

ASME B18.6.4-1998
[Revision of ANSI B18.6.4-1981 (R1997)]

THREAD FORMING AND THREAD CUTTING TAPPING SCREWS AND METALLIC DRIVE SCREWS (INCH SERIES)

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers



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FOREWORD

American National Standards Committee B18 for the standardization of bolts, screws, nuts, rivets, and similar fasteners was organized in March 1922, as Sectional Committee B18 under the aegis of the American Engineering Standards Committee (later the American Standards Association, then the United States of America Standards Institute and, as of October 6, 1969, the American National Standards Institute, Inc.), with the Society of Automotive Engineers and the American Society of Mechanical Engineers as joint sponsors. Subcommittee 3¹ was subsequently established and charged with the responsibility for technical content of standards covering slotted and recessed head screws.

An American Standard setting forth slotted head proportions was approved and published in April of 1930.

Over the years following the issuance of this document, the need for standards more comprehensive than head configurations became apparent. At a meeting held on April 14, 1942, Subcommittee 3¹ was reorganized and enlarged, and the following operating scope was established:

The scope of Subcommittee 3¹ shall consist of the development and promulgation of American Standards embracing screw products variously known as machine screws, wood screws, tapping screws, slotted head cap screws and slotted headless set screws and machine screw nuts. The standards shall comprise complete product standards covering all dimensions and tolerances required for the specification and production of the products. Details shall include boundary dimensions; such as nut width and thickness; screw head dimensions; slot and recess dimensions; body dimensions; thread classification or thread detail, as required; thread length; point design; chamfers; underhead fillets; and supporting general specifications covering the quality, finish, and the acceptable tolerances and limits as well as any information that may be necessary to insure satisfactory application of the products.

Several meetings of the Subcommittee over the ensuing 3 years resulted in the development and acceptance of a proposed revision containing complete product standards coverage for slotted and recessed head machine, tapping and wood screws; slotted head and hexagon head cap screws; and slotted headless set screws. Following approval by the B18 Committee and sponsor organizations, this proposal was forwarded to the American Standards Association and declared an American Standard, ASA B18.6 on April 12, 1947.

Recognizing the need for further refinements, Subcommittee 3¹ at a meeting held on February 1, 1951, established three standing working subgroups: one to develop details pertinent to tapping screw threads; a second to review, revise, and develop head dimensions and tolerances; and a third to correlate and edit the technical information emanating from the other two groups. Also at this meeting, numerous suggested changes were reviewed and assigned to the respective subgroups for further development. Additional meetings of the Subcommittee were held on October 9, 1952, October 29, 1953, and April 1 and 2, 1954. Between each of these meetings the subgroups held numerous working sessions and carried on technical development in cooperation with the technical committees of the U.S. Machine Screw and Tapping Screw Service Bureaus.

¹ As of April 1, 1966, Subcommittee 3 was redesignated Subcommittee 6.

At the April 1954 meeting, Subcommittee 3,¹ contemplating a partial revision of the ASA B18.6 document, recommended the publication of standards for wood screws, cap and set screws, machine screws, and tapping and drive screws in four separate documents each of which would consist of a complete product specification. This approach was confirmed by the B18 Committee with the further stipulation that the coverage for hexagon head cap screws, square head set screws and machine screw nuts from the ASA B18.2 standard be transferred to the documents covering cap and set screws and machine screws, respectively. It was understood that jurisdiction over the square head set screws and hexagon head cap screws would remain with Subcommittee 2 and that Subcommittee 3¹ would retain responsibility for machine screw nuts. Following this confirmation and additional direction, the preparation of proposals for the new documents was undertaken.

The proposed standard covering slotted and recessed head tapping screws and metallic drive screws was approved by Subcommittee 3¹ and after being circulated to industry for comment, it was revised, and subsequently approved by letter ballot of Sectional Committee B18. The standard was approved by the sponsor organizations and the American Standards Association and formally designated an American Standard on June 4, 1958.

Following issuance of the 1958 standard, Subcommittee 3¹ and the three subgroups continued to work on revision and refinement of the specifications for tapping screws. Numerous meetings held over several years culminated in a draft proposal incorporating revisions consisting mainly of the following: Inclusion of coverage for Type AB tapping screws, 100 deg flat head for some screw types, across corners gaging of hex heads, dimensions of large hex heads for sems, and factors for determining grip lengths on pointed screws; refinement of thread lengths, materials, performance requirements and editorial format; and de-emphasis of round heads and Type A tapping screws. This draft was accepted in principle by Subcommittee 3¹ at a meeting held on September 29 and 30, 1964, with further recommendations to include coverage for the Type 1A cross recess and wobble gaging of recessed heads, and to delete the coverage for Type BG tapping screws. A second draft incorporating these recommendations was approved by Subcommittee 3¹ at a meeting held on June 22 and 23, 1965. Subsequent to its approval by letter ballot of the Sectional Committee and the sponsor organizations, the revision was submitted to the USA Standards Institute (the reconstituted American Standards Association as of August 1966) and was designated a USA Standard on December 2, 1966.

Following publication of the 1966 document, Subcommittee 6 and the subgroups thereof continued to pursue the study and development of further simplifications and refinements to the standard for tapping screws. Numerous meetings held over the ensuing years resulted in committee acceptance of a proposed revision encompassing a more definitive title; significant changes to the specifications for points; more realistic minimum practical screw lengths; changes and clarifications to thread length specifications; extension of size coverages where applicable for consistency; corrections to recess dimensional data; addition of an appendix covering wrench openings for hex head screws; relegation of the coverage for the Type C point and the truss, 100 deg flat countersunk, slotted hex and slotted hex washer head styles to the appendices; and numerous editorial corrections and format changes. This revision was duly accepted by letter ballot of Subcommittee 6. Following its approval by letter ballot of the B18 Committee and the sponsor organizations the revision was submitted to the American National Standards Institute for recognition as an American National Standard. This was granted on June 18, 1981.

In 1995 Subcommittee 6 initiated work to revise the point diameters, head diameters for flat head screws, length measurement method for oval head screws, and method of measuring thread distance from the underside of the head. Additions proposed included adding protrusion height inspection for oval head screws, ductility testing, hydrogen embrittlement testing,

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