

ANSI B11.1–2009 (R2014)

American National Standard for Machines

***Safety Requirements for
Mechanical Power Presses***

Secretariat and Standards Developing Organization:

B11 Standards, Inc.
POB 690905
Houston, TX 77269
www.b11standards.org

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AMERICAN NATIONAL STANDARDS

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Foreword

(This foreword is not part of the requirements of American National Standard B11.1–2009 (R14))

The objective of this standard is to eliminate injuries to personnel from mechanical power press production systems by establishing requirements for the construction of mechanical power presses, and requirements for the set-up, operation and maintenance of the production systems in which presses are used. This standard should be used by builders, users, modifiers, and rebuilders, as well as by the appropriate authority having jurisdiction. Responsibilities have been assigned to the supplier (i.e., the manufacturer, the rebuilder and the modifier), the user, and the user personnel to implement this standard (see flowchart in the Introduction).

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

The safeguarding of press production systems in stamping operations is complicated by the wide variety of operations and operating conditions, due to the variations in size, speed and type of press used; the size, thickness and kind of pieces to be worked; the design and construction of dies; the required accuracy of the finished work; the skill of operators; the length of run; and the method of feeding, including part and scrap removal. Because of these varying factors in the operations and in the workplace, a wide variety of point-of-operation safeguarding methods (guards and protective devices) has been covered in this standard.

Point-of-operation safeguarding, the single most important factor in the elimination of injuries from presses, can only be determined by the user. A production system consists of the press as one component, dies (tooling) as another component, feeding methods (including part or scrap removal) as a third component, and point-of-operation safeguarding as the fourth component. The vital fourth component can be evaluated for effectiveness only after the first three components and operator involvements are known. Since this information is known only by the user, the responsibility for conformance with clause 8 has been assigned accordingly. The assignment of responsibility of the user for proper point-of-operation safeguarding has existed since the first B11.1 standard, approved in 1922.

Mechanical power presses 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.

HISTORY

The project on Safety Standard for Power Presses, B11, was initiated under the procedures of the American Engineering Standards Committee (which became the American Standards Association, the United States of America Standards Institute, and in 1969 the American National Standards Institute), with the National Safety Council as sponsor. The first standard, bearing the title *Safety Code for Power Presses and Foot and Hand Presses*, was developed by Sectional Committee B11 and was approved on November 13, 1922. Only two purposes of that "code" were listed. The first and primary use was for state industrial commissions in developing their workplace codes. The second use was as an operating guide for users operating press production systems. Revisions of the standard were issued on November 11, 1926; October 22, 1937; January 12, 1948; January 19, 1960; February 17, 1971; January 22, 1982; April 4, 1988; and November 6, 2001.

The philosophy underlying the 1971 standard was hands-out-of-die operation (HOOD). After the adoption of the 1971 standard by ANSI and its reference by OSHA regulations, many users documented an absolute inability to meet the hands-out-of-die objective. Accordingly, in 1974 OSHA modified the HOOD requirement, and subsequent versions of the ANSI B11.1 standard incorporate that modification. However, HOOD should be considered in the application of the press production system, with

appropriate safeguarding, to enhance the safe operation of mechanical power presses.

In this 2009 edition of the standard, the B11.1 Subcommittee reviewed the B11.1 2001 standard to incorporate current mechanical power press safety practice, and to increase explanatory material related to the standard. New areas that have been added include requirements for risk assessment and risk reduction for increasingly complex automatic press production systems that may include tandem and transfer presses with use of perimeter safeguarding. In addition, new pressroom technology including direct drive servo presses has been incorporated. The current edition also integrates NFPA 79 requirements directly within the standard, including two hand control and stop function requirements, moving parts (other than point-of-operation) and safeguarding supplier responsibilities. Finally, the current edition of ANSI B11.1 provided new requirements for slide locks, moving bolsters and scrap chutes.

Subsequent to beginning the revision of B11.1, the ANSI B11 Accredited Standards Committee (ASC) authorized creation of an overarching (“A-level”) standard dealing with general safety requirements for the entire series of machines. ANSI B11 was approved in August 2008. Since B11.1 was already well into its revision at that point, the B11 ASC agreed to allow this current (2009) version of the ANSI B11.1 standard to proceed absent integration with the ANSI B11 “A-level” standard.

Effective Date

The following information on effective dates is informative guidance only, and not a normative part of this standard. The 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, and/or modify existing designs or manufacturing processes in order to incorporate the new and/or revised requirements of this standard into their product development or production system.

The subcommittee recommends that suppliers complete and implement design changes for new machine tools and machine tool systems within 30 months of the approval of this standard.

The subcommittee recommends that users should evaluate whether an existing machine tool and machine tool system has 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 or the machine specific standard to implement protective measures for appropriate risk reduction.

