AMERICAN STANDARD

Microscope Objective Thread

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ERRATA

ANSI B1.11 – 1958 (R1972)
MICROSCOPE OBJECTIVE THREAD (JULY 1972)

Page 5, Section 7 should read, American National Standard ANSI B1.7-1965 (R1972)

Page 6, Section 14 should read, Angle Deviation.

Foreword

The standardization of the microscope objective thread is one of the projects toward unification of screw thread standards among inch-using countries. In Great Britain, the Royal Microscopical Society had established standards for microscope objectives in 1858, based on the Whitworth screw thread system, which were subsequently used throughout the world. The history of this standard is in the *Transactions* of the Society: 1858, p. 39; 1859, p. 92; 1896, pp. 389, 487; 1911, p. 175; 1915, p. 230; 1924, p. 266; and 1936, p. 377.

In practice, American manufacturers of this thread have always employed modifications of the Whitworth form because of their preference for flat crests, such modified threads being completely interchangeable with the RMS threads. At the Conference on Unification of Engineering Standards held in Ottawa, 1945, the American Delegation presented ASA Paper B1/57 and A.O. Drawing ED-95 giving limits of size for a truncated Whitworth thread. Since a thread form with rounded crest is preferred in Great Britain for optical instruments, it was recommended that the title of this document be amended to read, "Proposed Permitted Truncation and Tolerances for RMS Thread."

On the basis of this proposal a draft of a proposed American Standard, dated April, 1948, was circulated to the B1 Sectional Committee membership for comment. In conformity with comments received, a revised draft, dated October, 1954, was approved by Subcommittee No. 4 on Instrument Screw Threads and subsequently submitted to the Sectional Committee for approval. Final approval as an American Standard was given on January 7, 1958, by ASA.

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American Standard

MICROSCOPE OBJECTIVE THREAD

GENERAL AND HISTORICAL

1 This standard covers the screw thread used for mounting the objective assembly to the body or lens turret of microscopes. It is based on, and intended to be interchangeable with, the screw thread introduced and adopted many years ago by the Royal Microscopical Society of Great Britain, generally known as the "RMS thread" and now almost universally accepted as the basic standard for microscope objective mountings. Formal recognition, however, has been extremely limited.

2 Because of its British origin, the basic thread possesses the British Standard Whitworth form, having an included angle of 55° and rounded crests and roots. This same full Whitworth form is also employed as the design, or maximum material, form by the British. The present (American) standard, however, the design thread form established in ASA B1.6-1944, American War Standard for Truncated Whitworth Threads, has been adopted.

3 The pitch diameter allowance and tolerances promulgated in June, 1924, for the RMS thread were subsequently applied by most American manufacturers to their truncated versions and found to be acceptable. Uniformity of practice with regard to the allowances and tolerances for the other diameters never materialized.

4 Experience has established that the principal attributes of a good fit for microscope objective threads are:

(**a**) Adequate clearance to afford protection against binding due to the presence of foreign particles or minor thread crest damage.

(**b**) Sufficient depth of thread engagement to assure security in the short lengths of engagement commonly encountered.

(**c**) Allowances for limited eccentricities so that centralization and squareness of the objective are not influenced by such errors in manufacture.

5 The need for the above characteristics stems principally from the inherent longevity of optical equipment and the repeated use to which objective threads are subjected. The measures necessary to provide these properties precluded adoption of the allowances and tolerances recommended for threads of this pitch in the American War Standard for Truncated Whitworth Threads, ASA B1.6-1944 (withdrawn, 1951). The more significant departures from that standard are:

(**a**) A larger allowance on the pitch diameter of the external thread.

(**b**) Smaller tolerances on the major diameter of the external thread and the minor diameter of the internal thread.

(**c**) The provision of allowances on the major and minor diameters of the external thread.

The values established and further details regarding them are given under Specifications.

6 Though utilized principally for microscope objective mountings, this screw thread is recommended also for other optical assemblies of microscopes and associated apparatus, such as photomicrographic equipment.

TERMINOLOGY

7 The nomenclature, definitions, and letter symbols used in this standard are in conformance with American Standard ASA B1.7-1949, Nomenclature, Definitions, and Letter Symbols for Screw Threads.

SPECIFICATIONS

8 Basic Form of Thread. The basic form of the thread for this standard is the British Standard Whitworth form. Basic dimensions are given in Table 1.

9 Design Form of Thread. The design, or maximum material, forms of both the external and internal threads conform to the American War Standard for Truncated Whitworth Threads, ASA B1.6-1944 (withdrawn, 1951). The design dimensions are given in Table 1.