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

GB/T 16768-2025

Replacing GB/T 16768-1997

**Metal-cutting machine tools - Measurement method for
vibration**

金属切削机床 振动测量方法

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Table of Contents

1.Scope	1
2 Normative References	1
3.Terms and Definitions	1
4.Measurement conditions	2
5.Measurement Methods	2
3 Appendix A (Informative) Machine Tool Vibration Measurement Record.....	4

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 16768-1997 "Methods for Vibration Measurement of Metal Cutting Machine Tools". Compared with GB/T 16768-1997, except for... Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) Two new terms, "vibration" and "(vibration) peak-to-peak value", have been added (see
- b) The "Measurement Instrument Conditions" have been changed (see 4.1,.1997 edition 4.1);
- c) Added "Machine Tool Installation Requirements" (see 4.2);
- d) The "Machine tool idle time requirement before measurement" has been changed (see 4.3,.1997 version 4.3);
- e) Added the requirement to "draw a graph showing the relationship between rotational speed and absolute vibration velocity" (see 5.1.11);
- f) Added the requirement to "draw a graph showing the relationship between rotational speed and relative vibration displacement" (see 5.2.5);
- g) The "Numerical Processing" section has been changed and its contents have been incorporated into the "Measurement Methods" section (see Chapter 5, Chapter 5 of the.1997 edition). 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 by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Metal Cutting Machine Tools (SAC/TC22). This document was drafted by: National Machine Tool

Quality Supervision and Inspection Center, Xi'an Jiaotong University, Beijing Machine Tool Research Institute Co., Ltd., and Tianjin University. The institutions involved include. China General Technology Group Machine Tool Engineering Research Institute Co., Ltd., Shandong University, and Shanghai Xinsun Machine Tool Co., Ltd. The main drafters of this document are. Xue Ruijuan, Zhang Wei, Huang Zuguang, Gao Weiguo, Ji Shuai, Li Ke, Jiang Erbiao, Yu Chunping, Zhao Libo, and Lin Qijing. Bi Xingrui, Guan Duanyang, Chen Wei, He Chunshu, Wang Jing, Chen Yanyan. This document was first published in 1997, and this is its first revision.

This document presents a method for measuring vibration in metal cutting machine tools, with the aim of reducing and controlling the adverse effects of machine tool vibration. Adverse effects include impacting the surface quality and precision of finished products, causing premature wear and damage to machine tool components, reducing tool life, and generating unacceptable damage. Noise, harm to the operator's health, etc. In most cases, this document primarily addresses the vibrations generated between the cutting tool and the workpiece. Vibration measurement methods for metal cutting machine tools

1 Scope

GB/T 16768-2025 is the Chinese national standard on metal-cutting machine tools - measurement method for vibration, in the field of manufacturing engineering. 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 5 October 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2026. Classification: ICS 25.080.01, CCS J50. 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 describes the measurement conditions, methods, and records for the absolute and relative vibrations of metal cutting machine tools during idle operation. This document applies to vibration testing and inspection of metal cutting machine tools (hereinafter referred to as "machine tools").

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 2298-2010 Glossary of Mechanical Vibration, Shock and Condition Monitoring

3 Terms and Definitions

The terms and definitions defined in GB/T 2298-2010, as well as the following terms and definitions, apply to this document.

3.1 Vibration Mechanical oscillations around a certain equilibrium point.

Note. This oscillation can be periodic or random. [Source: GB/T 2298-2010, 3.1, with modifications]

3.2 machine tool vibration Vibrations generated during machine tool operation.

3.3 When a machine tool is in operation, a certain part of the machine tool vibrates relative to the foundation.

Note. The effective values of vibration velocity measured at a certain location on the machine tool in the X, Y, and Z directions are expressed in millimeters per second (mm/s).

3.4 When a machine tool is running, there is vibration between the cutting tool and the workpiece.

Note. The vibration displacement peak-to-peak value measured between the simulated tool and the simulated workpiece in a specified direction is expressed in micrometers (μm).

3.5 When the machine tool is stationary, the vibrations transmitted to it by all external vibration sources are transmitted to the machine tool.

3.6 At the instantaneous machining point of the machine tool, the direction is perpendicular to the forming surface of the imaginary workpiece.