

American National Standard

Safety Requirements for Shears

ANSI-Accredited Standards Developer and Secretariat:



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Foreword

(This Foreword is not part of the requirements of American National Standard B11.4–2003 (R2020)).

The primary objective of this standard is to eliminate or control the risk of injuries to personnel associated with shears by establishing requirements for the machine's construction, care and use and for the production systems in which shears are used. To accomplish this objective, responsibilities have been assigned to the builder, user, modifier, rebuilder and system integrator, as well as to the employer and the employee in the working environment.

Point-of-operation safeguarding is the single most important factor in the elimination of point-of-operation injuries. A production system consists of the shear as one component, feeding methods (including part or scrap removal) as a second component, and the third component, point-of-operation safeguarding. The vital third component, point-of-operation safeguarding, can be evaluated for effectiveness only after the first two components and operator involvement is known. Since this information is known and controlled by the employer, the responsibility for compliance with clause 6 has been assigned accordingly.

The safeguarding of production systems in shearing operations is complicated by the wide variety of operations and operating conditions, the variations in size, speed, and type of shear used; the size, thickness, and kind of pieces to be worked; the required accuracy of the finished work; the skill of operators; the length of run; and the method of sheet feeding and 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 devices) has been covered in this standard.

The words "safe" and "safety" are not absolutes. An element of safety is attitude. 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, job monotony, fatigue and experience are safety factors that must be considered by the employer.

To aid all parties concerned in conforming to the requirements of this standard, explanatory information has been placed in the right column, adjacent to the applicable requirements.

Shears 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 B11 Standards, Inc., PO Box 690905, Houston, Texas 77269-0905, USA. Attention: B11 Secretariat.

This standard was processed and approved for submittal to ANSI by the 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 it approved this standard, the B11 Accredited Standards Committee had the following members:

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Gary D. Kopps, Vice-Chairman
David A. Felinski, Secretary

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Alliance of American Insurers
Aluminum Extruders Council

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U.S. Department of the Navy (NAVSEA)	Various delegates depending on the Standard	

At the time this standard was approved, the ANSI B11 ASC **B11.4 Subcommittee** had the following members who participated in the development of this revision:

Dennis Cloutier, CSP, Chairman	Peter Barroso, Jr., PE	Barroso Engineering
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	Chris Soranno	Safe-T-Sense
	Barry A. Stockton	High Tech Consulting

Explanation of the format, and ANSI B11 conventions

This ANSI B11.4 – 2003 (R2020) 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 “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.

