

This is a draft document. DOE is releasing this document for comment regarding the sufficiency of the explanation to assist motor manufacturers in determining the applicability of the standards at 10 CFR § 431.446 to their equipment.

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This draft guidance document represents the Department's interpretation of its existing regulations and is exempt from the notice and comment requirements of the Administrative Procedure Act. See 5 U.S.C. § 553(b)(A). Nonetheless, the Department is accepting comments and suggestions from the public until **February 26, 2014**. Comments and suggestions should be provided in WordPerfect, Microsoft Word, PDF, or text file format by sending an email to SmallMotorsGuidance2014GUID@ee.doe.gov. Please also include the docket number EERE-2014-BT-GUID-0001.

DOE has received a number of inquiries related to whether specific basic models of small electric motors are covered by the amended standards adopted in the March 9, 2010 final rule (75 FR 10873, with a technical correction published on April 5, 2010 at 75 FR 17036), codified at 10 CFR § 431.446. DOE previously explained what motors would be subject to these standards in the course of the rulemaking adopting the March 9, 2010 final rule, defining small electric motors at 10 CFR § 431.442, and explaining DOE's interpretation of the definition in the preamble to the rule adopting the standard. See 75 FR 10873. DOE has further articulated the scope of coverage in the course of litigation in *NEMA v. DOE*, 654 F.3d 496 (4th Cir. 2011). In the interest of further helping manufacturers to understand how to apply the scope of coverage to specific motor designs, DOE issues this draft guidance based upon these previous public statements. DOE requests comment from stakeholders as to whether any portion of this guidance is confusing or unclear.

Through this guidance, DOE identifies some key design elements that manufacturers should consider when determining whether a given individual motor meets the small electric motor definition and is subject to the energy conservation standards promulgated for small electric motors.

A small electric motor is "a NEMA general purpose alternating current single-speed induction motor, built in a two-digit frame number series in accordance with NEMA Standards Publication MG1-1987." 42 U.S.C. § 6311(13)(G); see also 10 CFR § 431.442. DOE has set energy conservation standards for certain small electric motors at 10 CFR § 431.446. In determining whether a particular electric motor design would need to meet these standards, a manufacturer must ask whether the following design elements apply to the motor:

- 1) Single-speed induction?
- 2) NEMA general purpose alternating current?

- 3) Built in a two-digit frame number series in accordance with NEMA MG1-1987?

We discuss each of these design elements below as well as mention two additional design elements that limit the scope of DOE's coverage.

Single-speed induction

The first design requirement, "single-speed induction," is self-explanatory and generally understood within the motors industry.

NEMA general purpose alternating current

The second design requirement, "NEMA general purpose alternating current," requires additional discussion.

First, as a baseline, DOE has previously found that split-phase, shaded-pole, and permanent-split capacitor (PSC) motors do not qualify as NEMA general purpose alternating current motors – and, therefore, cannot meet the definition of a small electric motor. *See* 74 FR 61421; *see also* 75 FR 10883 (reaffirming DOE's interpretation that split-phase, shaded-pole, and PSC motors are not general purpose and are therefore not included in the definition of small electric motors). That means that only: (1) capacitor-start, induction-run (CSIR); (2) capacitor-start, capacitor-run (CSCR); and (3) polyphase motors can qualify as NEMA general purpose alternating current motors.

Second, DOE has interpreted the term "NEMA general purpose alternating current single-speed induction motor" used in 42 U.S.C. § 6311(13) as referring to elements within paragraph MG1-1.05 of NEMA MG1-1987, which provides a list of characteristics to help determine whether a particular motor is a general purpose alternating current motor. These characteristics include the following elements:

- 1) Built with an open construction;
- 2) Rated for continuous duty;
- 3) Incorporates the service factor in MG1-12.47 of MG1-1987;
- 4) Uses insulation that satisfies *at least* the minimum Class A insulation system temperature rise specifications detailed in MG1-12.42 of MG1-1987;
- 5) Designed in standard ratings (e.g., horsepower (hp) or kilowatt (kw) ratings);
- 6) Has standard operating characteristics;
- 7) Has standard mechanical construction;
- 8) Designed for use under usual service conditions; and
- 9) Is not restricted to a particular application.

In DOE's view, the absence of any reference in MG1-1.05 to any particular standard ratings or standard operating characteristics applicable to small electric motors demonstrates that a motor may satisfy this requirement of the general-purpose definition by complying with any standard ratings or standard operating characteristics set forth in industry standards (whether for small electric motors or medium electric motors, as NEMA uses those terms). So long as the other elements of the definition – open construction, rated for continuous duty, specified service factor, and insulation requirements – are

satisfied, such a motor would satisfy the requirements for a general-purpose, alternating-current motor. MG1-1.05 does not differentiate between small and medium motors in this respect.

A modified single-speed capacitor-start or polyphase induction motor that meets all of the above conditions may still be a small electric motor under DOE's definition if the motor's general purpose nature is retained. For example, if a motor uses a longer shaft than that found in motors of similar design that are built according to the standard dimensions in MG1-1987, this motor would still be considered to have standard mechanical construction and would be treated as a small electric motor unless the shaft length limited that particular motor to use in a unique application and prevented its use in applications for which other motor models could be used.

DOE notes that the small electric motor definition set out in 10 CFR § 431.442 includes motors built to IEC specifications. Since these electric motors otherwise satisfy the same criteria as NEMA-spec motors – e.g. designed in standard ratings (kw), have standard operating characteristics and standard mechanical construction – an IEC electric motor is covered under this definition. Following this approach will help ensure that these motors satisfy the same standards required of domestically-manufactured small electric motors.

Generally speaking, DOE considers the characteristics of the basic model of small electric motor when determining if the basic model meets the "usual" and "standard" terms within MG1 or another standardized scheme such as those laid out by the IEC. Some examples of these characteristics include temperature range over which the motor is to operate, the medium in which the motor is to operate, locked rotor current and torque/speed characteristics, the frame size, and the coolant medium. DOE notes, however, that this short list is not an exhaustive one and a manufacturer should look at all of the characteristics of the individual model of a given electric motor when comparing it to DOE's definitions for the purposes of determining that motor's coverage as a small electric motor.

Built in a two-digit frame number series

The third significant design element, "built in a two-digit frame number series in accordance with NEMA MG1-1987," notably also includes those electric motors that have equivalent physical dimensions to those denoted by the NEMA two-digit frame series specifications. As noted above, this design element includes those motors built to IEC specifications. DOE has adopted this position because of the fact that electric motors built to IEC specifications are based on metric units, rather than the English or Imperial units used by MG1. Consequently, building an electric motor in accordance with IEC specifications (e.g. using metric measurements) should not be a basis for exempting these electric motors from coverage.

Additional design elements limiting coverage

If a single-speed capacitor-start or polyphase induction motor built in a two-digit frame number series in accordance with NEMA MG1-1987 meets all of the above conditions, DOE considers it a small electric motor. If it is a small electric motor, a manufacturer should consider that the scope of coverage under 10 CFR § 431.446 is limited at this time to those small electric motors that:

- 1) have a horsepower level ranging from between 0.25 to 3.0 hp (or the metric equivalent in kw); and
- 2) are built in a 2-, 4-, or 6-pole configuration.

See 75 FR at 10883. Small electric motors that do not meet these two additional requirements are not covered by the energy conservation standards set forth by the March 2010 final rule.