Energy Independence & Securities Act
Frequently Asked Questions

What does EISA stand for?

EISA is the acronym for the Energy Independence & Securities Act. This law was signed on Dec. 19, 2007. This law requires higher efficiencies on motor designs as listed in the Rules. This law goes into effect on Dec. 19, 2010

Why was this law passed?

The DOE estimates that over a 10 year period, the impact of using Premium efficient motors will reduce 80 million tons of carbon and reduce 5,800 gigawatt/hours of power consumption. This is the equivalent of removing 16 million cars from American highways.

What motors are affected by this new law?

EPACT efficient motors today, will need to meet NEMA Premium efficiency. General Purpose motors that were exempt from EPACT because of voltage and mounting etc… will need to meet EPACT by this date in 2010. Special motor designs, such as having special shafts or non-standard frequencies are exempt. Inverter Duty motors are also exempt from this new law.

Will I still be able to purchase a General Purpose Epact motor after Dec. 19, 2010?

Yes, however the motor manufacturers can no longer produce these motors after that date.

What other motors are exempt from this law?

Single-phase, special shaft extension motors, TEBC, TEAO, DPFV and TENV motors, Special V/Hz inverter duty motors, Design D motors, Multi-speed motors, 50 Hz motors, and two digit frame size motors like 48 frame and 56 frame motors are exempt.

Are there other types of motors that will need to change efficiencies?

Yes, motors such as close coupled pump designs, vertical solid shaft, round body, non-standard 60Hz voltage motors, 200-500 HP motors, fire pump motors and U-frame motors will now have to meet EPACT (Table 12-11) efficiencies.

Are there any rebates available to help offset the cost difference between a Premium efficient motor and an EPACT efficient motor to the end users?

Today, Incentives and resources are available at the national, state, county and local levels. To locate what incentives are available in your area, the e-mail address is:
http://www1.eere.energy.gov/industry/about/state_activities/main_map.asp.

I heard about a "Crush for Credit" rebate program that will go into effect on Jan. 1, 2010 to help offset the cost difference between new, more expensive, higher efficient motors and to repair the older, more inefficient motors.

There is a bill pending today that has been approved by the U.S. Senate, that would provide a $25 per HP rebate for the purchase of a NEMA Premium efficient motor per the listed guidelines as listed in Section 342(b) of this energy Bill. In addition, a $5 per HP rebate is offered to the motor distributor for their expenses to process this rebate and disposal costs of the old motor.

How do I get this rebate if this bill is passed?

The exact procedure to file for this rebate has not been finalized yet. Most likely there will be an on-line form that can be downloaded from the DOE site, along with the rules and guidelines that need to be followed for the qualifying motor.

How can I evaluate the dollar savings on a Premium efficient motor?

There are three items needed to conduct an evaluation. First and most important, is the average cost per kilowatt hour of electricity. The simplest and most direct way to get this is to take the bottom line cost on a monthly electric bill and divide it by the total kilowatt hours used. This gives a net cost per kilowatt hour which is generally the best cost to use in evaluating energy saving equipment. The reason this works is that equipment designed for better efficiency will in general, reduce the demand, kilowatt hours, and fuel cost adjustments in equal proportions. Thus, using the average cost per kilowatt hour is the easiest way of making an evaluation. Next would be the HP size of the motor that is operating and, finally, the number of hours per month or year that it operates. With these three items and the efficiency difference between one motor and the other, it is easy to figure the cost savings. Here is a link that you can go to calculate your energy savings: http://www.motorsmatter.org/tools/index.html and then click on the "MotorSlide Calculator."

Do my motors have to be fully loaded to realize the savings available in premium efficiency motors?

It is usually advantageous to have motors loaded to more than 50% of rated load for optimum efficiency. Thus, it is usually best to resize a motor at the same time it is upgraded to premium efficiency. However, even if this is not done and the motor is oversized, there is still substantial savings to be gained by utilizing a premium efficiency motor. For example, at 25% of rated load, the difference in efficiency between a standard motor and a premium efficiency motor (of 10 HP) would be 80.4% vs. 86.6%. Thus, the premium efficiency motor is still substantially better even at low load levels than a non-premium efficiency motor. Even without resizing, a substantial efficiency improvement can be made.

Why do premium efficiency motors cost more than standard motors?

Premium efficiency motors use better materials and more of them. For example, the lamination material is a higher grade, higher cost steel. In addition, the rotor and stator are generally longer in a premium efficiency motor than in a standard motor. The laminations are thinner compared to a standard efficiency motor. This means there are more laminations. In addition, the lamination slots are larger so more copper can be used in the windings. Finally, premium efficiency motors are manufactured in smaller production lots, which also tends to make them more expensive.

If premium efficiency motors can save lots of money, why don't more people use them?

The main reason today is cost. A Premium efficient motor costs about 20% to 30% more than an EPACT efficient motor. Also, they have not taken into effect the savings that they will see on power consumption. There are on-line "Energy Calculators" today that a consumer can complete to see the energy savings a Premium efficient motor will give them and the "Pay-back" time. Manufacturers of motors also have not done a good job on educating customers on the other benefits of Premium efficient motors like longer life due to better insulation materials used on the motor's windings and cooler operating temperature, which will give longer life to the motor's bearings.

Are medium voltage motors covered by EISA?

