

# READINESS AND PREPARATORY SUPPORT

## ELECTRIC MOTORS MODEL REGULATION

Lebanon, *“Development of Energy Efficiency Standards and Labelling program for electric motors, transformers, washing machines and TVs in Lebanon”*

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### PRESENTED TO:



### PREPARED BY:

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International Copper Association  
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*List of abbreviations*

AC	Alternate current
CAR	Conformity Assessment Report
DC	Direct current supply
EU	European Union
Hz	Hertz
HS	Harmonized Standards
IEC	International Electrotechnical Commission
ISO	International Standards Organization
kV	Kilo volts
kVA	Kilo Volt amperes
LIBNOR	Lebanese Standard Institution
MV	Medium Voltage
NEMA	National Electrical Manufacturers Association
TENV	Totally enclosed non-ventilated
U4E	United for Efficiency
UNEP	United Nations Environment Programme

## Notes

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This Notes section shall be removed prior to the promulgation of this Technical Regulation!

"Ecodesign" is a general term covering different aspects of environmental design (energy, water, etc.) addressed by the framework regulations and the specific implementing technical regulations. It is therefore preferable to use this term (Ecodesign) in order to ensure consistency between all regulations on energy-related products.

The Regulation establishing a framework for the setting of Minimum Energy Performance (Ecodesign) Requirements for Energy-related Products is presented in the Overarching Policy Document (Annex 1). It will be promulgated before or at the same time as this Technical Regulation, as it is a Regulatory Framework on which this Technical Regulation is based.

In order for this Technical Regulation to be effective, the competent authority shall confirm or amend the following key information on the document:

- The proposed scope is Article 1.
- The proposed energy performance requirements in Article 3
- The proposed entry into force in Article 4.

## 0 Background

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This document is a technical regulation to determine the minimum energy performance standards for electric motors in Lebanon. This regulatory document is based on the U4E Energy Performance Requirements published by UNEP in July of 2019. The design of this regulation has been complemented with relevant elements of the European Ecodesign Commission Regulation (EC) No 640/2009 of 22 July 2009. The regulation has been adapted to Lebanon's needs to generate climate benefits.

# 1 Article 1 - Subject matter and scope

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## 1.1 Scope:

This Regulation applies to all single-speed electric induction motors that are manufactured in or imported into Lebanon and are either sold as standalone equipment or as a component of a motor-driven unit, and which meet the following criteria:

- are rated for performance and operating characteristics according to IEC 60034-1:2022 or the equivalent NEMA MG1 Standard; and
- have frame sizes according to IEC 60072-1:2022<sup>1</sup> or equivalent NEMA frame sizes; and
- are rated for operation on a three- phase sinusoidal voltage supply; and
- have a rated power from 0.75 kW to 375 kW; and
- have 2, 4, 6 or 8 poles; and
- have a rated voltage of 50 Volts and above, up to and including 1000 Volts; and
- have a rated frequency of 50 Hz or 60 Hz; and
- are capable of continuous operation at their rated power with a temperature rise within the limits of the specified insulation temperature class<sup>2</sup>; and
- are designed to operate in any ambient temperature within the range of -30°C to + 60°C<sup>3</sup>; and
- are designed to operate at any altitude up to 4000 m above mean sea level<sup>4</sup>.

This Regulation applies to induction motors with squirrel-cage rotors as well as with wound-rotors.

Motors which are rated for both fixed speed operation (i.e., directly online) and variable speed operation (e.g., through an inverter or converter), are within the scope of this Regulation, but shall bear the IE efficiency class (in accordance with IEC 60034-30-1:2014) for fixed speed operation only.

The motors within the scope of this Regulation fall within International Customs HS codes 850152 and 850153 (necessary, but not sufficient condition).

## 1.2 Exclusions

This regulation does not apply to:

- a. Motors other than induction motors;
- b. Induction motors that are rated for operation on a single-phase power supply;
- c. Induction motors that are mechanically or electrically integrated into the motor-driven unit to the extent that these are incapable of independent operation even if a temporary end shield or a drive end bearing is fitted;
- d. Motors rated for temperatures outside the range specified in clause 1.1 as these are of special construction, **this exclusion does not apply to smoke extraction motors with a temperature class of up to and including 300°C as they are covered by this Regulation;**

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<sup>1</sup> It is not necessary for the motors to have flanges, feet and/or shafts with mechanical dimensions conforming to IEC 60072-1:2022. Geared motors including those incorporating non-standard shafts and flanges are also covered by this regulation.