Inquiries with respect to interpretations of this standard, and suggestions for its improvement, are welcomed and should be sent to B11 Standards, Inc. POB 690905, Houston, TX, 77269-0905 Attention: B11 Secretariat. 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 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	
	Delegate	Alternate
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Aluminum Extruders Council	Melvin Mitchell	Doug Hart
American Society of Safety Engineers	Bruce W. Main, PE	George V. Karosas, PE, CSP
Association For Manufacturing Technology	Russell A. Bensman	Alan Metelsky
Automotive Industry Action Group	Nancy Malo	David A. Lalain
The Boeing Company	Don R. Nelson	Joe Oberuc

Canadian Standards Association	Elizabeth Rankin	Tom Eastwood
Can Manufacturers Institute	Geoff Cullen	Jenny Day
Deere and Company	Gary D. Kopps	Scott Fowler
General Motors Corporation	Michael Douglas	Michael Taubitz
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 and Health	Richard S. Current, PE	James R. Harris, PE
Occupational Safety & Health Administration	Kenneth Stevanus	Robert Bell
Packaging Machinery Manufacturers Institute	Charles F. Hayes	Maria Ferrante
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Sheet Metal & Air Cond. Contractors Natl. Assn.	Michael McCullion	Roy Brown
System Safety Society	John Etherton; PhD, PE	Rod Simmons, PhD
Tooling and Manufacturing Association	Daniel Kiraly	
Toyota Motor Manufacturing North America	Barry Boggs	Todd Mills

At the time this standard was approved, the ANSI **B11.1 Subcommittee** had the following members who participated in the development of this revision:

Dennis Cloutier, Co-Chairman	Cloutier Consulting
Russell Bensman, Co-Chairman	The Minster Machine Company
Cindy Haas, B11.1 Secretary	The Association For Manufacturing Technology
James G. Barrett, PhD	Link Systems
Kelyn Brown	Dana Holding Corporation.
Stanford A. Brubaker	Liberty Mutual Insurance Group
Scott Buchanan	Toyota Engineering and Manufacturing America
Lee Burk	Pilz Automation Safety L.P.
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Theodore Sberna	Applied Engineering Concepts
George M. Schreck	Komatsu America Industries, LLC
Kyle Sullivan	General Motors Corporation
Jerome B. (J.B.) Titus	Siemens Energy & Automation
Jim Van Kessel, P.Eng.	JVK Industrial Automation Inc.
Walter Veugen	Veugen Integrated Technologies Ltd.
Ron Walters	Chrysler Corporation
Robert Weaver	Schuler Incorporated

Explanation of the format, and ANSI B11 conventions

The 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.

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 conformance with the standard. The 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.).

Suggestions for improvement of this standard will be welcome. They should be sent to B11 Standards, Inc., POB 690905, Houston, TX, 77269-0905 - Attention: B11 Secretariat.

Introduction

The requirements of this ANSI standard are grouped according to those that apply to the supplier (i.e., manufacturer, rebuilder, modifier) and user. Some are shared between the supplier and user and are so indicated. Figure 1 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.

