4E

Energy Efficient End-use Equipment
International Energy Agency

ENERGY EFFICIENCY POLICY BRIEF

Coordination between IEC and ISO standards for efficient electric motor driven systems

EMSA5

The **4E Electric Motor Systems Annex (EMSA)** promotes the opportunities for energy efficiency in electric motor systems by disseminating best practice information worldwide. It supports the development of internationally aligned test standards and policies to improve the energy performance of new and existing motor systems with the aim of achieving 20% to 30% energy savings.

This policy brief explains the significance of an ISO (International Organisation for Standardization) / IEC (International Electrotechnical Commission) Joint Advisory Group (JAG 22) established in October 2021. ISO/IEC JAG 22 *Optimized Energy and Power Consumption of Electric Driven Machine Units* aims to facilitate co-ordination between IEC and ISO for all types of electric motor systems such as pumps, fans and compressors.

Observations for Policy Makers

- National energy efficiency regulations are a key driver for energy savings in electric motor systems and rely on international standards for testing, calculating and classifying the performance of electric motor systems.
- Highly energy efficient motor systems come from optimally matched components designed for specific loads. However, these components are often produced by more than one manufacturer, so may only be tested in their entirety following their final assembly.
- Currently, the individual elements of a motor system are covered by around 10 different IEC (responsible for electrical standards) and ISO committees (responsible for mechanical standards) (see Figure 1). Together these publish approximately 40 standards relating to the energy efficiency of electric motor systems, however most focus on single components e.g. motors, pumps, fans, compressors, variable speed drives (VSDs), etc.
- To ensure system-oriented standards, a coherent framework for co-operation between Technical Committees combining mechanical and electrical expertise is required.
- The establishment of the joint committee ISO/IEC JAG 22 in 2021, driven by EMSA and the IEC Advisory Committee on Energy Efficiency (ACEE), is therefore an important milestone in energy efficiency standardisation.
- To enable further energy savings, standardisation committees need to interact more closely and deal with energy efficiency in electric motor systems in a timely fashion.

