seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

July 2023

Electric Motors

Ecodesign Compliance Assessment

Interim Report

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Sustainable Energy Authority of Ireland
SEAI is Ireland's national energy authority investing in, and delivering, appropriate, effective and sustainable solutions to help Ireland's transition to a clean energy future. We work with the public, businesses, communities and the Government to achieve this, through expertise, funding, educational programmes, policy advice, research and the development of new technologies.

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Introduction

This report gives an overview of the results of ecodesign market surveillance of electric motors organised between 2020–2021 by SEAI and conducted as part of ongoing national market surveillance activities relating to the Ecodesign Directive (2009/125/EC).

It identifies the levels of non-compliance encountered relating to electric motor products that were available on the Irish and broader European market and may facilitate a degree of comparison between other electric motors market surveillance initiatives over time. This interim report summarises the findings from product assessments carried out to date. Further assessment of electric motors products which commenced in 2022 will be completed in 2023 and an updated summary report will be published covering all market surveillance activity relating to electric motors undertaken by SEAI.

When the work was undertaken, the Market Surveillance Authority (MSA) for ecodesign and energy labelling in Ireland was the Minister for the Environment, Climate and Communications and SEAI was supporting the Minister by organising market surveillance on his behalf. The MSA designation was subsequently transferred to SEAI in December 2022.

Relevant legislation

The regulations and standards in force at the time and used to verify compliance of the electric motors were:

Applicable regulations

- Commission Regulation (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for electric motors (as amended).

Applicable standards

- EN 60034-30:2009: "Rotating electrical machines — Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors (IE-code)".
- EN 60034-2-1:2007: "Rotating electrical machines — Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)".

Note that market surveillance activities were wholly completed prior to the entry into force of the new ecodesign legislation for electric motors on 1 July 2021. Further assessments which commenced in 2022 are being undertaken in accordance with the requirements of Commission Regulation (EU) 2019/1781.

Market screening and product selection

A 'long list' of electric motors in scope of the regulations was compiled from several sources in order to provide (insofar as possible) a reasonable representation of products available on the Irish market. Sources included electric motor product listings on electrical retailers' and manufacturers' websites offering products for sale on the Irish market.

A risk-based approach was taken to product selection, with a higher level of risk assigned to products with the greatest market penetration, low-priced brands, and new market entrants. Using this approach, 21 models were selected for assessment from 17 different manufacturers/brands.

Three electric motors were selected for testing, the results of which are detailed in the sections below. Further assessment of electric motors under the new regulation 2019/1781 will investigate if product testing for larger electric motors is necessary.

