ASME B94.2-1995

(REVISION OF ANSI B94.2-1983)

REAFFIRMED 2020

REAMERS

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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The American Society of
Mechanical Engineers

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This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

FOREWORD

This Standard for reamers was formulated by Technical Committee 20 of the B5 Sectional Committee on the Standardization of Small Tools and Machine Tool Elements. The organization of Technical Committee 20 on the Standardization of Reamers in March 1937 was prompted by a recognized need for unifying the practice in this field.

The proposal submitted by the committee was approved by ASA and designated ASA B5.14-1941. The Standard ASA B5.14-1941 was revised and approved in 1949, and subsequently reaffirmed in 1954. A sufficient number of requests for revision resulted in reactivation of the committee in 1957. The revision was approved by the sectional committee and the sponsors, and the required ASA approval and designation were granted April 9, 1959.

In November 1961, the ASA Mechanical Standards Board approved the request of the B5 Sectional Committee sponsors that a separate project be initiated under ASA Procedure on the subject of Cutting Tools. As a result of this action, a new project was initiated on Cutting Tools, and ASME accepted sponsorship. The committee was designated B94 Cutting Tools, and the activity on cutting tools was removed from the B5 Sectional Committee. The designation numbers of the technical committees were changed to conform with the new sectional committee organization. B5 Technical Committee 20 was changed to B94 Technical Committee 9.

Requests for revision to B5.14-1959 to cover additions, deletions, and clarification of the Standard necessitated reactivation of the committee. The revised draft was prepared and distributed to the members for review and comment. A meeting of TC-9 was held in November 1962, and the draft was subsequently approved by the committee.

The revised Standard was submitted to Sectional Committee B94 on May 27, 1964. Following approval by the Sectional Committee and the sponsor, the Standard was approved by ASA on December 21, 1964 and designated as ASA B94.2-1964.

In 1970, Technical Committee 9 revised the 1964 issue of B94.2, incorporating revisions and additions reflecting current industry practice. The revision was presented to American National Standards Committee B94 and to the B94 secretariat for approval. Thereafter, the revision was approved by ANSI on September 28, 1971.

In accordance with ANSI procedures, a further revision was undertaken in 1976 in order to update the Standard. This revision was approved by ANSI on May 4, 1977.

Since then, ANSI also approved a 1983 revision, on September 30 of that year, as well as the present one, on April 14, 1995.

ASME STANDARDS COMMITTEE B94
Standardization of Cutting Tools, Holders, Drivers, and Bushings

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

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Appendix

REAMERS

1 SCOPE

This Standard covers the American National Standard for Reamers — nomenclature, definitions, types, sizes, and tolerances.

2 NOMENCLATURE AND DEFINITIONS

reamer — a rotary cutting tool with one or more cutting elements used for enlarging to size and contour a previously formed hole. Its principal support during the cutting action is obtained from the workpiece. (See Fig. 1.)

actual size — the actual measured diameter of a reamer, usually slightly larger than the nominal size to allow for wear

angle of taper — the included angle of taper on a taper tool or taper shank

arbor hole — the central mounting hole in a shell reamer

axis — the imaginary straight line which forms the longitudinal centerline of a reamer, usually established by rotating the reamer between centers

back taper — a slight decrease in diameter, from front to back, in the flute length of reamers

bevel — an unrelieved angular surface of revolution (not to be confused with chamfer)

body — the fluted full diameter portion of a reamer, inclusive of the chamfer, starting taper, and bevel

chamfer — the angular cutting portion at the entering end of a reamer [see also *secondary (chamfer)*]

chamfer angle — the angle between the axis and the cutting edge of the chamfer measured in an axial plane at the cutting edge

chamfer length — the length of the chamfer measured parallel to the axis at the cutting edge

chamfer relief angle — see under *relief*

chamfer relief — see under *relief*

chip breakers — notches or grooves in the cutting edges of some taper reamers designed to break the continuity of the chips

circular land — see preferred term *margin*

clearance — the space created by the relief behind the cutting edge or margin of a reamer

core — the central portion of a reamer below the flutes which joins the lands

core diameter — the diameter at a given point along the axis of the largest circle which does not project into the flutes

cutter sweep — the section removed by the milling cutter or grinding wheel in entering or leaving a flute

cutting edge — the leading edge of the relieved land in the direction of rotation for cutting

cutting face — the leading side of the relieved land in the direction of rotation for cutting on which the chip impinges

external center — the pointed end of a reamer. The included angle varies with manufacturing practice.

flutes — longitudinal channels formed in the body of the reamer to provide cutting edges, permit passage of chips, and allow cutting fluid to reach the cutting edges

angular flute — a flute which forms a cutting face lying in a plane intersecting the reamer axis at an angle. It is unlike a helical flute in that it forms a cutting face which lies in a single plane.

helical flute — (sometimes called spiral flute) a flute which is formed in a helical path around the axis of a reamer

spiral flute (1) on a taper reamer, a flute of constant lead; or,
(2) in reference to a straight reamer, see preferred term *helical flute.*

straight flute — a flute which forms a cutting edge lying in an axial plane

flute length — the length of the flutes not including the cutter sweep

guide — a cylindrical portion following the flutes of a reamer to maintain alignment

heel — the trailing edge of the land in the direction of rotation for cutting