



Guideline No.:Z-12.6(202605)

**Z-12.6**

**SPECIAL GUIDELINES FOR CARBON  
FOOTPRINT SURVEY of MARINE  
PRODUCTS**

**MARINE ROTATING ELECTRICAL  
MACHINES**

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## **Foreword**

The Special Guidelines for Survey of Carbon Footprint of Marine Products – Marine Rotating Electrical Machines by the China Classification Society (hereinafter referred to as "the Society") stipulate the applicable technical requirements for marine pressure vessels applying for the Society's green additional mark for the carbon footprint.

These Guidelines do not restrict users from adopting other requirements, provided that such requirements are not less stringent than those of these Guidelines.

These Guidelines are compiled and updated by the Society and are published at <http://www.ccs.org.cn>. Relevant stakeholders may send feedback on the Society's guidelines to [service@ccs.org.cn](mailto:service@ccs.org.cn).

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## 1 Purpose and Scope

### 1.1 Purpose

These Guidelines aim to specify the detailed requirements for the approval and survey of the green additional mark for carbon footprint of marine rotating electrical machines (including electric motors and generators), and shall be used in conjunction with the Society's Guidelines for Survey of Carbon Footprint of Marine Products (No. Z-12).

### 1.2 Scope

These Guidelines apply to the product carbon footprint approval and survey of marine rotating electrical machines.

## 2 Normative References

2.1 ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification;

2.2 ISO 14064-3:2019 Specification with guidance for the verification and validation of greenhouse gas statements;

2.3 China Classification Society Guidelines for Survey of Carbon Footprint of Marine Products

Note: The contents of the above documents become indispensable provisions of these Guidelines through normative references in the text. For dated references, only the edition cited applies to these Guidelines. For undated references, the latest edition (including all amendments) applies.

## 3 Terms and Definitions

### 3.1 Fossil Fuel Combustion Emissions

Greenhouse gas emissions generated from the use of fossil fuels as raw materials or fuels.

### 3.2 Process Emissions

Greenhouse gas emissions caused by physical or chemical changes other than fossil fuel combustion .

### 3.3 Declared unit

A reference unit used to quantify the partial carbon footprint of a product, and the declared unit for rotating electrical machines is ton (t).

### 3.4 Primary data

Quantitative value of a process or activity obtained through direct measurement or calculation based on direct measurement.

Notes:

① Primary data is not necessarily derived from the system under study, as it may involve other systems comparable to the system under study.

② Primary data may include greenhouse gas emission factors or greenhouse gas activity data.

### 3.5 Secondary data

Data that do not meet the requirements of primary data.

Notes:

① Secondary data are verified and credible data from authoritative institutions, which can be sourced from databases, published literature, national emission factors, calculated or estimated data, or other representative data. The use of localized databases is recommended.

② Secondary data may include data obtained from substitute processes or estimates.

### 3.6 Activity data

A quantitative measure of a production or consumption activity that results in greenhouse gas emissions.

Note: For example, the consumption of various fossil fuels, carbon-containing raw materials, etc.

### 3.7 Greenhouse gas emission factor

A coefficient relating activity data to greenhouse gas emissions.

## **4 Division of Approval Units**

4.1 For marine rotating electrical machines, approval units shall in principle be divided according to the series of rotating electrical machines (different series are divided by excitation mode, cooling mode, base material, etc.). Products with different protection grades, voltage grades, single/double fulcrums and lubrication modes may be regarded as the same series. For the same manufacturing enterprise and the same series but different production sites, they shall be regarded as different approval units. The detailed approval scope of each approval unit shall be defined in the certificate.

4.2 For manufacturing enterprises with complex processes and a large number of product series, it is permitted to apply for approval for a representative product series first. After the initial approval is passed, the Society may apply simplified document review and on-site audit procedures for other similar extension applications.

## **5 Implementation**

## 5.1 General Requirements

5.1.1 Manufacturers applying for the green additional marks GPC0 and GPC1 for marine product carbon footprint shall, in addition to meeting the requirements of these Guidelines, comply with the relevant requirements of the Guidelines for Survey of Carbon Footprint of Marine Products.

