ANSI B11.13–2020

an American National Standard –

Safety Requirements for Single–Spindle or Multiple–Spindle Automatic Bar and Chucking Machines

ANSI-Accredited Standards Developer and Secretariat:

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Houston, TX 77269, USA

APPROVED: 18 SEPTEMBER 2020

by the American National Standards Institute
Board of Standards Review

AMERICAN NATIONAL STANDARDS

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Published by: B11 Standards, Inc.,
POB 690905, Houston,TX - USA

Table of Contents Page

List of Figures

Foreword

(not a normative part of ANSI B11.13-202x)

The primary objective of this standard is to eliminate, control or reduce hazards to individuals associated with Multiple Spindle Automatic Bar and Chucking Machines by establishing requirements for the design, construction, installation, commissioning, operation, maintenance and decommissioning of these machines. To accomplish this objective, responsibilities have been assigned to the supplier (e.g., manufacturer, modifier, distributor, rebuilder and integrator), the user, and individuals in the working environment.

The words "safe" and "safety" are not absolutes. An element of safety is attitude. While the objective of this standard is to eliminate, control, or reduce hazards, this standard recognizes that hazards cannot be practically reduced to zero in any human activity. This standard is not intended to replace good judgment, proper training, and personal responsibility. Operator skill, job monotony, fatigue, and experience are safety factors that should be considered by the user.

The original B11.13 safety standard for single-spindle and multiple-spindle automatic screw/bar and chucking machines was approved in 1975 and revised and approved again in 1983. It was superseded by ANSI B11.13-1992 titled America National Standard for Machine tools – Single-spindle or multiple-spindle Automatic Bar and Chucking Machines, which had been changed to accurately reflect current industry practice. That standard was reaffirmed in 1998, 2003, 2007 and again in 2012.

Technology for single-spindle or multiple-spindle automatic bar and chucking machines is continuously evolving. This standard reflects the most commonly used and time-tested methods used 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.

Effective Date

The following information on effective dates is informative guidance only, and not a normative part of this standard. This Subcommittee recognizes that some period of time after the approval date on the title page of this document is necessary for suppliers and users to develop new designs or modify existing designs or manufacturing processes in order to incorporate the new or revised requirements of this standard into their product development or production system.

This Subcommittee recommends that suppliers complete and implement design changes for new machines and machinery systems within 30 months of the approval date of this standard.

The Subcommittee recommends that users evaluating whether existing machinery and machinery systems implement this edition within 30 months of the approval date of this standard using generally recognized risk assessment methods. If the risk assessment shows that modification(s) is necessary, refer to the requirements of this standard or the machine-specific “base” safety standard to implement risk reduction measures (protective measures) for appropriate risk reduction.

Context (how to read/use this document)

The writers of this document understand that the reader/user of this American National Standard is unlikely to read it cover-to-cover but instead (for example), might use the Table of Contents as a sort of ‘roadmap’ to find a very specific topic and then review only that topic. However, the reader/user of this standard is informed that the elements (clauses, subclauses, etc.) of these documents are sequenced and often interrelated in such a way as to state requirements that may very well be dependent on text in a section(s) that precedes the actual requirement. It therefore becomes vital and important for the reader/user of this standard to ensure they understand the depth, range and especially the context of the section or topic in which the actual requirement appears.

Inquiries

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 B11 Standards, Inc. POB 690905, Houston, TX 77069 - Attention: B11 Secretariat.

Development

This standard was processed and submitted for ANSI approval by the B11 Standards Development Committee (B11 SDC) on safety standards for machines. 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 SDC was composed of the following member organizations:

Alan Metelsky, FS, Eng., Chair / Anne Mathias, PE, Vice-Chair / David Felinski, Secretary