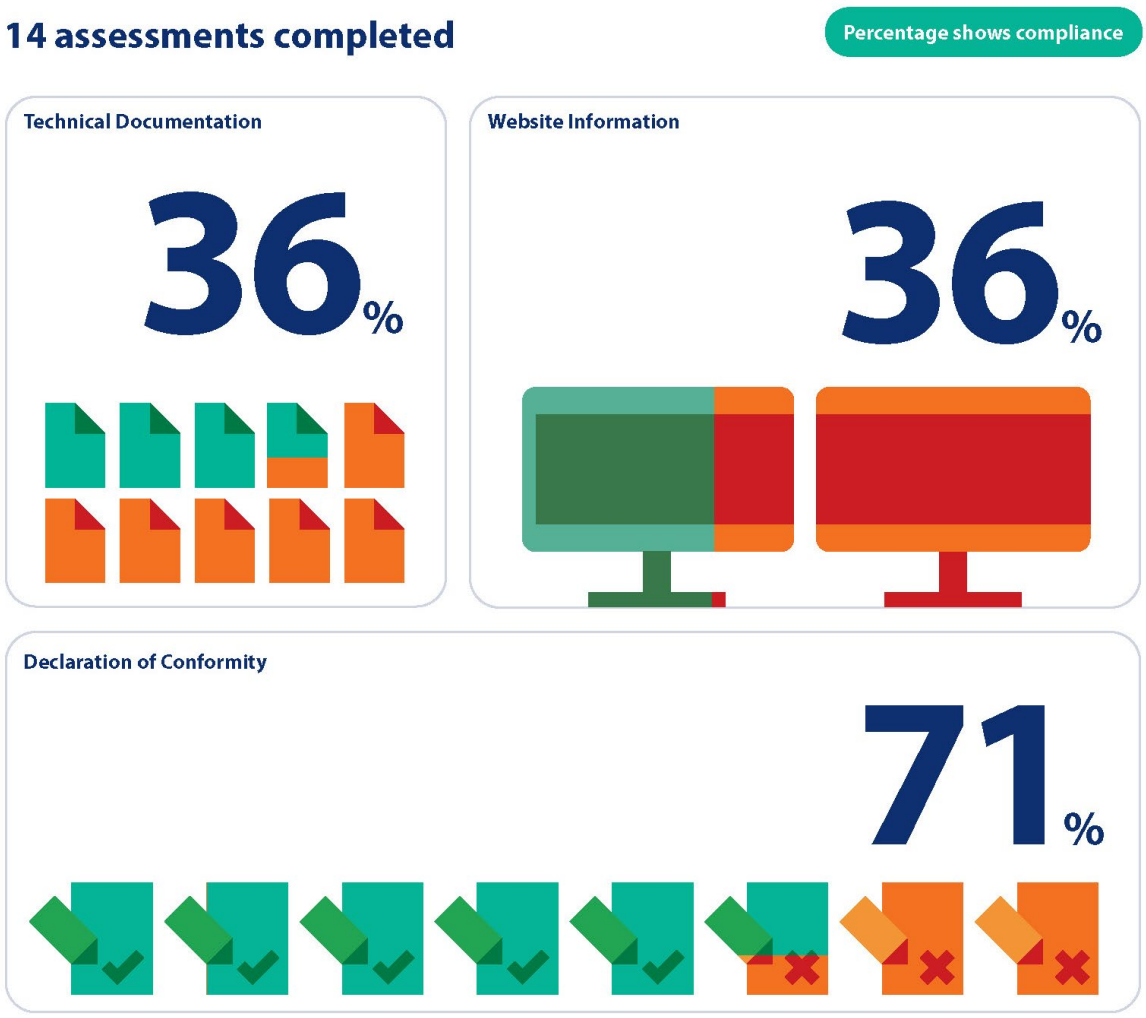
Assessment of compliance with formal (administrative) requirements

Formal written requests for the provision of appropriate technical documentation were made to the relevant companies. Technical documentation was received for 18 of the 21 products, with the remaining three products confirmed as being either discontinued, previously assessed by other market surveillance authorities or otherwise not warranting further assessment.

Initial assessments of the 18 responses received showed that only one complete technical documentation file indicating compliance with ecodesign requirements was received at the outset. Based on SEAI's experience gained through technical documentation assessments from previous product campaigns, this level of compliance at the initial point of technical documentation requests is not uncommon.

Over the course of the campaign, jurisdictional issues arose with four electric motors under assessment. As a consequence of the UK leaving the EU Single Market in January 2021, a small number of electric motor manufacturers based in the UK did not have an authorised representative based within the European Union, with some evidence that they had suspended sales activity within the Single Market. As a result, SEAI decided to discontinue assessment of the compliance of these products due to the limited scope for successful market surveillance outcomes. The closure of these cases left a total of 14 electric motors to be fully assessed during this campaign.

Summary of formal compliance assessments



The findings of the formal compliance assessments are summarised and described below:

'Declaration of Conformity': where non-compliant aspects of the Declaration of Conformity (DoC) were encountered, these typically included missing references to the applicable regulation and test standards.

'Technical Documentation': such non-compliances include:

- Absence of certain relevant documentation or specific aspects required.
- Incomplete product information or product information not set out in the required format.
- Technical documentation values not supporting the declared values.
- No test conditions or measurement methodologies described.

'Website Information': meaning non-compliances relating to the supplier's website, where there is typically a failure to provide all the required ecodesign-related information on free-access websites.

'% compliant': refers to the percentage of instances where compliant documents were provided, (usually after more than one request) and where no non-compliances were identified, and no changes required by the economic operator.

