

ANSI B11.5-1988 (R2008)

American National Standard for Machines

Ironworkers

**Safety Requirements for
Construction, Care and Use**

Secretariat and Accredited Standards Developer:
AMT – The Association For Manufacturing Technology
7901 Westpark Drive
McLean, VA 22102



Approved: August 23, 1988
Reaffirmed: July 15, 2008

by the American National Standards Institute, Inc.



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Foreword (This Foreword is not part of American National Standard B11.5-1988.)

Recognizing the uniqueness of ironworkers and the need for a safety standard for them, Accredited Standards Committee B11 on Safety Standards for Machine Tools established Subcommittee B11.5 in 1972, to develop the safety requirements for this equipment. The first standard was approved by ANSI on September 18, 1975, and reaffirmed on December 1, 1981. For the most part, this standard represents a minor revision of the original document by incorporating changes that update the standard with current references to other American National Standards and their illustrations, and the latest ANSI Style Manual.

Producing a workable safety standard treating the construction, safeguarding, care, and use of ironworkers is complicated by the wide variety and sizes of ironworkers manufactured and in use, and by the infinite combinations of methods and operations used to produce parts. Safeguarding the multiple work stations for the limitless variety of workpiece cross sections is further complicated by the need to preserve the flexibility and universal application of ironworkers.

Recognizing the difficulty in defining specific guarding requirements for all applications of ironworkers without detracting from their productivity and flexibility, the committee approached its primary objective of eliminating injuries to personnel associated with ironworkers from four directions:

- (1) Eliminating by design certain recognized construction hazards and establishing standard approaches to design so that the machines available from competitive manufacturers will have similar operational and control characteristics.
- (2) Safeguarding the point of operation to protect personnel should they inadvertently expose themselves to hazards at the point of operation.
- (3) Eliminating by design, procedure, and process the necessity of having the operator place his hands or fingers within the point of operation at any time the particular work station has not been made inoperative, thus minimizing his exposure to point-of-operation hazards.
- (4) Establishing guidelines for general training and specific job-related instructions for eliminating unsafe practices and procedures.

To implement these requirements, responsibilities have been assigned to the manufacturer, the reconstructor, the modifier, the employer, the employee, and the owner.

To assist all persons concerned in complying with the requirements of this standard, all explanatory information has been placed in the right column, adjacent to the requirements to which it applies.

Recognizing the difficulty of updating equipment immediately after the approval date of the ANSI B11.5-1975 standard, a three-year period was suggested before the applicable construction requirements of this standard become effective for former installations. All grace periods have long since expired.

Suggestions for improvement of this standard will be welcome. They should be sent to the National Machine Tools Builders' Association, 7901 Westpark Drive, McLean, Virginia 22102-4269, Attention: Safety Department.

This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Safety Standards for Machine Tools, B11. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the B11 Committee had the following members:

J. W. Hart, Chairman

William Atkinson, Jr, Secretary

Organization Represented

Aerospace Industries Association of America, Inc
Alliance of American Insurers
American Boiler Manufacturers Association
American Institute of Steel Construction

Name of Representative

Gerald W. Lancour
Joseph W. Hart
William Axtman
Frank Perrera
John Conley

<i>Organization Represented</i>	<i>Name of Representative</i>
American Insurance Services Group	Charles Peshek
American Society of Safety Engineers	Alfred Auerhaan
Defense Industrial Plant Equipment Center	Garland Smith
International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW)	Barrie Brooks
Machinery Dealers National Association	Jack Walker
Metal Building Manufacturers Association	Gary Beck
Motor Vehicle Manufacturers Association	Kenneth Lauck
National Association of Government Labor Officials	Jerry Skeers
National Electrical Manufacturers Association	James Rice
National Machine Tool Builders' Association	Emmett McCarthy
National Safety Council	Robert Jordan
National Tooling & Machining Association	William Ruxton
Presence Sensing Device Manufacturers Association	James Kirtan
Rubber Manufacturers Association	James Kendall
Sheet Metal & Air Conditioning Contractors' National Association	Charles Baxter
Society of Manufacturing Engineers	Theodore Wire
Steel Plate Fabricators Association	Earl Bratton
U. S. Department of Labor, Occupational Safety & Health Administration	James L. Scully (Not Voting) Frank A. Smith (Alt) (Not Voting)

Subcommittee B11.5 on Safety Requirements for the Construction, Care, and Use of Ironworkers, which developed this standard, had the following members:

Robert Patrick, Chairman	Bob Brown
Thomas Boyer, Secretary	Fred J. Brown
	Jim Dvorak
	Leon Feterl
	Arthur Kroetch
	Don LeTourneau
	Walt Lips
	Warren H. Obert

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Explanation of Standard Format

American National Standard B11.5-1988 uses a two-column format to provide both specific requirements and supporting information.

