Global MEPS
for Low Voltage Motors

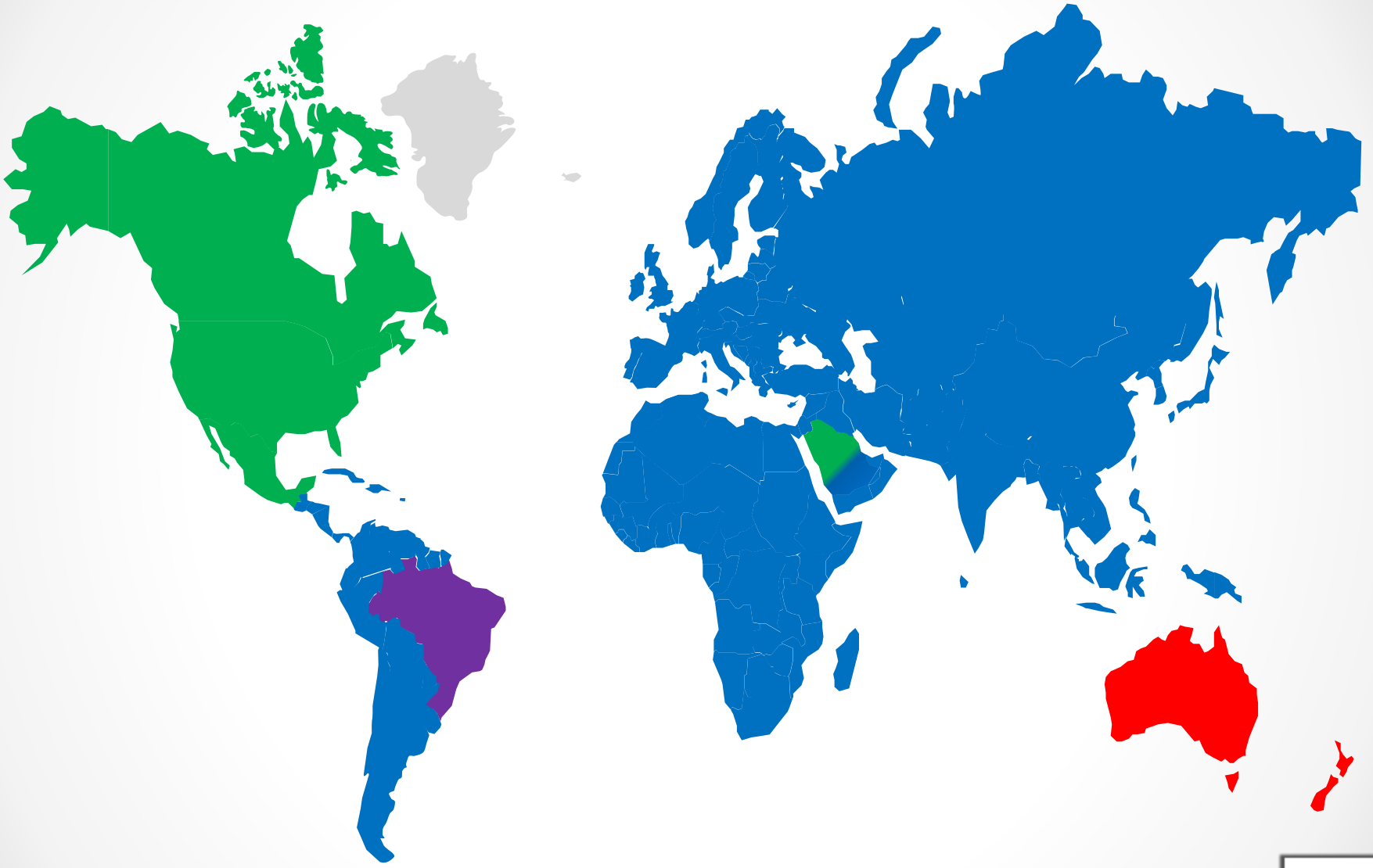
Rev: 10 – Sep 2017

Worldwide Standards Overview

Why is important to know and understand local efficiency regulations?

