TECHNICAL REGULATION ON ECODESIGN REQUIREMENTS FOR ELECTRIC MOTORS NO (XXX)FOR THE YEAR 2012, ISSUED IN ACCORDANCE TO ARTICLE (XXX) AND ARTICLE (XXX) OF STANDARDS AND METROLOGY LAW NO 22/2000

Article 1:
This Technical Regulation shall be referred to as the "Technical Regulation on ecodesign requirements for electric motors, No. ….".

Article 2:
This Technical Regulation represents an implementing Technical Regulation to Technical Regulation on ecodesign requirements for energy related products No. … (hereinafter: Framework Technical Regulation), both of which shall be used to establish the eco-design requirements for electric motors.

Section 1
Definitions

Article 3:
In addition to the definitions laid down in Article 2 of the Framework Technical Regulation, the following definitions shall apply for the purpose of this implementing Technical Regulation:
3-1 Motor: an electric single speed, three-phase 50 Hz or 50/60 Hz, squirrel cage induction motor that:

- has 2 to 6 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,
-is rated on the basis of continuous duty operation.

3-2 Variable Speed Drive: an electronic power converter that continuously adapts the electrical power supplied to the electric motor in order to control the mechanical power output of the motor according to the torque-speed characteristic of the load (being driven by the motor), by adjusting the three-phase 50 Hz power supply to a variable frequency and voltage supplied to the motor.
3-3 Squirrel cage motor: an electric motor with no brushes, commutators, slip rings or electrical connections to the rotor.
3-4 Phase: the type of configuration of the mains electrical supply.
3-5 Pole: 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.
3-6 Continuous duty operation: the capability of an electric motor with an integrated cooling system to operate at nominal load without interruption below its rated maximum temperature rise.
3-7 Brake motor: a motor equipped with an electromechanical brake unit operating directly on the motor shaft without couplings.

Section 2
Subject matter and scope

Article 4:
4-1 This implementing Technical Regulation establishes ecodesign requirements for placing on the market and for putting into service of motors, including where integrated in other products.
4-2 This implementing Technical Regulation shall not apply to:

(a) Motors designed to operate wholly immersed in a liquid;
(b) Motors completely integrated into a product (for example gear, pump, fan or compressor) of which the energy performance cannot be tested independently from the product;
(c) Motors specifically designed to operate:
(i) at altitudes exceeding 1 000 metres above sea-level;
(ii) where ambient air temperatures exceed 40 °C;
(iii) in maximum operating temperature above 400 °C;
(iv) where ambient air temperatures are less than – 15 °C for any motor or less than 0 °C for a motor with air cooling;
(v) where the water coolant temperature at the inlet to a product is less than 5 °C or exceeding 25 °C;
(vi) in potentially explosive atmospheres as defined in rules on potentially explosive atmospheres
(d) Brake motors;

Except as regards the information requirements of Annex A, points 2-3 to 2-6 and 2-12.

Section 3
Requirements, conformity assessment and market surveillance

Article 5: Ecodesign requirements

5-1 The ecodesign requirements for motors are set out in Annex A.
5-2 Each ecodesign requirement shall apply in accordance with the following timetable:
5-2-1 From 1 January 2014:
All motors shall not be less efficient than the IE2 efficiency level, as defined in Annex A, point 1;
5-2-2 From 1 January 2015:
All motors with a rated output of 7,5-375 kW shall not be less efficient than the IE3 efficiency level, as defined in Annex A, point 1, or meet the IE2 efficiency level, as defined in Annex A, point 1, and be equipped with a variable speed drive;
5-2-3 From 1 January 2017:
All motors with a rated output of 0,75-375 kW shall not be less efficient than the IE3 efficiency level, as defined in Annex A, point 1, or meet the IE2 efficiency level, as defined in Annex A, point 1, and be equipped with a variable speed drive.
5-3 The product information requirements on motors are as set out in Annex A. Compliance with ecodesign requirements shall be measured and calculated in accordance with requirements set out in Annex B.

