

ICS 21.200
CCS J17



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

GB/T 10227-2025

Replacing GB/T 10227-1988

Accuracy of fine-pitch cylindrical worm and worm-wheel

小模数圆柱蜗杆、蜗轮精度

Issued on: August 29, 2025

Implemented on: March 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

1	Scope
2	Normative references
3	Terms and Definitions
3.1	Worm Gear Deviation
3.1.1	Worm lead deviation F_{pz}
3.1.2	F_{px}
3.2	Worm Gear Deviation
3.3	Overall Deviation
4	Precision system
4.1	General Rules
4.2	Accuracy Class 8 5 tolerance
5.1	General Rules
5.2	Common ratio between grades
5.3	Rounding Rules
5.4	Tolerance Calculation
6	Inspection Rule
6.1	Lead deviation
6.2	Tooth profile deviation
6.3	Tooth pitch deviation
6.4	Radial runout deviation
6.5	Measuring distance deviation of the measuring rod is
6.6	Tangential composite deviation
6.7	Radial composite deviation
13	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 replaces GB/T 10227-1988 "Precision of Small Module Cylindrical Worms and Worm Gears". Compared with GB/T 10227-1988, except for the structure... Aside from

adjustments and editorial changes, the main technical changes are as follows:

- a) The scope has been changed (see Chapter 1, Chapter 1 of the 1988 edition);
- b) Some terms, definitions, and symbols have been changed (see Chapter 3, Chapter 3 of the 1988 edition);
- c) The requirements for center distance deviation, intermediate plane error, and shaft angle deviation of worm gear drives have been removed (see Chapter 3 of the 1988 edition);
- d) The requirements for the composition of precision units have been changed (see Chapter 4, Chapter 4 of the 1988 edition);
- e) The provisions concerning tolerance groups have been deleted (see 5.3 in the 1988 edition);
- f) An additional formula for calculating the tolerance value of the accuracy class has been added (see Chapter 5). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Gear Standardization (SAC/TC52). This document was drafted by: Zhengzhou Machinery Research Institute Co., Ltd., China Academy of Machinery Science and Technology, Chongqing University, and Shenzhen Zhaowei Electromechanical Co., Ltd. Limited Liability Company, Harbin Jingda Measuring Instruments Co., Ltd., Zhejiang Xiaxia Precision Manufacturing Co., Ltd., Dongguan Xinghuo Gear Co., Ltd. Zhengzhou Institute of Machinery Technology (Zhengzhou) Transmission Technology Co., Ltd., Zhejiang Fengli Intelligent Technology Co., Ltd., Zhejiang Jiezhong Technology Co., Ltd., Hangzhou Jiepai Transmission Technology Co., Ltd., Guizhou Aerospace Qunjian Precision Machinery Co., Ltd., Shandong Xianhe Auto Parts Co., Ltd., Guangdong Hantai Precision Mi Technology Co., Ltd., and Zhejiang Taijiu Precision Machinery Co., Ltd. The main drafters of this document are. Wang Zhigang, Chen Yonghong, Ye Shubing, Li Haixia, Cao Zhigang, Liu Lixue, Xia Ting, Tong Aijun, and Wang Youli. Zheng Yimiao, Chen Demu, Zhang Kun, Shi Lubing, He Zhibin, Fan Ruili, Lü Bin, Xiao Yuliang, Xiang Qingbo, Zhou Guangcai, Xie Guiping, Wang Defeng, Wang Bing Sun Kun, Lu Jianjiang, Liu Bo, Xu Wenbo, Dong Jinchao, Qiu Junzhu, Zhang Yingzhen, Guo Qingqing, Guan Hongjie, Xie Xueli, Huang Zongjun, Zhi Yanfeng, Yu Feipeng Guan Rongxin and Ma Chengtian. This document was first published in 1988, and this is its first revision. Small module cylindrical worm gear and worm wheel precision

1 Scope

GB/T 10227-2025 is the Chinese national standard on accuracy of fine-pitch cylindrical worm and worm-wheel, in the field of mechanical systems and components. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding

as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 29 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2026. Classification: ICS 21.200, CCS J17. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the precision system, tolerances, inspection rules, and drawing standards for small-module cylindrical worm gears, worm wheels (or helical gears), and worm gear transmission pairs. Note the requirements. This document applies to cylindrical worm gear pairs with a module m of 0.1mm to 0.5mm and an axis intersection angle sum of 90° . The worm's pitch circle... Diameter $d_1 \leq 30\text{mm}$, worm gear pitch circle diameter $d_2 \leq 320\text{mm}$, worm type is Archimedes worm (ZA), involute worm (ZI), or French worm. Straight profile worm (ZN) and conical envelope worm (ZK). This document also applies to worm gear pairs consisting of an involute worm (ZI) and an involute helical gear.

Note. In this document, small module cylindrical worm gears and small module cylindrical worm wheels are abbreviated as "worm" and "worm wheel," respectively, and small module involute helical gears are abbreviated as "helical gears." The term "worm gear pair" refers to a small-module cylindrical worm gear drive pair, while the term "worm gear pair" refers to a small-module involute cylindrical worm gear helical gear drive pair. The worm gear pair, worm wheel pair, and worm gear pair are collectively referred to as "worm gear transmission pair".

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 2363 Precision of Small Module Involute Cylindrical Gears

GB/T 2821 Gear Geometric Element Designations

GB/T 3374.1 Gears - Terminology and Definitions - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 2821, GB/T 3374.1 and GB/T 3374.2, as well as the following terms and definitions, apply to this document.

3.1.1 Worm lead deviation F_{pz}

1 The difference between the actual and nominal dimensions of the worm gear lead.

3.1.2 F_{px}

1 Within the worm gear shaft section, the difference between the actual tooth pitch and the nominal tooth pitch of any tooth.

Note. See Figure 1.