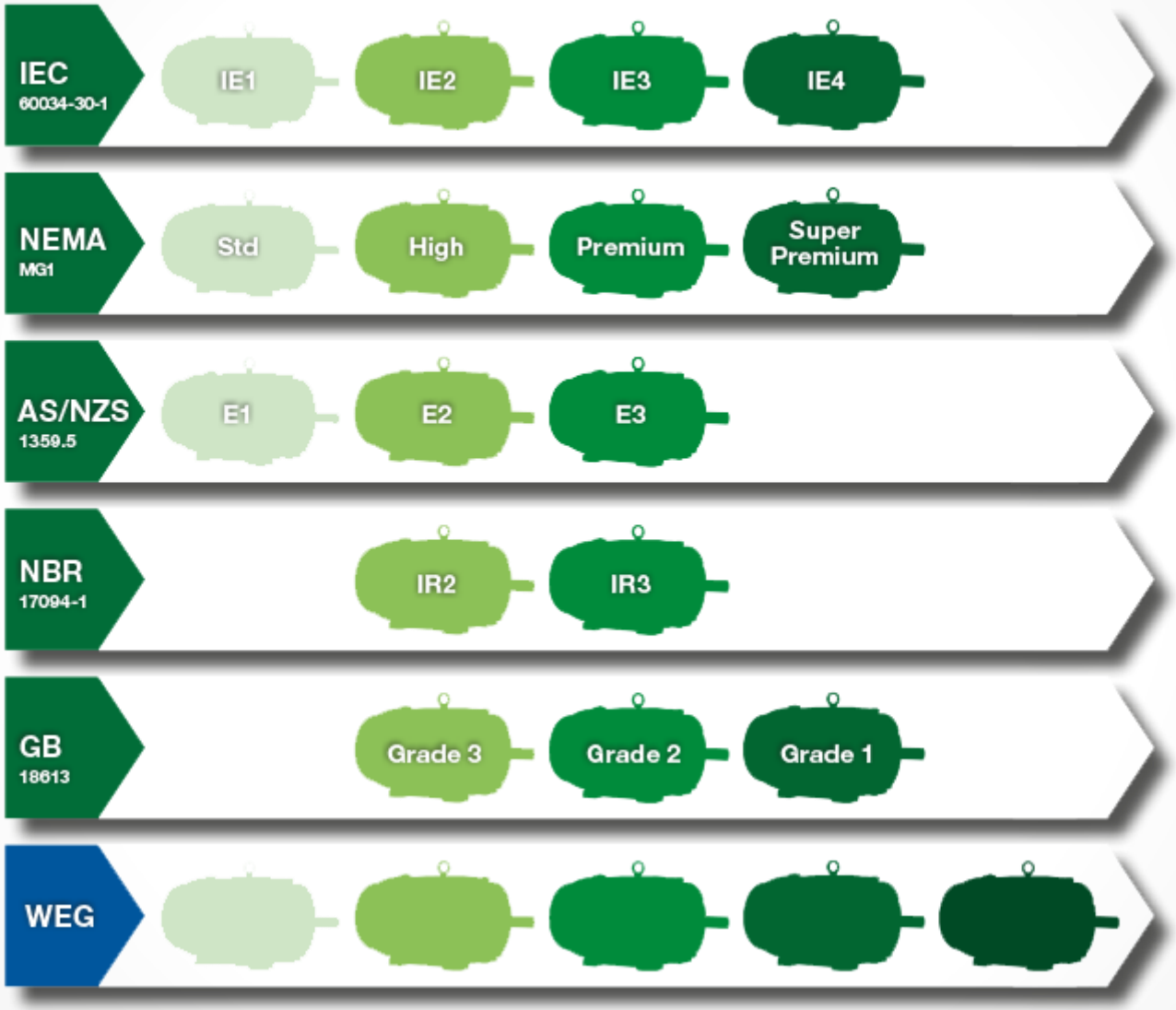
- Understand OEMs and end customers needs;
- Be a technical reference about efficiency regulations and get customer's trustworthy by giving correct support;
- Avoid non compliance efficiency level on the end of the sales process;
- Find the optimal point between stock volume and motor flexibility;
- Be aware and ready to react during shifting of efficiency levels having the right motors in stock and avoiding stock of outdated motors.