Organizations Represented	Name of Representative	
	Delegate	**Alternate**
AHT Insurance	John Russell, PE, CSP	George Forrester
Aluminum Extruders Council	Melvin Mitchell, CSP	Bradley Wyatt, CSP
American Society of Safety Professionals	Ted Sberna, Sr.	Anne Mathias, PE
Association For Manufacturing Technology	Russell Bensman	Alan Metelsky, FS Eng
The Boeing Company	Rhiannon McPherson	Mark Ellingson / Steven Thomas
Bridgestone	Kenji Furukawa, FS Eng	Joey Hinson, FS Eng
Canadian Standards Association	Andrea Holbeche, P.Eng.	Walter Veugen
Deere & Co.	Tony Beeth	Scott Winter
Euchner	Ron Yemmans	Brian Farrell, FS Eng
Exponent	Stephen Andrew, PE	Torsten Skujins
FDR Safety	Michael Taubitz	Joe Wolfsberger
General Motors Corporation	Michael Douglas	Stacey Brooks
Grantek	Adam Killian, ASP, FS Eng	Jeff Winter, CSP, FS Eng
Komatsu America Industries	George Schreck	James Landowski
Liberty Mutual	Stanford Brubaker, CSP	Julie Thompson, CSP
MAG Automotive	Erik Carrier	Doug Watts
Metal Powder Industries Federation	Dennis Cloutier, CSP	James Adams
National Institute for Occupational Safety & Health	Richard Current, PE	
Occupational Safety & Health Administration	Kenneth Stevanus	James McManus
Omron Scientific Technologies Incorporated	Tina Hull, FS Exp	Frank Webster
Packaging Machinery Manufacturers Institute	Bruce Main, PE, CSP	Tom Egan
Pilz Automation Safety, LP	Michael Beerman	Doug Sten, PhD
Plastics Industry Association	Jennifer Jones	Dale Bartholomew
Precision Metalforming Association	James Barrett, Jr. PhD	David Klotz
Presence-sensing Device Manufacturers Association	James Kirton	Michael Carlson
Robotic Industries Association	Carole Franklin	Jeff Fryman
Rockwell Automation	Michael Poynter, FS Eng	Darin Magnuson
Safe-T-Sense	Chris Gerges	Federico Badillo
SICK, Inc.	Chris Soranno, FS Exp	Nate Gose, FS Eng
Sheet Metal & Air Conditioning Contractors Nat'l. Assn.	Michael McCullion	Rick Di Ioli
Sub-Zero Group	Chad Pierce, CSP	Bill Lawrie
Toyota Motor Manufacturing North America	Chip Boertlein	

The B11.13 Subcommittee which revised the 1992 standard, had the following members:

Fred W. Lewis, Chairman
Richard D. Zanhiser, Secretary
Kirt M. Babuder
John Dogger
Russel Herlache
Henry Hubli
Val Parker
Peter K. Rosenkrands
Emmett Sindelar
Harold D. Walker

Since the last revision of B11.13, the format/style and even some content elements within the ANSI B11 series have evolved. This current revision has maintained many of those same safety requirements and in several instances, updated requirements up-to-date standards of safety practices and technology while updating the format of the standard to the modern B11 standards structure. Additionally, the ANSI B11 series of standards now incorporates the integration of a stratified approach using "**types**" of standards (i.e., type-A, type-B and type-C standards – see a more detailed explanation of this approach in the Introduction). ANSI B11.13 is a considered a type-C standard and is intended to be used (at a minimum) in conjunction with the type-A ANSI B11.0 and type-B ANSI B11.19 (see the B11 documents list on page xi).

The Subcommittee which developed this current revision of ANSI B11.13 had the following members:

Chris Felinski, Chairman, B11 Standards, Inc.
David Felinski, Secretary, B11 Standards, Inc.
Dennis Cloutier, CSP, Cloutier Consulting
Mike Douglas, General Motors
Jim Kirton, Kirton Industrial Equipment LLC
Heinz Knackstedt, Machine Control Safety Training
Bruce Main, PE, CSP, design safety engineering. Inc.
Ted Sberna, Sr., White Horse Safety
Chris Soranno, FS Eng, SICK Inc.
Mike Taubitz, FDR Safety

Explanation of the format, and ANSI B11 conventions

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

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.

Generally speaking, 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, however, the terms can often be used interchangeably.

B11 conventions:

The use of “hard” conversion between Metric and English units does not imply a tolerance requirement.

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 conformance with the standard.

The ANSI B11 standards generally use the term “OR” as an inclusive disjunction, meaning *one or the other or both,* but on occasion will use the term “and/or” to emphasize the fact that both are fully intended in cases where the Subcommittee believed it was imperative to make that clear.

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.).

