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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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Short-term capability evaluation of machining processes on metal-cutting machine tools

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Foreword

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

The translation method used in this standard is equivalent to the adoption of ISO

26303.2012 "Short-term Capability Assessment of Machine Tool Metal Cutting Machine Tool Processing".

The Chinese documents that have a consistent correspondence relationship with the normatively cited international documents in this standard are as follows.

---GB/T 10610-2009 Product Geometric Technical Specification (GPS) Surface structure profile method to evaluate the rules of surface structure

And methods (ISO 4288.1996, IDT).

This standard has made the following editorial changes.

---Modified the standard name;

---Fixed the mistake of quoting the chapter number in Figure 2;

--- Replace the symbols sg and act that are not referenced in 4.2 with sact;

--- Modify the symbol deltaXk used incorrectly in A.3 to deltaXc.

This standard was proposed by the China Machinery Industry Federation.

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

Drafting organizations of this standard. Wuhan Heavy Machine Tool Group Co., Ltd., National Machine Tool Quality Supervision and Inspection Center, Xiamen Meike Security Technology Co., Ltd.

Co., Ltd., Chongqing Machine Tool Group Co., Ltd., Jilin University, Beijing University of Technology, Shanghai Institute of Mechanical and Electrical Testing Technology, Anqing Machine

Bed Co., Ltd., Guangdong Tehua Technology Co., Ltd., Guangdong Manya Technology Co., Ltd., Jiangmen Yibingding Machinery Co., Ltd.

Introduction

Short-term capability assessment of the machining process and machine tool performance testing methods that adopt GB/T 17421 (all parts) and other machine tool related standards

Compared with the method, it is a different evaluation method for machine tools.

Analyze the quality of the test piece according to the data obtained from the test and statistical conditions.

The purpose of this standard is to enable as many interested parties as possible to obtain this information.

For mass production, in addition to machine tool performance testing, short-term process

capability evaluation and capability testing are often used. In fact, the machine

Bed users are increasingly using statistical process control (SPC) technology in their activities, and often require the machine tool manufacturer/supplier to do the same.

For system suppliers, give them responsibility for the processing process.

Statistical methods in process management are included in ISO 22514 (all parts).

Due to the lack of recognized national standards, for the acceptance of machine tools based on the ability to process specific workpieces, each user stated

The requirements and methods are very different. Therefore, lengthy discussions and adaptation processes during acceptance testing are usually necessary, which can delay the machine.

The bed is delivered to the customer and incurred a lot of related time and cost expenditures. This standard provides a short-term capability test for the machining process during machine tool acceptance.

Provided a unified procedure. This standard describes.

---The short-term capability of a given process, including the machine tool tested, the machining process, the tools and fixtures used, and the workpiece

performance;

---Estimation of relevant machine tool performance indicators.

This standard complies with and complies with the requirements of ISO 22514 (all parts). The term "process performance" specified in ISO 22514-3 corresponds to

The term "short-term capability" in this standard. The term "short-term capability" has been widely used in the machine tool industry for many years. Therefore, this standard still continues

Continue to use this term.

Combined with statistical evaluation, many influencing factors significantly limit the proportion of tolerance intervals covered by machine tool changes. Therefore, machine tool capability refers to

The number should be specified together with the test conditions and the required tolerance range.

Short-term capability assessment of metal cutting machine tool processing

1 Scope

This standard stipulates that the short-term capability of the machining process of the metal

cutting machine tool shall be determined through the specified test piece during the acceptance of the metal cutting machine tool (i.e., indirect test)

It also gives suggestions on the test conditions, the measuring system used and the relevant requirements of the machine tool.

This standard is consistent with ISO 22514 (all parts) describing statistical methods for process management, and involves the use of these methods in machine tools and testing.

Specific application in batch processing of parts. This standard does not include functional tests that are usually performed before testing accuracy, nor does it include

Full condition test.

Appendix A provides supplementary information related to statistical evaluation. For the protocol table and analysis table of the short-term ability test, see Appendix B and Appendix C.

Appendix D is an example.

Note 1.The purpose of direct testing is to study the performance of a single machine tool, such as geometry or positioning accuracy. The short-term capability assessment is to prove that a machine tool is capable of

As a specific processing task, the short-term ability test only focuses on processed products. This means that the direct test method is more suitable for determining the machine

Based on this, the machine tool that is widely used in production is structurally improved; the short-term capability test is not suitable for detecting the error source of the machine tool.

Therefore, metal cutting machine tools are more suitable for special machine tools that mainly process specific workpieces through short-term ability assessment of the processing process, such as the production line.

Workstation, the processing time of each workpiece is less than 10min, so that at least 50 test pieces are processed per shift, less than this number will make the statistical uncertainty large

Big increase. Short-term capability assessment can also be carried out on general-purpose machine tools, such as machining centers for mass production that meet the above statistical requirements.

Note 2."Short-term capability" is a term that has been widely used in the machine tool industry and corresponds to the term "process performance" specified in ISO 22514-3.2008.