Main Standards Worldwide

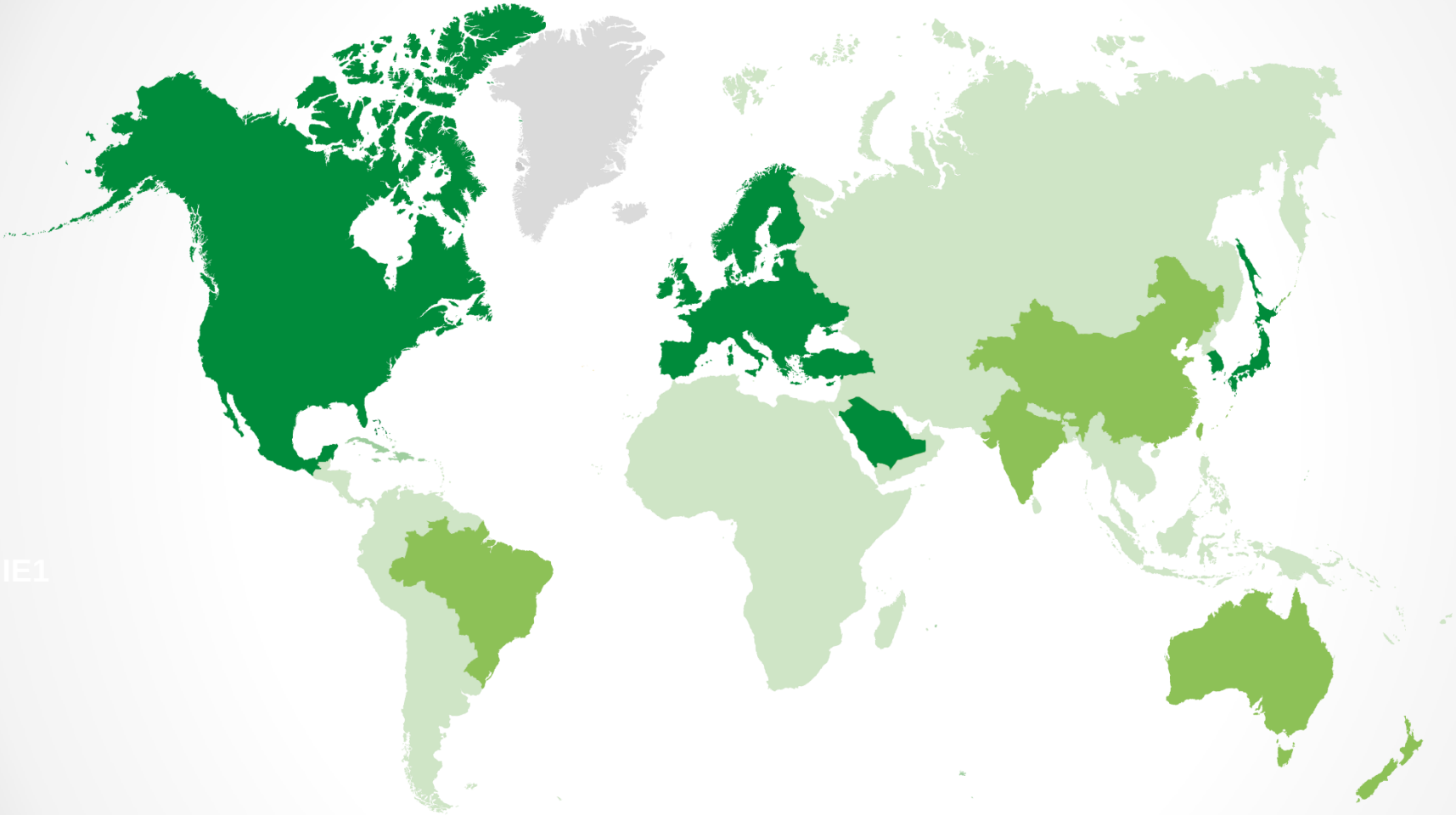


Frequency Worldwide

Efficiency Grades



Mandatory Efficiency Regulations
Worldwide Overwiew



WEG

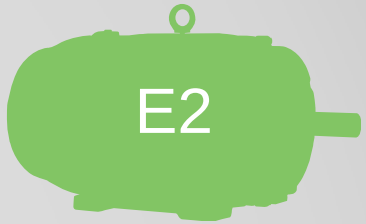
Australia & New Zealand

GEMS Act of 2012
AS/NZS 1359.5 : 2004

Applicable to:
- Ratings from 0.73 to 185 kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 50 Hz
- Voltage up to 1100 V

Not applicable to:
- 2 speed motors
- Dedicated VFD design (not suitable for DOL)
- Intermittent duty short duty cycles
- Integrated design with driven machine (in exception of TEAO that is included)
- Motors designed to operate wholly immersed in a liquid
- Torque motors
- Motors for re-export

Requirements



- Efficiency level minimum E2

  or E3 as per AS/NZS 1359.5
- Efficiency level shall be detailed on motor nameplate
- Motor design shall be registered

Brazil

Interministerial Decree nº 553/2005
NBR 17094-1:2013

Applicable to:

- Motors with 2, 4 poles up to 250 HP
- Motors with 6 poles up to 200 HP
- Motors with 8 poles up to 150 HP
- Frequency: 60 Hz (or 50 Hz operating at 60 Hz)
- Voltage up to 1000 V
- Closed and opened enclosures
- Duty cycle S1 or S3 (ED higher or equal to 80%)
- Starting torque as per design N, H, NY or HY (or NEMA equivalent)

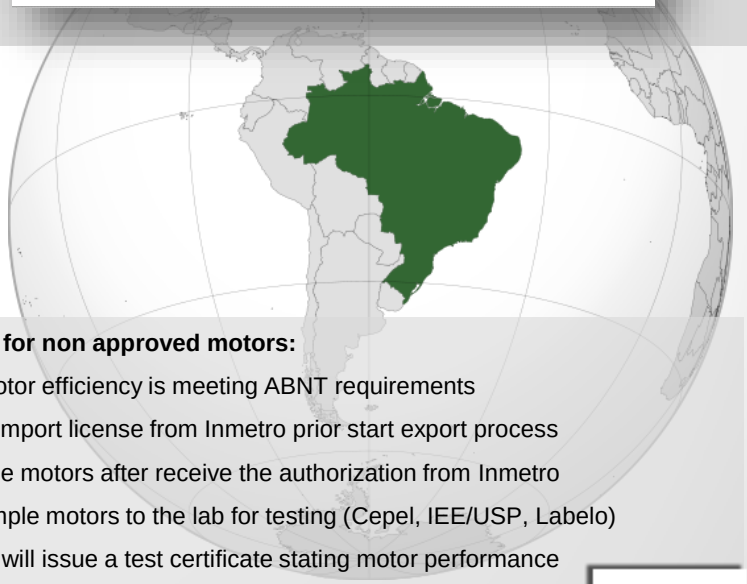
Not applicable to:

- Dedicated VFD design (not suitable for DOL)
- Explosion proof (Ex d / Ex de)
- Increased safety (Exe)
- Water cooled motors
- Motors designed to operate wholly immersed in a liquid

European electrical design is not registered on Inmetro!

Requirements

Motors without this marking will not be allowed through Brazilian customs!



Procedure for non approved motors:

- Check if motor efficiency is meeting ABNT requirements
- Ask for an import license from Inmetro prior start export process
- Dispatch the motors after receive the authorization from Inmetro
- Submit sample motors to the lab for testing (Cepel, IEE/USP, Labelo)
- Laboratory will issue a test certificate stating motor performance
- After evlauate the test certificate Inmetro releases motors license
- More information at www.inmetro.gov.br (Portaria 488)

Chile

NCh 3086 of 2008
IEC60034-30-1

Applicable to:

- Ratings from 0.75 to 7,5 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 Hz
- Voltage up to 690 V

Not applicable to:

- Brake Motors
- Dedicated VFD design (not for DOL)

Requirements

IE1

Motors held in stock by distributors must be certified for the Energy label according PE nº 7/01/2.

China

GB 18613-2012

Applicable to:

- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 or 50/60 Hz
- Voltage up to 1000 V
- Safe and Hazardous Area
- Torque design N
- TEFC motors
- Increased safety motors (Exe)

Not applicable to:

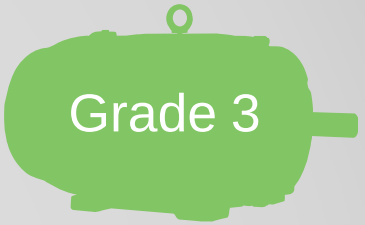
- Motors completely integrated into a product
- Smoke extraction motors and motors for textile industry
- Conical rotor motors for electric hoist and construction machinery
- Motors with electro-magnetic braking inside
- Motors with a duty type other than S1 or S3 with a rated cyclic duration factor of 80% or higher
- Wound-rotor induction motors
- Two/Multiple winding motors

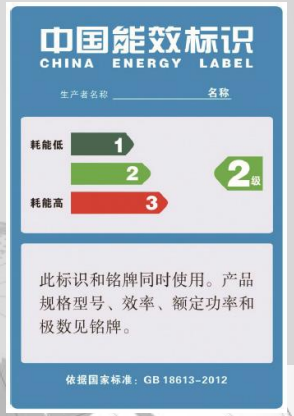
Requirements

Motors without this label will not be allowed through Chinese customs.

