

ANSI B11.22–2002

American National Standard for Machine Tools –

Safety Requirements for Turning Centers and Automatic, Numerically Controlled Turning Machines

Secretariat and Accredited Standards Developer:

AMT – The Association For Manufacturing Technology
7901 Westpark Drive
McLean, VA 22102

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by the American National Standards Institute, Inc.



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Foreword (This foreword not part of the requirements of American National Standard B11.22-2002)

The primary objective of this standard is to eliminate or control hazards to personnel associated with numerically controlled turning machines by establishing requirements for the construction, operation and maintenance of these machines. To accomplish this objective, responsibilities have been assigned to the supplier (e.g., manufacturer, rebuilder, reconstructor, installer, integrator), the user, and personnel in the working environment.

The words "safe" and "safety" are not absolutes. Safety begins with good design. While the goal of this standard is to eliminate injuries, it is recognized that risk factors cannot be practically reduced to zero in any human activity. This standard is not intended to replace good judgment and personal responsibility. Operator skill, attitude, training, job monotony, fatigue and experience are safety factors that must be considered by the user.

Turning centers, numerically controlled turning machines, and associated equipment technologies are continuously evolving. This standard reflects the most commonly used and time-tested state of the art at the time of its approval. The inclusion or omission of language relative to any evolving technology, either in the requirements or explanatory area of this standard, in no way infers acceptance or rejection of such technologies.

Inquiries with respect to the application or the substantive requirements of this standard, and suggestions for its improvement are welcomed, and should be sent to the AMT – The Association For Manufacturing Technology, 7901 Westpark Drive, McLean, Virginia 22102-4206, Attention: B11 Secretariat.

This standard was prepared by the B11.22 Subcommittee, processed and submitted for ANSI approval by the B11 Accredited Standards Committee on Safety Standards for Machine Tools. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time this standard was approved as an American National Standard, the ANSI B11 Accredited Standards Committee was composed of the following member organizations:

John W. Russell, PE, CSP Chairman
Gary D. Kopps, Vice-Chairman
David A. Felinski, Secretary

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Name of Representative(s)

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Unified Abrasives Manufacturers' Association, Bonded Division	Charles S. Conant	
U.S. Department of the Navy (NAVSEA)	William Riley	William Aberg

At the time this standard was approved, the ANSI B11 ASC **B11.22 Subcommittee** had the following members who participated in the development of this standard:

Name	Company	Title
James Hoffman	Cincinnati Milacron	Chairman
Carl Sharak	Liberty Mutual	Secretary
Anthony M. Bratkovich, PE	AMT	Administrator
John F. Bloodgood, PE	JFB Enterprises	
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Larry Siefring	Monarch	
Mark D. Vetty	Okuma	
Joseph Volk	Okuma	

Explanation of the format of this standard, and ANSI B11 conventions

This ANSI B11.22 – 2002 American National Standard is divided into parts formerly referred to as sections or chapters and now referred to as clauses in line with the current ANSI style manual. Major divisions of clauses are referred to as subclauses and, when referenced by other text in the standard, are denoted by the subclause number (e.g., see 5.1).

The standard uses a two-column format to provide supporting information for requirements. The material in the left column is confined to “Standard Requirements” only, and is so captioned. The right column, captioned “Explanatory Information” contains information that the writing Subcommittee felt would clarify the standard. This column should not be construed as being a part of the requirements of this American National Standard.

As in all American National Standards, the term “SHALL” denotes a requirement that is to be strictly followed in order to conform to this standard; no deviation is permitted. The term “SHOULD” denotes a recommendation, a practice or condition among several alternatives, or a preferred method or course of action.

Similarly, the term “CAN” denotes a possibility, ability or capability, whether physical or causal, and the term “MAY” denotes a permissible course of action within the limits of the standard.

B11 conventions: Operating rules (safe practices) are not included in either column of this standard unless they are of such nature as to be vital safety requirements, equal in weight to other requirements, or guides to assist in compliance with the standard. The B11 standards do not use the term “and/or” but instead, the term “OR” is used as an inclusive disjunction, meaning *one or the other or both*. A distinction between the terms “*individual*” and “*personnel*” is drawn. Individual includes personnel (employees, subcontractors, consultants, or other contract workers under the indirect control of the supplier or user) but also encompasses persons who are not under the direct or indirect control of the supplier or user (e.g., visitors, vendors, etc.). Gauge refers to a measuring or testing instrument; gage refers to limiting device (e.g., backgage).

