

Motor energy efficiency certification

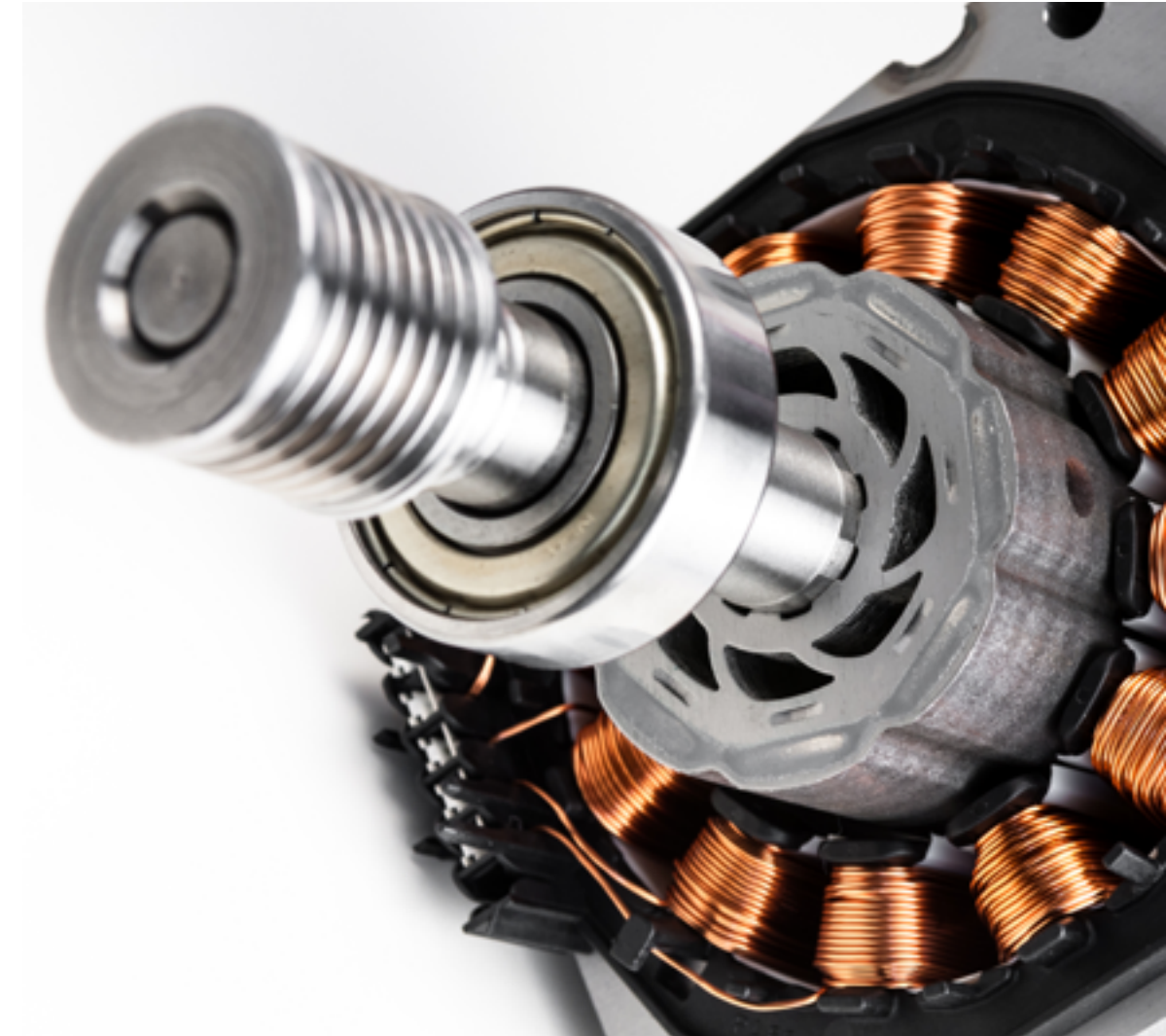
UL Solutions can provide conformity testing and certification for motor energy efficiency ratings and related performance according to global energy efficiency regulations and requirements

With decades of experience in motor product safety, we provide manufacturers with the necessary motor energy efficiency offerings through long-standing professional and innovative services.

Energy saving and carbon reduction have become a global consensus. For motors, which have always accounted for a high proportion of energy consumption, the authorities in different countries have published mandatory energy efficiency regulations, requiring motors imported or manufactured in their countries to obtain certification or registration before they can be sold in the market.

With authorities in many countries announcing that they plan to expand the scope of motor energy efficiency regulations, the gradual improvement

of energy efficiency seems to be gaining more traction. In the face of increasingly complex and ever-changing energy efficiency regulations, UL Solutions' motor experts keep up with the regulatory developments and proactively analyze requirements from various regions around the world. We will integrate resources in UL Solutions quickly and provide local comprehensive services to help motor manufacturers get certification or demonstrate that their products meet the requirements of their target markets in order to enter the global market.





U.S. Department of Energy’s Motor Energy Efficiency Act

The U.S. Department of Energy’s (DOE) energy policy initially focused on regulating industrial motors but has since expanded its scope to include more types of motors, as well as increased energy efficiency.

A new revision of DOE regulation developed and published in 2022 covered test methods for different types of motors. **Manufacturers or importers that mark the efficiency rating on motor nameplates or declare the efficiency rating in marketing materials and all public representations will need to verify that the represented value is correct in accordance with the published test methods in DOE regulation after the effective date.**

The following are the motor types added in the new revision of DOE regulation and their effective dates:

Motor type	Effective date
Electric motors, > 500 hp (≤ 750 hp)	Oct. 14, 2024
Air-over electric motors other than air-over SNEMs	Oct. 14, 2025
Expanded scope electric motors (i.e., SNEMs), including Air-over SNEMs	Oct. 14, 2026
Inverter-only electric motors	Oct. 14, 2026
Synchronous electric motors	Oct. 14, 2026

Additionally, DOE has established the minimum energy efficiency levels (Energy Conservation Standards) for some new types of motors in 2023, with a mandatory effective date of 2027. After the effective date, manufacturers or importers have to obtain DOE certification, as well as have their motors’ efficiency rating meet the minimum values set by the Energy Conservation Standards.

The following are the required efficiency levels for the relevant motor types:

Motor type	Energy efficiency level
NEMA Design A/B electric motors, 100–250 hp	Super Premium Efficiency
Electric motors, > 500 hp (≤ 750 hp)	Premium Efficiency
Air-over electric motors with standard frame size, 100-250 hp	Super Premium Efficiency
Air-over electric motors with standard frame size, < 100 hp	Premium Efficiency
Air-over electric motors with specialized frame size, 1-20 hp	High Efficiency

Furthermore, DOE will publish a new amendment in 2025, which requires DOE certification for following Expanded Scope Electric Motors (ESEMs) with mandatory effective date January 1, 2029.

- High-torque and Medium-torque ESEMs (e.g. CSIR motor, CSCR motor, Split-phase motor).
- Low-torque ESEMs (e.g. Shaded Pole motor, PSC motor).
- Polyphase ESEMs.

Note: It also includes Air-over ESEMs.



EU Motor Energy Efficiency Regulation

Improvements in motors' energy efficiency have long been recognized as important in the EU's Ecodesign Directive. New Directive (EU) 2019/1781 entered into force in 2021 and replaced the previous Directive (EC) 640/2009. Directive (EU) 2019/1781 has been implemented in phases and requires that different types of motors comply with the respective efficiency ratings. Currently, the new Directive is in the second phase of its implementation process in 2023 and is aimed at upgrading 75-200 kW 3-phase electric motors to IE4.

Whether you are a motor manufacturer or a manufacturer of products that include motor components, your products must comply with updated energy efficiency regulations in order to continue accessing the global marketplace. Our experts can conduct conformity assessment for your products in accordance with international energy efficiency standards, helping you differentiate your products and enter into your target markets faster.

UL Solutions' motor energy efficiency services reach global markets

Americas

- U.S. DOE – 10 CFR Parts 429 and 431
- Natural Resources Canada (NRCAN) – Energy Efficiency Regulations – Motors
- Mexico – NOM-016-ENER-2016
- Colombia – IEC 60034-2-1, Ed. 2.0
- Argentina – IRAM 62405:2012

Europe

- European Union – (EU) 2019/1781

Asia Pacific

- Taiwan – CNS 14400
- China – GB 18613-2020 and GB 30253-2013
- Japan – JIS C 4034-2-1
- Korea – KS C IEC 60034-2-1
- Singapore – IEC 60034-2-1, Ed. 2.0
- Australia and New Zealand – IEC 60034-2-1, Ed. 2.0

Middle East

- Saudi Arabia – SASO 2893:2018

UL Solutions' comprehensive motor and pump offerings

- U.S. UL and Canadian C-UL certifications
- European Union CE testing and evaluation
- IEC CB test certificate and international safety certification (CCC, SASO, BSMI)
- DOE and ENERGY STAR® energy efficiency testing
- Global energy efficiency regulation testing and evaluation
- Hazardous Location certification
- Drinking water system certification (health effects, lead content)
- Product enclosure protection IP testing and evaluation

Why UL Solutions

UL Solutions is a leader in motor safety certification with proven technical expertise and market acceptance, so you can be confident in our capability to perform energy efficiency evaluations on your products:

- UL Solutions is recognized by the U.S. DOE as a third-party testing organization for motor energy efficiency and can provide evaluation services based on the Alternative Efficiency Determination Method (AEDM) test protocol.
- UL Solutions is accepted by NRCAN in Canada as a third-party motor energy efficiency certification body. Our UL Energy Verification Mark is recognized by NRCAN.
- UL Solutions is currently the National Certification Body (NCB) in Energy Efficiency Category E3 of the International Electrotechnical Commission System for Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE) and can issue CB Test Certificates.

UL Solutions' bundled service covers the following items:

- Evaluating motors to UL Standards and issuing the UL Certification Mark
- Testing motors for energy efficiency in accordance with DOE and NRCAN regulations
- Conducting IEC 60034-2-1 motor energy efficiency test and providing IECEE CB Test Certificates
- Providing evaluation of Type Rating enclosure protection according to UL 50E, the Standard for Enclosures for Electrical Equipment, Environmental Considerations, or conducting IEC IP rating evaluation, and can also provide UL and IEC Hazardous Location certifications.
- Additionally, evaluating safety requirements to IEC 60034-1 and IEC 60335-1, which can be used for most markets in Europe and Asia.

For more information and assistance, please visit our

Motor & Pump Certification Services webpage