ASME B5.54-2005
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Methods for Performance Evaluation of Computer Numerically Controlled Machining Centers

AN AMERICAN NATIONAL STANDARD

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Three Park Avenue • New York, NY 10016

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The 2005 edition of this Standard is being issued with an automatic addenda subscription service. The use of addenda allows revisions made in response to public review comments or committee actions to be published as necessary. This Standard will be revised when the Society approves the issuance of a new edition.

The American Society of Mechanical Engineers
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FOREWORD

The primary purpose of this Standard is to provide procedures for the performance evaluation of computer numerically controlled (CNC) machining centers. The secondary purpose is to facilitate performance comparisons between machines and to provide for machine evaluation after refit. Definitions, environmental requirements, and test methods are specified. This Standard defines the test methods capable of yielding adequate results for most machines, but is not intended to supplant more complete tests that may be required for particular special applications.

This first revision of this Standard provides consistency with the recently published standard for turning centers (ASME B5.57-1998) with respect to some definitions, data analysis, and reported parameters. To achieve consistency, uncertainty analysis was used to analyze data and report parameters for many of the procedures, deemed appropriate, within this Standard. Availability of improved measurement technology and increasing demand for greater accuracy require more robust procedures for assessing performance of machining centers, as provided within this revision of the B5.54 standard. This Standard does not address issues of machine safety.

This revision was approved by the American National Standards Institute on July 7, 2003 and January 12, 2005.

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General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B5 Standards Committee
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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Attending Committee Meetings. The B5 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B5 Standards Committee.

METHODS FOR PERFORMANCE EVALUATION OF COMPUTER NUMERICALLY CONTROLLED MACHINING CENTERS

Chapter 1
Scope

1.1 GENERAL

This Standard establishes methodology for specifying and testing the performance of CNC machining centers. In addition to clarifying the performance evaluation, this Standard facilitates performance comparisons between machines by unifying terminology, general machine classification, and the treatment of environmental effects. It provides a series of tests that should be used to perform acceptance testing (runoff) of new and reconditioned machines and could be used to verify continued capability of production machines, already in operation, through periodic testing. The set of acceptance tests and the specification limits for machine conformance shall be the subject of contractual agreement between the Supplier and the User. This Standard is rather comprehensive; therefore, for smaller and less expensive machines the conformance to specifications could be based on a recommended subset of tests to evaluate machine performance.

1.2 PERFORMANCE FORMS

Any performance forms described, as complying with this Standard, shall include at least those items specified in Forms 1.1 through 1.6. Other forms shall be included, depending on the acceptance tests agreed between the Supplier and the User. The form for machining test parts is included in Chapter 8 as Form 8.1.