'% non-compliant': refers to the percentage of instances where non-compliances with respect to the applicable regulations have been identified by the MSA. Actions carried out by the economic operator to rectify such formal non-compliances when identified by the MSA are referred to as 'corrective actions' by the MSA.

The most common non-compliances encountered when assessing technical documentation were related to required documentation not being submitted by the manufacturer or were related to the format of product information requirements as laid out under Annex II of Regulation 640/2009.

Regulation 2019/1781 more clearly defines the obligations of manufacturers in terms of product information, requiring that product information as set out under the regulation is visibly displayed on the technical data sheet or user manual supplied with the motor. It is expected that this change will increase compliance relating to product information requirements by providing clarity on how and where product information is to be displayed.

Assessment of compliance with technical requirements (Laboratory testing)

Laboratory testing can be undertaken by an MSA in order to verify whether a product meets the requirements of the relevant regulations. Typically this involves testing one unit of the product to be assessed and if this fails to meet the requirements of the regulations then another three units of the same product must be tested to verify non-compliance.

Due to the size of the larger industrial electric motors and the associated costs of procuring, transporting and laboratory testing such products, we decided to focus our testing activity on smaller electric motors. Furthermore, following assessment of technical documentation, it was decided that the best candidates for product testing were electric motors in the lower power ranges.

Three electric motors were selected for initial verification testing based on findings from the technical documentation checks (e.g., results for product testing deemed at risk of not meeting limit values, and non-provision of requested information).

An appropriate laboratory was selected through a procurement exercise and an individual unit of each of the three selected models was purchased from website suppliers. These units were shipped to the laboratory in accordance with a chain of custody procedure for testing, with purchase and shipping of the products undertaken in a single batch across July and August 2021.

The following parameters were measured and reported upon by the laboratory:

- Nominal minimum efficiency (η) at full rated load and voltage.
- Determination of total losses (1-η).

Where:

'Nominal minimum efficiency' (η): refers to the efficiency of a motor at full rated load and voltage without tolerances and is the ratio of its useful power output to its total power input.

'Determination of total losses' (1-η): refers to the sum of all differences between the output mechanical power and the input electrical power due to losses occurring in the motor.

Results

Of the three models tested, two out of three (67%) products did not achieve the nominal minimum efficiency required under the regulation. However, with the application of the verification tolerances set out in the regulation, both were deemed compliant for the parameters tested.

Test Product ID No.	Required Nominal Motor Efficiency (η)	Measured Nominal Motor Efficiency (η)	Measured Total Losses (1-η)	Maximum Allowable Total Losses (1-η) With Use of Tolerances	Test Results
1	82.5%	81.9%	20.1%	20.1%	Pass within tolerance
2	79.6%	81.1%	23.5%	23.5%	Pass
3	88.7%	88.5%	13.0%	13.0%	Pass within tolerance

As all three tested products were deemed compliant with the parameters tested during the initial round of product testing, follow-up triplicate testing of these products was not required.

Summary

Of the 14 products subjected to formal compliance assessment, non-compliances were identified in nine (64%) cases. The main source of formal non-compliance was in the provision of product information (also occurring in nine cases), with primary reasons being the omission of product information requirements relating to disposal of the product and product information not provided in the order set out in the regulation. The three products that were laboratory tested were found to be compliant with technical requirements.

Where formal non-compliance has been identified, in most instances, it has been rectified voluntarily by the economic operator, without recourse to formal enforcement measures. Following engagement with the manufacturers and corrective actions being applied, eight out of nine (89%) of these products were deemed to have been brought into compliance and the cases were closed.

During this campaign, a small number of products ceased being placed on the market and no further action was taken. Jurisdictional issues relating to enforcement, which arose due to Brexit, also resulted in a small number of cases being closed.

Further market surveillance activity focusing on electric motors commenced in 2022 in line with the requirements of Regulation 2019/1781 focusing on product types covered by ecodesign legislation for the first time. This regulation covers a wider range of electric motor types and power ranges, and variable speed drives are covered by ecodesign regulations for the first time. Manufacturers of electric motors products not previously engaged with by SEAI are also being targeted through this campaign.

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