ANSI B11.3 - 2012

American National Standard for Machines –

Safety Requirements for Power Press Brakes

Secretariat and Accredited Standards Developer:
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Houston, TX 77269

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by the American National Standards Institute

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Foreword (This Foreword is informative and not part of the normative requirements of American National Standard ANSI B11.3-2012.)

The primary objective of this standard is to eliminate, control or reduce hazards to individuals associated with power press brakes by establishing requirements for the design, construction, operation and maintenance of these machines. To accomplish this objective, responsibilities have been assigned to the supplier (e.g., manufacturer, modifier, 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.

HISTORY

The original B11.3 standard was approved in 1973 and revised in 1982 and again in 2002. In the 2002 document, powered folding machines were included in the scope of the standard because they were predominantly similar to press brakes in that they are metal bending machines and they were not covered by any other standard. During the current revision process, the subcommittee determined that powered folding machines have evolved into multi-axis machines that process metal in numerous ways, many of which are unlike a press brake. Additionally, there is now a type-A standard, ANSI B11.0, which can be used in conjunction with the type-B standard ANSI B11.19 to provide guidance for the safe use of machines in general. It is for these reasons that the subcommittee decided to exclude powered folding machines in the scope of the 2012 ANSI B11.3 standard.

This current 2012 standard was revised by the B11.3 Subcommittee, processed and administered by the Secretariat, and approved by the B11 Accredited Standards Committee for submittal to the ANSI Executive Standards Council as an American National Standard. New topics included in this revision are the “close proximity point of operation AOPD” safeguarding devices, and a safeguarding means called “Safe Speed.” In addition, this revision incorporates the B11 Accredited Standards Committee’s “FASTT” initiative, which defined common language to be used by the entire series of ANSI B11 standards. Consequently, many definitions of common terms contained in the previous edition of B11.3 can be now be found in the ANSI B11.0 and ANSI B11.19 standards. This initiative also significantly impacted clauses 4, 5, 7, 9 and a brand new clause 10 and Annex I on training was added.

The B11 standards for machine tools were first approved beginning with safety requirements for power presses in 1922. Since that time, safety requirements for a variety of machine tools have been developed and continually updated and revised to become a series of some 30 B11 standards and technical reports. Maintaining these documents with consistent language proved a significant challenge. In 2008 ANSI B11 was published with the long term objective to reorganize the B11 family of standards by gathering the requirements common to many or most of the B11 standards into a single document while retaining the machine tool specific requirements in the machine-specific standards. This B11.3 standard is intended to be used with ANSI B11.0 and ANSI B11.19. The requirements of all three standards must be met as applicable to a particular machine.

Power press brake technology is 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.

Suggestions for improvement to the content of this standard are welcomed. Similarly, any inquiries with respect to the application of the substantive requirements of this standard are to be sent to B11 Standards, Inc., PO Box 690905, Houston, Texas 77269-0905, USA. Attention: B11 Secretariat.

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 of this standard.

The Subcommittee recommends that users evaluate whether existing machinery and machinery systems have acceptable risk 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 to implement risk reduction measures (protective measures) for appropriate risk reduction.

Explanation of the format of the standard

This ANSI B11.3 – 2012 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 felt would clarify 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. 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.

By convention, the B11 standards generally 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*. When "and/or" is used, it is intended by the standard writers to emphasize the point.

DEVELOPMENT

This standard was processed and submitted for ANSI approval by the B11 Accredited Standards Committee 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 document was approved as an American National Standard, the ANSI B11 Accredited Standards Committee was composed of the following member organizations:

