

ICS 27.020
CCS J 92



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

GB/T 1149.11-2023

Replacing GB/T 1149.11-2010

**Internal combustion engines - Piston rings - Part 11: Half
keystone rings made of cast iron
(English Translation)**

Issued on: December 28, 2023

Implemented on: July 1, 2024

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

Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Overview
5 Type and marking examples
5.1 HK type---cylindrical 7° wedge-shaped cast iron ring
5.2 HKB type---symmetrical barrel surface 7° wedge-shaped cast iron ring
5.3 HKBA type---Asymmetric barrel surface 7° wedge-shaped cast iron ring ($h_1 \geq 1.2\text{mm}$)
6 Common Characteristics
6.1 HK type, HKB type, HKBA type ring---surface layer structure
6.2 HK type, HKB type and HKBA type rings---external/internal edge chamfering (KA, KI)
6.3 HK type, HKB type and HKBA type rings (fully plated, semi-mounted, inlaid)---plating/coating thickness
7 Elasticity coefficient
8 Specifications
Appendix A (normative) Calculation method of wedge ring measurement height h_3
Reference

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 11 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 1149.11-2010 "Internal combustion engine piston rings - Part 11: Wedge cast iron rings" and is consistent with GB/T 1149.11-Compared with:2010, the main technical changes are as follows:

- a) Added the type of wedge-shaped cast iron ring HKBA (see Chapter 1 and Chapter 5, Chapter 1 and 4 of the:2010 edition);
- b) 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);
- c) Added the calculation method for the measurement height h_3 of the wedge-shaped cast iron ring (see Appendix A):

This document is equivalent to ISO 6624-2:2016 "Internal combustion engine piston rings - Part 2: Wedge cast iron 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 11: Wedge Cast Iron 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 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 1149.12 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:

Internal combustion engine piston rings Part 11: Wedge-shaped cast iron rings

1 Scope

This document specifies the basic specifications for wedge-shaped cast iron piston rings (hereinafter referred to as wedge-shaped cast iron rings) with piston ring models HK, HKB