Introduction

The main purpose of every machine tool is to process materials. Inadvertent interference with, or accidental misdirection of the released energy during production, maintenance, commissioning and de-commissioning can result in injury.

The purpose of the ANSI B11 series of machinery safety standards is to devise and propose ways to eliminate or minimize risks of the potential hazards associated with the required tasks. This can be accomplished either by an appropriate machine design or by restricting personnel or other individuals' access to hazard zones, and by devising work procedures to minimize personnel exposure to hazardous situations. This is the essence of the ANSI B11 series of safety standards. This standard recognizes that zero risk does not exist and cannot be attained. However, a good faith approach to risk assessment and risk reduction should achieve an acceptable risk level.

Organization and Application of B11 Documents

The B11 standards and technical reports can be associated with the ISO "type A-B-C" structure as described immediately below, and as shown in Figure 1.

- **Type-A standards** (basis standards) give basic concepts, principles for design, and general aspects that can be applied to machinery;
- **Type-B standards** (generic safety standards) deal with one or more safety aspects or one or more types of engineering controls that can be used across a wide range of machinery:
- **Type-C standards** (machinery safety standards) deal with detailed safety requirements for a particular machine or group of machines**.**

The B11.0 standard on general safety requirements common to ANSI B11 machines is primarily a "type-A" standard in that it applies to a broad array of machines and contains very general requirements. However, in many areas it also contains very specific requirements. B11.19, B11.20, B11.21, B11.25, B11.26, as well as the entire B11 series of Technical Reports are all typical "Type-B" documents addressing general safety elements that can be used across a wide range of machinery (such as B11.19 and B11.26) or as a standard when combining machines (B11.20). The B11 series of Technical Reports are informative documents that may be generally applied to many different machines, and as such would fall into the "Type-B" category. The machine-specific ("Type-C") B11 standards contain detailed safety requirements for a particular machine or group of machines (such as this standard). The Type-A B11.0 and the Type-C (machine-specific) B11 standards are intended to be used concurrently by the supplier and user of machines. When a Type-C standard deviates from one or more provisions dealt with by a Type-A standard or by a Type-B standard, the Type-C standard requirement generally takes precedence. Any deviation in conforming to a requirement of any standard should be carefully evaluated and should be based on a documented risk assessment.

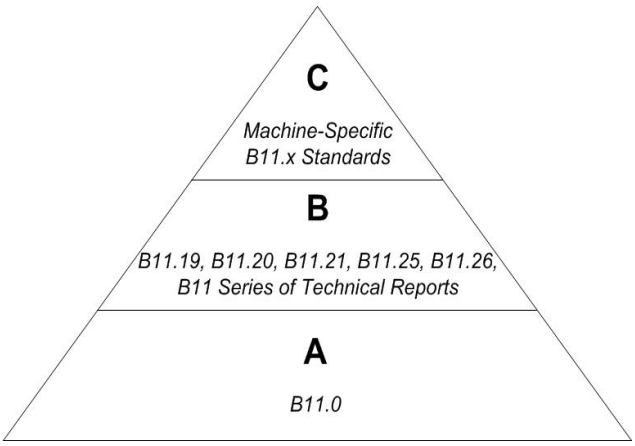

Figure 1 – Organization of the B11 series of documents

As of the date of approval of this standard, the ANSI B11 series of American National Standards and Technical Reports on machinery safety consisted of the following documents shown in the list below. The user should check a licensed reseller such as ANSI (www.ansi.org) for the current versions of any of these documents. All archival / historical versions of the documents are available at www.b11standards.org.

