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Life Cycle Assessment Method for Electric Machine

电机产品生命周期评价方法

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Life Cycle Assessment Method for Electric Machine

1 Scope

This Standard specifies the life cycle assessment and life cycle report of electric machine.

This Standard is applicable to the life cycle assessment of electric machine, and the Type III environmental declarations made by electric machine products in accordance with GB/T 24025.

NOTE: in accordance with GB/T 24025, this Standard is the Product Category Rules (PCR) of Type III environmental declarations made by electric machine products. The application of the Product Category Rules in Type III environmental declarations helps to ensure the credibility and comparability of the conclusions of life cycle assessment.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 1029 Test Procedures for Three-phase Synchronous Machines

GB/T 1032-2012 Test Procedures for Three-phase Induction Motors

GB/T 1311-2008 Test Procedure for Direct Current Machines

GB/T 9651-2008 Test Procedures for Single-phase Induction Motor

GB/T 22669-2008 Test Procedures for Three-phase Permanent Magnet Synchronous Machines

GB/T 22670-2018 Test Procedures for Converter-fed Three Phase Cage Induction Motors

GB/T 24025 Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures

GB/T 24040-2008 Environmental Management - Life Cycle Assessment - Principles and Frameworks

3.5 Functional Unit

Functional unit is used as the benchmark unit to quantify the performance of the product system.

NOTE 1: if the life cycle assessment is for a certain product, then, the functional unit may also be a product unit.

NOTE 2: Definition 3.20 of GB/T 24040-2008 is modified.

3.6 System Boundary

System boundary is to determine which unit processes are part of the product system through a set of criteria.

[Definition 3.32 of GB/T 24040-2008 is modified]

3.7 Cut-off Criteria

Cut-off criteria refer to the stipulation of whether the quantity of materials and energy flows related to the unit process or product system, or the degree of importance of environmental impact are excluded from the scope of the study.

[GB/T 24040-2008, Definition 3.18]

3.8 Impact Category

Impact category refers to the classification of concerned environmental issues. The results of life cycle inventory analysis may be classified into it.

[GB/T 24040-2008, Definition 3.39]

3.9 Reference Flow

Reference flow refers to the process output required to realize the function of a functional unit in a given product system.

[GB/T 24044-2008, Definition 3.29]

3.10 Reference Product

Reference product refers to a product or product system provide by the manufacturer, simulated in the life cycle assessment, and capable of realizing the specified functional unit.

[GB/T 37552-2019, Definition 3.13]

3.11 Reference Life Time

power asynchronous motors shall be measured in accordance with the “direct method” of GB/T 9651-2008; three-phase low-power asynchronous motors shall be measured in accordance with the “input - output method” of GB/T 1032-2012.

---Three-phase asynchronous motors shall be measured in accordance with the “loss analysis method for input - output power measurement (Method B)” specified in GB/T 1032-2012.

---Asynchronous starting three-phase permanent magnet synchronous motors shall be measured in accordance with the “loss analysis method for input - output power measurement (Method B)” specified in GB/T 22669-2008.

---Converter-fed permanent magnet synchronous motors shall be measured in accordance with the “input - output method” of GB/T 22670-2018.

---Three-phase synchronous motors shall be measured in accordance with the stipulations of GB/T 1029.

---Converter-fed three-phase cage induction motors shall be measured in accordance with the “input - output method” of GB/T 22670-2018.

---Direct current motors shall be measured in accordance with the stipulations of GB/T 1311-2008.

4.3.1.2.3 Requirements for maintenance

If applicable, the maintenance frequency of the product and the parts used for maintenance shall be stated, such as: bearings, seals and fasteners, etc.

4.3.1.3 End-of-life stage

The following processing links shall be considered for all elements of the product life cycle and recorded in the life cycle assessment report:

---Recycling of parts / materials (re-use, recycling);

---Disposal process of parts / materials (energy recovery and landfill, including secondary wastes generated during disposal).

4.3.2 Data unit

4.3.2 of GB/T 37552-2019 is applicable to this Standard.

4.3.3 Requirements for data collection

4.3.3 and 4.3.4 of GB/T 37552-2019 are applicable to this Standard.

4.3.4 Data quality assessment

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