No. EISA only covers motors that are operational at 60 Hz with voltages through 600 V.

Does your previous answer imply that 60/50 Hz rated motors must meet EISA efficiencies?

Yes, 60/50 Hz motors must comply with the applicable efficiency requirement at the 60 Hz rating.

What efficiencies are documented in NEMA tables 12-11, 12-12, 12-13 and 12-14?

NEMA table 12-11 defines efficiencies associated with EPAct. 12-12 contains efficiencies associated with NEMA Premium (former CEE efficiencies). 12-13 defines medium voltage (>600V). 12-14 defines NEMA Premium levels @ 50 Hz.

Must spread voltage (eg. 200-230/460V) or tri-voltage (eg. 230/460/796) rated motors meet EISA efficiencies at all rated voltages?

Yes. The motor must meet the required efficiency at each rated voltage on the nameplate. Note that since the efficiency requirements of the stated voltages may vary (200V must meet "EPAct"/Table 12-11, whereas 230 & 460 must meet "NEMA Premium"/Table 12-12), varying efficiency claims must be made on the same nameplate.

What about 208 volt?

NEMA standards state that a 230V rated motor must operate satisfactorily at +/-10% of rated voltage. 208V is within the tolerance and must therefore meet the same efficiency requirements as its 230V companion.

Can a 208-230/460V motor be designed to meet NEMA Premium?

In some cases this is possible, but in most cases not. First of all, the motor must meet NEMA Premium at every stated voltage. Secondly, in order to design a motor to meet this efficiency, we would have to "over-design" at 230V (to meet NEMA Premium at 208V). This action would result in a motor with high locked rotor amps at 230V, and may no longer meet NEMA Design B specifications. Generally, it is not possible to design the motor to meet both the efficiency and Design B amp and torque requirements at all nameplate voltages of a spread voltage design.

Are single phase motors covered by EISA?

No, regardless of motor frame size or HP rating.

Are 48 and 56 frame motors covered by EISA?

No. However there are discussions about the possible establishment of efficiency standards for fractional HP motors.

Must a 3 HP, 56H frame motor meet EISA ("56H" is a frame designation for 56 frame shaft height, diameter and length but with a 143/145T frame "footprint")?

No, since the frame size is considered a "Small Electric Motor" (fractional...two-digit frame).

Are "inverter duty" motors covered by EISA?
Yes, if the motor is operational at 60 Hz. If the motor can be used as a "general purpose" motor, it must meet EISA-mandated efficiency. Special V/Hz motors (eg. 45Hz/230V) are not covered, nor are special ventilation schemes such as blower cooled or TENV.

Are you saying that all TENV (and TEAO) motors are exempt from the legislated efficiencies?

Yes I am.

Are motors that are intermittent duty or 60 minute duty covered?

Motors that are truly intermittent duty or time limited and will fail if operated continuously are not covered. Motors that are labeled for less than continuous duty but are capable of operating continuously are covered.

Are elevator motors covered?

Elevator motors that operate on utility power (no inverter) and would otherwise be covered, will remain covered as their voltage and frequency require. This includes motors for 80 starts per hour and/or 120 starts per hour. Elevator motors that are inverter motors with special duty cycle (60 minute duty) are not covered.

Are motors with double shaft extensions covered?

As with EPACT legislation, motors that have a NEMA double shaft extension are covered. Other features such as voltage and frequency determine efficiency levels.

Are motors with brakes covered?

Motors that have brakes installed on the motor are not covered. Motors that are purchased with a shaft extension or "brake provisions" are covered.

Are gearmotors covered?

Motors that are part of the gear assembly and share bearings or other components such that they cannot operate without the gear assembly are not covered. Motors that can be operated separately but are used with a gearbox are covered.

Are motors with encoders or encoder provisions covered?

Yes, both motor with encoders and motors with encoder provisions are covered based upon their other features such as enclosure, voltage and frequency. The inclusion of an encoder or other accessories is not required for the motor to operate so they are not considered reasons for exemption.

Are motors that are listed as "horizontal or shaft down" covered?

Yes, they are covered. Motors that can operate horizontally will have their efficiency determined by other features and could be as high as Table 12-12 efficiency. Motors that can only operate vertically will have their efficiency determined by other features but could be as high as Table 12-11 efficiency.

Are form-wound coil motors covered?

It depends. Whether a motor is form wound is not a factor in determining what efficiency level is required. Other features such as horsepower, voltage, frequency, etc. should be used.

Are induction generators covered?

Induction generators that are used as generators are not covered but if the unit operates as a motor, it must meet the efficiency level required by its other features.

Are motors with kW rating instead of horsepower covered?

Marking a motor with a kW rating instead of hp does not impact efficiency in itself. The scope of the legislation is 1-500hp or 3/4kW-375kW. All other kW ratings are included, so other features will determine efficiency.

Are multi-speed motors covered?

No, multi-speed motors (ex: 25/12.5hp 1800/900rpm) are not covered. There are no efficiency levels established for multi-speed motors so they cannot be labeled as EPACT or NEMA Premium regardless of the efficiency value.

Are eight (8) pole motors covered?

Yes, eight-pole motors operating on 60Hz power supplies are covered. There are no NEMA Premium efficiency levels defined for eight-pole motors so they cannot be labeled as NEMA Premium even if the efficiency exceeds EPACT (Table 12-11) levels.