



This is a summary of the latest DOE regulations for electric motors and an analysis of their effects.

The U.S. Department of Energy (DOE) has published new efficiency and testing regulations. These rules affect motors ranging from 1/4 hp to 750 hp. Understanding the DOE's new electric motor rules and identifying which motors fall under each category can be challenging. This informative offers an overview of each new rule and their implementation dates, enabling users to anticipate upcoming changes and start planning accordingly.



Motors covered under this new rule include the following:

- a. Are single-speed, induction motors;
- b. Are rated for continuous duty (MG 1) operation or for duty type S1 (IEC);
- c. Contain a squirrel-cage (MG 1) or cage (IEC) rotor;
- d. Operate on polyphase alternating current 60-hertz sinusoidal line power;
- e. Are rated 600 volts or less;
- f. Have a 2-, 4-, 6-, or 8-pole configuration;
- g. Are built in a three-digit or four-digit NEMA frame size (or IEC metric equivalent), including those designs between two consecutive NEMA frame sizes (or IEC metric equivalent), or an enclosed 56 NEMA frame size (or IEC metric equivalent);
- h. Produce at least one horsepower (0.746 kW) but not greater than 750 horsepower (559 kW), and
- i. Meet all of the performance requirements of one of the following motor types: A NEMA Design A, B, BE, C and CE motor or an IEC Design N, NE, NEY, NY or H, HE, HEY, HY motor.

The Medium Electric Motor Rule - (Title 10 of the Code of Federal Regulations (CFR), Part 431)

The DOE's revised medium electric motor (MEM) regulation expands the range of motor sizes and types required to meet NEMA Premium and Super Premium efficiency standards. Previously, this standard applied only to three-phase motors ranging from 1 hp to 500 hp and now covers through 750HP as well as adding previously exempt Totally Enclosed Air Over (TEAO) as covered product.

Implemented by the U.S Department of Energy (DOE) in June 2023 as a direct final rule, the revised MEM it becomes effective in June 2027, the new standards will introduce requirements for motors that must adhere to MEM rule specifications.

Output (HP)	Current Minimum Efficiency Level	New Regulation (in force June 1,2027)
1 – 75	NEMA PREMIUM	NEMA PREMIUM
100 – 250	NEMA PREMIUM	NEMA PREMIUM 4 (SUPER PREMIUM)
300 – 500	NEMA PREMIUM	NEMA PREMIUM
550 – 750	-	NEMA PREMIUM



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Most from 100 hp to 250 hp will need to comply with NEMA Super Premium Efficiency standards, which are comparable to IE4 standards. The new efficiency values differ slightly for open drip proof (ODP) motors. While some ODP motors align with IE4 values, others fall slightly short due to their smaller frame sizes compared to totally enclosed fan cooled (TEFC) motors, which are the basis for IEC IE4 values.

Enclosed								
HP	Number of Poles							
	2		4		6		8	
	Premium	Super Premium	Premium	Super Premium	Premium	Super Premium	Premium	Super Premium
100	94.1	95	95.4	96.2	95	95.8	93.6	94.5
125	95	95.4	95.4	96.2	95	95.8	94.1	95
150	95	95.4	95.8	96.2	95.8	96.2	94.1	95
200	95.4	95.8	96.2	96.5	95.8	96.2	94.5	95.4
250	95.8	96.2	96.2	96.5	95.8	96.2	95	95.4

Open								
HP	Number of Poles							
	2		4		6		8	
	Premium	Super Premium	Premium	Super Premium	Premium	Super Premium	Premium	Super Premium
100	93.6	94.5	95.4	96.2	95	95.8	94.1	95
125	94.1	94.5	95.4	96.2	95	95.8	94.1	95
150	94.1	94.5	95.8	96.2	95.4	95.8	94.1	95
200	95	95.4	95.8	96.2	95.4	95.8	94.1	95
250	95	95.4	95.8	96.2	95.8	96.2	95	95.4

550 hp to 750 hp : These motors, which were not previously regulated, will now need to comply with NEMA Premium Efficiency standards.

Nominal full-load efficiency (%)				
HP	2 Pole		4 Pole	
	Enclosed	Open	Enclosed	Open
550	95.8	96.2	96.2	96.2
600	95.8	96.2	96.2	96.2
650	95.8	96.2	96.2	96.2
700	95.8	96.2	96.2	96.2
750	95.8	96.2	96.2	96.2

Air-over electric motors : 1 hp to 250 hp – Motors built in a NEMA frame size will need to comply with NEMA Premium efficiency for 1 hp to 75 hp and Super Premium standards for 100 hp to 250 hp. Motors exceeding 250 hp are not currently included.

DOE 2027 IMPACT ON MOTOR DESIGN

The upcoming DOE 2027 efficiency mandate introduces significant design challenges for medium electric motors. While the regulatory intent is to improve energy performance, the practical implications extend beyond efficiency alone, influencing physical dimensions, electromagnetic design, and electrical characteristics. The two critical areas where users may notice changes: **physical dimensional adjustments and locked rotor current behavior.** **WEG highly recommends you contact your motor suppliers ahead of the transition to evaluate impacts on your applications.**

For pricing, contact your Local WEG distributor.

To locate a distributor, Please visit <https://www.weg.net/institutional/US/en/contact/where-to-buy>



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