Article 6: Conformity assessment

The conformity assessment procedure referred to in Article 10 of the Framework Technical Regulation shall be the internal design control system set out in Annex B in the Framework Technical Regulation.

Article 7: Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 15 of the Framework Technical Regulation, the Organization shall apply the verification procedure set out in Annex C to this implementing Technical Regulation.

Article 8: Indicative Benchmarks

The indicative benchmarks for the best-performing motors currently available on the market are identified in Annex D.

Section 4
Related documents

Article 9

9-1 This Technical Regulation represents transposition of EU Commission Regulation 640/2009 on ecodesign requirements for electric motors.
9-2 Technical Regulation on the eco-design requirements for energy related products, No. ...
9-3 Jordan Standards and Metrology Law, No. 22/2000.
9-4 Instructions on market surveillance, No. ... .

Section 5
Entry into force

Article 10:
This Technical Regulation shall enter into force on 1/1/2014.

ANNEX A

ECODESIGN REQUIREMENTS FOR MOTORS

1. Motor Efficiency Requirements

The nominal minimum efficiency requirements for motors are set out in Tables 1 and 2.

Table 1

Nominal minimum efficiencies (**η**) for IE2 efficiency level (50 Hz)

Rated output power (kW)	Number of poles		
	2	4	6
0,75	77,4	79,6	75,9
1,1	79,6	81,4	78,1
1,5	81,3	82,8	79,8
2,2	83,2	84,3	81,8
3	84,6	85,5	83,3
4	85,8	86,6	84,6
5,5	87,0	87,7	86,0
7,5	88,1	88,7	87,2
11	89,4	89,8	88,7
15	90,3	90,6	89,7
18,5	90,9	91,2	90,4
22	91,3	91,6	90,9
30	92,0	92,3	91,7
37	92,5	92,7	92,2
45	92,9	93,1	92,7
55	93,2	93,5	93,1
75	93,8	94,0	93,7
90	94,1	94,2	94,0
110	94,3	94,5	94,3
132	94,6	94,7	94,6
160	94,8	94,9	94,8
200 up to 375	95,0	95,1	95,0

Table 2
Nominal minimum efficiencies (**η**) for IE3 efficiency level (50 Hz)

Rated output power (kW)	Number of poles		
	2	4	6
0,75	80,7	82,5	78,9
1,1	82,7	84,1	81,0
1,5	84,2	85,3	82,5
2,2	85,9	86,7	84,3
3	87,1	87,7	85,6
4	88,1	88,6	86,8
5,5	89,2	89,6	88,0
7,5	90,1	90,4	89,1
11	91,2	91,4	90,3
15	91,9	92,1	91,2
18,5	92,4	92,6	91,7
22	92,7	93,0	92,2
30	93,3	93,6	92,9
37	93,7	93,9	93,3
45	94,0	94,2	93,7
55	94,3	94,6	94,1
75	94,7	95,0	94,6
90	95,0	95,2	94,9
110	95,2	95,4	95,1
132	95,4	95,6	95,4
160	95,6	95,8	95,6
200 up to 375	95,8	96,0	95,8

2. Product Information Requirements on Motors

The information on motors set out in points 1 to 12 shall be visibly displayed on:

(a) the technical documentation of motors;

(b) the technical documentation of products in which motors are incorporated;

(c) free access websites of manufacturers of motors;

(d) free access websites of manufacturers of products in which motors are incorporated.

As regards to the technical documentation, the information must be provided in the order as presented in points 1 to 12. The exact wording used in the list does not need to be repeated. It may be displayed using graphs, figures or symbols rather than text.

1. nominal efficiency (η) at the full, 75 % and 50 % rated load and voltage (U_N);

2. efficiency level: 'IE2' or 'IE3';

3. the year of manufacture;

4. manufacturer's name or trade mark, commercial registration number and place of manufacturer;

5. product's model number;

6. number of poles of the motor;

7. the rated power output(s) or range of rated power output (kW);

8. the rated input frequency(s) of the motor (Hz);

9. the rated voltage(s) or range of rated voltage (V);

10. the rated speed(s) or range of rated speed (rpm);

11. information relevant for disassembly, recycling or disposal at end-of-life;

12. information on the range of operating conditions for which the motor is specifically designed:
(i) altitudes above sea-level;
(ii) ambient air temperatures, including for motors with air cooling;
(iii) water coolant temperature at the inlet to the product;
(iv) maximum operating temperature;
(v) potentially explosive atmospheres.