<sup>2</sup> Most motors covered by this Regulation are rated for duty type S1 (continuous duty), S3>80% and S6>80%. However, some motors that are rated for other duty cycles are still capable of continuous operation at their rated power and these motors are also covered.

<sup>3</sup> The rated efficiency and efficiency classes are based on 25 °C ambient temperature according to IEC 60034-2-1:2014.

<sup>4</sup> The rated efficiency and efficiency class are based on a rating for altitudes up to 1000 m above sea level.

- e. Motors specifically designed to operate wholly immersed in a liquid;
- f. Multi-speed motors, torque motors;
- g. Brake motor
- h. Totally enclosed non-ventilated (TENV) motors IC410; Motors with cooling methods other than IC0Ax, IC1Ax, IC2Ax, IC3Ax or IC4Ax (see IEC 60034-6:1991);
- i. Motors intended for use in explosive atmospheres and certified as “Ex eb” increased safety motors, as defined in IEC EN 60079-7:2015 (other explosion-protected motors certified as “Ex ec”, “Ex tb” or “Ex tc” are however included in the scope of this Regulation);
- j. Motors with an integrated brake which forms an integral part of the inner motor construction and can neither be removed nor supplied by a separate power source during the testing of the motor efficiency;
- k. Motors for special requirements of the driven machine beyond the requirements of the IEC 60034 series of standards (such as motors for heavy starting duty, special torque stiffness and/or breakdown torque characteristics, large number of start/stop cycles, very low rotor inertia);
- l. Motors for special characteristics of the grid supply beyond the requirements of the IEC 60034 series of standards (such as motors with limited starting current, increased tolerances of voltage and/or frequency);
- m. Motors that will be exported to other countries, provided that these meet with the alternative requirements of the importing countries, if any;
- n. Motors covered by International Customs HS codes other than 850152 and 850153.

## 2 Article 2 – Terms and Definitions

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The following definitions shall apply to this Regulation.

1. 'arithmetical mean' means the average of a set of numerical values, calculated by adding them together and dividing by the number of terms in the set.
2. 'Brake motor' means a motor equipped with an electro-mechanical brake unit operating directly on the motor shaft without couplings.
3. 'compliance' means conforming to a rule, such as a law, policy, specification or standard. Also, fulfilment by countries/businesses/individuals of emission reduction and reporting commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol.
4. 'Conformity Assessment Report' (CAR) means the documentation prepared by the manufacturer or importer of the electric motor which contains the compliance declaration, the evidence, and the test reports to demonstrate that the product is fully compliant with all applicable regulatory requirements.
5. 'Continuous duty operation' means the capability of an electric motor with an integrated cooling system to operate at nominal load without interruption below its rated maximum temperature rise.
6. 'Cooling' stands for a procedure by means of which heat resulting from losses occurring in a motor is given up to a primary coolant, which may be continuously replaced or may itself be cooled by a secondary coolant in a heat exchanger.
7. 'Direct efficiency determination' means a method by which the determination of efficiency is made by measuring the input power and the output power directly.
8. 'Duty' means the statement of the load(s) to which the motor is subjected, including, if applicable, starting, electric braking, no-load and rest and de-energised periods, and including their durations and sequence in time.
9. 'Duty type' means a continuous, short time or periodic duty, comprising one or more loads remaining constant for the duration specified, or a non-periodic duty in which load, and speed vary within the permissible operating range.
10. 'Efficiency' means the ratio of output power to input power expressed as a percentage.
11. 'Full load' means the load that causes a motor to operate at its rating.
12. 'Full load value' means a quantity value for a motor operating at full power, torque, current or speed.
13. 'IE Class' means the 'International Efficiency' classification of motors and other components of a motor system defined by the respective IEC Standards.
14. 'IEC Standard' means an international standard that is published by the International Electrotechnical Commission denoted by the letters "IEC" and identifying number and/or letters.
15. 'Indirect efficiency determination' means a method by which the determination of efficiency is made by measuring the input power or the output power and determining the total losses. Those losses are added to the output power, thus giving the input power, or subtracted from the input power, thus giving the output power.
16. 'Load' means all the values of the electrical and mechanical quantities that signify the demand made on a rotating machine by an electrical circuit or a mechanism at a given instant.

