ANSI B11.24–2002 (R07)

American National Standard for Machine Tools –

Safety Requirements for Transfer Machines

Secretariat and Accredited Standards Developer:

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

Approved: JUNE 14, 2002
Reaffirmed: August 28, 2007

by the American National Standards Institute, Inc.

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Foreword (This Foreword is not part of the requirements of American National Standard B11.24-2002)

The primary objective of this standard is to eliminate or control hazards to personnel associated with transfer 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.

Transfer 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 B11.24 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

Organizations Represented	***Name of Representative(s)***	
	Delegate	**Alternate**
Aerospace Industries Association of America	Robert Eaker	
Alliance of American Insurers	John Russell, PE, CSP	Keith Lessner
Aluminum Extruders Council	Jeff Dziki	Martin Bidwell
American Insurance Service Group	Henry S. Pankiw	Paul Frenier
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Association For Manufacturing Technology	Russell Bensman	
Can Manufacturers Institute	Geoff Cullen	
Deere and Company	Gary D. Kopps	Kent D. Johnson
Forging Industry Association	John W. Commet	Karen Taylor
General Motors Corporation	Michael Taubitz	
Graphic & Product Identification Mfgs. Assn.	Donald Root	
International Association of Machinists & Aerospace Workers, District Lodge 142	Jim Soptic	Ken Hass
Intl. Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW)	Jim Howe, CSP	Luiz Vazquez
Machinery Dealers National Association	John Stencel III	James Heppner, Jr.
Metal Building Manufacturers Association	Charles M. Stockinger	Charles E. Praeger

Metal Powder Industries Federation	Dennis Cloutier, CSP	Donald White
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National Fluid Power Association	June VanPinsker	
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Tooling and Manufacturing Association	Jeffery W. Hayes	Bruce C. Braker
Unified Abrasives Manufacturers' Association, Bonded Division	Charles S. Conant	
U.S. Department of the Navy (NAVSEA)	Various delegates depending on the Standard	

At the time this standard was approved, the ANSI B11 ASC **B11.24 Subcommittee** had the following members who participated in the development of this standard:

Name	**Company**	**Title**
Ronald K. Farleman, PE	Masco Machine	Chairman
John F. Bloodgood, PE	JFB Enterprises	Secretary
Anthony M. Bratkovich, PE	AMT	Administrator
Joe Ammond	Daimler Chrysler	
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Charles Hayes	Ford	
James Howe	UAW	
Joe Lovati	Cargill Detroit	
Warren Stanford	GM	
Stephen L. Stevens	Cross Hueller	
Gene Tkachuk	Lamb-Technicon	

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

This ANSI B11.24 – 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 believed would help 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).

