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

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**Environmental evaluation of machine tools - Part 1: Design
methodology for energy-efficient machine tools**

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Foreword

GB/T 40808 "Machine Tool Environmental Assessment" is divided into the following 5 parts.

- Part 1. Energy-saving design methods for machine tools;
- Part 2. Measurement methods for energy consumption of machine tools and machine tool components;
- Part 3. Principles of energy efficiency testing of metal cutting machine tools;
- Part 4. Principles of energy efficiency testing of metal forming machine tools and laser processing machine tools;
- Part 5. Principles of energy efficiency testing for woodworking machine tools.

This part is Part 1 of GB/T 40808.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

The translation method used in this section is equivalent to ISO 14955-1:2017 "Environmental Assessment of Machine Tools Part 1. Energy-saving Design Methods for Machine Tools".

The following editorial changes have been made to this section.

- Modified the standard name.

This part was proposed by China Machinery Industry Federation.

This part is under the jurisdiction of the National Standardization Technical Committee for Metal Cutting Machine Tools (SAC/TC22).

Drafting organizations of this section. Chongqing Machine Tool (Group) Co., Ltd., National Machine Tool Quality Supervision and Inspection Center, Chongqing University, Southwest University

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Limited company.

Introduction

As natural resources become more and more scarce, environmental impact has become a common problem for all products, so it is necessary to formulate targeted

Environmental assessment standards for machine tools and implementation of these standards.

Machine tools are complex industrial products used to manufacture parts or semi-finished products. The performance of the machine tool and its economic value, technical indicators and operating requirements

Correlation is the key factor of investment. Even if the same machine tool, in the actual use process, due to the difference in the processed parts and the processing technology,

Its energy consumption will also vary. Therefore, when carrying out the environmental impact assessment of machine tools, it needs to be carried out in conjunction with the conditions of use of the machine tools.

In order to highlight the commonality of the existing wide variety of machine tools, this section proposes to analyze the use of machine tools. In order to achieve various functions

Energy-efficient machine tool components are specific energy-saving improvement objects, which will improve the environmental performance of machine tool products. The methods specified in this section can also be different

Manufacturers, suppliers and users provide ways to improve the environmental impact of machine tools.

In order to quantify the improvement of the environmental impact of machine tools over a period of time, it can be based on a series of available and positive environmental impact indicators for machine tools.

The standard assesses the environmental impact of machine tools.

This section provides machine tool design and manufacturing guidelines for reducing the environmental impact of energy consumption during the use phase of the machine tool.

Machine tools may have a significant impact on the environmental performance of the products they manufacture.

Machine tool environmental assessment

Part 1. Energy-saving design methods for machine tools

1 Scope

This part of GB/T 40808 belongs to the category of machine tool ecological design standards, which is mainly applicable to automatic machine tools and CNC machine tools.

This section focuses on the energy-saving issues during the use phase of the machine tool (that is, within its service life). The energy consumption of the machine tool during the non-use phase or other environmental problems

Environmental impact issues are not within the scope of this section. These problems require special treatment (for example, according to GB/T 24062-2009).

This part applies the eco-design procedures in compliance with GB/T 24062-2009 to machine tools, and provides eco-designs to users and suppliers

Report and monitor results.

Energy efficiency assessment needs to quantify energy consumption and effective output. This section provides guidelines for repeated quantification of energy consumption. Due to work

In industrial applications, according to the properties of the processed workpiece (i.e. material, shape, accuracy, and surface quality), production constraints (such as minimum batch size, flexibility, etc.)

Specific) and other appropriate parameter selection. Each operation or a group of operations may obtain different effective outputs. Therefore, this section does not provide

Universal method of optimizing effective output.

This section provides some energy-saving design methods for machine tools. It is not suitable for comparing the energy consumption of different machine tools, nor is it suitable for

The comparison of energy consumption and effective output caused by the use of different process methods by different users in the use stage of the machine tool.

Appendix A provides a list of improvement measures related to machine tool components, control of machine tool components, machine tool component combinations and the

environment. Appendix B gives

An application example of this method is presented.

Note. Certain processing techniques and specific machine tools can significantly change the impact of processed workpieces on the environment, such as the use of special stamping technology to reduce the material of aluminum cans,

Dense forming grinder processing improves the performance of the compressor [10,13]. The impact of such processing technology or processing machine tool on the environment may affect the workpiece itself or the workpiece

The use of is less important. These changes in the impact of processed workpieces on the environment are not the content of this section, but the impact of products on the environment is included in different

It may be important to compare the processing technology of different machine tools or the content of different machine tools. For example, the accuracy of a certain machined workpiece may be

It has a significant impact, so if you want to compare the impact of different machine tools on the environment, you need to consider this factor.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 24062-2009 Environmental management introduces environmental factors into product design and development (ISO /T R14062.2002, IDT)

3 Terms and definitions

The following terms and definitions defined in GB/T 24062-2009 apply to this document.

3.1

Designanddevelopment

A set of processes that translate requirements into specified characteristics or specifications of a product, process, or system.

Note 1.The terms "design" and "development" are sometimes synonymous, and sometimes used to specify the different stages of the entire design and development process.

Note 2.Product development is the process of implementing product ideas from planning,