The left column, designated "Standard Requirements," is confined solely to these requirements and is printed in bold type. Where supporting tables, photographs, or sketches are required, they are designated as "tables" or "figures."

The right column, designated "Explanatory Information," contains only information that is intended to clarify the standard. This column is not a part of the standard. Where supplementary photographs or sketches are required, they are designated as "illustrations."

All material designated as "tables," "figures," or "illustrations" appears at the end of the standard.

Operating rules (safe practices) are not included in either column unless they are of such a nature as to be vital safety requirements, equal in weight to other requirements, or guides to assist in compliance with the standard.



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American National Standard for Machine Tools –

Ironworkers – Safety Requirements for Construction, Care, and Use

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

(Not part of American National Standard for Machine Tools—Ironworkers—Safety Requirements for Construction, Care, and Use, ANSI B11.5-1988)

1. Scope, Purpose, and Application

1.1 Scope.

1.1.1 General. The requirements of this standard apply to those combination, multipurpose powered machines that punch, shear, notch, cope, and form metals or other materials, commonly referred to as ironworkers.

1.1.2 Specific Types of Ironworkers Included. The requirements of this standard also apply to those single- or multipurpose powered machines similar in construction to, and identical in the use of, an ironworker or portions thereof, such as, but not limited to, the following:

- (1) Single-end punches
- (2) Double-end punches
- (3) Structural shearing machines
- (4) Notching machines
- (5) Copping machines
- (6) A combination of (1) through (5)

1.1.3 Specific Types of Ironworkers Excluded. The requirements of this standard shall apply to all ironworkers or combinations as defined in 1.1.2, but excluding the following:

- (1) Alligator shears
- (2) Bar shears
- (3) Billet shears
- (4) Manually powered machines
- (5) Nibblers
- (6) Portable hand tools
- (7) Portable machines
- (8) Power press brakes
- (9) Power presses
- (10) Power shears

E1.1.2 Specific Types of Ironworkers Included. Because of the numerous special names used in different segments of the industry for machines performing the same function as ironworkers, it is not feasible to list all such machines by specific names. However, this standard is intended to include machines generally referred to as beam punches, detail punches, spacing punches, etc., as long as they are similar in construction to, and identical in the use of, an ironworker or portions thereof.

E1.1.3 Specific Types of Ironworkers Excluded

- (7) Portable machines. See *Portable* (3.38).

1.2 Purpose. The purpose of this standard is to establish safety requirements with respect to the construction, safeguarding, care, and use of ironworkers.

1.3 Application. All ironworkers shall be in compliance with this standard.

E1.3 Application. The grace periods listed in ANSI B11.5-1975 (R1981) have expired.

2. Referenced Publications

2.1 American National Standards. This standard shall be used in conjunction with the following American National Standards. When these standards are superseded by a revision approved by the American National Standards Institute, Inc, the revision shall apply.

ANSI B11.1-1988, Machine Tools — Mechanical Power Presses — Safety Requirements for Construction, Care, and Use

ANSI Z35.1-1974, Specifications for Accident Prevention Signs

ANSI Z35.2-1968 (R1974), Specifications for Accident Prevention Tags

ANSI Z53.1-1979, Safety Color Code for Marking Physical Hazards

ANSI/ASME B15.1-1984, Safety Standard for Power Transmission Apparatus

ANSI/ASME Boiler and Pressure Vessel Code, 1986

2.2 Related Standard

ANSI Z229.1-1982, Safety Requirements for Shops Fabricating Structural Steel and Steel Plate

3. Definitions

3.1 Adjustable Restrictor. An adjustable attachment that restricts entry of the hands and fingers into the point of operation.

3.2 Angle Shear. See *Structural Shearing Station* (3.52)

3.3 Antirepeat. Antirepeat limits the ironworker to a single stroke if the activating means is held operative.

E3.3 Antirepeat. Antirepeat requires release of all activating mechanisms before another stroke can be initiated.

3.4 Awareness Barrier. An attachment that offers resistance against entry into the point of operation.

3.5 Bar Cutter. See *Structural Shearing Station* (3.52).

3.6 Bar Shear. See *Structural Shearing Station* (3.52).

3.7 Blade. A replaceable tool having one or more cutting edges for shearing, notching, or coping.

3.7.1 Fixed Blade. A stationary blade having one or more cutting edges.

3.7.2 Movable Blade. A blade, having one or more cutting edges, that is attached to the moving actuating member within the frame.

3.8 Clutch. An assembly that connects the flywheel or drive shaft, either directly or through a gear train, to impart motion to the ram.

3.9 Continuous. Refers to uninterrupted, multiple strokes of the ram without intervening stops at the end of individual strokes.

3.10 Coping-Notching Station. The work station at which material from the edge or periphery of the workpiece is sheared.

3.11 Counterbalance. The mechanism, apart from the drive, that is used to balance or support the weight of the ram assembly.

3.12 Cycle. A complete movement of the ram from its starting position and return to that same starting position.

3.13 Device. An ironworker control or attachment that does one of the following:

- (1) Restrains the operator from inadvertently reaching into the point of operation
- (2) Inhibits normal ironworker operation if the operator's hand(s) is inadvertently within the point of operation
- (3) Automatically withdraws the operator's hand(s) if the operator's hand(s) is inadvertently within the point of operation

3.14 Drive. A method of power transmission to the ram.

3.15 Employer. Any person who is responsible for the personnel associated with ironworker operations.

3.16 Feeding. The process of placing material within the point of operation.

3.17 Flat Shearing Station. The work station at which workpieces of rectangular cross section are sheared.

3.18 Foot Control. A foot-operated control mechanism that initiates a cycle.

3.18.1 Foot Pedal. A foot-operated lever that is fixed or that can be positioned anywhere around the ironworker.

E3.8 Clutch. At the present time, ironworkers designed with clutches use only the full-revolution type. As the state of the art is such, this standard does not exclude part-revolution clutches.

E3.13 Device. Subcommittee B11.5 deemed impractical the use of devices in connection with an ironworker. However, in the remote possibility that an employer finds the use of a device a practical method for safeguarding his particular application, such devices should comply with the requirements of ANSI B11.1-1988.

3.18.2 Foot Switch. An electrical, pneumatic, or hydraulic foot control.

3.19 Frame. The basic and primary housing of the ironworker used to support the power system and operating stations.

3.20 Guard (Fixed or Adjustable). A barrier that prevents entry of the operator's hand(s) or fingers into the point of operation.

3.21 Hand Tool. Any hand-held object designed for placing material to be processed within, or for removing processed parts from, the point of operation.

3.22 Helper. Any individual who assists an operator in the work process.

3.23 Hold-Down. An adjustable mechanism that restrains movement of the workpiece during shearing action.

3.24 Ironworker. Multiple work stations at which various operations may be performed singly or simultaneously, including, but not limited to, punching, shearing, notching, coping, and forming.

3.25 Maintenance Personnel. Individuals who care for, inspect, and maintain ironworkers.

3.26 Manufacturer. Any person who manufactures, reconstructs, or modifies ironworkers for installation in the United States.

3.27 Mobile. An ironworker that may be moved but not hand-carried; the workpiece is brought to the ironworker.

3.28 Modifier. Any person who alters or modifies an ironworker in such a way that it changes the safety procedures, capacity, or intended functions of the ironworker.

3.29 Movable Cover. An attachment that shields the opening of the work station on the drop-off side.

3.30 Multiple Controls. More than one actuating mechanism that may initiate ram movement at the same work station.

3.31 Normal Maintenance. Periodic upkeep and inspection of an ironworker as prescribed by the manufacturer, as opposed to inspection or repair.

3.32 Operator. An individual who performs operations on an ironworker and is responsible for controlling any machine function.

E3.20 Guard (Fixed or Adjustable). In this standard the word "guard" is reserved exclusively for referring to barriers designed for safeguarding at the point of operation.

E3.23 Hold-Down. For the purpose of this standard, the hold-downs and the material supports may also be considered as guards and awareness barriers as long as they meet the respective functional requirements given in 5.1.3 and 5.1.4.

E3.24 Ironworker. Illustrations 1 and 2 represent two of the various design approaches used in the construction of ironworkers; however, the basic control and operational characteristics of any design approach are similar. See Illustrations 1-5.

3.30 Multiple Controls. Subsection 4.3.6 precludes actuation by multiple controls.