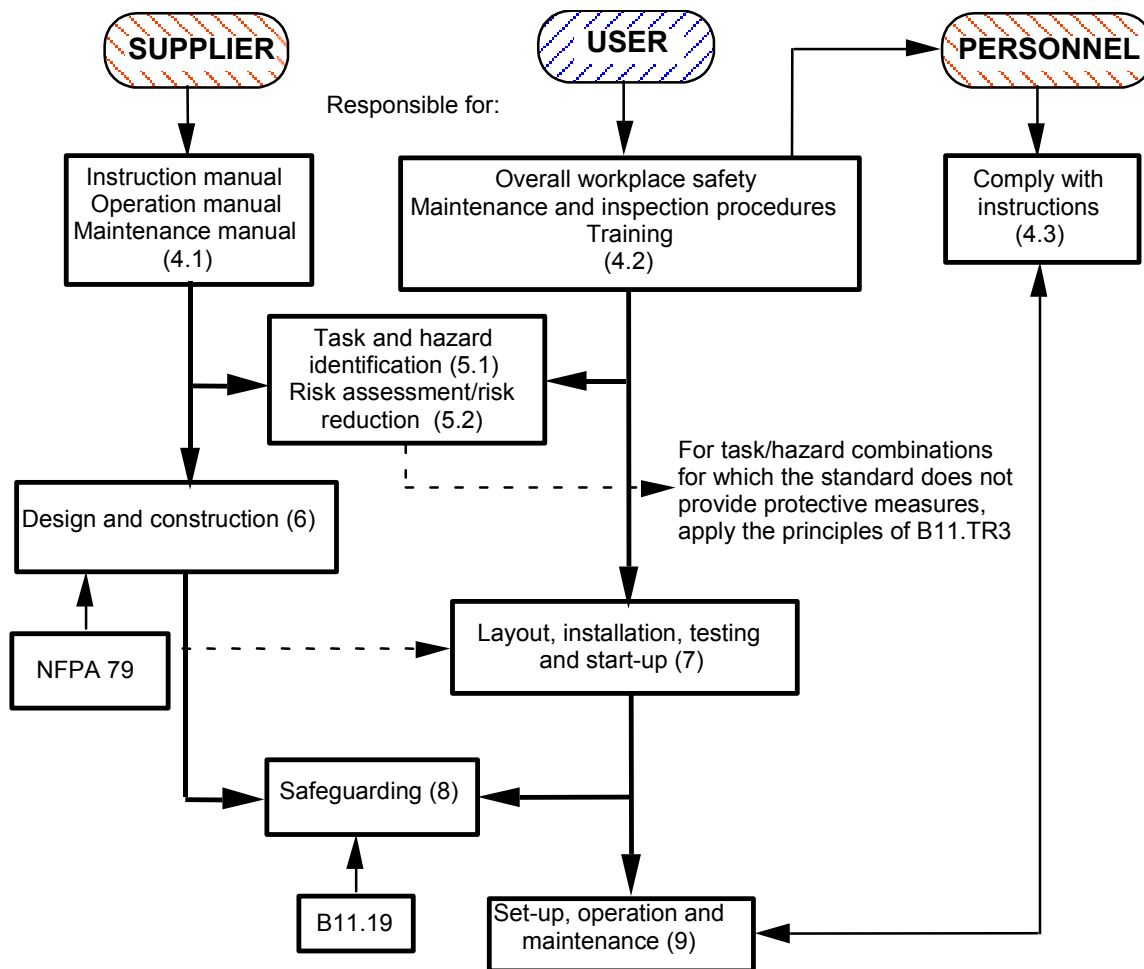
Suggestions for improvement of this standard will be welcome. They should be sent to AMT-The Association For Manufacturing Technology, 7901 Westpark Drive, McLean, VA 22102 - Attention: B11 Secretariat.

Introduction

The primary purpose of every machine tool is to process parts. This is accomplished by the machine imparting process energy onto the workpiece. Inadvertent interference with, or accidental misdirection of the released energy during production, maintenance, commissioning and de-commissioning may result in injury.

The purpose of the ANSI B11 series of machine tool safety standards is to devise and propose ways to minimize risks of the potential hazards. This can be accomplished by an appropriate machine design, by restricting personnel and other individuals' access to hazard areas, and by devising work procedures to minimize personnel exposure to hazardous situations. This is the essence of the ANSI B11 series of safety standards.

The responsibility for the alleviation of these risks is divided between the equipment supplier, its user and its operating personnel, as follows (numbers in parentheses refer to the clause numbers in these standards which address that responsibility):



*American National Standard for Machine Tools –
Safety Requirements for Turning Centers and Automatic,
Numerically Controlled Turning Machines*

Standard Requirements

Explanatory Information

(This column is not part of the requirements of this American National Standard for Machine Tools – Safety Requirements for Turning Centers and Automatic, Numerically Controlled Turning Machines, ANSI B11.22-2002).

1 Scope

E1

This standard specifies the safety requirements for the design, construction, operation and maintenance (including installation, dismantling and transport) of turning centers and automatic, numerically controlled turning machines (see 1.1 and 1.2).

This standard is applicable to:

- automatic, numerically controlled horizontal- and vertical- spindle turning machines and turning centers which are designed to accept workholding devices up to 500 mm (20 inches) outside diameter and with distance between centers of up to 2 m (80 inches);
- auxiliary equipment and components which are integral to the machine;
- machines which are integrated into automatic production lines or turning cells as much as the potential hazards and associated risks are comparable to those of machines working separately.

Larger machines may comply with this standard or use other effective means to reduce the risks associated with the identified hazards.

Generally, workholding chucks are not considered to be integral parts of the machine.

1.1 Turning centers

These are automatic, numerically controlled turning machines with additional features such as power driven tools, the capability to orient the workholding spindle around its axis and automatic tool changing or workholding changing from a magazine.

1.2 Automatic, numerically controlled turning machines

These are machine tools that use automatic control of a process performed by a device that makes use of numeric data introduced while the operation is in progress. The principal movement is the rotation of the workpiece against a stationary tool(s) such that the cutting force is from the workpiece and not the tool. This machine operates under numerical control (NC) or computer numerical control (CNC).

E1.2

A NC turning machine can also include, but is not limited to, functions such as gaging, burnishing, grinding, boring and drilling.