

UNITED ARAB EMIRATES STANDARD

UAE.S 5010-4:2021

**Labeling – Energy Efficiency Label for Electrical Appliances
Part 4: Electric Storage Water Heaters**

دولة الإمارات العربية المتحدة
UNITED ARAB EMIRATES

ICS: 75.020

ELECTRIC WATER HEATERS – FULL CERTIFICATION SCHEME

ISSUING DATE	
Technical Regulation	

Contents

Introduction.....	Error! Bookmark not defined.
1. Scope.....	3
2. Applicable Standards	3
3. Terms and Definitions	3
4. Product Requirements	4
5. Appliance Classification.....	4
6. Energy Efficiency Index Calculation	5
7. Annual Energy Consumption Calculation	7
8. Manufacturer Requirements.....	7
9. Product Certification	7
10. Violations and Penalties	Error! Bookmark not defined.
11. Liability and Disclaimer	Error! Bookmark not defined.

DRAFT

Labeling – Energy Efficiency Label for Electrical Appliances

Part 4: Electric Storage Water Heaters

1. Scope

This regulation establishes requirements for electric storage water heaters for household and similar purposes and intended for heating water below boiling temperature, their rated capacity being not more than 500 liters.

2. Applicable Standards

The following standard shall apply:

- 2.1. UAE.S IEC 60379:2013 1987 – Methods for measuring the performance of electric storage water heaters for household appliances
- 2.2. UAE.S IEC 60335-1: 2020 :
- 2.3. UAE.S IEC 60335-2-21: 2018 :

3. Terms and Definitions

For the purpose of this regulation, the following terms shall apply:

- 3.1. MOIAT – Ministry of Industry and Advance Technology , the national authority mandated to implement this regulation.
- 3.2. (ECAS) Emirates Conformity Assessment Scheme for Low Voltage Equipment (LVE)
- 3.3. • Rated water capacity: the water capacity (in liters) specified for the water heater and indicated on it by the manufacturer.
- 3.4. • Rated input: The electrical power (in watts or in kilowatts) specified for the water heater and indicated on it by the manufacturer.
- 3.5. • Stable loss per 24 hours: The energy consumed for a water-filled heater after it reaches stable conditions when it is connected to the electricity source during any 24-hour period without drawing water from the heater.
- 3.6. • Rated voltage: the voltage in volts (in the case of a three-phase source, the voltage between two phases) specified for the water heater and indicated on it by the manufacturer.

4. Product Requirements

Products covered by this regulation shall comply with the requirements stipulated under this section.

4.1. National Deviations

The following deviations shall be met by products covered by this regulation:

4.1.1. Voltage Rating: 220V-240V

4.1.2. Frequency Rating: 50Hz

4.1.3. Arabic Instruction Manual shall be provided along with the product.

4.2. Electrical Safety

This section gives reference to the requirements set by the Emirates Conformity Assessment Scheme (ECAS) for Low Voltage Equipment (LVE). Products covered by this Technical Regulation shall comply with the requirements set by the applicable standards reference in the ECAS for Low Voltage Equipment (LVE).

4.3. Energy Efficiency Label

The product shall be supplied with the energy efficiency label as per the prescribed design in this regulation. Products that are displayed in the market shall be affixed with the energy efficiency label.

The energy efficiency label shall be affixed on the packaging of the product without exemptions, as prescribed in Annex (A) of this regulation.

The energy efficiency label for products not intended for display may be provided or supplied along with the instruction manual.

All energy efficiency labels shall be printed with the energy efficiency serial number which is assigned

5. Appliance Classification

All electric storage water heaters covered by this regulation shall be classified into four (4) categories as per below descriptions:

Table 1: Appliance Classification

Class	Description
1	Unvented electric storage water heaters having a rated capacity not exceeding 30 liters
2	Open-outlet electric storage water heaters having a rated capacity not exceeding 30 liters
3	Horizontal tank type electric storage water heaters having a rated capacity 30 liters up to 500 liters
4	Vertical tank type electric storage water heaters having a rated capacity 30 liters up to 500 liters

6. Energy Efficiency Index Calculation

The following formula and factors shall apply in calculating the energy efficiency index of the product.

6.1. Energy Consumed (E_{cons})

$$E_{cons} = \frac{E_1}{t_1} \times 24$$

Where: E_1 – Energy consumed over t_1 duration > 48 hours

t_1 – Elapsed time where steady state condition is reached and measurement of E_1 is done

6.2. Mean Water Temperature (θ_M)

$$\theta_M = \frac{\theta_A + \theta_E}{2}$$

Where: θ_A – Mean water temperature after a thermostat cut-out

θ_E – Mean water temperature after thermostat cut-in

6.3. Standby Loss (Q_{pr})

$$Q_{pr} = \frac{45}{\theta_M - \theta_{amb}} \times E_{cons}$$

Table 2: Average Energy Consumption for Standby and Fixed Loss

Appliance Category	Average Energy Consumption (Standby Loss) (kWh/24h) $E_{av_{standby}}$	Average Energy Consumption (Fixed Loss) (kWh/24h) $E_{av_{fixed}}$
1 & 2	$0.13 + 0.0553V^{0.6}$	0.072
3	$0.75 + 0.008V$	0.12
4	$0.75 + 0.008V$	0.12

Note: V is the rated capacity in liters

6.4. Standard Energy Consumption (E_{std})

$$E_{std} = E_{av_{standby}} + E_{av_{fixed}}$$

Table 3: Local Factor

Appliance Category	Local Factor (kWh/24h) E_{loc}
1	0.2
2	0.1
3	0.3
4	0.3

6.5. Calculated Energy Consumption (E_{calc})

$$E_{calc} = Q_{pr} - E_{av_{fixed}} - E_{loc}$$

6.6. Energy Efficiency Index (I_e)

$$I_e = \frac{E_{calc}}{E_{std}} \times 100\%$$

Table 4: Energy Efficiency Index

Star Rating	Energy Efficiency Index (%) I_e
5	$I_e \leq 50$
4	$50 < I_e \leq 60$
3	$60 < I_e \leq 70$
2	$70 < I_e \leq 85$
1	$85 < I_e \leq 100$

7. Annual Energy Consumption Calculation

The annual energy consumption of the product shall be calculated using the formula below:

$$AEC = Q_{pr} \times 75$$

Note: An assumption of an annual standby hour of 1,800 hours.

8. Manufacturer Requirements

Manufacturers of the product shall have an effective implementation of a Quality Management System for production and control based on the latest edition of ISO 9001 standard.

9. Product Certification

The product(s) shall comply with the requirements of a Model H conformity assessment.