Nameplate shall record:

- Name of manufacturer
- The criteria: GB 18613-2012
- Efficiency values for 100% load





Colombia

Resolución nº 4 1012:2015

Applicable to:

Single Phase motors:

- Ratings from 0.18 to 1,5 kW
- Motors with 2, 4 and 6 poles
- Frequency: 60 Hz
- Voltage up to 240 V
- Enclosure ODP and TEFC

Three Phase motors:

- Ratings from 0.18 to 373 kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 60 Hz
- Voltage up to 600 V
- Enclosure ODP and TEFC

Note: Planned shifts for three-phase motors: IE1 in August 2017, IE2 in August 2018, IE3 for 7,5-373 kW in August 2020 and IE3 for 0,75-373 kW in August 2021.

Requirements

Motors without this label will not be allowed through Colombian customs.

1ph > 45%

3ph > 50%

Europe & Switzerland

EC 640/2009 &
EU 4/2014 IEC
60034-30-1

SR 730.01
IEC 60034-30-1

Requirements

Nameplate shall detail :

- IE code (IE3)
- Efficiency values for 50, 75 and 100% load (not mandatory for small motors)
- CE mark
- IE2 motors fed by VFD are permitted but must be labelled for exclusive VFD operation

Applicable to:

- Motors 2, 4 and 6 poles
- Ratings from 0.75 to 375kW
- Frequency: 50, 60 and 50/60Hz
- Voltage up to 1000V

Not applicable to:

- 2 speed motors
- Intermittent duty
- Motors wholly immersed in a liquid
- Motors completely integrated into a product
- Altitude higher than 4000 masl
- Ambient temperature below -30 ºC or above 60 ºC
- Motors specified to operate exclusively above 400 ºC
- Motors for explosive atmospheres
- Brake motors

Japan

JIS C 4213:2014

Requirements

Importer must provide a self declaration for Efficiency level

IE3 (200/400 V 50 Hz)
IE3 (220/440 V 60 Hz)
IE2 JIS (200/400 V 60 Hz)

Applicable to:

- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- 200/400 V (50 or 60 Hz)
- 220/440 V (60 Hz)

Not applicable to:

- Explosion proof motors
- Delta-star starting
- Marine motors
- Motors wholly immersed in a liquid
- High-slip motors
- Ambient temperature below -20 ºC
- Dedicated VFD design (not suitable for DOL) and with Forced ventilation.

Saudi Arabia

SASO IEC 60034-30:2013

Requirements

Nameplate shall detail :

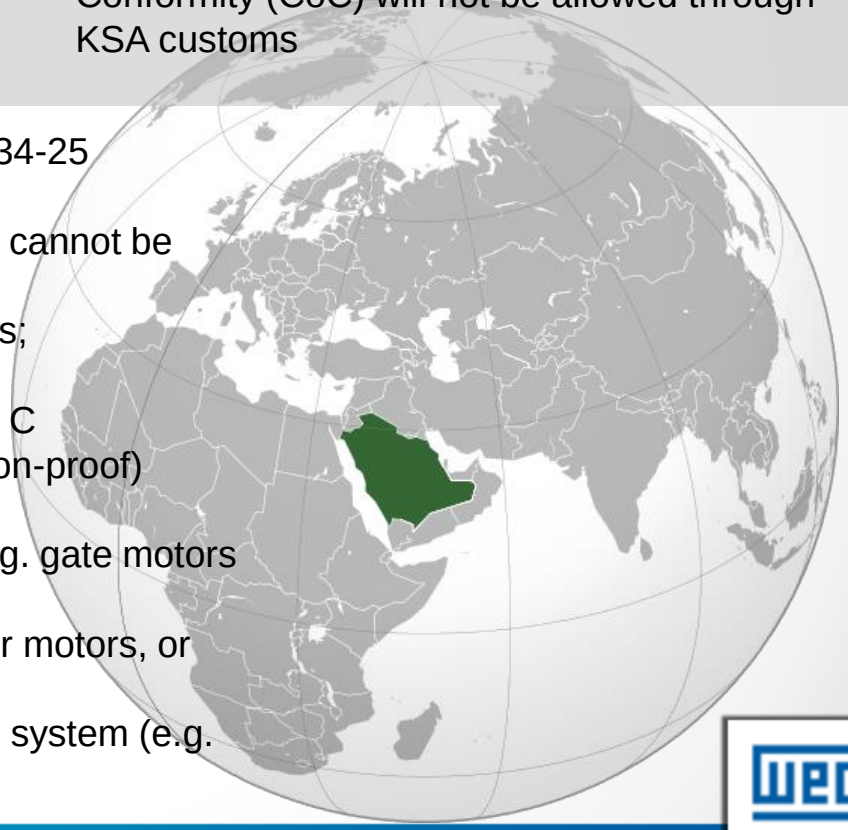
- IE code (IE3)
- Efficiency values at 100% load
- Motors without a SASO Certification of Conformity (CoC) will not be allowed through KSA customs

Applicable to:

- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 60 Hz
- Voltage up to 1000 V
- Duty cycle S1 or S3 (ED higher or equal to 80%)

Not applicable to:

- Motors solely for converter operation per IEC 60034-25
- 2-speed motors
- Motors completely integrated into a product which cannot be independently tested
- Brake motors, Gear Motors & Wound Rotor Motors;
- Motors specifically designed to operate:
- In maximum operating temperatures above 400 ° C
- In potentially explosive atmospheres (e.g. explosion-proof)
- Wholly immersed in a liquid
- Torque motors (corresponding to IEC design H, e.g. gate motors & crane motors)
- With cooling from external equipment (e.g. air over motors, or liquid cooling)
- In an enclosed container and part of an integrated system (e.g. canned motor)



North America

EEA
C390-10

NOM-016-
ENER-2010

EISA 2014
NEMA MG-1
DOE 10 CFR Part 431

Requirements

Premium

- Efficiency level shall be as per NEMA MG1 NEMA Premium ®
- Efficiency level shall be detailed on motor nameplate
- Motor shall be registered at Department of Energy (DOE)
- DOE registration number shall be printed on nameplate (WEG: CC029A)

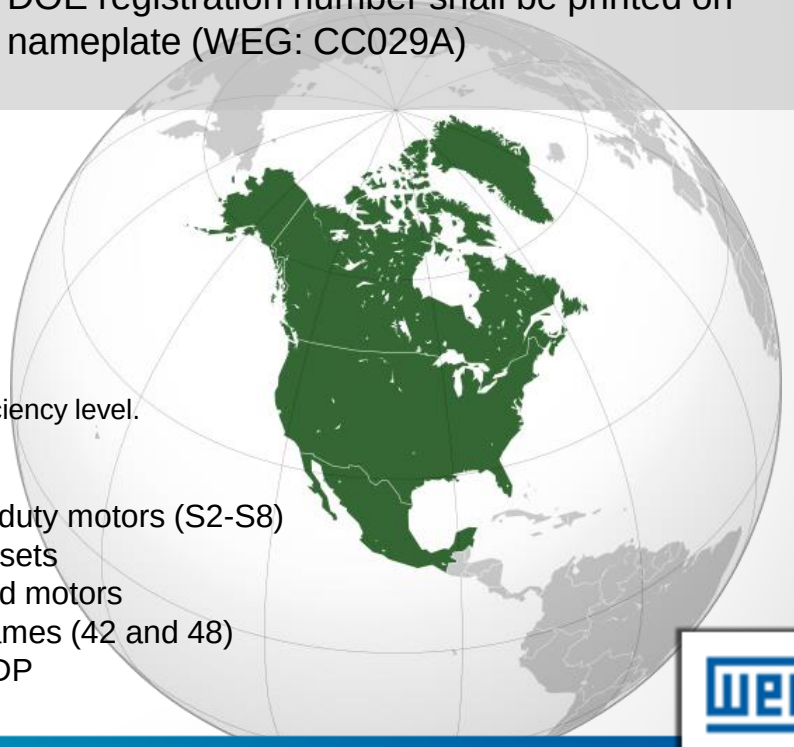
Applicable to:

