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**Carbon footprint quantification and reporting for internal
combustion engine products**

温室气体 产品碳足迹量化方法和要求 内燃机

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Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Principle	2
4.1 Life cycle perspective	2
4.2 Relative methods and functional units	3
4.3 Iterative Method	3
4.4 Correlation	3
4.5 Integrity	3
4.6 Consistency	3
4.7 Unity	3
4.8 Accuracy	3
4.9 Transparency	3
4.10 Avoiding Double Counting	3
5 Methods for quantifying the carbon footprint of internal combustion engine products or parts of them	3
5.1 Overview	3
5.2 Determination of purpose and scope	4
5.3 Life Cycle Inventory Analysis	8
5.5 Explanation of product carbon footprint results	15
28 Reference	31

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document was prepared by the National Technical Committee on Standardization of Internal Combustion Engines (SAC/TC177) and the National Technical Committee on Standardization of Carbon Emission Management (SAC/TC548) jointly managed. This document was drafted by:

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Greenhouse gas product carbon footprint quantification methods and requirements internal combustion engine

1 Scope

China's national standard for quantifying and reporting the carbon footprint of internal combustion engine products. The engine industry is in an unusual position: its product's emissions in use are its defining characteristic and are already regulated in detail, while the emissions embodied in making it have never been counted. As transport electrifies, that balance shifts, and the questions being asked change with it - a heavy diesel engine may run on renewable fuel, a marine or generating set engine may operate for thirty years, and in each case the manufacturing footprint becomes a larger share of the total. The methodological difficulty is the one the scope names: an engine's footprint may be assessed over the full life cycle or over part of it, and where that boundary is drawn determines the answer entirely. The standard specifies the principles, the quantification methods and the reporting requirements, and applies to full and partial life cycle accounting, evaluation and reporting for engine products.

This document specifies the principles, quantification methods and carbon footprint reporting requirements for internal combustion engine products. This document applies to the accounting, evaluation and reporting of carbon footprint of internal combustion engine products during their full life cycle and partial life cycle.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 1147.1 Small and medium power internal combustion engines Part

3 Terms and definitions

The terms and definitions defined in GB/T 24040, GB/T 24044, GB/T 32150 and GB/T 24067 and the following terms and definitions apply to this document.

3.1 A heat engine is a machine that burns fuel inside the machine and converts the heat energy generated by the combustion into mechanical energy.

3.2 The sum of greenhouse gas emissions and greenhouse gas removals in the product system, expressed in carbon dioxide equivalent, based on the climate change Life cycle assessment of a single impact type. Note

1.Product carbon footprint is shown in Table 1 of GB/T 24067-2024, which uses different legends to distinguish and indicate specific greenhouse gas emissions and removals. Traces can also be broken down into the various stages of their life cycle. Note

2.The quantitative results of the carbon footprint are recorded in the product carbon footprint study report, expressed as carbon dioxide equivalent (CO₂e) per functional unit. [Source: GB/T 24067-2024, 3.1.1, modified]