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# Z-12.3

# SPECIAL GUIDELINES FOR CARBON FOOTPRINT SURVEY OF MARINE PRODUCTS

# MARINE COATINGS

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**Foreword**

The Guidelines for Survey of Carbon Footprint of Marine Products – Marine Coatings by China Classification Society (hereinafter referred to as "the Society") stipulate the applicable technical requirements for marine coatings applying for the Society's green additional mark for carbon footprint of fire protection materials.

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.

Historical Versions and Issuance Dates: Newly released

Main changes: None.

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## 1 Purpose and Scope

### 1.1 Purpose

This Guideline specifies the detailed requirements for the approval and survey of the green additional mark for carbon footprint of marine coatings, 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

This Guideline applies to the approval and survey of product carbon footprint of marine coatings, including anti-fouling paint, ballast tank paint, crude oil cargo tank paint, anti-corrosive paint, hull paint, deck paint, etc.

## 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.

### 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 On-site data

Primary data obtained from within the product system.

Notes:① All on-site data are primary data, but not all primary data are on-site data, as data may be obtained from within different product systems;

② On-site data include greenhouse gas emissions and removals from a specific unit process within the site.

3.6 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.

3.7 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..

3.8 Greenhouse gas emission factor

A coefficient relating activity data to greenhouse gas emissions.

## 4 Division of Approval Units

4.1 For marine coatings, approval units shall, in principle, be divided according to production process. The same factory, the same type of material, and the same production process shall constitute one approval unit. Approval units may also be further subdivided according to the actual needs of the marine coating manufacturer. For the same coating manufacturer and the same product subcategory but with different production sites, they shall be treated as different approval units. The detailed scope of approval for products in each approval unit shall be defined in the approval certificate.

4.2 For coating manufacturers with a wide range of product types and complex processes, it is permitted to first apply for approval for a representative product subcategory or production line. After the initial approval is granted, the Society may apply simplified document review and on-site audit procedures for extension applications of other similar product subcategories or production lines.

## 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 data and document exchange.

### 5.2 Application for approval

5.2.1 The applicant shall submit an application for the green additional mark for carbon footprint of marine coatings, specifying the products covered by the approval, the scope of production sites, and boundary conditions (system boundary, time boundary). In principle, the scope of products covered by the approval shall be consistent with the scope of the works approval. Meanwhile, manufacturers applying for the green additional marks GPC0 and GPC1 for carbon footprint of marine products shall submit at least the following documents and materials for review:

(1) Relevant information about the manufacturer and products, including: product name, material, process type, applicable standards, main purpose, boundary conditions (system boundary, time boundary), etc.;

(2) Organizational chart, production process, list of major energy-consuming equipment, list of measuring equipment, list of testing equipment, and production capacity information corresponding to the approval period; for multi-site production, this shall be specified separately;

(3) Basic information table for products of the approval unit and a filing list of key raw and auxiliary materials;

(4) Measured data for net calorific value of fossil fuels, carbon content per unit calorific value, and measured carbon content of carbon-containing materials (if applicable);

(5) Quantitative assessment report on carbon footprint of products of the approval unit;

(6) Other documents stipulated in 5.2.1 of Guidelines for Survey of Carbon Footprint of Marine Products.

5.2.2 For manufacturers applying for the green additional mark GPC1 for marine product carbon footprint, they shall also submit other documents specified in Clause 5.2.2 of Guidelines for Survey of Carbon Footprint of Marine Products.

5.3 Acceptance of approval application

After reviewing the approval application and related documents submitted by the manufacturer, the China Classification Society will decide whether to accept the application. The approval application will be rejected or its acceptance suspended if any of the following situations occur:

(1) The conditions stipulated in 5.2 of Guidelines for Survey of Carbon Footprint of Marine Products are not met;

(2) The provided relevant documents contain falsifications;

(3) Circumstances where applications cannot be accepted in accordance with laws, regulations, or other administrative provisions, etc..

