

ICS 27.020
CCS J 92



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 1149.12-2023

Replacing GB/T 1149.12-2013

**Internal combustion engines - Piston rings - Part 12: Half
keystone rings made of steel
(English Translation)**

Issued on: December 28, 2023

Implemented on: July 1, 2024

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 12 of GB/T 1149 "Piston Rings for Internal Combustion Engines": GB/T 1149 has published the following parts:

---Part 1: General rules;

---Part 2: Terminology;

---Part 3: Material specifications;

---Part 4: Quality requirements;

- Part 5: Inspection methods;
- Part 6: Cast iron scraper rings;
- Part 7: Rectangular cast iron rings;
- Part 8: Rectangular steel ring;
- Part 9: Trapezoidal cast iron rings;
- Part 10: Trapezoidal steel rings;
- Part 11: Wedge-shaped cast iron rings;
- Part 12: Wedge-shaped steel rings;
- Part 13: Oil rings;
- Part 14: Spiral spring oil ring;
- Part 15: Thin cast iron spiral spring oil ring;
- Part 16: Steel belt combined oil ring;
- Part 17: Steel spiral spring oil ring;

This document replaces GB/T 1149.12-2013 "Internal combustion engine piston rings - Part 12: Wedge-shaped steel rings" and is the same as GB/T 1149.12-Compared with:2013, the main technical changes are as follows:

- a) The types of wedge-shaped steel rings have been added, and the applicable bore range of wedge-shaped steel rings has been modified (see Chapter 1, Chapter 1 of the:2013 edition);
- b) Added types and marking examples of wedge-shaped steel rings HKBA (see Chapter 5, Chapter 4 of the:2013 edition);
- c) Added PVD-related content to the general characteristics and elastic coefficient (see 6.1, 6:3, Chapter 7, 5:1, 5:3, Chapter:2013 version Chapter 6);
- d) In the general characteristics, elastic coefficient and specification tables, the corresponding content of HKBA type has been added (see Chapter 6, Chapter 7, Chapter 8 Chapter, Chapter 5, Chapter 6, Chapter 7 of the:2010 edition);
- e) Added the calculation method for the measurement height h_3 of the wedge-shaped steel ring (see Appendix A):

This document is equivalent to ISO 6624-4:2016 "Internal combustion engine piston rings - Part 4: Wedge steel rings":

A "Terms and Definitions" chapter has been added to this document:

This document has made the following minimal editorial changes:

---In order to coordinate with the existing standards, the standard name is changed to "Internal Combustion Engine Piston Rings Part 12: Wedge Steel Rings":

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

GB/T 1149 "Internal Combustion Engine Piston Rings" is a national standard that guides the design, inspection and use of internal combustion engine piston ring products in my country:

Composed of 17 parts:

---Part 1: General rules: The purpose is to establish the general characteristics of piston rings (the individual dimensional characteristics are in the corresponding national standards regulations), codes, marks and logos:

---Part 2: Terminology: The purpose is to establish the classification, types, names of each part, terminology and definition:

---Part 3: Material specifications: The purpose is to establish specifications for the classification of materials used in piston rings according to their mechanical properties:

---Part 4: Quality requirements: The purpose is to establish product quality requirements that are not usually expressed on technical requirements on drawings:

---Part 5: Inspection methods: The purpose is to establish the inspection method of piston rings:

---Part 6: Cast iron scraper rings: The purpose is to establish the basic dimensions of cast iron scraper rings for piston ring models N, NM, E and EM:

feature:

---Part 7: Rectangular cast iron ring: The purpose is to establish the basic dimensions of rectangular cast iron piston rings for R, B, BA and M piston ring types:

inch characteristics:

---Part 8: Rectangular steel ring: The purpose is to establish the basic dimensions of rectangular steel piston rings with piston ring types R, B, BA and M:

feature:

---Part 9: Trapezoidal cast iron rings: The purpose is to establish the piston ring models as T, TB, TBA, TM, K, KB, KBA and KM Basic dimensional characteristics of trapezoidal cast iron piston rings:

---Part 10: Trapezoidal steel ring: The purpose is to establish the piston ring models as T,

TB, TBA, TM, K, KB, KBA and KM ladder Basic dimensional characteristics of shaped steel piston rings:

---Part 11: Wedge-shaped cast iron rings: The purpose is to establish the piston ring models of HK, HKB and HKBA wedge cast iron piston rings:

Basic dimensional characteristics:

---Part 12: Wedge-shaped steel rings: The purpose is to establish the basis for wedge-shaped steel piston rings with piston ring models HK, HKB and HKBA:

Characteristics of this size:

---Part 13: Oil rings: The purpose is to establish the basic dimensions of piston ring models for S-type, G-type, D-type and DV-type oil rings:

feature:

---Part 14: Spiral spring oil ring: The purpose is to establish the piston ring models as DSF-C, DSF-CNP, SSF, GSF, DSF, Basic dimensional characteristics of DSF-NG and SSF-L spiral spring oil rings:

---Part 15: Thin cast iron spiral spring oil ring: The purpose is to establish the piston ring models as DSF-C, SSF, GSF, DSF and Basic dimensional characteristics of SSF-L thin cast iron spiral spring oil ring:

---Part 16: Steel belt combined oil ring: The purpose is to establish the basic dimensional characteristics of the steel belt combined oil ring:

---Part 17: Steel spiral spring oil ring: The purpose is to establish the piston ring models as SOR (R-type oil groove) and SOV (V-type oil groove):

Groove) Basic dimensional characteristics of steel spiral spring oil rings:

Part 1 ~ Part 5 of GB/T 1149 stipulates the common content of all piston ring products, and Part 6 ~ Part 17 respectively Specifies the characteristics of piston rings of different materials and types:

This document and GB/T 1149.11 respectively specify the basic dimensional characteristics of wedge-shaped piston rings of different materials:

This document gives a wide range of parameters in the general characteristics and specification tables of piston rings: When designing, designers need to base their designs on the parameters of the piston rings:

Choose according to specific working conditions:

Designers need to refer to other relevant standards of GB/T 1149 before conducting piston ring design and parameter selection: