasons for acceptance and shall order the matter closed.

(7) If the Authority rejects the explanation, it shall record the reasons for rejection of the response and shall pass an order regarding cancellation of the registration of the product. Beside the cancellation of registration, the Authority may also direct for withdrawal of all the stocks from the market immediately and it may also recommend imposition of fine as determined by the Board as per Schedule-V.

(8) The decision of the Authority under sub-regulation (7) shall forthwith be communicated to the said person.

(9) The Authority may also communicate its decision as to cancellation of registration of the product to the relevant offices of Customs for prohibiting the import of such products which are in non-conformance of Pakistan energy label use in accordance with these regulations.

8. Complaints related to performance testing or test-reports.—(1) The testing required for verification shall be got conducted through an accredited lab or labs enlisted by the Authority for this purpose at the expense of the manufacturer or importer.

(2) For any random verification, the Authority shall carry out risk based sampling in the market and shall buy models from the market for verification test. At least one sample of the registered product shall be picked from the distributors or retailers by the monitoring team. If the registered product's model fails to pass the verification test, the registered company or firm of the model shall be issued a show cause notice. However on request of such registered company or firm, the Authority may get the second check testing of the model at the registered company's or firm expense.

(3) In case of the second verification test, the Authority shall pick three samples of the same model from the market and test the samples. The cost of these three samples shall be borne by the manufacturer, assembler, importer, or retailer, as the case may be, as per nature of complaint. The Authority shall inform the registered company or firm of the model about the date of second check testing to witness.

(4) The manufacturer, seller or importer shall be responsible for providing due assistance to the Authority's monitoring team.

(5) In case of failure of performance test results as compared to the results of test conducted at the time of model registration under these regulations, the Authority shall pass an order regarding cancellation of the registration of the product. Beside the cancellation of registration, the Authority may also direct for withdrawal of all the stocks from the market immediately and it may also recommend imposition of fine as determined by the as per Schedule-V.

(6) The Authority may also communicate its decision as to cancellation of registration of the product to the relevant offices of Customs for prohibiting the import of such products which fail performance testing in accordance with these regulations.

PART-V

COMPLAINTS

9. (1) Any consumer of a registered product, may lodge a complaint before the Authority, if the product is not in conformity with the approved specifications or standards or it does not bear the requisite label thereon.

(2) Upon receipt of the complaint, the Authority may cause the designated officer for issuing an explanation to the seller or manufacturer or importer of the product to show cause within fifteen days as to why further action in terms of the provisions of Part IV of these regulations may not be taken against him. If considered necessary, the designated officer may make site inspections or get the product tested through the accredited laboratory at the expense of the seller, or manufacturer or importer against whom the complaint was lodged.

(3) An opportunity of hearing may also be provided by the designated officer to the parties.

(4) Upon receipt of the response to the explanation issued under sub-regulation (2) or after making site inspection or testing of the product, the designated officer may make recommendations as to the decision of the complaint and may recommend to the Authority either for dismissal of the complaint or for taking further action in terms of Part IV of these regulations.

(5) The decision upon such complaint shall be given by the Authority within sixty days of the lodging of the complaint.

(6) Any person aggrieved by the decision of Authority may file an appeal before the Energy Conservation Tribunal in accordance with the provisions of the Act.



SCHEDULE-I
[See regulations 4(2), 4(5) and 4(6)]



Pakistan Energy Labeling Scheme Registration Form

for Grant of Authorization to use "Pakistan Energy Label for House Hold Refrigerating Appliances"

To be filled in by the applicant

1. Applicant information

- a. Name of Company/Firm: _____
- b. Address: _____
- c. Location of Factory/Plant: _____
- d. Telephone: _____

Factory: _____

Office: _____

Name of Company Managing Director/Director of the factory/firm: _____

e. Name of Contact Person: _____

Phone #: _____

Mobile#: _____

E-mail: _____

2. Company/Firm Sale Tax Number: _____

3. Company/Firm National Taxpayer Number: _____

4. Whether the Company/firm is registered with the local Chamber of Commerce and Industry? If YES then fill the following;

Registration #: _____

Year: _____

5. Whether a member of any Association? YES ☐ NO ☐ If YES:

Name: _____

Membership No: _____

Year: _____

6. Whether you have sales/distributors/retailers' network for the specific product? (Tick the applicable box)

- | | | | |
|----------------------|--------------------------|---------------------|--------------------------|
| Throughout Pakistan | <input type="checkbox"/> | Khyber Pakhtun Khwa | <input type="checkbox"/> |
| Punjab | <input type="checkbox"/> | Sindh | <input type="checkbox"/> |
| Azad Jammu & Kashmir | <input type="checkbox"/> | Baluchistan | <input type="checkbox"/> |
| Gilgit Baltistan | <input type="checkbox"/> | | |