5.1.2 The applicant shall use the CCS platform for the exchange of data and materials.

## 5.2 Application for Approval

5.2.1 The applicant shall submit an application for the green additional mark for marine product carbon footprint, specifying the products involved in the approval, the scope of production sites, boundary conditions (system boundary, time boundary) and other information. In principle, the scope of products involved in the approval shall be consistent with the type approval scope. Meanwhile, manufacturing enterprises applying for the green additional marks GPC0 and GPC1 for marine product carbon footprint shall submit at least the following documents and materials for review:

- (1) Relevant information of the manufacturing enterprise and products, including: company profile, organizational chart, product name, product category, model, relevant standards, main purpose, scope of production sites, boundary conditions (system boundary, time boundary), functions and other information;
- (2) Production process (flow);
- (3) List of major energy-consuming equipment, list of measuring equipment, list of testing equipment, production capacity information corresponding to the approval period, and separate explanations shall be provided for multi-address production;
- (4) Basic Information Form of Products in Approval Units and Filing Form of Key Raw and Auxiliary Materials;
- (5) Measured data of net calorific value of fossil fuels, carbon content per unit calorific value, and measured carbon content of carbon-containing materials (where applicable);
- (6) Quantitative Evaluation Report on Carbon Footprint of Products in Approval Units;
- (7) Other documents stipulated in 5.2.1 of the Guidelines for Survey of Carbon Footprint of Marine Products.

If the approval unit already holds a Carbon Footprint Assessment Report that meets the requirements of Clause 5.2.1 of the Guidelines for Survey of Carbon Footprint of Marine Products, and the institution issuing the Carbon Footprint Assessment Report is confirmed by the Society to have the qualification for product carbon footprint certification, it is not necessary to provide it repeatedly.

5.2.2 Manufacturers applying for the green additional mark GPC1 for products shall also

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provide the materials specified in Clause 5.2.2 of the Guidelines for Survey of Carbon Footprint of Marine Products.

### 5.3 Acceptance of Approval

After reviewing the approval application and relevant documents, China Classification Society shall make a decision on whether to accept the application. The approval application shall be rejected or the acceptance shall be suspended if any of the following circumstances occurs:

- (1) Failing to meet the conditions stipulated in 5.2 of the Guidelines for Survey of Carbon Footprint of Marine Products;
- (2) The provided relevant documents contain fraudulent acts;
- (3) Circumstances where acceptance is not possible in accordance with laws, regulations or other administrative provisions, etc.

### 5.4 Document Review

5.4.1 The content of document review includes the relevant data and supporting materials of the approval applicant, with a focus on:

- (1) The legality of the organization, including the existence and legality of the qualifications of relevant institutions such as the certification client, producer (manufacturer) and manufacturing enterprise;
- (2) Confirmation of the declared unit: 1t (1000kg) of marine rotating electrical machines that have completed manufacturing and been transported out of the gate of the manufacturing enterprise (manufacturer), regardless of the characteristic parameters of the product in terms of diameter, length, height or other geometric aspects;
- (3) Confirmation of the time boundary: The time boundary shall cover a complete production cycle of the product, which is in principle the most recent consecutive natural year;
- (4) Confirmation of the system boundary: Including the production stage and transportation stage of raw and auxiliary materials, the manufacturing and testing stages of rotating electrical machine products, excluding the downstream product transportation, use and material recycling processes. It shall at least include:
  - ① Production and transportation of raw materials (such as magnet wire, silicon steel sheet, steel plate, magnetic steel, cast iron/cast aluminum raw materials, shaft raw materials, bearings, paint, insulation materials, etc.);
  - ② Production and transportation of auxiliary materials (such as cutting gas, welding shielding gas, industrial water, etc.) and energy (natural gas, electricity, etc.);
  - ③ Manufacturing and testing of marine rotating electrical machine products:

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- (a) Material forming and preprocessing, including electrical engineering, winding, cutting, stamping, lamination, welding, casting, forging and smelting, etc.;
  - (b) Material processing, including mechanical processing, surface heat treatment and painting, etc.;
  - (c) Component assembly (shaft, bearing, stator, rotor, collector ring or commutator, cooling device, excitation device, etc.), including assembly, welding, fitting and varnish dipping, etc.;
  - (d) General assembly, including assembly, fastening and painting, etc.;
  - (e) Inspection and testing, including process inspection and factory testing, etc.;
  - (f) Product packaging, including moisture-proof, shock-proof and reinforcement treatment, etc.;
- ④ Treatment of waste (wastewater, waste gas, solid waste) in the production process;
- (5) Data selection and cut-off: There are many types of unit process data. Primary data should be appropriately selected and cut off according to internationally recognized or equivalent standards, or according to the principles stipulated below. Omitted greenhouse gas emissions and removals shall be documented in writing:
- ① General solid waste accounting for less than 1% of the total solid waste generated may be ignored;
  - ② Each excluded material flow shall not exceed 1% of the mass, energy or greenhouse gas emissions of each unit process;
  - ③ The total excluded material flow in the system shall not exceed 5% of the mass, energy or greenhouse gas emissions;
  - ④ Consumption and emissions from infrastructure such as roads and factory buildings, equipment of each process, and personnel and living facilities within the factory area shall all be ignored;
- (6) Primary data and secondary data related to product carbon footprint shall at least include:
- ① Emissions during the production and transportation of raw materials (such as magnet wire, silicon steel sheet, steel plate, magnetic steel, cast iron/cast aluminum raw materials, shaft raw materials, bearings, paint, insulation materials, etc.), auxiliary materials (such as cutting gas, welding shielding gas, industrial water, etc.) and energy (natural gas, electricity, etc.);

