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

GB/T 40808.2-2025

**Environmental evaluation of machine tools - Part 2: Methods for
measuring energy supplied to machine tools and machine tool
components**

机床环境评估 第2部分：机床和机床部件能耗的测量方法
(English Translation)

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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 2 of GB/T 40808 "Machine Tool Environmental Assessment". GB/T 40808 has already published the following parts.

---Part 1: Energy-Saving Design Methods for Machine Tools;

---Part 2: Methods for measuring energy consumption of machine tools and machine tool components;

---Part 3: Principles for Energy Efficiency Testing of Metal Cutting Machine Tools this document adopts ISO 14955-2:2018 "Machine tools - Environmental assessment - Part 2: Measurement of energy consumption of machine tools and machine tool components".

method".

The following minimal editorial changes have been made to this document.

---To align with existing standards, the standard title has been changed to "Machine Tool Environmental Assessment Part 2: Measurement of Energy Consumption of Machine Tools and Machine Tool Components".

method";

---Version 7.6 added ANR comments.

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).

Introduction

Machine tools are complex industrial products used to manufacture parts or semi-finished products. The performance of a machine tool is related to its economic value, technical specifications, and operational requirements.

Related factors are key considerations for investment. Even with the same machine tool, in actual use, the different parts being processed and their processing techniques will vary.

The energy consumption of different machine tools will also vary. Therefore, when conducting an environmental impact assessment of a machine tool, it is necessary to consider the machine tool's operating conditions.

GB/T 40808 aims to quantify the improvement of the environmental impact of machine tools over a period of time, based on a range of available and positive machine tool environmental impact assessment standards.

The environmental impact assessment of machine tools will consist of five parts.

---Part 1: Energy-Saving Design Methods for Machine Tools. The aim is to provide methods for reducing the environmental impact of energy consumption during machine tool operation.

Machine tool design and manufacturing guidelines.

---Part 2: Methods for Measuring Energy Consumption of Machine Tools and Machine Tool Components. The purpose is to provide necessary methods for measuring the energy consumption of machine tools and machine tool components.

Parameters and calculation methods.

---Part 3: Principles for Energy Efficiency Testing of Metal Cutting Machine Tools. The purpose is to provide guidelines for energy efficiency testing of metal cutting machine tools as specified in GB/T 40808.1 and GB/T 40808.2.

These are the application principles and methods in machine tools.

---Part 4: Energy Efficiency Testing Principles for Metal Forming Machine Tools and Laser Processing Machine Tools. The purpose is to provide guidance for testing energy efficiency in GB/T 40808.1 and...

GB/T 40808.2 Principles and methods for application in metal forming machine tools and laser processing machine tools.

---Part 5: Energy Efficiency Testing Principles for Woodworking Machine Tools. The purpose is to provide guidelines for energy efficiency testing of woodworking machine tools according to GB/T 40808.1 and GB/T 40808.2.

Application principles and methods in bed.

This document provides a basis and guidance for energy consumption measurement of various machine tools and machine tool components. This document is based on GB/T 40808.1.

The above describes a method for measuring machine tool energy consumption to support energy-saving design principles. This is to ensure the input energy is rationally allocated to various machine tool functions.

Yes, measurements need to be performed at the machine tool component level. These measurements are repeatable and are only affected by the conditions of recording and documentation. The measurement results...

The results are intended to record design improvements, particularly improvements in energy utilization, and/or to evaluate the performance of a particular machine tool in producing a particular part.

Energy consumption. All comparisons must be conducted under identical conditions, and similar results must be ensured through explicit regulations and precise measurements.

Machine Tool Environmental Assessment Part 2: Machine Tools and Machine Tools
Methods for measuring component energy consumption

1 Scope

This document specifies methods for measuring the energy consumption of machine tools under specific conditions to obtain repeatable energy data. It also specifies the energy consumption of machine tool components.

Energy consumption quantification method for allocating its energy consumption to the

general machine tool functions described in GB/T 40808.1-2021.

This document verifies the energy-saving design methodology in GB/T 40808.1-2021 through machine tool energy consumption measurement methods. Machine tool functional energy consumption.

The allocation must be measured at the machine tool component end. The measurement is repeatable and unaffected by factors other than recording and documentation conditions.

Influence.

The measurement results specified in this document are used to record improvements in machine tool design regarding energy consumption, and to evaluate the performance of a specific machine tool in machining a given zero.

Energy consumption during the manufacturing process of the component. When comparing measurement results, it is necessary to conduct the measurements under identical conditions and ensure comparable results through standardization and measurement.

result.

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 40808.1-2021 Machine tool environmental assessment - Part 1: Energy-efficient design methods for machine tools (ISO 14955-1:2017, IDT) Note. GB/T 3853-2017 Acceptance Tests for Positive Displacement Compressors (ISO 1217:2009, MOD) Note. GB/T 28783-2012 Pneumatic Standard Reference Atmosphere (ISO 8778:2003, IDT)

3 Terms and Definitions

The terms and definitions defined in GB/T 40808.1-2021, as well as the following terms and definitions, apply to this document.

ISO and IEC maintain a terminology database for standardization work, available at the following URL.

The average value of active power over a specific time period.

Note: IEEE 1459-2010[13] provides the definition of the measurement of electrical power under sinusoidal, non-sinusoidal, balanced or unbalanced conditions.