7. Detailed information of the product for which labeling is required:

- a. Brand Name: _____
- b. Model Name: _____
- c. Date of Manufacturer or Imported year: _____
- d. If Imported, Origin of the Country of the product: _____
- e. Rating of Product/Appliance in kW: _____
- f. Rated Annual Energy Consumption: _____
- g. Total Volume In Litre: _____
- h. Type of Refrigerant: _____
- i. Color (specify all the available colors):

j. Is the product granted PS Mark by Pakistan Standards & Quality Control Authority (PSQCA)

YES ☐ NO ☐ If YES: Specify the No. _____

k. Any other salient feature of the product regarding energy consumption/ efficiency:

8. Read and understand the National Energy Efficiency and Conservation (Pakistan Energy Labels for House Hold Refrigerating Appliances) Regulations, 2023. Do you agree with the requirement, criteria and conditions for grant of Pakistan Energy Label given in these Regulations?

YES ☐ NO ☐

9. Specify the information about deposited non-refundable Fees payable to NEECA

☐ Company Registration Fees:

Demand Draft/ Pay Order No: _____

Dated: _____

for Amount Rs.: _____

☐ Product/Appliance Registration Fee:

Demand Draft/ Pay Order No: _____

Dated: _____

for Amount Rs.: _____

☐ Model Registration Fee:

Demand Draft/ Pay Order No: _____

Dated: _____

for Amount Rs.: _____

☐ Renewal Fee:

Demand Draft/ Pay Order No: _____

Dated: _____

for Amount Rs.: _____

10. Estimated production per annum of product/appliance of Model for which the application is submitted?

11. The following documents should be attached with the application

- a. Company Brochure
- b. Product Brochure/catalogue
- c. Product Test Report issued by an Accredited Lab
- d. Original Demand Draft(s)/ Pay Order(s)

Signature: _____

Name: _____

Designation: _____

Date: _____

(Stamp of the firm/company)

Data Of The Registered Household Refrigerating Appliance

Data	Remarks
Product registration number	
Date of the product registration	
Type of product	
Brand name	
Model name and manufactured or imported year	Model name/year
Origin of the country of the product	
Total volume in litre	
Adjusted volume, in litre	
Rated annual energy consumption (CEC) , in kWh/year	
Rating of the label standard (No. of Stars?)	
Appliance type	
Refrigerant type	
Label period	
No. of Manufactured, imported and sold biannually in unit	
Example: 1-Jan-2022 to 31-MAR-2022	

Data of The Test Report Of Registered Household Refrigerating Appliance

Data	Remarks
1. Testing laboratory	
1.1 Name of the testing laboratory	
1.2 Laboratory address where testing was conducted	
1.3 Contact details (name of contact, phone number and e-mail address)	
1.4 Date of specific tests	
1.5 Relevant accreditation(s) (where applicable)	
2. Client (This part can be skipped, in the case of in-house testing laboratory)	
2.1 Company registration number	
2.2 Manufacture/importer/supplier's name	
2.3 Address of manufacture/importer/supplier	
2.4 Contact name and title	
2.5 Contact details (Phone number and e-mail address)	
3. Test methods	
3.1 Test standards and editions used	
3.2 Applied ambient temperature	

4. Energy consumption of household refrigerating appliance	
4.1 Brand	
4.2 Model	
4.3 Serial number	
4.4 Rated voltage and frequency, in volts and hertz	
4.5 Refrigerant	
4.6 Test conditions (ambient temperature and humidity)	
4.7 Total volume and volume of each compartment, in litre	
4.7.1 Total volume, in litre	
4.7.2 Volume of fresh food compartment, in litre	
4.7.3 Volume of freezer, in litre	
4.8 Adjusted total volume and adjusted volume of each compartment	
4.8.1 Total adjusted volume, in litre	
4.8.2 Adjusted volume of fresh food compartment	
4.8.3 Adjusted volume of freezer compartment	
4.9 Daily energy consumption, in kWh	
4.10 Annual energy consumption, in kWh	

SCHEDULE-II

[See regulation 4(3)]

FEE STRUCTURE

Sr. No	Fee Type	Fee in Pak Rs.
(1)	(2)	(3)
1	Company/Firm Registration Fee (One Time)	200,000/-
2	Product Registration Fee (One Time)	Nil
3	Model Registration/Renewal Fee (2 Years)	20,000/-
4	Pakistan Energy Label / Security Sticker Fee	50/-

Note: For the companies/importers which are going to register with the Authority within one year of notification of the regulations, the company/firm registration fee shall be waived off. The fee prescribed in column (3) of the table above shall have to be submitted by the companies or firms which shall register with the Authority after one year of notification of these regulations. The Authority may revise the fee subject to change in market price of testing, labeling, and other associated expenses.

SCHEDULE-III
[See regulations 2(xviii) and 4(10)]
Star Rating Band & Classification

1. Star Rating Band

The star rating shall be in accordance with the following table:-

two (2) door refrigerator/freezer	Star rating band	
	1 star	$0.576 \times V_{adj} + 420 \geq CEC > 0.504 \times V_{adj} + 368$
	2 star	$0.504 \times V_{adj} + 368 \geq CEC > 0.432 \times V_{adj} + 315$
	3 star	$0.432 \times V_{adj} + 315 \geq CEC > 0.374 \times V_{adj} + 273$
	4 star	$0.374 \times V_{adj} + 273 \geq CEC > 0.288 \times V_{adj} + 210$
	5 star	$CEC < 0.288 \times V_{adj} + 210$

2. MEPS requirement

The following equation shall be used to determine the MEPS requirement.

$$CEC \text{ (kWh/year)} = a \times V_{adj} + b$$

where

a is a variable allowance factor in kWh/litres/year

b is a fixed allowance factor in kWh/year

V_{adj} is adjusted volume in litres.

The MEPS requirement is follows.

$$\text{MEPS requirement} = 0.576 \times V_{adj} + 420 \text{ (kWh/year)}$$

SCHEDULE-IV
[See regulations 2(xviii) and 5(1)]
Pakistan Energy Label

1.1 Affixing of Pakistan Energy Label:

The energy star rating label shall be in the form of a sticker and affixed on front side of refrigerator and printed on packing on some prominent position with at least one side of the package box fully displaying the label for clear visibility. The label shall display the approved energy star rating for the model of the Refrigerator. The format of the energy star rating label shall be as given in Figure 1. This label will have some proprietary material, Overt & Covert security features with QR Code along with unique code for instant digital verification by the end-user. The label Pakistan Energy Label shall be provided by NEECA after granting permission to use Pakistan Energy Label. Pak Rs. 50 would be charged per product unit from the manufacturer by NEECA on the basis of the production/import quantity as declared vide Part III 6(2), which shall be paid in advance

in the form of a nonrefundable Payee Account Demand Draft in favor of the Authority as per declared production quantity.

The following contents shall be displayed on its label.

- The name of manufacture, seller or importer and brand
- The model and year of manufacturing or import
- Appliance type (direct cool/frost free)
- Total volume in litres
- Annual energy consumption in units
- Star level
- Label period
- Refrigerant







PAKISTAN ENERGY LABEL		PAKISTAN ENERGY LABEL		PAKISTAN ENERGY LABEL	
					
Annual Energy Consumption:		Annual Energy Consumption:		Annual Energy Consumption:	
National Energy Efficiency and Conservation Authority (NEECA) Label Period: 01-January-24 to 31-December-24		National Energy Efficiency and Conservation Authority (NEECA) Label Period: 01-January-24 to 31-December-24		National Energy Efficiency and Conservation Authority (NEECA) Label Period: 01-January-24 to 31-December-24	
Star Level	ABC	Star Level	ABC	Star Level	ABC
Brand/Model	XYZ/2021 / ORST	Brand/Model	XYZ/2021 / ORST	Brand/Model	XYZ/2021 / ORST
Refrigerant	R600	Refrigerant	R600	Refrigerant	R600
Appliance Type	Direct Cool	Appliance Type	Direct Cool	Appliance Type	Direct Cool
Total Capacity	28 Litres	Total Capacity	28 Litres	Total Capacity	28 Litres
Label Period	01-January-24 to 31-December-24	Label Period	01-January-24 to 31-December-24	Label Period	01-January-24 to 31-December-24
More Red Stars Mean More Energy Efficient  Scratch & send code to 123456789 for instant verification.		More Red Stars Mean More Energy Efficient  Scratch & send code to 123456789 for instant verification.		More Red Stars Mean More Energy Efficient  Scratch & send code to 123456789 for instant verification.	
NEECA National Energy Efficiency and Conservation Authority		NEECA National Energy Efficiency and Conservation Authority		NEECA National Energy Efficiency and Conservation Authority	



Figure 1: Format for Pakistan Energy Label

1.2 Dimensions & Character size of the Pakistan Energy Label

The Pakistan Energy Label for House Hold Refrigerating Appliances shall have the dimension of 50x85mm.

1.3 Prohibited Information

Advertising information, other than that being included on the Pakistan Energy Label, is prohibited.

SCHEDULE-V

[See regulations 7(7) and 8(5)]

Penalties for Non-Compliance

Sr. No.	Non-Compliance Related to	Penalties(Rs.)
(1)	(2)	(3)
1	Pattern/design of label	100,000
2	Validity of authorization of label users	100,000
3	Label contents	200,000
4	Manner of display of label	150,000
5	Verification test failure	1,500,000
6	Manufacture/assemble, sale and import without getting registered	2,000,000

SCHEDULE-VI
[See regulation 4(8)]

TESTING PARAMETERS & CONDITIONS

The house hold refrigerating appliances sought to be registered should conform to the following standards and parameters:-

- a. PS: IEC62552-1/2018 Household Refrigerating Appliances – Characteristics and Test Methods - Part1: General requirements)
- b. PS: IEC62552-2/2018 Household Refrigerating Appliances – Characteristics and Test Methods - Part2: Performance requirements)
- c. PS: IEC62552-3/2016 Household Refrigerating Appliances – Characteristics and Test Methods - Part3: Energy consumption and volume)
- d. PS: IEC62552-3 AMD 1/2021 Household Refrigerating Appliances – Characteristics and Test Methods - Part3: Energy consumption and volume

Star rating index shall be based on CSPF Cooling Seasonal Performance Factor on the basis of following standards and testing conditions:

1. Electricity supply

The refrigerator shall be tested at the 230V, 50Hz.

2. Ambient temperature

Ambient temperature of 32°C only.

3. Specified auxiliaries (E_{aux})

This value is determined by ambient controlled anti-condensation heaters only. Probability for temperature and humidity data is shown in Table 1.

Table 1: Population-weighted probability for temperature and humidity data – ambient controlled anti-condensation heater

Relative humidity	RH band mid-point	Probability at 16°C	Probability at 22°C	Probability at 32°C
0 to 10 %	5 %	0.00 %	0.05 %	0.15 %
10 to 20 %	15 %	0.06 %	0.41 %	1.39 %
20 to 30 %	25 %	0.16 %	2.23 %	3.18 %
30 to 40 %	35 %	0.60 %	3.41 %	4.48 %
40 to 50 %	45 %	2.09 %	4.41 %	5.62 %
50 to 60 %	55 %	2.81 %	4.04 %	8.15 %
60 to 70 %	65 %	4.55 %	5.23 %	21.09 %
70 to 80 %	75 %	4.48 %	4.01 %	8.74 %
80 to 90 %	85 %	2.98 %	3.04 %	0.23 %
90 to 100 %	95 %	0.97 %	1.47 %	0.00 %
Total	-	19 %	28 %	53

4. Load processing efficiency

This value is determined by using equation (57) of Annex G of PS: IEC62552-3. This value is determined at ambient temperature of 32°C only. A regional factor to scale processing load used is 1.

5. Determination method for number of valid defrost and recovery period Both option 1 and 2 of Annex C.4 of PS: IEC62552-3 can be used.

6. Calculation of the CEC and the adjusted volume

The CEC and adjusted volume shall be used to determine the MEPS requirement.

6.1 Projected annual energy consumption (PAEC)

PAEC is calculated by Equation (59), Annex G Determination of load processing efficiency, PS: IEC62552-3/2016 as follows. PAEC shall be rounded to the nearest whole number.

$$E_{\text{Total}} = E_{\text{daily32C}} \times 365/1000 + E_{\text{aux}} + \Delta E_{\text{processing32C}} \times 365/1000$$

where

E_{daily32C} is the daily energy consumption in Wh/day determined at ambient temperature of 32°C.

E_{aux} is the annual average energy consumption of any ambient controlled anti-condensation heater present in accordance with PS: IEC62552-3/2016, Part 3, Annex F.

$\Delta E_{\text{processing32C}}$ is the load processing efficiency (Wh/day) at an ambient temperature of 32 °C in accordance with PS: IEC62552-3/2016, Part 3, Annex G.

6.2 Comparative energy consumption (CEC)

The CEC shall not be less than the average PAEC. CEC shall be rounded to the nearest whole number.

6.3 Adjusted volume (Vadj)

The adjusted volume (Vadj) of a refrigerating appliance is calculated by summing the adjusted volume for each compartment as per equation below.

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

where

n is number of compartments in the refrigerating appliance

V_i is volume of compartment i, which is determined in accordance with PS: IEC 62552-3/2016, Annex H (litres).

K_{ci} is volume adjusted factor for compartment i as determined in accordance with the following equation.

$$K_{ci} = \frac{(T_{ka} - T_{ci})}{(T_{ka} - T_{tfl})}$$

where

T_{ka} is the ambient (test room) temperature at 32°C

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

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

The volume adjustment factors (K_{ci}) for each compartment type is specified in Table 2 below.

Table 2: Volume adjustment factor by compartment type

Compartment type	Target temperature (°C)	Volume adjustment factor (K_d)
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

[No. Ind/Gazette/Regulation/Ref/2403-001.]

DR. SARDAR MOHAZZAM,
Managing Director,
NEECA.