Note: The carbon emissions of raw and auxiliary materials need to be supported by corresponding certification materials provided by upstream manufacturers, or indirectly

obtained according to the consumption of raw and auxiliary materials and relevant greenhouse gas emission factors.

- ② Fuel combustion emissions: Greenhouse gas emissions generated by the complete combustion of net consumed fossil fuels, including oxyacetylene cutting and blanking, pre-weld flame preheating, post-weld local flame heat preservation, etc., as well as emissions from mobile sources used for production (such as transportation vehicles and on-site handling equipment, etc.);
  - ③ Process emissions: Greenhouse gas emissions caused by physical or chemical changes other than fuel combustion during production, waste treatment and disposal. Greenhouse gas emissions generated by manufacturing enterprises from other purchased carbon-containing raw materials (such as welding materials, flaw detection reagents, water for hydraulic test, varnish dipping, painting, etc.) in processes such as welding, flaw detection, testing, etc.;
- (7) The results are verified by the Society or an institution with product carbon footprint certification qualification, with credible data and accurate conclusions.

5.4.2 The primary data and secondary data related to product carbon footprint in the Carbon Footprint Assessment Report shall be verified and validated, data from different data sources shall be cross-checked through evidence materials, and the differences between data sources shall be reasonably explained to ensure that the quantified carbon footprint values are reasonable, accurate and traceable.

5.4.3 If the Society determines that the Carbon Footprint Assessment Report does not meet the requirements of these Guidelines, the manufacturer shall clarify the relevant issues, or conduct a new carbon footprint assessment and submit the corresponding results until the conclusion is approved by the Society.

## **5.5 On-site Audit**

5.5.1 The content of the on-site audit includes the audit of the relevant management assurance capability and product consistency of the enterprise applying for the carbon footprint green additional mark for marine product approval. The on-site audit team shall keep complete records of the verification process for subsequent inspection, including but not limited to:

- (1) On-site verification of operational activities to confirm the consistency of carbon footprint data and information for applicable aspects—such as the name, grade, manufacturer, boundaries and key components, energy and resources (including scrap steel, etc.), and production process of the approved product—with the application documents;
- (2) On-site confirmation of the source and consumption of energy such as electricity and heat;
- (3) On-site confirmation of the power and service time of major energy-consuming equipment, and verification of the consistency and validity of measuring instruments with the application documents;

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- (4) Focus on verifying the relevant documents, records and vouchers of the core unit processes, and sample the original data and information to verify the traceability of the data, such as stator and rotor processing (stamping, winding), impregnation and curing, base and end cover processing, testing, etc.;
- (5) On-site confirmation of the treatment process of production waste (wastewater, waste gas, solid waste), auxiliary production process, on-site transportation process, carbon capture, utilization and storage process (if any);
- (6) Conduct interviews and discussions with personnel involved in relevant systems, procedures and operational control.

5.5.2 For manufacturers applying for GPC1, if the Society determines that the relevant on-site management systems are not effectively operated, and the sampled documents, records and vouchers are inconsistent with the declared documents, the Society may require the manufacturer to clarify the relevant issues or re-submit the relevant materials.

## **5.6 Maintenance of Approval**

5.6.1 When the carbon footprint approval certificate held by the manufacturer becomes invalid, suspended, revoked or canceled, the green additional mark for marine products shall be automatically invalidated.

5.6.2 The manufacturer shall regularly confirm the carbon footprint quantification and product consistency, and take necessary measures to avoid the unintended use or delivery of approved products. If the carbon footprint quantification and product consistency of the approved products are not in conformity, the manufacturer shall timely feed back information such as cause analysis, disposal and corrective measures to the Society. If necessary, apply to the Society for an additional audit to re-determine the green additional mark for marine products of the manufacturer.

5.6.3 The manufacturer shall apply for the periodic audit of the green additional mark for marine products every year to maintain the validity of the approval certificate. The audit shall be conducted within 3 months before or after the anniversary date of the approval certificate, or in conjunction with the periodic audit of type approval (if applicable).