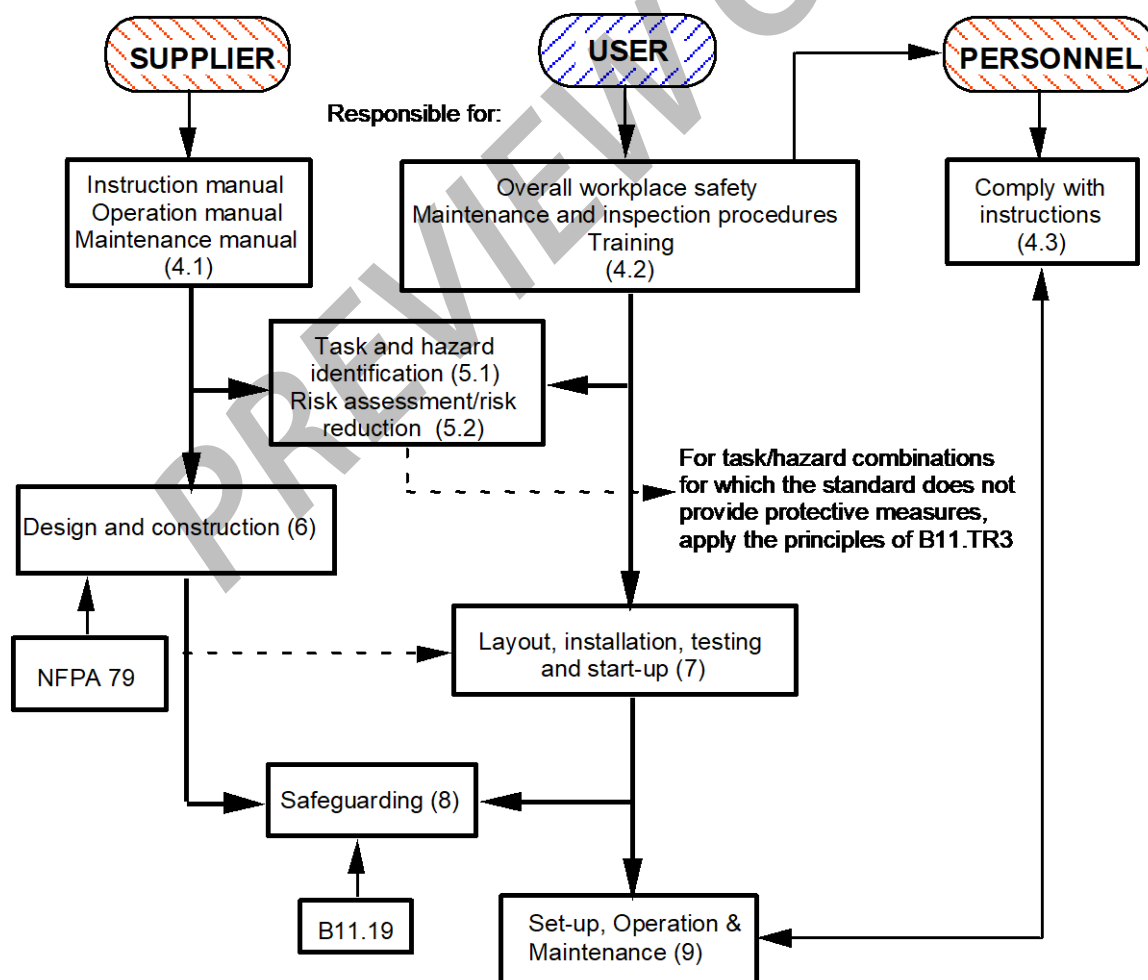
B11 conventions: Operating rules (safe practices) are not included in either column of this standard unless they are of such nature as to be vital safety requirements, equal in weight to other requirements, or guides to assist in compliance with the standard. The B11 standards do not use the term “and/or” 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).

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 primary 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 either 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, the equipment user and its operating personnel, as follows (numbers in parentheses refer to the clause numbers in these standards which address that responsibility):



STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

*American National Standard for Machine Tools –**Safety Requirements for Shears*

(Not part of the requirements of this American National Standard for Machine Tools — Safety Requirements for Shears - ANSI B11.4–2003 (R2020)).

1 Scope

This standard applies to those mechanically, hydraulically, hydro-mechanically or pneumatically powered shears used to cut material by shearing, and which utilize a fixed blade(s) and non-rotary moving blade(s).

Shears addressed in this standard are commonly found in these basic applications:

- 1) stand-alone
- 2) stand-alone, automatic
- 3) process line

For the purpose of this standard, the term shear shall be inclusive of stand-alone, stand-alone automatic, and process line shears.

E1

See the following Figures in Annex B for examples of shears:

Figure #	Description
1	Mechanical power shear, underdrive type
2	Mechanical power shear overdrive type
3	Hydraulic power shear
4	Pneumatic powered shear
5	Manually powered shear
6	Right angle shear
7	Crop shear

1) Stand-alone shears are those single units in which each stroke is activated by some action of the operator. This may include initiation of a foot or hand control or feeding a sheet until it contacts a probe or other stroke initiating device.

2) Stand-alone, automatic shears include those single units with fully automatic sheet feeder and/or positioning systems in which, once started, a continuous series of cuts are made without operator intervention.

3) Process line shears include those machines which have been integrated into an automated system including a number of processes. Cycling of the shear stroking mechanism is a slave to the system control. Examples would be coil cut-to-length lines, coil slitting lines with crop shears (ANSI B11.18), or manufacturing systems (ANSI B11.20).