17. 'Losses' means the difference between the input power and the output power, comprising of various components viz. core losses, stator and rotor losses, friction and windage losses and stray load losses.
18. 'Minimum energy performance standard (MEPS)' means a mandatory minimum energy performance level that applies to all products sold in a market, whether imported or manufactured domestically.
19. 'Motor' means an electric single speed, three-phase 50 Hz or 50/60 Hz, squirrel cage or wound-rotors induction motor that:
  - has 2 to 8 poles,
  - has a rated voltage of  $U_N$  up to 1 000 V,
  - has a rated output  $P_N$  between 0,75 kW and 375 kW, and
  - is rated on the basis of continuous duty operation.
20. 'Motor-Driven Unit' includes the aggregate of the motor, elements for transmitting its motion such as a coupling, belt, gear, clutch, brake etc., the driven equipment such as a pump, fan, compressor, conveyor etc., and a soft-starter or electronic speed control device.
21. 'Nominal energy efficiency' of a motor design is a representative value that is less than or equal to the average full-load efficiency of a statistically significant population of motors of the same design.
22. 'Nominal minimum efficiency' ( $\eta$ ) means the efficiency at full rated load and voltage without tolerances.
23. 'Pole' means the total number of magnetic north and south poles produced by the rotating magnetic field of the motor. The number of poles determines the base speed of the motor.
24. 'Power factor' means the ratio of 'active' or 'real' power (i.e., useful power) to 'apparent' power drawn by a motor from the mains.
25. 'Rated output' means the value of the output included in the rating. For a motor it means the mechanical power available at the motor shaft under rated operating conditions. It is expressed in kilo-Watts (kW) in countries following the metric system, and in horsepower (hp) in other countries.
26. 'Rated value' means a quantity value assigned, generally by a manufacturer, for a specified operating condition of a motor. NOTE The rated voltage or voltage range is the rated voltage or voltage range between lines at the terminals.
27. 'Rating' means the set of rated values and operating conditions.
28. 'Registration verification' means a process of confirming that registered products meet the requirements of a programme's entry conditions.
29. 'Routine test' means a test to which each individual motor is subjected during or after manufacture to ascertain whether it complies with certain criteria.
30. 'Self-certification' means a practice of submitting information about one's product in a formal statement rather than being obliged to ask a third party to do so.
31. 'Single-speed motor' means a motor rated for 50 Hz and/or 60 Hz on-line operation.
32. 'SI unit' means any of the units adopted for international use under the Système International d'Unités.
33. 'Tolerance' means the permitted deviation between the declared value of a quantity and the measured value.

34. 'Type test' means a test of one or more motors made to a certain design to show that the design meets certain specifications.

## 3 Article - 3 Requirements

All electric induction motors in the scope of this Regulation as defined in Article 1, that are manufactured in, or imported into Lebanon, shall meet the minimum energy efficiency requirements of Article 3.1 according to the enforcement schedule specified in Article 4, the product information requirements of Article 3.2, and shall be assessed according to the compliance criteria and the referenced standards of Article 3.3.

### 3.1 Energy Performance Requirements

The nominal energy efficiency<sup>5</sup> of a motor included in the scope of this Regulation must not be less than the value specified in Table 1 and Table 2 for 50 Hz and 60 Hz induction motors, respectively, for the specified rated output power and number of poles, at full load and under rated operating conditions. For motors with a rated output power other than the values specified in Table 1, but within the range of 0.75 kW to 375 kW, the efficiency value determined in accordance with the interpolation method specified in clause 5.4.5 of IEC 60034-30-1:2014 shall apply.