The information referred to in points 1, 2 and 3 shall be durably marked on or near the rating plate of the motor.

The information listed in points 1 to 12 does not need to be published on motor manufacturer's free access website for tailor-made motors with special mechanical and electrical design manufactured on the basis of client request. Information on the mandatory requirement to equip motors, which do not meet the IE3 efficiency level with a variable speed drive, shall be visibly displayed on the rating plate, technical documentation of the motor:

(a) from 1 January 2015 for motors with a rated output of 7,5-375 kW;

(b) from 1 January 2017 for motors with a rated output of 0,75-375 kW.

Manufacturers shall provide information in the technical documentation on any specific precautions that must be taken when motors are assembled, installed, maintained or used with variable speed drives, including information on how to minimise electrical and magnetic fields from variable speed drives.

3. Definitions for the purposes of Annex A

1. Nominal minimum efficiency (**η**): the efficiency at full rated load and voltage without tolerances.

2. Tolerance: the maximum allowable variation in test measurement result of any given motor compared to the declared value on the rating plate or in the technical documentation.

ANNEX B
MEASUREMENTS AND CALCULATIONS

For the purposes of compliance and verification of compliance with the requirements of this implementing Technical Regulation, measurements and calculations shall be made using a reliable, accurate and reproducible method, which takes into account the generally recognised state-of-the-art methods, and whose results are deemed to be of low uncertainty, including methods set out in Jordanian standards adopting EU documents, the reference numbers of which have been published for that purpose in the Official gazette. They shall fulfil all of the following technical parameters.

The energy efficiency is the ratio of mechanical output power to the electrical input power.

The efficiency level of the motor, as specified in Annex A, shall be determined at rated output power (P_N), rated voltage (U_N), and rated frequency (f_N).

The difference between the output mechanical power and the input electrical power is due to losses occurring in the motor.

The determination of total losses shall be carried out by one of the following methods:

— measurement of total losses, or

— determination of separate losses for summation.

ANNEX C
VERIFICATION PROCEDURE

When performing the market surveillance checks referred to in Article 15 of the Framework Technical Regulation, the Organization shall apply the following verification procedure for the requirements set out in Annex A.

1. The Organization shall test one single unit.

2. The model shall be considered to comply with the provisions set out in this Implementing Technical Regulation, if in the nominal motor efficiency (η), the losses (1-η) do not vary from the values set out in Annex I by more than 15 % on power range 0,75-150 kW and 10 % on power range > 150-375 kW.

3. If the result referred to in point 2 is not achieved the market surveillance authority shall randomly test three additional units, except for motors that are produced in lower quantities than five per year.

4. The same model shall be considered to comply with the provisions set out in this Implementing Technical Regulation, if in the average of the nominal efficiency (η), the losses (1-η) of the three units referred to in point 3 do not vary from the values set out in Annex A by more than 15 % on power range 0,75 to 150 kW and 10 % on power range > 150-375 kW.

5. If the results referred to in point 4 are not achieved, the model shall be considered not to comply with this Implementing Technical Regulation.

For the purposes of checking conformity with the requirements of this implementing Technical Regulation, the Organization shall apply the procedure referred to in Annex B and reliable, accurate and reproducible measurement methods, which take into account the generally recognised state of the art, including methods set in Jordanian standards adopting EU documents, the reference numbers of which have been published for that purpose in the Official Gazette.

ANNEX D

INDICATIVE BENCHMARKS REFERRED TO IN ARTICLE 8

At the time of adoption of this implementing Technical Regulation, the best available technology on the market for motors was identified as the IE3 level, or an IE3 motor equipped with a variable speed drive, as defined in Annex A.