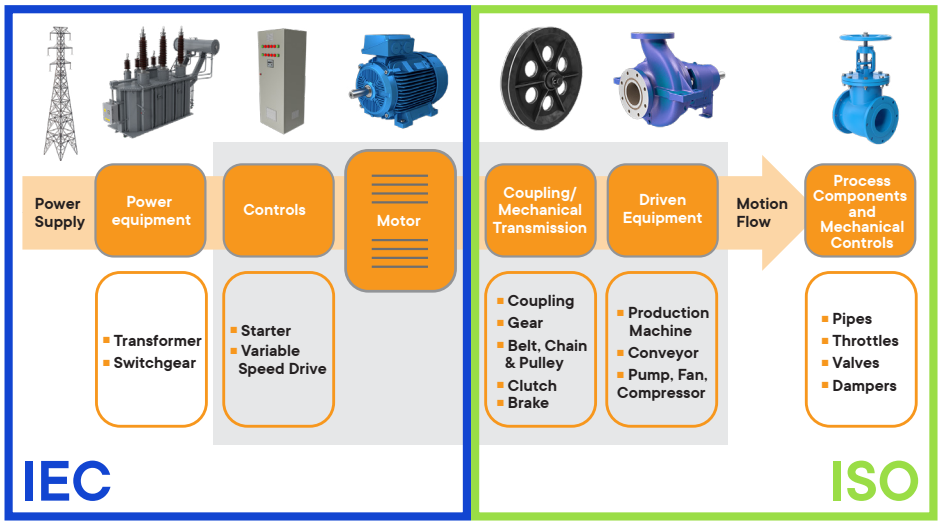

Figure 1: Scope of IEC and ISO for motor systems

MORE INFORMATION

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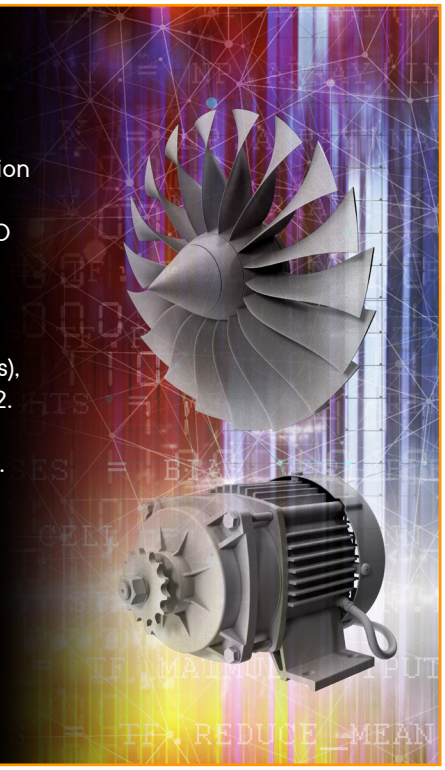
Further information is available on **www.iea-4e.org/emsa** and by contacting the EMSA Operating Agent at **mvanwerkhoven@tpabv.nl.**

Key Findings

Global co-operation in international standardisation work is key



Led by EMSA and ACEE, discussion within the international standardisation community resulted in the establishment of the ISO & IEC Joint Advisory Group: JAG 22. Its role is to advise, guide and co-ordinate activities in ISO and IEC relating to optimise the energy consumption of Electric Driven Machine Units.

The Joint Advisory Group currently has 27 members nominated from the respective National Committees of 10 countries. IEC TC 2 (electric motors), IEC SC 22G (VSDs) and ISO TC 117 (fans) are the three founders of JAG 22. Other committees like ISO TC 115 (pumps), ISO TC 118 (compressors) as well as other interested ISO and IEC committee are invited to participate.

JAG 22 is a unique example of global co-operation, bringing together industry and independent experts in addressing all aspects of Electric Driven Machine Units (EDMU) to maximise the possible energy savings. The main tasks of the Joint Advisory Group are to:

- Measure and calculate energy efficiency
- Measure and calculate energy consumption and losses
- Calculate, measure and reduce power consumption

First results show the benefits of co-ordination

JAG 22 has been co-ordinating the integration of relevant parts of IEC standards for electric motor and VSDs into ISO 12759, covering the efficiency classification for fans. Relevant calculation methods are referenced in the ISO standard, with the focus on the alignment of definitions for fan efficiency metrics in IEC and ISO standards. As a result of this work, the calculation of energy performance for each type of application will be more precise.

EMSA's engagement in international standardisation

The global market for electric motor systems and their individual components has developed strongly over the last two decades, fed by global economic development and new energy efficiency policies stimulating innovation in mechanical and electrical technologies.

Given the global trade in components for electric motor systems, there are considerable advantages if national and regional policies are supported by international standards that address not only the individual components but the whole system.

EMSA is proactively engaged in the development of international standards, providing independent, evidence-based information[1] and a greater focus on policy aspects within the standardisation for dealing with motor systems. EMSA also acts as a catalyst for new initiatives such as the establishment of the JAG 22.

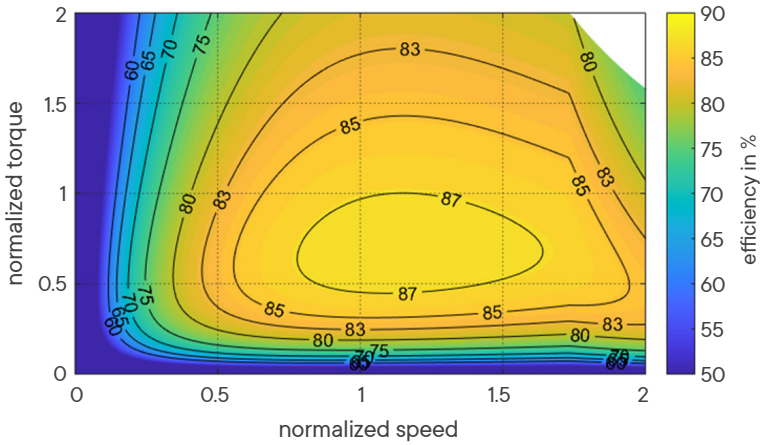


Figure 2: Example of data shared between IEC and ISO Technical Committees *(Source: IEC 61800-9-2, Ed. 2 CDV, 2022)*

1 See also the EMSA project on Round Robin for VSDs