List of the ANSI B11 Series of Safety Standards and Technical Reports

#	SHORT TITLE / TOPIC	YEAR	TYPE
B11.0	Safety of Machinery	2020	A
B11.1	Mechanical Power Presses	2009 (R20)	C
B11.2	Hydraulic & Pneumatic Power Presses	2013	C
B11.3	Power Press Brakes	2012	C
B11.4	Shears	2003 (R20)	C
B11.5	Ironworkers	1988 (R20)	C
B11.6	Manual Turning Machines w/ or without Auto Control	2001 (R20)	C
B11.7	Cold Headers and Cold Formers	2020	C
B11.8	Manual Milling, Drilling, & Boring Machines	2001 (R20)	C
B11.9	Grinding Machines	2010 (R20)	C
B11.10	Sawing Machines	2003 (R20)	C
B11.11	Gear and Spline Cutting Machines	2001 (R12)	C
B11.12	Roll Forming and Roll Bending Machines	2005 (R20)	C
B11.13	Single & Multiple-Spindle Automatic Bar and Chucking Machines	2020	C
B11.14	Withdrawn (Coil Slitting Machines; combined into B11.18)	(1996)	C
B11.15	Pipe, Tube and Shape Bending Machines	2001 (R20)	C
B11.16	Powder / Metal Compacting Presses	2014 (R20)	C
B11.17	Horizontal Hydraulic Extrusion Presses	2004 (R20)	C
B11.18	Machines Processing or Slitting Coiled or Non-Coiled Metal	2006 (R20)	C
B11.19	Performance Requirements for Risk Reduction Measures (Safeguarding)	2019	B
B11.20	Integration of Machinery into a System	2017	B
B11.21	Machine Tools Using Lasers for Processing Materials	2006 (R20)	B
B11.22	Turning Centers and Automatic Numerically Controlled Turning Machines	2002 (R20)	C
B11.23	Machining Centers & CNC Milling, Drilling & Boring Machines	2002 (R20)	C
B11.24	Transfer Machines	2002 (R20)	C
B11.25	Large Machines	2015 (R20)	B
B11.26	Functional Safety for Equipment / Machine Control Systems	2018	B
B11.27	Electro-Discharge Machines	2020	C
B11.TR1	Ergonomics	2016	B
B11.TR2	Metal Working Fluids	1997 (R16)	B
B11.TR3	Withdrawn (Risk Assessment / Risk Reduction Guide)	(2000 R15)	B
B11.TR4	Selection of Programmable Electronic Systems (PES/PLC)	2004 (R15)	B
B11.TR5	Noise Measurement	2006	B
B11.TR6	Withdrawn (Safety Control Systems for Machines)	(2010)	B
B11.TR7	Integration of Lean and Safety	2007 (R17)	B
B11.TR8	Sustainable Safety Systems Through Inspection of Risk Reduction Measures	202x	B
B11.TR9	Cybersecurity	2019	B
B11.TR10	Guidance on Artificial Intelligence into Machinery Safety Applications	2020	B
ANSI/ISO 12100	Safety of machinery (identical adoption of ISO 12100-2010)	2012	A

STANDARD REQUIREMENTS EXPLANATORY INFORMATION

Safety Requirements for Single-Spindle or Multiple-Spindle Automatic Bar and Chucking Machines

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

(Not part of ANSI B11.13-2020, *American National Standard for Machine Tools — Safety Requirements for Single-Spindle or Multiple-Spindle Automatic Bar and Chucking Machines)*

1 Scope

This standard applies to single-spindle and multiple-spindle automatic bar and chucking machines in which all tool movement is controlled by the machine.

E1

A machine of this type is automatic in the sense that it repeatedly performs all the necessary operations, which may include ejecting the machined piece and presenting a new piece or length of stock to the tools. These machines run continuously until stopped by an operator, sensing device or automatic function of the machine control system. The energy sources for these machines can be provided by, but are not limited to, mechanical, pneumatic, hydraulic or electrical sources, or a combination thereof. Use of the term “machine” in this standard refers to single-spindle or multiple-spindle automatic bar and chucking machines unless explicitly stated otherwise.

Historically some machines to which this standard applies were referred to as “screw machines.”

1.1 Included machines

The following machines are included in the scope of this standard:

E1.1

Specific automatic machines will be referred to as single-spindle or multiple-spindle automatic bar and chucking machines. Also, the term ”machines” used by itself throughout this standard will mean single-spindle or multiple-spindle automatic bar and chucking machines.

a) Single-spindle automatic bar machines of the tool turret-indexing type;

a) Turret-indexing types are those in which tools are mounted in an indexing turret and are advanced automatically to the work material or piece held in the spindle. Additional tools are mounted in radial cross slides (see Annex A, Figures 3-4);

b) Single-spindle automatic machines of the sliding-headstock type, or those with a fixed headstock and a sliding guide bushing (Swiss-type);

b) Sliding headstock types are those in which the headstock moves axially, advancing or retracting the stock past radially mounted tools.

In another design, the headstock is stationary while the guide bushing and one or more side-