

ASME B107.49-2004
(Revision of ASME B107.49M-1998)

Nail Sets

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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Three Park Avenue • New York, NY 10016

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FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers, was reorganized as an ASME Standards Committee, and its title was changed to Hand Tools and Accessories. In 1996, the B209 Committee, which had published an earlier version of this Standard as B209.4, merged with the B107 Committee, and the B107 Committee scope was expanded to include safety considerations.

The purposes of this Standard are to define performance and safety requirements specifically applicable to nail sets, to specify test methods, to evaluate performance relating to the defined requirements, and to indicate limitations of use.

Principle changes in this edition of the Standard are the addition of performance tests and use of the classification methods used in other B107 Standards.

The format of this Standard is in accordance with *The ASME Codes and Standards Writing Guide 2000*. Requests for interpretations of the technical requirements and suggestions for the improvement of this Standard should be addressed to The American Society of Mechanical Engineers, Secretary, B107 Standards Committee, Three Park Avenue, New York, NY 10016-5990.

The requirements of this Standard become effective at the time of publication. ASME B107.49-2004 was approved as an American National Standard on October 5, 2004.

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Hand Tools and Accessories

(The following is the roster of the Committee at the time of approval of this Standard.)

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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Interpretations. Upon request, the B107 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B107 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The B107 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B107 Standards Committee.

NAIL SETS

1 SCOPE

This Standard provides performance and safety requirements for nail sets that are intended primarily for setting unhardened finishing nails below the surface of the material being nailed.

This Standard may be used as a guide in selecting, testing, and using the hand tools covered. It is also meant to serve as a guide in developing manuals and posters for training personnel in safe practices.

This Standard may be used as a guide by state authorities or other regulatory bodies in the formulation of laws or regulations. It is also intended for voluntary use by establishments that use or manufacture the tools covered. It is not the purpose of this Standard to specify the details of manufacturing.

The methods employed to ensure compliance with this Standard shall be determined by the proper regulatory or administrative authority.

2 CLASSIFICATION

Type I: One-piece nail set (see Fig. 1)

Type II: Self-centering (center punch) nail set (see Fig. 2)

3 REFERENCES

The following is a list of publications referenced in this Standard.

ANSI Z87.1, Practice for Occupational and Educational Eye and Face Protection

ANSI Z535.4, Product Safety Signs and Labels

Publisher: American National Standards Institute (ANSI), 25 West 43rd Street, New York, NY 10036

ASTM E 18, Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

Publisher: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

Guide to Hand Tools — Selection, Safety Tips, Proper Use and Care

Publisher: Hand Tools Institute, 25 North Broadway, Tarrytown, NY 10591

4 DEFINITIONS

body: the portion of the nail set between the head and taper, used for holding during nail setting operation.

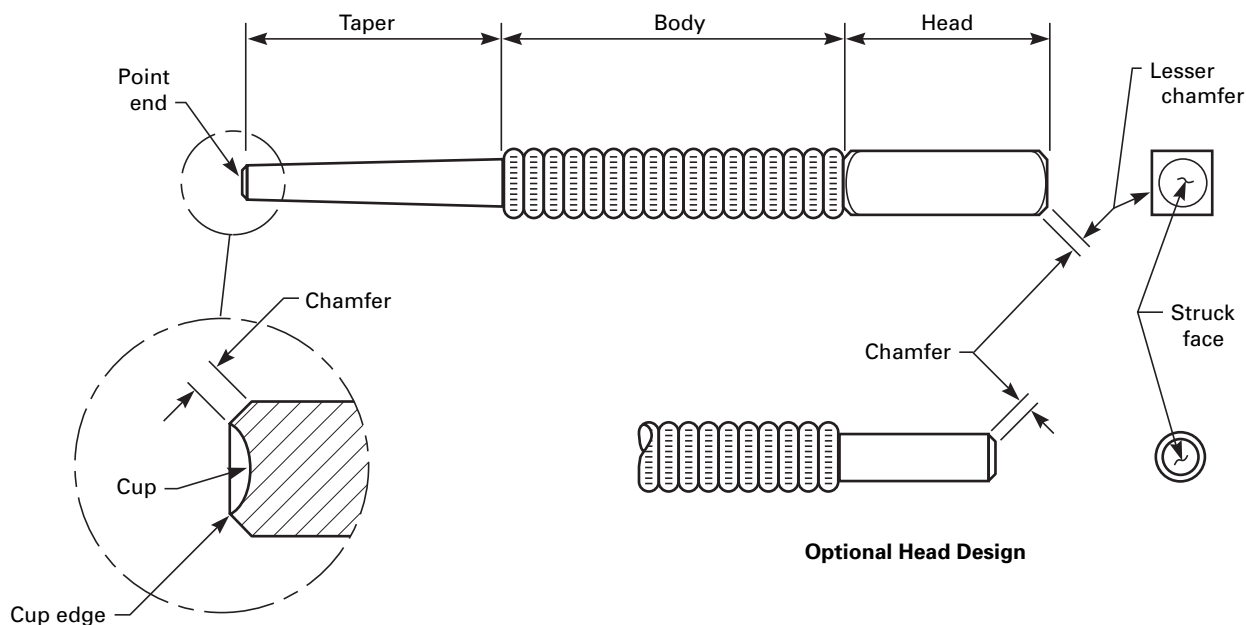


Fig. 1 Type I Nail Set

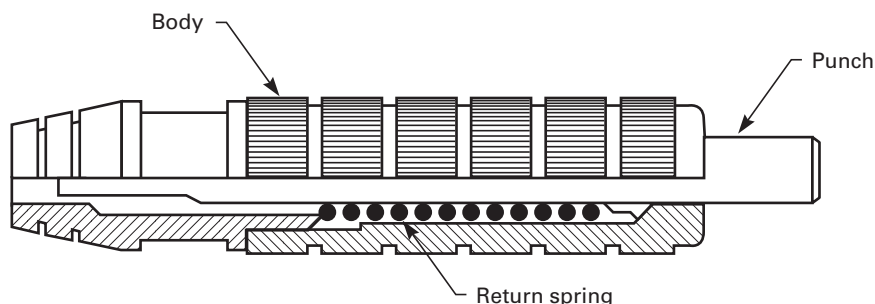


Fig. 2 Type II (Self-Centering) Nail Set

chamfer: the angled flat surface, or equivalent radius, encircling the perimeter of the struck face and of the point end encircling the cup.

cup: the conical, concave relief at the center of the point end of the nail set (not normally provided on self-centering nail sets).

cup edge: the edge formed by the intersection of the cup and the chamfer surfaces (not normally provided on self-centering nail sets).

equivalent: indicates alternative designs or features that will provide an equal degree of safety.

head: the portion of the nail set between the struck face and the body.

punch: the movable, struck member of a self-centering nail set.

safety message: the information imprinted on or affixed to the nail set that is intended to promote safety.

shall: indicates mandatory requirements of this Standard.

should: indicates if a provision is of an advisory nature or is stated as a recommendation.

struck face: the end directly opposite the point end exclusive of the chamfer.

taper: the portion of the nail set between the body and the point end chamfer and having a gradually reducing cross-sectional area.

5 PERFORMANCE REQUIREMENTS

Nail sets shall withstand the tests specified in para. 6.

5.1 Design

5.1.1 Type I. Nail sets shall have a chamfer and cup surface on the point end for setting unhardened nails below the surface of the material being nailed and a struck face on the opposite end.

5.1.2 Type II. Self-centering nail sets shall have a body with an internal movable punch. A cup point may be provided on the punch point end. A return method shall

be provided to hold the punch in the retracted position.

5.1.3 Struck Face. The struck face shall have a flat or convex shape and a chamfer of approximately 45 deg or equivalent radius all around the perimeter. The lesser chamfer width (see Fig. 1) shall be equal to approximately one-tenth of the diameter of the struck face. For example, if the struck face diameter is 0.25 in., then the lesser chamfer width will equal approximately 0.025 in.

5.2 Materials

Materials used in the manufacture of nail sets shall be such as to produce nail sets that meet the requirements herein. Nail sets shall be free of manufacturing and material defects, such as seams that would jeopardize sound construction, and shall be free of nonfunctional sharp edges or surface roughness that could inflict personal injury when handling the tool.

5.3 Hardness

Hardness of the point end shall be 48 HRC to 60 HRC or equivalent for at least 0.125 in. from the point end. Hardness of the struck face of the nail set shall not exceed 44 HRC or equivalent.

6 TESTS

Tests required herein are inherently hazardous; adequate safeguards for personnel and property shall be employed in conducting such tests. Separate (new) samples shall be used for each of these tests. Failure to meet the requirements of either of these tests indicates that the nail sets are not in compliance with this Standard.

6.1 Hardness Determination Test

Hardness determination shall be made per ASTM E 18.