- Ratings from 1 to 500 HP (2, 4, 6 and 8 poles)
- Voltages up to 600 V
- Three-phase
- Frequency: 60 Hz
- Frames 143 and above (or IEC equivalent)
- Hazardous Location
- NEMA Design A, B or C or IEC Design N or H

Applicable only in US:

- 56 frames (enclosed)
- Pump motors
- Footless motors
- Motors with non-standard base or mounting feet
- Vertical motors
- Motors with special shafts and flanges (including JM/JP)
- Brake motors
- Gear motors (if the motor can be removed from the gear)
- Partial motors (except stator-rotor sets)

Note: Fire pump motors from 1 to 500HP, 2 to 8 poles must meet High Efficiency level.



Not applicable to:

- Dedicated VFD design (not suitable for DOL)
- Submersible motors (IP68)
- Multispeed motors
- Design D
- TEAO or ODPAO
- Intermittent duty motors (S2-S8)
- Stator-rotor sets
- Water cooled motors
- Two digit frames (42 and 48)
- 56 frame ODP

North America

DOE 10 CFR Part 431
Small Electric Motors

Applicable to:

- Ratings from 1/4 to 3 HP
- Motors with 2, 4 and 6 poles
- ODP
- Three or Single Phase (only for CSCR and CSIR)
- NEMA 2-digit frame or IEC equivalent

Not applicable to:

- Definite purpose motors as defined by NEMA MG-1 Part 18 Submersible motors (IP68)
- Non-standard mounting
- Multi-speed motors
- TEAO or ODPAO
- Enclosed motors (Enclosed three-phase 56 frame Integral Horsepower motors covered under EISA, as of June 2016)

Penalties for violations: $110 per violation per day

South Korea

MKE-2015-28
KS C IEC60034

Applicable to:

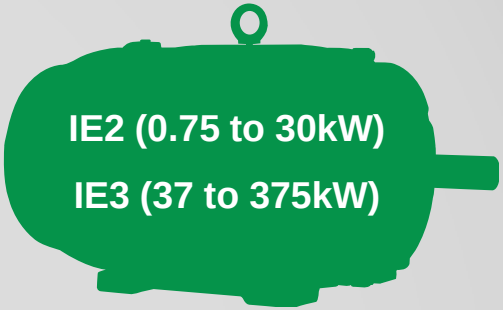
- Ratings from 0.75 to 200 kW (2, 4 ,6 and 8 poles)
- Ratings from 200 to 375 kW (2 and 4 poles)
- Frequency: 60 Hz
- Voltage up to 600 V
- Closed and open enclosures
- Inverter-driven motor with continuous operating (fan, blower and pump)

Not applicable to:

- TEAO and TENV designs
- Duty type S2
- Motors wholly immersed in a liquid
- Design C and D
- Multi-speed motors
- Thrust or sleeve bearing

Requirements

Motors without this label will not be allowed through Korean customs!



Taiwan

CNS 14400

Applicable to:

- Ratings from 0.75 to 200 kW
- Motors with 2, 4, 6 and 8 poles
- Frequency: 60 Hz
- Voltage up to 690 V

Not applicable to:

- Motors wholly immersed in a liquid
- Motors completely integrated into a product
- Dedicated VFD design (not for DOL)
- Multi-speed motors

Turkey

SMG-2012/2
IEC 60034-30-1

Applicable to:

- Ratings from 0.75 to 375 kW
- Motors with 2, 4 and 6 poles
- Frequency: 50 or 50/60 Hz
- Voltage up to 1000 V
- Closed and open enclosures

Not applicable to:

- 2 speed motors
- Intermittent duty
- Motors wholly immersed in a liquid
- Motors completely integrated into a product
- Altitude higher than 1000 masl
- Ambient temperature out below -15 ºC or above 40 ºC
- Motors for explosive atmospheres
- Brake motors
- Motors specified to operate exclusively above 400 ºC

Requirements

Nameplate shall detail :

- IE code (IE3)
- Efficiency values for 50, 75 and 100% load (not mandatory for small motors)
- CE mark
- IE2 motors fed by VFD are permitted but must be labelled for exclusive VFD operation

Thank You!