AMERICAN NATIONAL STANDARD

Dryseal Pipe Threads

(Inch)

ANSI B1.20.3 - 1976

(REVISION AND REDESIGNATION OF B2.2-1968)

REAFFIRMED 2018

SECRETARIAT

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THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

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AREA THDS

FOREWORD

In 1913 a Committee on the Standardization of Pipe Threads was organized for the purpose of re-editing and expanding the Briggs Standard. The American Gas Association and The American Society of Mechanical Engineers served as joint sponsors. After six years of work, this committee completed the revised standard for taper pipe thread which was published in the ASME "Transactions" of 1919, and was approved as an American Standard by the then American Engineering Standards Committee (later changed to American Standards Association) in December, 1919. It was the first standard to receive this designation under the ASA procedure, and was later republished in pamphlet form.

In the years which followed, the need for a further revision of this American Standard became evident as well as the necessity of adding to it the recent developments in pipe threading practice. Accordingly, the Sectional Committee on the Standardization of Pipe Threads, B2, was organized in 1927 under the joint sponsorship of the A.G.A. and the ASME.

During the following 15 years, several meetings were held leading to approval by the members of the Sectional Committee, of the April 1941 draft. The revision was approved by the sponsors and ASA and published as an American Standard in October 1942.

Shortly after publication of the 1942 standard, the Committee undertook preparation of a complete revision. The text and tables were re-arranged and expanded to include Dryseal pipe threads, and an extensive appendix was added to provide additional data on the application of pipe threads and to record in abbreviated form the several special methods which were established for gaging some of the various applications of pipe threads.

The resulting proposal was designated an American Standard on December 11, 1945. The section covering Dryseal Pipe Threads in ASA B2.1-1945 was deleted and developed as a separate standard designated ASA B2.2-1960, Dryseal Pipe Threads. Another updating occurred with republication as USAS B2.2-1968.

In 1973, Standards Committee B2 was absorbed by American National Standards Institute Standard Committee B1 and reorganized as subcommittee 20. A complete rewrite of the B2.2-1968 document was undertaken with the product thread data in separate documents from the gaging standards for Dryseal Pipe threads. The system of renumbering, to include metric revisions, is as follows:

ANSI B1.20.3-1976	Inch Dryseal Pipe Threads
ANSI B1.20.4-1976	Metric Dryseal Pipe Threads
ANSI B1.20.5-197	Gaging for Inch Dryseal Pipe Threads
ANSI B1.20.6-197	Gaging for Metric Dryseal Pipe Threads

Since the product thread documents are being published before completion of the new gaging standards, the gaging data in the B2.2-1968 Standard should be used until superseded by publication of the new B1.20.5 and B1.20.6 gaging standards.

ANSI B1.20.3 and B1.20.4 were approved by ANSI Committee B1 for publication as official ANSI Standards and thereupon submitted to the Secretariat and the American National Standards Institute. They were approved and formally designated as American National Standards on November 18, 1976.

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Standardization and Unification of Screw Threads

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

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SCOPE: Nomenclature of screw threads; form of threads; diameter and pitches of screws for various uses; classification of thread fits, tolerances and allowances for threaded parts; and the gaging of threads. Screw threads for fire hose couplings are not included within the scope.

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AMERICAN NATIONAL STANDARD

INCH DRYSEAL PIPE THREADS

SECTION I
PRODUCT THREADS

1.1 Introduction

Dryseal pipe threads are based on the USA (American) pipe thread, however, they differ from the USA (American) pipe thread in that they are designed to seal pressuretight joints without the necessity of using sealing compounds. To accomplish this some modification of thread form and greater accuracy in manufacture is required. The roots of both the external and internal threads are truncated slightly more than the crests, i.e. roots have wider flats than crests, so that metal-to-metal contact occurs at the crests and roots coincident with or prior to flank contact, see Figure 1. Thus as the threads are assembled by wrenching, the roots of the threads crush the sharper crests of the mating threads. This sealing action at both the major and minor diameters tends to prevent spiral leakage and makes the joints pressuretight without the necessity of using sealing compounds, provided that the mating threads are in accordance with standard specifications and tolerances and are not damaged by galling in assembly. The control of crest and root truncation is simplified by the use of properly designed threading tools. Also, it is desirable that both external and internal threads have full thread height for the L_1 length. However, where not functionally objectionable, the use of a compatible lubricant or sealant may be used to minimize the possibility of galling. This is desirable in assembling Dryseal pipe threads in refrigeration and other systems to effect a pressuretight seal.[1]

1.1.1 In order to obtain a pressure tight seal using Dryseal pipe threads without a sealer, it is necessary to hold crest and root truncation of both internal and external threads within the limits specified. Unless this is done by use of threading tools with the crest and root truncation controlled so as to assure reproduction on the product threads, it is necessary to use a system of measuring or a system of gaging and measuring to determine conformance.

1.1.2 Even without truncation gages, the standard practice of using two separate thread gages for Dryseal pipe threads, each with a difference in truncation, length of engagement and point of engagement, provides a more detailed check of angle, lead and taper deviations than is required for non-dryseal taper pipe threads.

1.1.3 One method of checking crest truncation is by using 6 step plain gages. It should be recognized that this method may give misleading results in that the crest truncation of the product threads is always less (flat narrower) than that indicated by the position of the gages, the degree of inconsistency depending on the angle, lead and taper deviations present in the product thread.

1.1.4 Another method employs both crest and root truncation check gages. The root check gage is made with a thread form having an included angle of 50 degrees and with a smaller gage crest flat than the root flat to be checked. The major diameter of this gage is controlled in relation to 6 gaging steps in a similar manner to the plain 6 step crest check gage. Like the crest check gage, the results may be somewhat misleading except that in the case of the root check gage, the root truncation of the product thread is always more (flat wider) than is indicated by the position of the gages.

1.1.5 Unless lead, angle and taper of product threads are very well controlled, use of 6 step crest and root check gages will result in product threads with narrower crest flats and wider root flats than envisioned by the dryseal tolerances. Use of such a gaging system could result in rejection of threads which would actually conform to the dryseal tolerances specified. The only completely reliable referee method for determining whether crest and root truncation has been

[1] The refrigeration industry has generally accepted the use of a sealant to obtain an absolute pressuretight joint, when assembling taper pipe threads.