Alan Metelsky, Chairman
Barry Boggs, Vice-Chairman
David A. Felinski, Secretary

Organizations Represented	Name of Representative	
	Delegate	**Alternate**
Aerospace Industries Association of America	Lisa Goldberg	Christopher Carnahan
Aluminum Extruders Council	Melvin Mitchell	Scott J. Burkett
American Society of Safety Engineers	Bruce W. Main, PE, CSP	George Karosas, PE, CSP
Association For Manufacturing Technology	Russell A. Bensman	Alan Metelsky
The Boeing Company	Willard J. Wood, ARM	Don R. Nelson
Canadian Standards Association	Elizabeth Rankin, CRSP	Walter Veugen
Deere & Co.	Gary D. Kopps	Scott Fowler
FDR Safety	Michael Taubitz	Flavius Brown
Komatsu America Industries	George Schreck	James Landowski
General Motors Corporation	Michael Douglas	
Metal Building Manufacturers Association	Charles M. Stockinger	Charles E. Praeger
Metal Powder Industries Federation	Dennis R. Cloutier, CSP	Teresa F. Stillman
National Institute for Occupational Safety & Health	Richard S. Current, PE	James R. Harris, PhD, PE
Occupational Safety & Health Administration	Kenneth Stevanus	Robert Bell
Omron Scientific Technologies Incorporated	Frank Webster	Christopher Soranno
Packaging Machinery Manufacturers Institute	Charles F. Hayes	Maria Ferrante
Pilz Automation Safety, LP	Michael Beerman	Lee Burk
Precision Metalforming Association	James G. Barrett, Jr. PhD	Bill Gaskin
Presence Sensing Device Manufacturers Assn.	James V. Kirton	Michael S. Carlson
Property Casualty Insurers	John W. Russell, PE, CSP	
Robotic Industries Association	Jeffrey Fryman	Claude Dinsmoor
Rockwell Automation	Patrick Barry	Michael B. Miller
Safe-T-Sense	Samuel M. Boytor	Mark Witherspoon
Sheet Metal & Air Cond. Contractors Natl. Assn.	Michael McCullion	Roy Brown
System Safety Society	John Etherton, PhD, CSP	Rod Simmons, PhD
Toyota Motor Manufacturing North America	Barry Boggs	Todd Mills
International United Automobile Workers	Tom Ford	

At the time this standard was approved, the ANSI **B11.3 Subcommittee** had the following members who participated in the development of this revision:

Name	Company
James V. Kirton, Co-Chairman	Kirton Industrial Equipment, LLC
Christopher Soranno, Co-Chairman	Omron STI
David A. Felinski, Secretary	B11 Standards, Inc.
Rob Appleyard	LazerSafe, Pty.
Doug Boyer	Advanced Manufacturing Solutions
Roy Brown	SMACNA
Dennis Cloutier	Cloutier Consulting, LLC
Howard DeWees	SICK, Inc.
Lutz Fiessler	Fiessler Elektronic GmbH
Rob Hamilton	Trumpf, Inc.
Michael Hattick	Paragon Industrial Controls
John Kemp	Bystronic
Chris King	CLK 365 Enterprises, LLC
Heinz Knackstedt	C&E Sales
Sam Mamula	Liberty Mutual Insurance
Scott Ottens	Amada America
Ted Sberna	Applied Engineering Concepts
Jim Van Kessel	JVK Industrial Automation, Inc.
Walter Veugen	Veugen Integrated Technologies, Ltd.
Scott Whittington	Cincinnati Incorporated

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. 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. Additional activities might be needed to monitor the ongoing effectiveness of the risk reduction measures in place.

The primary purpose of the ANSI B11 series of machine safety standards is to devise and propose ways to minimize risks of the potential hazards. 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.

Organization and Application of B11 Series of Documents

The B11 series of documents can be associated with the ISO "Type A-B-C" structure as described below:

- **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 safeguards 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**.**

This ANSI B11.3 standard on power press brakes is a "Type-C" standard. The ANSI 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 and the B11 series Technical Reports are all typical "Type-B" documents addressing general safety elements that can be applied across a wide range of machinery (B11.19) 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 machines, and as such would fall into the "Type-B" group. The machine-specific (Type-C) B11 standards contain detailed safety requirements for a particular machine or group of machines (such as in the case of this standard). The B11.0 and the 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 this 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 based on a documented risk assessment.