6.2 Impact Test

The nail set shall be mounted vertically with the point end resting on a steel plate that is on a rigidly supported steel block weighing not less than 200 lb. A weight of 1.0 lb having a striking face hardness of 45 HRC to 60 HRC or equivalent shall be dropped, unrestricted 20

times in such a manner that each drop applies the full force of the weight squarely to the struck face. Typically, the weight is cylindrical and is dropped through a seamless tube or pipe slightly larger in diameter than the weight. For nail sets with a point diameter up to 0.063 in., the weight shall be dropped from a height of 10.0 in. For point diameters greater than 0.063 in., the weight shall be dropped from a height of 18.0 in. The test plate shall have a minimum thickness of 0.25 in. with a uniform hardness of 25 HRC to 30 HRC or equivalent and shall be moved after each drop of the weight to make a new impression. The point end or struck face shall neither chip nor spall, and the nail set shall neither crack nor bend as a result of the test. Normal deformation at either end is permitted.¹

7 SAFETY REQUIREMENTS AND LIMITATIONS OF USE

Instructors and employers shall stress proper use and safety in the use of nail sets and shall emphasize the necessity to wear and ensure the use of safety goggles. The publication *Guide to Hand Tools — Selection, Safety Tips, Proper Use, and Care* provides guidelines for the safe use of these tools.

(a) Nail sets are special-purpose tools designed and intended only for the specific use of setting unhardened nails below the surface of the material being nailed.

(b) To avoid possible eye or other bodily injury, nail sets shall not be used to strike hard or hardened objects, such as rocks, bricks, concrete, masonry nails, and other hardened nails or steel tools.

(c) A striking tool always should be used with the striking face parallel to the struck face of the nail set.

¹ The striking test is so severe that a degree of permissible deformation, such as denting of the struck face, can be anticipated. A much less severe test would not cause this, but it would not provide the level of safety assurance desired.

Glancing blows, overstrikes, and understrikes should be avoided. No surface of the nail set other than the struck face shall be struck. The striking tool of the appropriate size shall have a diameter not less than 0.375 in. larger than the struck face of the nail set.

(d) Nail sets shall not be used for prying, wedging, or aligning holes.

(e) Safety goggles or equivalent eye protection conforming to ANSI Z87.1 shall be worn by the user and all persons in the immediate area in which any nail set is being used to avoid possible eye injury from flying objects.

(f) Nail sets shall be inspected before each use, and their use shall be discontinued at the first sign of bending of the nail set or chipping, mushrooming, or cracking of the point end or struck face.

(g) No part of the nail set shall be ground, welded, treated by reheating, or otherwise altered from the original condition as furnished by the manufacturer.

(h) The body of a self-centering nail set is placed over the protruding unhardened nail, and the punch is struck with the appropriate hammer to set the nail below the surface of the material being nailed. The appropriate hammer shall have a striking face of approximately 0.375 in. larger in diameter than the struck face of the nail set.

(i) Each punch, size permitting, shall be stamped, labeled, or otherwise marked by the manufacturer with the following safety message or equivalent:



WARNING
WEAR SAFETY GOGGLES
USER AND BYSTANDER

Pictorials are an acceptable equivalent. This safety message shall be located in a position that will not interfere with the quality or performance of the tool. The principles set forth in ANSI Z535.4 shall be used as the guide for alternate, equivalent methods of labeling.

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B107 AMERICAN NATIONAL STANDARDS FOR HAND TOOLS

Socket Wrenches, Hand (Inch Series)	B107.1-2002
Socket Wrenches, Extensions, Adaptors, and Universal Joints, Power Drive (Impact) (Inch Series).	B107.2-2002
Driving and Spindle Ends for Portable Hand, Impact, Air, and Electric Tools (Percussion Tools Excluded).	B107.4M-2005
Socket Wrenches, Hand (Metric Series).	B107.5M-2002
Adjustable Wrenches.	B107.8-2003
Handles and Attachments for Hand Socket Wrenches — Inch and Metric Series.	B107.10M-1996
Pliers: Diagonal Cutting and End Cutting.	B107.11-2002
Nutdrivers.	B107.12-2004
Pliers: Long Nose, Long Reach	B107.13-2003
Hand Torque Tools (Mechanical).	B107.14-2004
Flat Tip Screwdrivers	B107.15-2002
Shears (Metal Cutting, Hand)	B107.16M-1998 (R2004)
Gages, Wrench Openings, Reference	B107.17M-1997
Pliers: Wire Twister	B107.18-2003
Pliers: Retaining Ring	B107.19-2004
Pliers: Lineman's, Iron Worker's, Gas, Glass, Fence, and Battery.	B107.20-2004
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Locking Pliers.	B107.24-2002
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