The full-load energy efficiency of any individual motor, when tested at rated voltage and rated frequency in accordance with IEC 60034-2-1:2014, shall not be less than the nominal efficiency declared by the manufacturer in technical documentation as well as on the rating plate, after allowing for the tolerance on the total losses according to IEC 60034-1:2022.

The values in Tables 1 and 2 correspond to the International Energy Efficiency classes IE2 and IE3 as per the IEC 60034-30-1:2014 standard.

The efficiency figures for motor sizes below 0.75 kW and above 375 kW are included for information purposes only, as these are not covered by this Regulation.

Table 1: Nominal energy efficiency requirements for 50 Hz motors (IE2 and IE3).

Rated output power (kW) (50 Hz)	Level 1 (IE2)				Level 2 (IE3)			
	No of poles / Synchronous speed				No of poles / Synchronous speed			
	2-pole 3000 RPM	4-pole 1500 RPM	6-pole 1000 RPM	8-pole 750 RPM	2-pole 3000 RPM	4-pole 1500 RPM	6-pole 1000 RPM	8-pole 750 RPM
	Energy Efficiency (%)				Energy Efficiency (%)			
<b>0.12</b>	53.6	59.1	50.6	39.8	60,8	64.8	57.7	50.7
<b>0.18</b>	60.4	64.7	56.6	45.9	65.9	69.9	63.9	58.7
<b>0.2</b>	61.9	65.9	58.2	47.4	67.2	71.1	65.4	60.6
<b>0.25</b>	64.8	68.5	61.6	50.6	69.7	73.5	68.6	64.1
<b>0.37</b>	69.5	72.7	67.6	56.1	73.8	77.3	73.5	69.3
<b>0.4</b>	70.4	73.5	68.8	57.2	74.6	78	74.4	70.1
<b>0.55</b>	74.1	77.1	73.1	61.7	77.8	80.8	77.2	73
<b>0.75</b>	77.4	79.6	75.9	66.2	80.7	82.5	78.9	75
<b>1.1</b>	79.6	81.4	78.1	70.8	82.7	84.1	81	77.7
<b>1.5</b>	81.3	82.8	79.8	74.1	84.2	85.3	82.5	79.7
<b>2.2</b>	83.2	84.3	81.8	77.6	85.9	86.7	84.3	81.9

<sup>5</sup> The energy efficiency rating of a given motor design is not a unique value, but rather a band of values due to variations in materials, manufacturing processes and testing. Therefore, each motor design is assigned a nominal efficiency rating, which is a representative value that is less than or equal to the average full-load efficiency of a statistically significant population of motors of the given design. Individual motors are permitted a positive tolerance on total losses according to IEC 60034-1 viz. 15% for motors below 150 kW, and 10% for motors above 150 kW. This tolerance relates only to the verification of the measured parameters by the competent authorities and shall not be used by the manufacturer, or importer or authorised representative as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

3	84.6	85.5	83.3	80	87.1	87.7	85.6	83.5
4	85.8	86.6	84.6	81.9	88.1	88.6	86.8	84.8
5.5	87	87.7	86	83.8	89.2	89.6	88	86.2
7.5	88.1	88.7	87.2	85.3	90.1	90.4	89.1	87.3
11	89.4	89.8	88.7	86.9	91.2	91.4	90.3	88.6
15	90.3	90.6	89.7	88	91.9	92.1	91.2	89.6
18.5	90.9	91.2	90.4	88.6	92.4	92.6	91.7	90.1
22	91.3	91.6	90.9	89.1	92.7	93	92.2	90.6
30	92	92.3	91.7	89.8	93.3	93.6	92.9	91.3
37	92.5	92.7	92.2	90.3	93.7	93.9	93.3	91.8
45	92.9	93.1	92.7	90.7	94	94.2	93.7	92.2
55	93.2	93.5	93.1	91	94.3	94.6	94.1	92.5
75	93.8	94	93.7	91.6	94.7	95	94.6	93.1
90	94.1	94.2	94	91.9	95	95.2	94.9	93.4
110	94.3	94.5	94.3	92.3	95.2	95.4	95.1	93.7
132	94.6	94.7	94.6	92.6	95.4	95.6	95.4	94
160	94.8	94.9	94.8	93	95.6	95.8	95.6	94.3
200 up to 375	95	95.1	95	93.5	95.8	96	95.8	94.6
375 up to 1000*	95	95.1	95	93.5	95.8	96	95.8	94.6

Table 2: Nominal energy efficiency requirements for 60 Hz motors (IE2 and IE3).