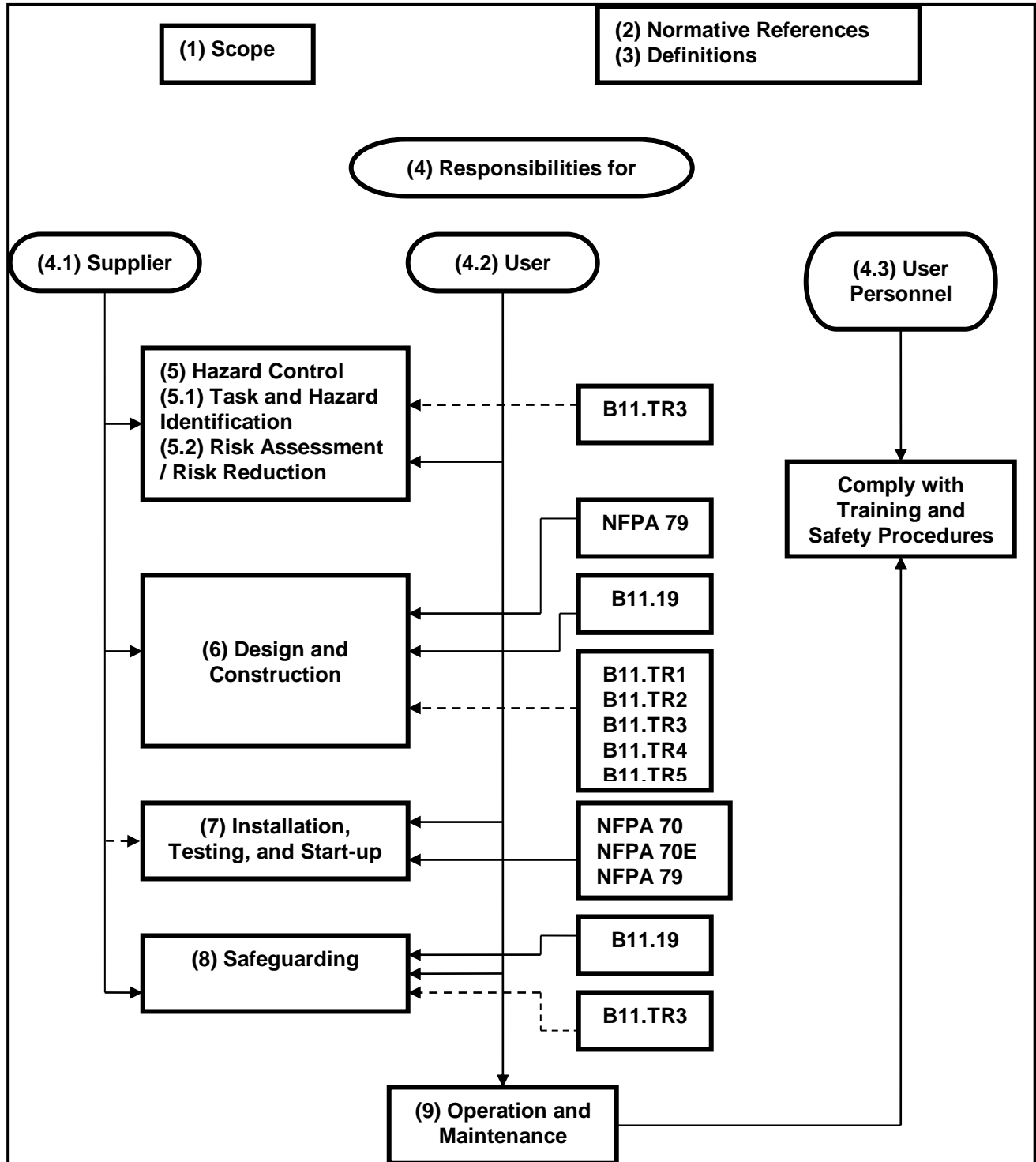


Figure 1 – General layout of the standard showing the various responsibilities

Notes for Figure 1:

- 1) Scope – Provides the boundaries or limits of the standard (i.e., what is/is not included).
- 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, 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) Hazard control (task/hazard identification & risk assessment/risk reduction) – Although clause 5 is intended to require a shared responsibility between supplier and user, the requirements of this clause may fall primarily on either entity (see B11.TR3 for further explanation of hazard/task identification and risk assessment/risk reduction).
- 6) Design and construction – It is assumed that the supplier will be responsible for the requirements of clause 6 with the understanding that the user may add to or modify these requirements through the purchase agreement.
- 7) 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 but often, either the supplier or the user will provide the requirements of clause 8.
- 9) Operation and maintenance – The user is normally responsible for the requirements of clause 9 with possible assistance from the supplier for training.

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.

American National Standard for Machine Tools - Safety Requirements for Mechanical Power Presses

STANDARDS REQUIREMENTS

1 Scope

The requirements of this standard apply only to those mechanically powered machines, commonly referred to as mechanical power presses, which transmit force mechanically to cut, form, or assemble metal or other materials by means of tools or dies attached to or operated by slides.

1.1 Inclusions

The requirements of this standard shall apply to:

- Mechanical power presses (as above);
- transfer presses;
- tandem line presses;
- presses used in production cells;
- automatically fed presses;
- manually fed presses.

1.2 Exclusions

Excluded from the requirements of this standard are the following:

- a) bulldozer
- b) cold header and cold former
- c) eyelet machine
- d) forging presses and hammer

EXPLANATORY INFORMATION

(Not part of the requirements of this American National Standard for Machine Tools – Safety requirements for Mechanical Power Presses - ANSI B11.1 – 2009 (R14))

E1

See Annex A, Figures A.1 and A.2.

The requirements of this standard are aimed at eliminating injuries to operator, maintenance, and set-up personnel, while working on or adjacent to a mechanical power press.

This standard does not establish requirements for personal protective equipment that may be needed for specific operations.

E1.1

See also, Annex A, Figures A.18 and A.20.
See also, Annex A, Figure A.19.

E1.2

These exclusions exempt machines that normally do not have the characteristics of mechanical power presses, or are addressed by specific standards. If a machine is not addressed by a specific B11 standard, see ANSI B11 (*General Safety Requirements*) for guidance.

a) A slow-acting horizontal mechanical press with a large bed used for bending, straightening, etc. The work, which is done between dies, can be either hot or cold. The machine is closely allied to a forging machine.

b) Cold headers and cold formers perform many operations such as shearing, heading, upsetting, extruding, trimming, forming, cold working or warm forming material by means of tools and dies. See ANSI B11.7.

c) An automatic multiple station transfer feed machine for making drawn stampings by use of cam-driven adjustable plungers, acting from above and below the workpiece, and to which individual tool elements are attached.

d) See ANSI B24.1.