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Z-12.1

SPECIAL GUIDELINES FOR CARBON FOOTPRINT SURVEY OF MARINE PRODUCTS

ROLLED STEEL

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Foreword

The Special Guidelines for Survey of Carbon Footprint of Marine Products-Marine-grade Rolled Steel by the China Classification Society (hereinafter referred to as "the Society") stipulate the applicable technical requirements for Marine-grade Rolled Steel applying for the Society's green additional mark for the carbon footprint of marine-grade rolled steel.

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.

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CONTENTS

1 Purpose and Scope

1.1 Purpose

This Guideline aims to specify the detailed requirements for the approval and survey of the green additional mark for carbon footprint of marine-grade rolled steel products, 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 marine-grade rolled steel, including marine-grade rolled steel itself, its billets, stainless steel, etc., as specified in CCS Rules, for product carbon footprint approval and survey.

2 Normative References

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

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

2.3 ISO 20915:2018 Calculation method for life cycle inventory of steel products.

2.4 National standards and standards accepted by the Society.

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 consumption emissions

Carbon dioxide emissions generated from the use of fossil fuels as raw materials or for fuel purposes.

3.2 Process emissions

Greenhouse gas emissions resulting from physical or chemical changes other than fuel combustion during processes such as production and waste treatment and disposal.

3.3 Emissions embedded in carbon-containing products

Carbon dioxide emissions corresponding to the carbon sequestered in products such as pig iron and crude steel produced by the enterprise.

Note: The carbon-containing products in these guidelines refer to crude steel products and externally sold pig iron, crude benzene, and tar.

3.4 Declared unit

A reference unit used to quantify the partial carbon footprint of a product.

3.5 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.

3.6 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.

3.7 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.

3.8 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.

3.9 Greenhouse gas emission factor

A coefficient relating activity data to greenhouse gas emissions.

4 Division of Approval Units

4.1 For marine-grade steel, approval units are, in principle, divided according to product subcategories. The same factory, same product type, same subcategory, and same process/production line constitute one approval unit. It can also be refined to the corresponding product standard, grade, or specification according to the actual needs of the steel mill. For the same steel mill and the same product subcategory but different production sites, they should be treated as different approval units. The detailed scope of approval for each approval unit's products will be defined in the approval certificate.

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

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-grade steel products, specifying information such as the products involved, the scope of production sites, and boundary conditions (system boundary, time boundary). In principle, the scope of products involved in the approval should be consistent with the scope of the works approval. Meanwhile, manufacturers applying for the green additional marks GPC0 and GPC1 for the 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, grade, delivery condition (the correspondence between deoxidation method, grain refining elements, delivery condition, etc., for each steel grade should be specified), applicable standards, main purpose, and boundary conditions (system boundary, time boundary);

(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 should be specified separately;

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

(4) 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);

(5) Quantitative Evaluation Report on Carbon Footprint of Products in Approval Units;

(6) Other documents stipulated in 5.2 of Guidelines for Survey of Carbon Footprint of Marine Products.

The total greenhouse gas emissions allocated to and deducted for co-products generated during the production of castings and forgings per declared unit, and the emissions corresponding to the carbon sequestered in the product, shall be deducted. If the approval unit already holds a Carbon Footprint Assessment Report issued by an organization qualified for product carbon footprint certification, and it covers the above content, it does not need to be provided again.

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 t (1000 kg) of marine-grade steel that has completed manufacturing and is transported out of the steel mill (manufacturer) gate, irrespective of the product's characteristic parameters such as diameter, length, thickness, or other geometric features.

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

(4) Confirming the system boundary: This includes the extraction of raw/auxiliary materials and energy (the 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), the production stage, the transportation stage for raw/auxiliary materials and energy, and the steel product production stage. It does not include downstream use processes. It shall at least include:

① Raw material extraction, production, and transportation;

② Auxiliary material extraction, production, and transportation (dolomite, limestone, refractory materials, etc.); energy extraction, production, and transportation (coal, natural gas, purchased coke, etc.);

③ Scrap steel collection and processing;

④ Steel product production (sintering/pelletizing process, blast furnace process, converter process, electric furnace process, refining process, casting, rolling, heat treatment, and post-treatment, etc.);

⑤ Treatment of waste (wastewater, exhaust gas, solid waste) from the production process; reuse of steel co-products.

(5) Data cut-off: There are many types of unit process data. Primary data should be appropriately 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 Auxiliary materials with a mass less than 1% of the total raw material consumption;

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 and production stages of raw/auxiliary materials and energy: emissions during the extraction and production processes of raw materials (iron ore, alloys, etc.), auxiliary materials (dolomite, limestone, refractory materials, etc.), and energy (coal, natural gas, purchased coke, electricity, etc.).

② Fuel combustion emissions: CO2 emissions from the net consumption of fossil fuels, including emissions from stationary sources within the steel production enterprise (such as coke ovens, sintering machines, blast furnaces, industrial boilers, and other stationary combustion equipment), and emissions from mobile sources used for production (such as transportation vehicles and in-plant handling equipment).

③ Industrial process emissions: CO2 emissions generated from the decomposition and oxidation of other purchased carbon-containing raw materials (such as electrodes, pig iron, ferroalloys, direct reduced iron, etc.) and fluxes in processes such as sintering, iron-making, and steel-making within the steel production enterprise.

④ Emissions embedded in carbon-containing products: A small portion of carbon is sequestered in externally sold products such as pig iron and crude steel produced by the enterprise during the steel production process. Another small portion is sequestered in carbon-sequestering products such as methanol, which are produced using by-product gas as a raw material. The carbon dioxide emissions corresponding to this portion of carbon sequestered in the products shall be deducted.

(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 establishment and operation of relevant management systems and the product conformity of the enterprise applying for the green additional mark for the carbon footprint of marine-grade steel products. Management systems include the establishment, operation, and certification status of quality, environmental, occupational health and safety, energy, and carbon emission management systems. A conformity audit refers to the random sampling and inspection of approved products for conformity from among the products that have been confirmed by the enterprise as qualified. 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, 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, processes within the steel product production stage such as sintering/pelletizing process, blast furnace process, converter process (for long-flow steel products), electric furnace process (for short-flow steel products), refining process, casting, rolling, heat treatment, and post-treatment (if any).

(5) On-site confirmation of the waste (wastewater, exhaust gas, solid waste) treatment process, auxiliary production processes, in-plant transportation process, co-product reuse process, and carbon capture, utilization, and storage process (if any).

(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 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-grade rolled steel 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 Survey of Carbon Footprint of Marine-Grade Rolled Steel

5.9.1 The product survey (individual/batch survey) after approval for the green additional mark for the carbon footprint of marine products shall include the following specific items 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 the approval for the green additional mark for the carbon footprint of the marine product.

(2) Key raw material supply conformity assessment: Verify that the suppliers of raw materials that have a major impact on carbon emissions have not changed.

(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.