Rated output power (kW) (50 Hz)	Level 1 (IE2)				Level 2 (IE3)			
	No of poles / Synchronous speed				No of poles / Synchronous speed			
	2-pole 3000 RPM	4-pole 1500 RPM	6-pole 1000 RPM	8-pole 750 RPM	2-pole 3000 RPM	4-pole 1500 RPM	6-pole 1000 RPM	8-pole 750 RPM
	Energy Efficiency (%)				Energy Efficiency (%)			
0.12	59.5	64	50.5	40	62	66	64	59.5
0.18	64	68	55	46	65.6	69.5	67.5	64
0.25	68	70	59.5	52	69.5	73.4	71.4	68
0.37	72	72	64	58	73.4	78.2	75.3	72
0.55	74	75.5	68	62	76.8	81.1	81.7	74
0.75	66	75.5	78	73	77	83.5	82.5	75.5
1.1	75.5	82.5	84	85.5	84	86.5	87.5	78.5
1.5	82.5	84	84	86.5	85.5	86.5	88.5	84
2.2	84	85.5	87.5	87.5	86.5	89.5	89.5	85.5
3.7	85.5	87.5	87.5	87.5	88.5	89.5	89.5	86.5
5.5	85.5	88.5	89.5	89.5	89.5	91.7	91	86.5
7.5	88.5	89.5	89.5	89.5	90.2	91.7	91	89.5
11	90.2	91	90.2	88.5	91	92.4	91.7	89.5
15	90.2	91	90.2	89.5	91	93	91.7	90.2
18.5	91	92.4	91.7	89.5	91.7	93.6	93	90.2
22	91	92.4	91.7	91	91.7	93.6	93	91.7
30	91.7	93	93	91	92.4	94.1	94.1	91.7
37	92.4	93	93	91.7	93	94.5	94.1	92.4
45	93	93.6	93.6	91.7	93.6	95	94.5	92.4
55	93	94.1	93.6	93	93.6	95.4	94.5	93.6

<b>75</b>	93.6	94.5	94.1	93	94.1	95.4	95	93.6
<b>90</b>	94.5	94.5	94.1	93.6	95	95.4	95	94.1
<b>110</b>	94.5	95	95	93.6	95	95.8	95.8	94.1
<b>150</b>	95	95	95	93.6	95.4	96.2	95.8	94.5
<b>185</b>	95.4	95	95	93.6	95.6	96.2	95.8	94.75
<b>185 up to 375</b>	95.4	95.4	95	93.6	95.8	96.2	95.8	95
<b>375 up to 1000*</b>	95.4	95.8	95	94.1	95.8	96.2	95.8	95

### 3.2 Product Information Requirements

Manufacturers shall provide the following information for the motors covered by this Regulation either on one or more rating plates, in accordance with IEC 60034-1:2022, in accompanying technical documentation and free access websites. Letter symbols for units and quantities shall be in accordance with IEC 60027-1:1992/AMD2:2005 and IEC 60027-4:2006.

If the manufacturer gives more information than specified below, this need not necessarily be marked on the rating plate(s).

- a. year of manufacture,
- b. efficiency class (IE code),
- c. nominal efficiency ( $\eta$ ) at 100%, 75 % and 50 % rated load and voltage ( $U_N$ ); rated efficiency class as specified in IEC 60034-30-1:2014 e.g., "IE3",

[note: these first three shall be durably marked on or near the rating plate of the motor]

- d. manufacturer's name,
- e. manufacturer's serial number, Manufacturer's machine code,
- f. number of phases, i.e., 3,
- g. number of poles
- h. number(s) of the rating and performance standard(s) which are applicable<sup>6</sup>,
- i. degree of protection (IP code) in accordance with IEC 60034-5:2020,
- j. thermal class and the limit of temperature rise,
- k. class(es) of rating of the machine if designed for other than rating for continuous running duty S1,
- l. rated power output (kW),
- m. rated voltage(s) or range of rated voltage (V),
- n. rated frequency (Hz),
- o. rated current(s) or range of rated current,
- p. rated speed(s) or range of rated speed.
- q. maximum safe operating speed if less than that specified in section 9.6 of IEC 60034-1:2022,
- r. rated power factor(s).
- s. rated open-circuit voltage between sliprings and the rated slip-ring current *for wound-rotor induction machines*,
- t. maximum ambient air temperature, if other than 40 °C,