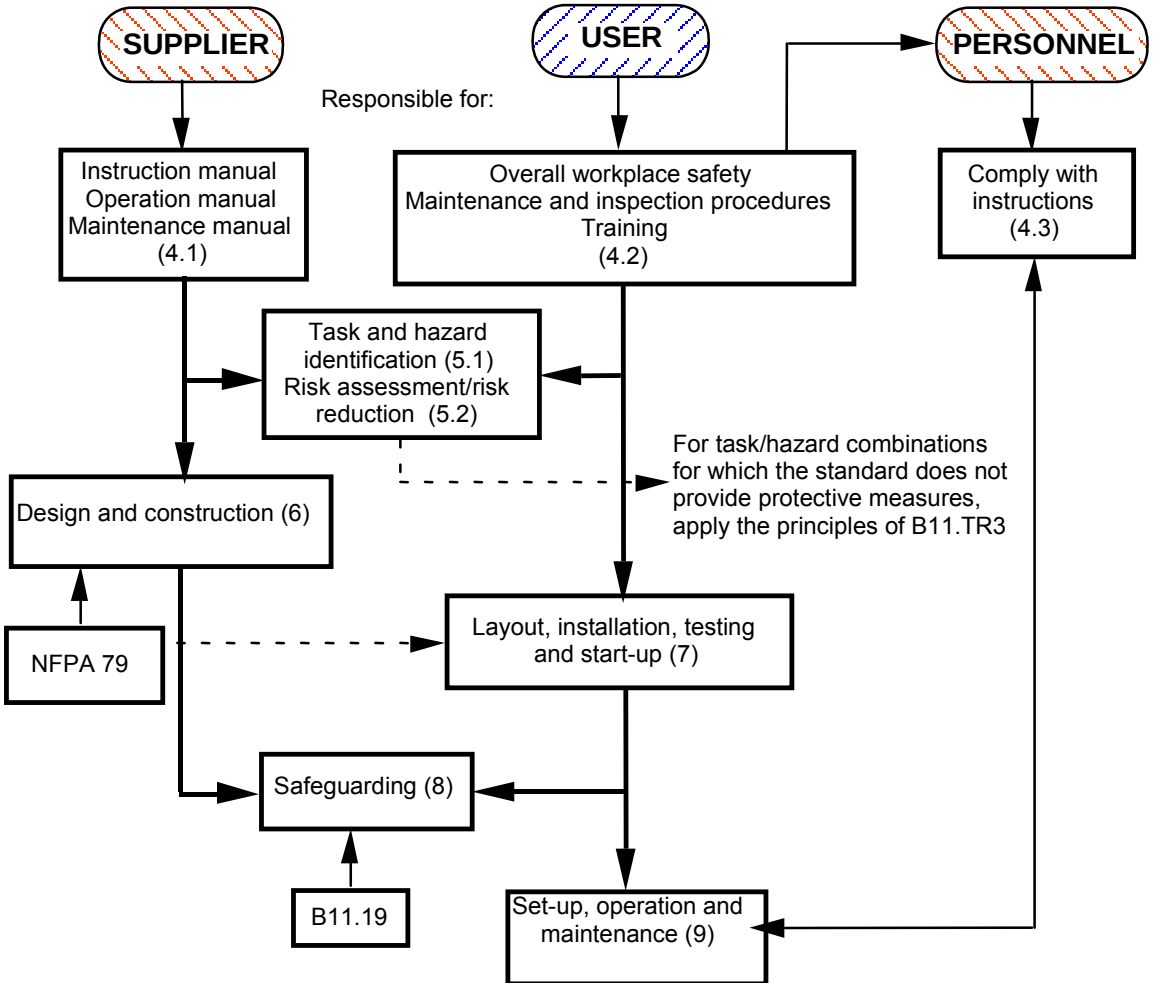
Suggestions for improvement of this standard will be welcome. They should be sent to AMT-The Association For Manufacturing Technology, 7901 Westpark Drive, McLean, VA 22102 - Attention: B11 Secretariat.

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 or 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 Transfer Machines

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

(This column is not part of the requirements of this American National Standard for Machine Tools – Safety Requirements for Transfer Machines, ANSI B11.24-2002).

1 Scope

E1

This standard specifies the safety requirements for the design, construction, operation and maintenance (including installation, dismantling and transport) of transfer machines.

1.1 General

E1.1

A transfer machine is a machine with more than one station and one or more workpiece transport systems (e.g., transfer bar) designed to process (e.g., machine, assemble) only a pre-specified workpiece or a limited family of workpieces by means of a predetermined sequence of operations and process parameters (see Annex A, Figures 1 and 2).

The terms machine or machinery as used throughout this standard mean transfer machine.

NOTE -- The machine may include one or more of the following elements:

- stations;
- workpiece transport systems (e.g. transfer bars);
- workpiece clamping devices;
- coolant systems;
- swarf removal systems;
- tool storage and automatic tool change systems;
- measurement and test systems.

Transfer machine can also include functions like gaging, leak-testing and other non-machining operations.

Types of transfer machines:

- metal cutting;
- assembly;
- inspection / testing;
- combination of the above.

Types of transfer means:

- in–line;
- shuttle;
- dial index;
- synchronous / non–synchronous.

1.2 Exclusions

This standard is not intended to cover safety requirements of manufacturing systems/cells (integrated manufacturing systems; see ANSI B11.20), nor of transfer press lines.

2 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid.

E2 Informative references

All normative documents are subject to revision and users of this standard are encouraged to investigate applying the most recent revisions of the normative references listed in clause 2.

The following documents (this column, below) are listed for information only, and are not essential for the completion of the requirements of this standard: