European Committee of Manufacturers of Electrical Machines and Power Electronics

- Updated version, February 14th, 2017 -

Usage of Manufacturing Tolerances in Ecodesign and Energy Labelling Implementing Measures for Low Voltage Motors, Falling under the Modified Regulation "EC 640/2009/" with Reference to the Official Journal L346, December 20th, 2016, Page 65.

This change of the current regulation EC 640/2009 may have an impact for the European motor manufacturers or importers when they declare the efficiency classes of their motors, in case the modification is not explained more clearly.

This CEMEP position is dedicated to provide one valid interpretation as a guideline for the European motor manufacturers.

The results out of a face-to-face meeting between representatives of the DG ENER and DG GROWTH and a delegation of the European CEMEP in Brussels at September, 14th are used in this position paper for backing-up the interpretation. The outcome of this discussion had been agreed by the commission representatives after the September 2016 meeting.

Manufacturing Tolerance

During mass production of low voltage motors, the efficiency classes labelled on the name plates and measured values of samples out of this production will differ due to variations of the raw material and assembly. Copper wirings, iron or bearings, processing etc. that may have a certain, statistical variation in their characteristics, may slightly degrade or upgrade the efficiency of one produced sample.

This has to be understood as the "manufacturing tolerance".

Manufacturing Tolerance Values from the International Agreed Standard IEC EN 60034-1, Table 20

The values from IEC EN 60034-1, Table 20 are derived from an international expertise consensus and indicate the allowed range in order to protect the motor manufacturers or importers against claims, that they intentionally indicating too optimistic values on the name plates. When compliance to table 20 is achieved, the motor sample fulfills the name plate declared efficiency value!

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As an example, take a motor 400V, 7,5 kW, 4 poles, IE3.

The required efficiency value from Annex I, Table 1 of EC 640/2009 is 90,4%.
Because of the manufacturing tolerances this value might deviate to a minimal efficiency of 90,4% - (1 – 90,4%)*15% = 89%, according to IEC EN 60034-1, Table 20 and shall still be judged as a compliant IE3 motor from any market surveillance authority.

It is not the intention of the European Commission to change this rule with the new modification of EC 640/2009, as published in L346 from December 20th, 2016!

What is the Intention of the European Commission to Modify the Current Legislation for Motors?

The intention of the omnibus amendment is to avoid that the manufacturers or importers measure one efficiency value on a model, and then automatically increase the value by the verification tolerance for the purposes of conformity assessment and declarations about the product.

Secondly the European Commission wanted to make clear to manufacturers or importers, that Member States authorities will not apply both, the tolerance values indicated in the harmonized standard IEC EN 60034-1, Table 20 and on top of them, the tolerance values listed in the EU regulation EC 640/2009 as measurement uncertainties.

In our example this would mean for a motor with a declared name plate efficiency of IE3 = 90,4%, that if the market surveillance authorities detect an average test sample value of:
90,4% - (1 – 90,4%) * 2 * 15% = 0,875% this motor would not comply!

It is clear for the CEMEP, that the manufacturing tolerance values from IEC EN 60034-1, Table 20 shall be used only once when verifying compliance and declaring efficiencies.

About Upcoming, Succeeding Legislations?

The European Commission pointed out in this meeting, that during the forthcoming revision of the motor regulation itself (what has actually no time schedule today), the tolerance values of motor efficiencies are likely to be discussed again.

Member States are calling for tolerance values in future that provide only for measurement uncertainty due to variation in laboratory equipment. They argue that differences stemming from production variation should be internalized by the manufacturers.

In this context, if market surveillance authorities find, through a series of tests carried out on a range of units of the same model, that they are all borderline compliant at 89% and there are no units measured above the 90.4% efficiency level of the above example, they will deduce that the applied tolerance of 15% is too generous, as in practice there is not such a big variation.

This would be interpreted, that motor manufacturers or importers are taking unrestrained advantage of the over-generous tolerance to sell products that are systematically less efficient than the limit values of EC 640/2009.

This could be an issue for a future lowering the tolerance value in a revised regulation!

CEMEP Positions to the Above Explained Contents

CEMEP welcomes the clarification that with the new modification of EC 640/2009, according to L346 from December 20th, 2016, the European product quality of the motors is generally confirmed.

CEMEP points out that the mass produced motors have been designed according to the internationally established standards IEC EN 60034-1 and IEC EN 60034-30-1 and that any deviation from this specified values (means full internalization of all possible worst-case production variations to the shoulders of the manufacturers), will lead to some unplanned development phases for extra European motor designs which is an unreasonable burden to the competitiveness of the European industry.

CEMEP concluded that while connecting motor efficiency tolerances to some general CO_2 abatement effects, the latter shall consider that motors are statistically not operated constantly in the point of classification but in an arbitrary crowd of different partial loads requested from some individual application process needs and that the effective motor efficiency may deviate in case of partial load conditions from the declared nominal value, that a direct relation from the name plate efficiency to a CO_2–abatement is somehow very questionable.

CEMEP welcomes that the essential difference between “determination uncertainties” in comparison to the” manufacturing tolerances” for efficiencies shall be considered more comprehensively, before any change in future legislation will be threatening the European competitiveness.

About CEMEP

CEMEP is the European Committee of Manufacturers of Electrical Machines and Power Electronics, representing an industry with a market value of € 6.3 billion and 130,000 employees. The members of

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CEMEP are the National Associations in Europe, representing manufacturers of electric motors, variable speed drives and uninterruptible power supplies.

This organization allows industry to co-ordinate actions at the European and International level, with the main topics being: market evolution, standardization, regulation, promotion and connection with other products & professional groups

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