<sup>6</sup> Two different rated values shall be indicated by X/Y and a range of rated values shall be indicated by X–Y (see IEC 61293:2019)

- u. minimum ambient air temperature if other than -15 °C,
- v. the altitude for which the motor is designed (if exceeding 1000 m above sea-level)
- w. the approximate total mass of the motor, if exceeding 30 kg,
- x. the direction of rotation indicated by an arrow, For motors suitable for operation in only one direction of rotation - This arrow need not be on the rating plate, but it shall be easily visible,
- y. the connecting instructions in accordance with IEC 60034-8:2007/AMD1:2014 by means of a diagram or text located near the terminals,
- z. information relevant for disassembly, recycling or disposal at end-of-life, and
- aa. information on the range of operating conditions for which the motor is specifically designed:
  - a. altitudes above sea-level;
  - b. ambient air temperatures, including for motors with air cooling;
  - c. water coolant temperature at the inlet to the product;
  - d. maximum operating temperature;
  - e. potentially explosive atmospheres.

### **3.3 Reference test standards, compliance certification, surveillance testing**

This Regulation specifies Standard IEC 60034-2-1:2014; Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles); subclause 6.1.3, Method 2-1-1B – Summation of losses, additional load losses according to the method of residual loss as the test method for determining motor energy efficiency.

The motor efficiency classes (IE codes) is determined in accordance with IEC 60034-30-1:2014 Rotating electrical machines - Part 30-1: Efficiency classes of line operated AC motors (IE code).

#### **3.3.1 Test Certificates**

Test certificates are accepted from test laboratories that have been accredited by their respective national accreditation bodies or by an international accreditation body. These may be either manufacturer's in-house laboratories or third-party laboratories.

#### **3.3.2 Registration**

Importers and manufacturers of motors and motor-driven units, equipment or systems covered by this Regulation must register themselves with the designated authority, following the prescribed procedure, accompanied by the required documents and information and the applicable fees.

Motor designs covered by this Regulation must be registered with the designated authority through the submission of the full product information as required under Article 3.2 together with test certificates as required by the Test Certificates clause (clause 3.3.1).

#### **3.3.3 Surveillance testing**

In order to verify the claimed energy efficiency of a motor design covered by this Regulation, the designated market surveillance authority shall test any one single motor to be picked at any time directly from the market, at its sole discretion, according to the test method prescribed in this Regulation.

The motor design shall be considered to comply with this Regulation, if the measured full-load efficiency of the motor at rated voltage and rated frequency is not less than the nominal efficiency according to Article 3.1 and the enforcement schedule set in Article 4, after allowing for the tolerance on the total losses according to IEC 60034-1:2022 i.e., 15% on the power range 0.75 – 150 kW and 10% on the power range 150 – 375 kW.

If the selected motor fails this test, the market surveillance authority shall randomly test three additional motors of the same design except for motors that are produced in lower quantities than five per year.

The motor design shall be considered to comply with the provisions set-out in this Regulation, if the arithmetic average of the measured full-load efficiency of the three test motors at rated voltage and rated frequency is not less than the nominal efficiency according to Article 3.1 and enforcement schedule set in Article 4, after allowing for the tolerance on the total losses according to IEC 60034-1 i.e., 15 % on the power range 0.75 – 150 kW and 10 % on the power range 150 – 375 kW.

If this result is not achieved, the motor design shall be considered to be not in compliance with this Regulation.

If a decision of non-compliance is taken, the market surveillance authority may inform other government authorities to take consequential enforcement actions against the manufacturer and / or importer, as well as inform other authorities in the region of the decision being taken to help protect against the widespread sale of the same model.