5.4 Document review

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

(1) The legality of the organization, including the existence and legality of the qualifications of relevant entities such as the certification client, producer (manufacturer), and manufacturing enterprise;

(2) Confirming the declared unit: 1 kg of marine coatings (including curing agent that may be supplied together and thinner used with the product);

(3) Confirmation of time boundary: It shall cover a complete production cycle of the product, generally the most recent consecutive calendar year;

(4) Confirming the system boundary: This includes production of raw and auxiliary materials, transportation of raw and auxiliary materials and energy, and the coating production stage, excluding downstream use processes. It shall at least include:

① Production and transportation of raw materials including resin, curing agent, solvent, additive, pigment, filler, etc.;

② Production and transportation of electricity/heat required for coating production;

③ Synthesis of resin preform (where applicable);

④ Production of marine coatings (batching, dispersion, grinding, paint mixing, packaging);

⑤ Treatment of waste from production process (wastewater, exhaust gas, volatile organic compounds (VOCs), solid waste).

(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 Greenhouse gas emissions accounting for less than 1% of the total emissions;

③ The sum of the excluded mass or greenhouse gas emissions shall not exceed 5% of the total raw material mass or total greenhouse gas emissions;

④ Consumption and emissions from infrastructure such as roads and workshops, process equipment, as well as personnel and living facilities within the plant area shall be ignored.

(6) Primary data and secondary data related to the product carbon footprint shall at least include:

① Emissions from the extraction, production and transportation stages of raw and auxiliary materials: emissions during the extraction, production and transportation of raw materials such as resin, curing agent, solvent, additive, pigment and filler. Note: Carbon emissions of raw and auxiliary materials shall be supported by corresponding documents provided by upstream suppliers, or indirectly obtained based on the consumption of raw and auxiliary materials and relevant greenhouse gas emission factors;

② Emissions from the production and transportation of energy (electricity, heat);

③ Fuel combustion emissions: emissions from mobile sources used for production (such as transportation vehicles and in-plant handling equipment);

④ Emissions from marine coating production process: greenhouse gas emissions generated during resin preform synthesis (where applicable), batching, dispersion, grinding, paint mixing, filtration and packaging of marine coatings;

⑤ Emissions from waste treatment during production: greenhouse gas emissions generated from the treatment of solid waste, wastewater and exhaust gas, such as greenhouse gas emissions from the combustion of volatile organic compounds (VOCs).

(7) The results are verified internally or by a third party, ensuring the data is credible and the conclusions are accurate.

5.4.2 The Carbon Footprint Assessment Report shall verify and validate the primary and secondary data related to the product carbon footprint. Data from different sources shall be cross-checked with supporting evidence, and discrepancies between data sources shall be reasonably explained to ensure 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 comply with the requirements of these guidelines, the manufacturer shall clarify the relevant issues, or re-conduct the carbon footprint assessment and submit the corresponding results, until its conclusions are accepted by the Society.

5.5 On-site audit

5.5.1 The on-site audit includes an audit of the relevant management assurance capabilities and product conformity of the enterprise applying for the green additional mark for the carbon footprint of marine coating products. The on-site audit team shall properly record the verification process for future reference. This includes, but is 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 sources and consumption of energy such as electricity and heat;

(3) On-site confirmation of the power and operating time of major energy-consuming equipment; verification of the consistency and validity of measuring instruments against the application documents;

(4) Focusing on verifying the relevant documents, records, and vouchers for core unit processes, and sampling raw data and information to verify data traceability. For example, resin preform synthesis (where applicable), dispersion, grinding, filtration and packaging of coating products;

(5) On-site confirmation of the waste (wastewater, exhaust gas, solid waste) treatment process, in-plant transportation process, and carbon capture, utilization and storage process (where applicable);

(6) Interview and discuss with personnel involved in the relevant systems, procedures, and operational controls.

5.5.2 For manufacturers applying for GPC1, if the Society determines that the on-site relevant management systems are not operating effectively, or that the sampled documents, records, and vouchers do not conform to the application documents, the Society may require the manufacturer to clarify the relevant issues or resubmit the relevant materials..

5.6 Maintenance of Approval

5.6.1 When the manufacturer's CCS Works Approval certificate becomes invalid, is suspended, withdrawn, or canceled, the green additional mark for the carbon footprint of the marine product will automatically become invalid.

