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

GB/T 16460-2016

Replacing GB/T 16460-1996

Tool life testing in end milling

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(English Translation)

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Foreword

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

This standard replaces GB/T 16460-1996 "end mill life testing." this standard compared with GB/T 16460-1996, the main changes are as follows.

--- Remove the ISO foreword;

--- Remove the foreword statement Appendix nature, increasing the draft rules are based on the standard preparation;

--- Revised introduction;

--- Modify the list of normative references;

--- Modify the label position in the left aa Introduction Figure 2.

This standard uses redrafted Law Amendment uses ISO 8688-2. 1989 "cutter life testing - Part 2. End mills." And ISO 8688-2. 1989 as compared to made the following modifications.

--- Use the "standard" instead of "this International Standard";

--- Remove the preface;

--- Introduction to the front of the body;

--- With applicable national standards instead of international standards of reference;

--- Modify the label position in the left aa introduction in Figure 2;

--- Appendix A in the chemical composition of the steel according to GB/T 699 requirements;

--- Deleted references.

The standard proposed by China Machinery Industry Federation.

This standard tool by the National Standardization Technical Committee (SAC/TC91)

centralized.

Drafting of this standard. Chengdu Tool Research Institute Limited.

Introduction

Single point turning tool life test procedures and conditions relating to the international standard ISO 3685, since the effective application of standards, and called for the development of similar documents other common cutting method.

This standard corresponds to international standards under the International Research Society for Production Engineering (CIRP) of the proposed initiative, suitable for carrying out milling machining high speed steel cutter, it is a major mechanical processing methods, as shown in Figure 1 ~ Figure 3.

1 Slot milling test

a) milling b) Climb

Figure 2 Milling Test ($aa > ar$)

a) milling b) Climb

3 Milling test ($aa < ar$)

The standard recommended method is also suitable both for the laboratory plant applications, which aims to unify step, when the cutting tool, workpiece material, cutting parameters and cutting fluids for comparison, can improve the reliability and comparability of test results. To the extent possible to achieve this objective, this standard includes recommended reference materials and conditions, can be employed as far as practicable.

In addition, the standard recommended values may be used to help determine the recommended cutting data, or some of the processing to determine the constraints and characteristic values, such as cutting force, the machined surface property values and chip shape. Especially for the above purposes, even if the already Recommended values are given certain parameters, it may be used as a variable.

The recommended standard test conditions suitable for steel and cast iron with normal microstructure do Milling Test. However, if the make the appropriate changes, this standard is also applicable to other materials, test milling or for special usage developed the tool.

The accuracy of the recommended values specified shall be considered as minimum requirements. Any deviation from the recommended values should be described in detail in the test report.

NOTE: This standard does not specify acceptance tests, nor for such use.

Milling cutter life test

1 Scope

This standard specifies the procedure recommended tool life test high-speed steel end mills milling steel and cast iron when it is suitable for laboratory and actual production.

This standard specifies the following three types of milling test specification.

- a) Milling (see Figure 1);
- b) weekly-based tooth cutting Milling --- side milling (see Figure 2);
- c) by the end of the main cutting tooth milling --- end milling (see Figure 3).

When milling can be considered two types of cutting conditions.

- a) mainly due tool wear and failure conditions;
- b) tool is mainly due to other phenomena, such as the cutting edge breakage or plastic deformation and failure conditions. This type of test condition under study.

This standard is only considered to tool wear mainly recommended tests.

For each type of test, the recommended values are given on the following factors. the workpiece, tool, cutting fluids, cutting conditions, equipment, tools and tool life failure assessment, test procedure and recording, evaluation and reporting of results.

This standard applies to high speed steel cutter life test.

2 Normative references the following documents for the application of this document is essential. For cited documents with dates, only the dated edition applies to this document. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 699 high-quality carbon structural steel GB/T 1112.1 straight shank keyway cutter (GB/T 1112.1-1997, ISO 1641-1. 1978, MOD) GB/T 3933 precision milling machine GB/T 6117.1 End mills - Part 1. straight shank end mill (GB/T 6117.1-2010, ISO 1641-1:2003, MOD) GB/T 6133.1 Weldon shank toolholders Part 1. Transmission of the tool shank size (GB/T 6133.1-2006, ISO 5414-1:2002, IDT) GB/T 9439 Gray Iron Castings (GB/T 9439-2010, ISO 185:2005, MOD) GB/T 9943 high-speed tool steel (GB/T 9943-2008, ISO 4957:1999, NEQ) GB/T 12204 metal cutting basic terms (GB/T 12204-2010, ISO 3002-1. 1982; ISO 3002-3. 1984; ISO 3002-4. 1984, MOD) ISO 2854 Statistical interpretation of data and testing methods estimate the mean and variance 3 workpiece

3.1 Workpiece material

In principle, each person according to their needs optionally test workpiece material. However, in order to improve the comparability of test results were obtained between, it

suggested the use of the following material as a reference material that according to GB/T 699 45 steel or press GB/T 9439 of HT250 cast iron. Reference material more detailed specifications listed in Appendix A.