5.6.4 When necessary, the Society's surveyor may conduct an additional audit and verification on the manufacturer to verify that the production and inspection of products are consistent with the control requirements confirmed at the time of approval, and the manufacturer shall cooperate.

5.6.5 The manufacturer shall take measures to ensure that all data collected in the design, procurement, production, inspection and quality control management processes are reliable, complete, consistent and representative.

5.6.6 The manufacturer shall identify and preserve important documents and information related to product carbon footprint labeling certification, such as carbon verification reports, product carbon footprint reports, third-party environmental monitoring reports, enterprise production statements, material balance sheets, lists of inspection and monitoring instruments and equipment, invoice vouchers for purchased key parts, energy and resources, statistical statements, status information of product carbon footprint labeling certification certificates (valid, suspended,

revoked, can celled, etc.), approval information of certification changes, product quality, environmental complaints and their handling results, and other documents and information related to product carbon footprint labeling certification.

### **5.7 Certificate and Additional Mark**

5.7.1 For manufacturing enterprises that have completed the approval of the green additional mark for marine product carbon footprint, the Society shall separately issue a Marine Product Carbon Footprint Approval Certificate with a validity period of 5 years or add the green additional mark for marine product carbon footprint to the original approval certificate, and the validity period shall be consistent with the original certificate.

5.7.2 For enterprises that have completed the approval of the green additional mark for marine product carbon footprint, the approved unit product carbon footprint value shall be indicated in the details of the approval certificate.

### **5.8 Periodical and Additional Audits, Changes to Approval**

5.8.1 After the approval of marine green products, a periodic audit shall be conducted at least once a year. For specific requirements, refer to the requirements for periodic approval audit in Chapter 3, Part 1 of the CCS Rules for Classification of Sea-Going Steel Ships, and at the same time, special attention shall be paid to carbon footprint-related content, such as verifying whether the approved emission reduction technologies and measures are continuously implemented and effectively operated.

5.8.2 When the Society deems it necessary, it may conduct an additional audit on the manufacturer approved for marine green products through prior agreement or its own decision.

5.8.3 If the quantified product carbon footprint increases by more than 5% due to planned changes and the situation lasts for more than three months, or the quantified product carbon footprint increases by more than 10% due to unplanned changes and the situation lasts for more than three months, an additional audit shall be required, and an approval change shall be made if necessary.

### **5.9 Survey of Carbon Footprint of Marine Rotating Electrical Machines**

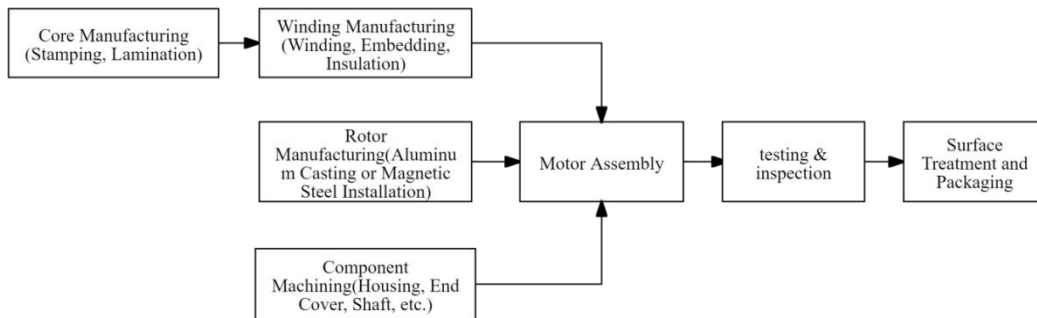
5.9.1 The product survey (single piece/batch survey) after the approval of the green additional mark for marine product carbon footprint shall include the following specific items to ensure the stability and traceability of the product carbon footprint:

- (1) Conformity check of production process flow: Confirm that the actual production process is consistent with the process approved at the time of the approval of the green additional mark for marine product carbon footprint;
- (2) Compliance assessment of key raw material supply: Verify the changes of suppliers of raw materials that have a major impact on carbon emissions;
- (3) Confirmation of carbon footprint data compliance: After the on-site audit by the surveyor is passed, the approved unit product carbon footprint value is permitted to be indicated on

the product certificate.

5.9.2 If a product needs to undergo the survey of the green additional mark for marine product carbon footprint but has not obtained the approval described in these Guidelines, the survey shall be conducted in accordance with the relevant requirements of Clause 5 of these Guidelines.

**Appendix: Manufacturing Process Flow of Marine Rotating Electrical Machines**



Note: As manufacturing and subcontracting processes may vary by enterprise, the current process documents and manufacturing specifications of the manufacturer shall prevail.