5.6.2 The manufacturer shall periodically confirm the carbon footprint quantification and product conformity, and take necessary measures to prevent the unintended use or delivery of approved products. In case of non-conformity in the carbon footprint quantification or product conformity of an approved product, the manufacturer shall promptly provide feedback to CCS with information on cause analysis, disposition, and corrective actions. If necessary, an application for an additional audit shall be made to CCS to re-determine the manufacturer's green additional mark for the carbon footprint of the marine product.

5.6.3 The manufacturer shall apply for a periodical audit for the green additional mark for the carbon footprint of the marine product annually to maintain the validity of the approval certificate. The audit should be conducted within three months before or after the anniversary date of the Works Approval certificate or in conjunction with the periodical audit for the works approval.

5.6.4 When necessary, a CCS surveyor may conduct an additional audit of the manufacturer to verify that the production and inspection of the products conform to the control requirements confirmed at the time of CCS approval. The manufacturer shall provide cooperation.

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

5.6.6 The manufacturer shall identify and retain important documents and information related to the 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, invoices and vouchers for purchased key components, energy, and resources, statistical reports, status information of the product carbon footprint labeling certification certificate (valid, suspended, withdrawn, canceled, etc.), information on the approval of certification changes, product quality, environmental complaints and their handling results, and other documents and information related to the product carbon footprint labeling certification.

5.7 Certificate and Additional Mark

5.7.1 For manufacturers of marine castings and forgings that have completed the approval for the green additional mark for marine product carbon footprint, the Society shall either issue a separate "Approval Certificate for Carbon Footprint of Marine Products" with a validity period of 5 years or add the green additional mark for marine product carbon footprint to the original approval certificate, with the validity period consistent with the original certificate.

5.7.2 The approved carbon footprint value per unit product shall be specified in the details of the approval certificate for manufacturers of marine steel castings, steel forgings (including propellers) that have completed the approval for the green additional mark for marine product carbon

footprint.

5.8 Periodical and Additional Audits, Changes to Approval

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

5.8.2 When CCS deems it necessary, it may, by prior agreement or at its own discretion, conduct an additional audit of the manufacturer of the approved green marine product.

5.8.3 If a planned change leads to an increase of more than 5% in the quantified product carbon footprint, and this situation persists for more than three months, or if an unplanned change leads to an increase of more than 10% in the quantified product carbon footprint, and this situation persists for more than three months, an additional audit is required, and a change to the approval may be necessary.

5.9 Guidelines for Survey of Carbon Footprint of Marine Coatings

5.9.1 If the manufacturer voluntarily applies for product survey (individual/batch survey) after approval for the green additional mark for carbon footprint of marine products, the following specific items shall be included to ensure the stability and traceability of the product's carbon footprint:

(1) Production process conformity check: Confirm that the actual production process is consistent with the process approved at the time of approval for the green additional mark for carbon footprint of marine products;

(2) Key raw material supply conformity assessment: Verify changes in suppliers of raw materials that have a major impact on carbon emissions;

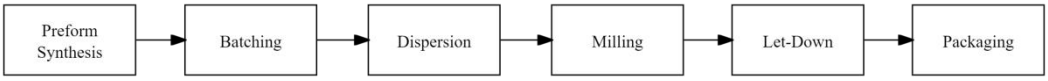
(3) Carbon footprint data conformity confirmation: After the surveyor's on-site audit is passed, the approved carbon footprint value per unit product is permitted to be noted on the product certificate.

5.9.2 When a product requires a survey for the green additional mark for the carbon footprint of marine products but has not obtained the approval described in these guidelines, the survey shall be conducted in accordance with the relevant requirements of Section 5 of these guidelines.

## Appendix: Typical Manufacturing Process Flow of Marine Coatings

(1) Manufacturing Process Flow Without Preform Synthesis


(2) Manufacturing Process Including Preform Synthesis




Note: The above production steps shall be selected in accordance with actual conditions. For example, the milling step may not be applicable to the production of solvent-free or high-solids coatings.