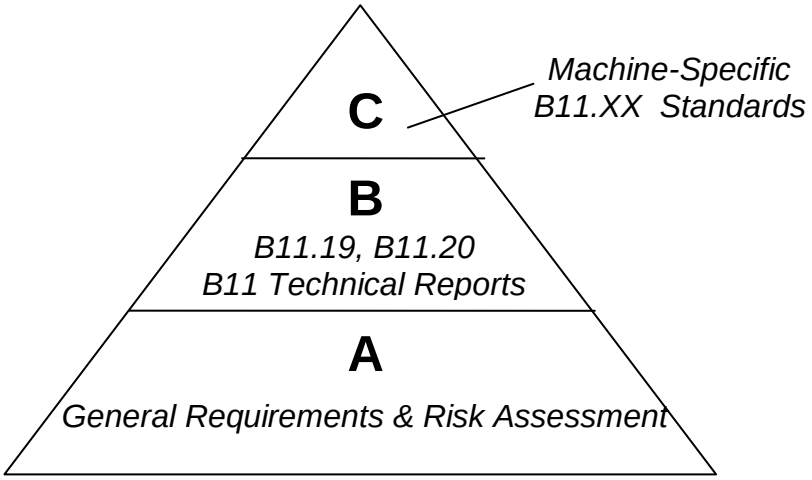

Figure 1 — Organization of the B11 Series of Documents

Figure 2 (following page) provides an overview of this standard and in particular, the responsibilities of and requirements for the supplier and user, including the user personnel. Numbers in parentheses denote the particular clause or subclause of the standard. A solid line between a block showing reference standard(s) and a block showing a normative clause denotes part of the requirements. A dashed line denotes an informative reference.

Notes for Figure 2:

1) Scope – Provides the boundaries or limits of the standard (i.e., what is/is not included in the coverage or requirements).

2) Normative references – Other standards which in whole or in part provide additional requirements when referenced in the normative text (i.e., left-hand column of clauses 4 – 9) of this standard.

3) Definitions – Terms used in this standard in a unique or particular manner, together with their definitions (terms used in the same context as are generally understood and commonly used in everyday English are not defined).

4) Responsibility – The general responsibilities of the supplier (builder), user, and the user personnel are listed in clause 4 together with which of the remaining clauses they have primary responsibility.

5) Risk assessment process –Clause 5 presents the general approach to risk assessment (see B11.0 [B11.TR3] for further explanation of hazard/task identification and risk assessment/risk reduction).

6) Design and construction – Generally, the supplier will be responsible for the requirements of clause 6, understanding that the user may add to or modify these requirements through the purchase agreement.

7) Layout, installation, testing and start-up – Although the requirements of clause 7 are predominantly the responsibility of the user, the supplier will normally provide assistance either directly (providing personnel) or indirectly (instruction materials).

8) Safeguarding – This is normally a shared responsibility between the supplier and user but often, either the supplier or the user will provide and/or meet most or even all of the requirements of clause 8.

9) Setup, operation and maintenance – The user is generally responsible for the requirements of clause 9, with possible assistance from the supplier for training.

10) Training – The user is generally responsible for the requirements of clause 10, with possible assistance from the supplier for materials or the training itself.