## 4 Entry Into Force

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The energy performance requirements set out in Article 3 shall take effect as follows:

- a. Level 1 from 1 January 2025
- b. Level 2 from 1 January 2030

All other requirements set out in Article 3 shall take effect from 1 January 2025.

## 5 Declaration of Conformity

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Compliance with the requirements of this Regulation shall be demonstrated in accordance with the provisions of Article 3 according to the enforcement schedule set-out in Article 4. Suppliers (i.e., importers and manufacturers) shall provide the information and technical documentation necessary for the market surveillance authority to assess conformity and verify compliance and any additional optional claims. This information and technical documentation can be provided by the supplier as a Conformity Assessment Report (CAR) and/or entered into the relevant product registration database or supplied in any other format as reasonably determined by the market surveillance authority. The conformity assessment information and documentation should:

- a. demonstrate that the product model fulfils the requirements of this Regulation;
- b. provide any other information required to be present in the technical documentation file;
- c. specify the reference settings and conditions in which the product complies with this Regulation.

The information shall be submitted to the designated authority by the supplier for review prior to placing the product on the market. If the CAR or application for registration for the designated model is approved, which is confirmed by written correspondence from the designated authority and/or listing of the product on the relevant product registration system, the model may be placed on the market. If a CAR or application for registration is rejected, a written explanation shall be provided to the submitter. All aspects identified in the written explanation must be addressed in any revised CAR or application for registration. Until the CAR or application for registration is approved, the product is ineligible for placement on the market. The duration of product CAR or registration validity shall be as reasonably determined by the market surveillance authority. The supplier is obliged to check and update product conformity information, including informing the market surveillance authority of pertinent information as defined by the authority related to product compliance without undue delay.

## 6 Market Surveillance and Enforcement

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The designated authority responsible for implementing this Regulation shall develop or designate an appropriate programme or programmes to check compliance with this standard and to monitor the market for noncompliance. The programme(s) shall include details on sample size, lab accreditation requirements (to international standards such as ISO/IEC 17025 certification or equivalent), and a redress process that manufacturers or their authorised representatives can utilize if, following surveillance testing, their product is found to be out of compliance.

The designated authority will be responsible for enforcement activities in Lebanon. The designated authority shall establish written policies that clearly spell out its authority, procedures, penalties including the publishing of test results and details of non-compliant suppliers. All testing carried out for compliance and for market surveillance testing purposes shall be in accordance with the measurement and calculation methods set out in this Regulation.

Any person, persons or firm manufacturing, importing, storing for sale, supplying, selling, or distributing electric induction motors in the scope of this Regulation, which do not meet the specified minimum energy performance requirements after the date of entry into force of this Regulation shall be liable for penal actions including, but not limited to warnings, sanctions, fines, penalties, public naming, delisting etc. as may be determined by the designated authority.

An exception shall be allowed for motors which have been placed on the market (i.e., supplied by a manufacturer or importer for distribution and sale) prior to the entry into force of this Regulation. Existing stocks of such motors in the distribution chain may continue to be sold even after the entry into force of this Regulation, up to a maximum period of two years or until the stocks of such motors are exhausted, whichever is earlier.

Further, any person, other than an end-user, in possession of an electric induction motor in the scope of this Regulation after the date of entry into force of this Regulation, that does not meet the specified minimum energy performance requirements shall ensure that it is rendered unusable and dispose of it as scrap within three months from the date that the nonconformance is first detected.

## 7 Revision

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This Regulation shall be reviewed after not more than 5 years after its entry into force, so as to take into account technological progress related to motors and drives, to address any unforeseen loopholes being exploited and any other relevant matters. It is recommended that any subsequent review or revision to this Regulation take into consideration the following topics:

- a. setting more stringent energy efficiency requirements for the motors within its current scope (e.g., reaching IE4);
- b. extending the size range of induction motors to 1000 kW on the upper side;
- c. extending the size range of induction motors to 0.12 kW on the lower side (including single-phase motors);
- d. extending the coverage to motors for use with variable-speed drives;
- e. combining this regulation with other motor-related regulations;
- f. extending the scope to motor-driven units viz. pumps, fans and compressors;
- g. include resource efficiency, re-use and recycling and the level of measurement uncertainty.