



Australian Government

GEMS Regulator



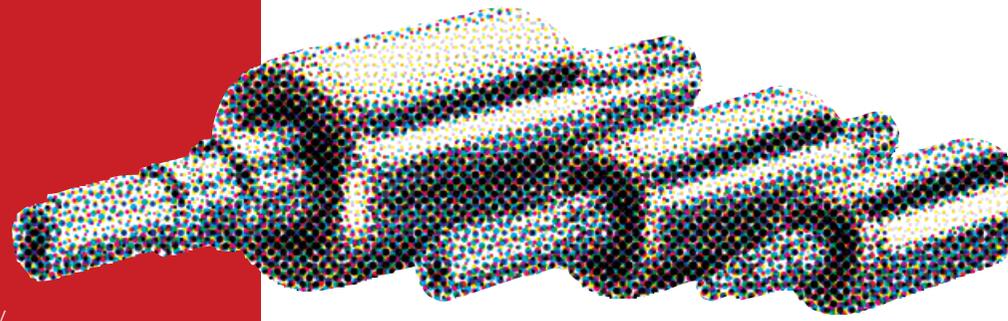
# Motor torque

## Mandatory efficiency requirements for electric motors

## Motor torque

### HOW TO AVOID A BRUSH WITH THE LAW

- Improving the energy efficiency of appliances and equipment is a key objective for all Australian Commonwealth, State and Territory, and New Zealand Governments. It has significant economic and environmental benefits including reduced running costs for businesses.
- Minimum Energy Performance Standards (MEPS) specify the minimum level of energy performance that specific appliances and equipment must meet or exceed before they can be offered for sale or used for commercial purposes.
- On 1 October 2012, the Greenhouse and Energy Minimum Standards (GEMS) legislation came into effect, creating a national framework for appliance and equipment energy efficiency in Australia.
- MEPS for three phase induction motors were introduced in 2001 and the requirements became more stringent in 2006.
- Mandatory requirements are set out in the *GEMS (Three Phase Cage Induction Motors) Determination 2012* (the Determination). The Determination calls up the MEPS and testing requirements from the relevant Australian/ New Zealand Standards by reference.
- It is the responsibility of motor importers and suppliers to ensure that their motors meet the requirements specified in this Determination.
- The Determination sets the scope of motors covered by MEPS as single speed three-phase cage induction motors from 0.73 kW up to but not including 185 kW with 2, 4, 6 or 8 poles, for rated voltages up to 1100 V.



- Motors that fall within the scope of the Determination must be registered prior to being offered for supply or used commercially in Australia.
- MEPS energy performance levels in the standard AS/NZS 1359.5:2004 are similar to the high efficiency levels (IE2) specified in IEC 60034-30-1:2014. Voluntary high efficiency levels (HEPS) are similar to the premium efficiency levels (IE3).
- Future reviews of electric motor MEPS may assess a range of options including adopting IE3 levels specified in IEC 60034-30-1:2014.
- The GEMS Act and the Electric Motors Determination are available at <http://www.energyrating.gov.au/legislation-for-e3-under-gems/>
- For more information on the electric motor MEPS program, registration requirements, and to compare motors supplied in Australia and New Zealand, see [www.energyrating.gov.au](http://www.energyrating.gov.au). Suppliers and consumers can refer to this website to confirm that their motors are registered.

The information in this brochure is provided as guidance only. This brochure has been prepared by the GEMS Regulator, in consultation with the Rotating Machines Forum of The Australian Industry Group, to help registrants of electric motors better understand their responsibilities. It should be read in conjunction with the Greenhouse and Energy Minimum Standards Act 2012 and its supporting Regulations and Instruments. Changes to legislation may affect the information in this document.

Ultimately, persons are responsible for determining their obligations under the law, and for applying the law to their individual circumstances. This document does not constitute legal advice and is not a substitute for independent professional advice.

# Frequently Asked Questions

## CONCERNING MEPS FOR ELECTRIC MOTORS

**1. As a small machine manufacturer, we import our own low volumes of electric motors to meet our requirements. Do I have to comply with the MEPS requirements?**

Yes. If you import electric motors into Australia or New Zealand that fall within the specified product classes covered by the Determination, then irrespective of quantity, you must ensure that the motors you import are compliant at the time of importation. You must also register your motors on the Energy Rating website ([www.energyrating.gov.au](http://www.energyrating.gov.au)) before you can legally offer to supply your products in Australia or New Zealand.

**2. We are an engineering contractor responsible for the installation of industrial plants. We import various types of mechanical equipment such as pumps, fans and conveyor systems, which are powered by electric motors. Are we responsible for ensuring these motors are MEPS compliant?**

Yes. If you are importing this equipment, the motors installed must be MEPS compliant and registered at [www.energyrating.gov.au](http://www.energyrating.gov.au). It is an offence to supply or commercially use motors that are not registered. Penalties apply for non-compliance.

**3. As an end user, how do I know that the motors I purchase and use are MEPS compliant?**

You should check [www.energyrating.gov.au](http://www.energyrating.gov.au) and only purchase registered products.

**4. Why are there different test procedures for measuring motor energy efficiency? Can I register my motors based on the IEC 60034-2-1:2007 test method standard?**

Currently, two methods for measuring energy efficiency are allowed by the Determination and accepted for registering electric motors on the Energy Rating website ([www.energyrating.gov.au](http://www.energyrating.gov.au)). Referred to

as Test Method A and Test Method B, the main difference is the way stray losses are accounted for.

Suppliers need to specify either Method A or Method B in their registration and motors will be checked tested using the method listed in the registration.

A revision of international test standard IEC 60034-2-1 is expected to be published in June 2014. The E3 Program is considering this standard for use in Australia.

**5. I have stock of motors that do not meet MEPS requirements. Can I still sell these or use them in my local machines?**

No, unless you have documented proof that the motors were imported prior to the implementation of the current MEPS requirements.

Penalties apply for non-compliant products, including product recall, so good record keeping is recommended.

**6. Should I have an electric motor rewound?**

Like all machines, electric motors may fail at some stage. When this happens, a choice is needed between replacement and repair. The decision usually depends upon the age of the failed motor, downtime, application and operational constraints. If the motor is rewound, considerable losses in motor efficiency and higher energy usage are possible.

Replacement with a new MEPS-compliant or high efficiency motor is recommended for downtime reduction and also for the considerable energy savings that are achievable over the life of the new motor. The cost of replacing such a motor is usually recovered with payback from energy savings within reasonable periods.

**7. What are the benefits of using a more efficient motor?**

- lower operating costs
- quieter and cooler operation
- higher reliability and longer motor life
- reduced greenhouse gas emissions

**8. What else should be considered regarding motor efficiency?**

- Motors are most efficient between 75% and 100% load. You should size your motor according to the machine demand power.
- Consider using variable speed drives to adjust your process speeds for optimal efficiency.
- Look at the motor and complete system efficiency. What is the motor driving and how can the efficiency of the driven load be improved?
- Talk to your motors and systems supplier about energy efficient solutions

**9. Does MEPS apply if the electric motor is incorporated in package equipment, such as an air conditioning unit, air compressor or conveyor belt?**

Exemptions from MEPS requirements are listed in the Determination. MEPS do not apply to motors that are integral to, and not separable from, a driven unit e.g. a motor constructed on the same shaft as a compressor for an air-conditioning unit. Such a motor:

- (a) must share common components, apart from connectors such as bolts, with the driven unit; and
- (b) must not be able to be separated from the driven unit as an entire motor that can operate independently of the driven unit.

If the motor can be removed from the equipment and it is still functional then it does not meet the exclusion requirements. In this case it is mandatory to use MEPS compliant motors and register them before supplying in Australia. This exclusion may be removed if IEC 60034-30-1:2014 is adopted in the future.