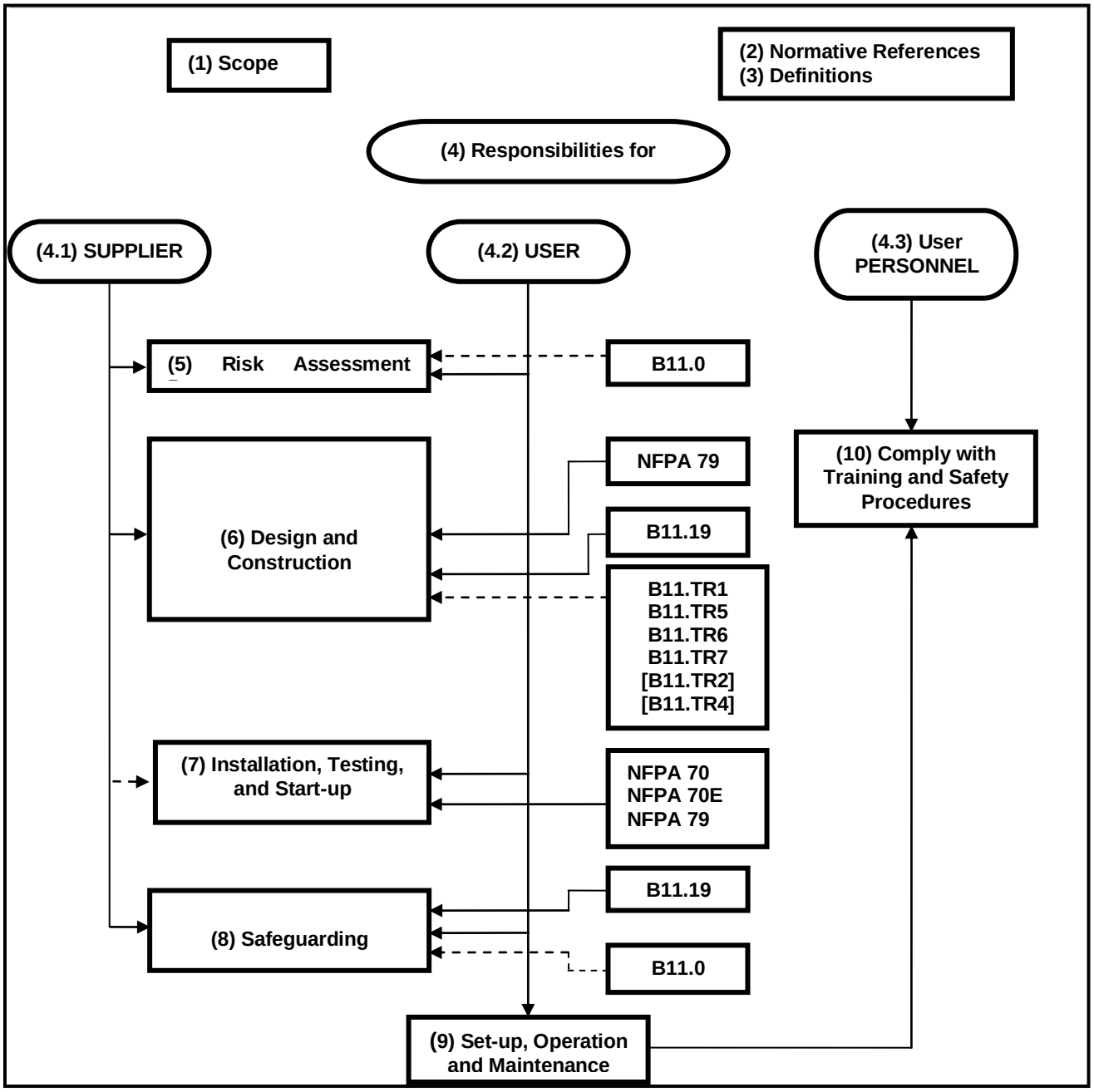

Figure 2 – Typical layout of B11 base standards showing the various responsibilities

STANDARD REQUIREMENTS EXPLANATORY INFORMATION

American National Standard for Machines-

Safety Requirements for Power Press Brakes

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

(Not part of the requirements of this American National Standard for Machines - *Safety Requirements for Power Press Brakes - ANSI B11.3–2012*)

1 Scope

1.1 General

The requirements of this standard apply to those machines classified as power press brakes (hereinafter referred to simply as "press brakes"), which are designed and constructed for the specific purpose of bending material.

Where used in this standard, the terms *machine* or *machine system* refer to the press brake or press brake production system, respectively.

E1.1

To achieve this purpose, the press brake is provided with a plate-type ram and a plate-type bed with standard provisions for attaching standardized press brake tooling.

When used for operations other than bending material, other standards may provide additional information and requirements for the specific use or application.

1.2 Exclusions

Excluded from the requirements of this standard are:

E1.2

These exclusions exempt machines that normally do not have the characteristics of power press brakes, or are addressed by specific standards. If a machine is not addressed by a specific B11 standard, see ANSI B11.0 for guidance on general safety / risk assessment, and ANSI B11.19 for guidance on safeguarding.

- Manual apron brakes;
  - An apron brake uses a clamping bar and several removable blocks which may be removed and rearranged to permit bending of restricted areas of a piece of sheet material or of already partially formed pieces. Also called 'box-and-pan brake.'
- Folding machines;
  - A folding machine typically uses a clamping beam and a folding beam to fold the workpiece. Also called a 'powered folding machine' or 'bending brake.'
- Hand brakes;
  - A hand brake bends material by using a hinged clamping bar to hold the metal down against the bed. A hinged bending "leaf" is manually lifted to fold the metal around the fulcrum point of the clamping bar to the desired angle. Also called 'leaf brake.'
- Hydraulic or pneumatic power presses;
  - A hydraulically or pneumatically powered machine which transmit force hydraulically or pneumatically to cut, form, or assemble metal or other materials by means of tools or