ASME B107.500-2020

(Revision of ASME B107.500-2010)

Pliers and Shears

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Two Park Avenue • New York, NY • 10016 USA

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This Standard will be revised when the Society approves the issuance of a new edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the Committee web page and under http://go.asme.org/InterpsDatabase. Periodically certain actions of the ASME B107 Committee may be published as Cases. Cases are published on the ASME website under the B107 Committee Page at http://go.asme.org/B107committee as they are issued.

Errata to codes and standards may be posted on the ASME website under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The B107 Committee Page can be found at http://go.asme.org/B107committee. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting "Errata" in the "Publication Information" section.

The American Society of Mechanical Engineers
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FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers (ASME), was reorganized on June 28, 1967 as an ASME Standards Committee, and its title was changed to Hand Tools and Accessories. In 1996, its scope was expanded to include safety considerations.

In 1999, ASME initiated a project to consolidate hand tool standards by category of tool. The initial implementation included distinct standards within a single publication bearing a three-digit number corresponding to the responsible B107 subcommittee. It was intended that subsequent revisions would integrate the component standards resulting in a more traditional document. To maintain continuity within the user community, the former component standard numbers are renamed as categories in the consolidated standard. Types, classes, styles, and designs were retained.

The purposes of this Standard are to define dimensional, performance, and safety requirements specifically applicable to pliers and shears; to specify test methods to evaluate performance relating to the defined requirements; and to indicate limitations of safe use.

To comply with the ASME directive to address Additive Manufacturing processes in B107 standards, a failure mode test has been added.

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.

This Standard supersedes, replaces, and renders obsolete the following standards:

B107.11 Pliers: Diagonal Cutting and End Cutting
B107.13 Pliers: Long Nose, Long Reach
B107.16 Shears (Metal Cutting, Hand
B107.18 Pliers: Wire Twister
B107.19 Pliers: Retaining Ring
B107.20 Pliers: Lineman's, Iron Worker's, Gas, Glass, Fence, and Battery
B107.22 Electronic Cutters and Pliers
B107.23 Pliers: Multiple Position, Adjustable
B107.24 Pliers: Locking, Clamp, and Tubing Pinch-Off
B107.25 Pliers: Performance Test Methods
B107.27 Pliers: Multiple Position, Electrical Connector
B107.37 Pliers: Wire Cutters/Strippers

Members of the Hand Tools Institute Pliers and Shears Standards Committee, through their knowledge and hard work, have been major contributors to the development of the B107 standards. Their active efforts in the promotion of these standards are acknowledged and appreciated.

ASME B107.500-2020 was approved by the B107 Standards Committee on January 3, 2020, and by the Board on Standards and Testing on January 3, 2020. It was approved as an American National Standard on January 21, 2020. The requirements of this Standard take effect upon its issue date.

ASME B107 COMMITTEE
Hand Tools and Accessories

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

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CORRESPONDENCE WITH THE B107 COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B107 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

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.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B107 Standards 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.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at http://go.asme.org/InterpretationRequest. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the B107 Standards Committee at the above address. The request for an 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 in one or two words.
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. Please provide a condensed and precise question, composed in such a way that a “yes” or “no” reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of “Yes” or “No,” with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

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

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

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 and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the B107 Standards Committee. Future Committee meeting dates and locations can be found on the Committee Page at http://go.asme.org/B107committee.

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PLIERS AND SHEARS

1 SCOPE

This Standard provides performance and safety requirements for pliers suitable for cutting wire; for long-nose, long-reach pliers; for hand shears generally used for cutting sheet metal; for wire-twister pliers, which are used primarily for securing safety wires; for pliers suitable for inserting and removing internal and external retaining rings, including those covered by ASME B18.27; for pliers having gripping surfaces and/or cutting edges; for cutters and pliers less than 6 in. long, equipped with a spring, typically used in the manufacture of electronic equipment; for adjustable joint and slip joint pliers; for locking pliers that are suitable for gripping, clamping, pinching, cutting, and wrenching; for pliers (also known as Cannon Plug Pliers) that are used primarily for connecting or disconnecting threaded lock collars of electrical connectors; and for wire strippers, and the cutting and stripping functions of multipurpose tools, for use on solid and stranded copper wire. The tools covered in this Standard are listed by Category number in Sections 6 through 16.

Inclusion of dimensional data in this Standard does not mean that all products described herein are stock production sizes, nor that all production sizes are listed. Consumers should consult with manufacturers concerning lists of stock production sizes.

This Standard also details the purpose, apparatus, procedures, and performance specifications for the functional testing of pliers and shears. It is intended to be used by manufacturers, purchasers, and other persons involved with evaluating these products. Test procedures described herein are used to evaluate conformance to performance requirements.

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 manufacture the tools covered.

2 DEFINITIONS

blade pattern: orientation and configuration of the cutting blades.

compound leverage: a system of pivot points that multiply the force applied at the handles and transfer that force to the cutting blades.

convertible: changeable from internal to external setting by disassembly.

copier paper: 20-lb 84-92 GE brightness grain long multipurpose paper or other paper conforming to ASTM D3460.

crusher: parallel flat areas on the inside handle surfaces near the pivot, designed for crushing.

deflection: movement under load.

force: the action of one body on another body that changes, or tends to change, the position or motion of the body acted on.

full length of cut: maximum distance cut in one operation.

initial load: a small force applied to the pliers' handles during the hand load test prior to the major load.

jaw area: the portion of the pliers between the fastener (pivot point) and the cutting or gripping end.

length of cut: the distance cut in one operation.

load: mass or force, depending on use. A load that produces a force due only to gravity may be expressed in mass units. Any other load is expressed in force units.

major load: the force applied to the pliers' handles during the handle load test intended to deflect the handles.

moment: a measure of the tendency of a force to rotate a body upon which it acts about an axis.

permanent set: the difference in distance, measured at a right angle to the centerline, between handles before and after application and removal of the major load (also known as plastic deformation).

room temperature: 60°F to 80°F.

scored surface: serrated or crosshatched surface to enhance gripping ability.

shall, should, and may: mandatory requirements of this Standard are characterized by the word *shall*. If a provision is of an advisory nature, it is indicated by the word *should* or is stated as a recommendation. If a provision is of an optional or alternative nature, it is indicated by the word *may.*

shearing blades: blades that have a single contact point (with each other) that moves from the joint end of the blade to the tip of the blade as handles close.

shroud: device used to limit tip travel on external ring pliers.

universal: changeable from internal to external setting without disassembly.

Additional definitions are shown in ISO 5742.