



Standard Specification for Modified Stub ACME Thread Joint with Elastomeric Seal in Plastic Piping Components¹

This standard is issued under the fixed designation F2768; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers a Modified Stub ACME Thread Joint with an Elastomeric Seal used to seal the joint components in plastic piping components, or (if applicable) to components made of other non-plastic materials used for plastic piping components used in turf irrigation systems.

1.2 This specification establishes requirements for dimensions and gauging of Modified Stub ACME Thread and Elastomeric seal.

1.3 Tapered pipe threads are not covered in this specification.

NOTE 1—The terms “bottom out ” and “back off” are used to imply complete engagement of the threaded connection and un-threading of the connection and do not imply using a pipe wrench or other tools which would damage plastic pipe and fittings.

1.4 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D1600 Terminology for Abbreviated Terms Relating to Plastics](#)

[F412 Terminology Relating to Plastic Piping Systems](#)

[F477 Specification for Elastomeric Seals \(Gaskets\) for Joining Plastic Pipe](#)

[F1970 Specification for Special Engineered Fittings, Appurtenances or Valves for use in Poly \(Vinyl Chloride\) \(PVC\)](#)

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems

3. Terminology

3.1 Terminology is in accordance with Terminology [F412](#) and abbreviations are in accordance with Terminology [D1600](#), unless otherwise indicated.

4. Significance and Use

4.1 Connections made in accordance with these specifications consist of a Modified Stub ACME external and a Modified Stub ACME internal thread, in addition to an elastomeric seal. The threaded connections are intended to provide limited radial movement of the internal and external threaded components while maintaining a pressure tight and leak-tight connection. Sealing is affected by the elastomeric seal and not between the threaded parts in final assembly.

5. Classification

5.1 *Thread Form*—The form of thread profile specified in this specification shall be known as the Modified Stub ACME Thread Form. The relations as specified herein, for form of thread and general notations are shown in [Table 1](#) and [Table 2](#).

5.2 *Thread Designations*—The type of pipe threads included in this specification are designated by specifying in sequence the nominal pipe size, number of threads per inch, and the thread series symbols as follows: 1½-10 Modified Stub ACME which indicates a 1½ Iron Pipe Size, 10 threads per inch, right hand, single thread. For left-hand threads add LH to the designation, otherwise right-hand threads will be understood. For example: 1¼-10 Modified Stub ACME –LH.

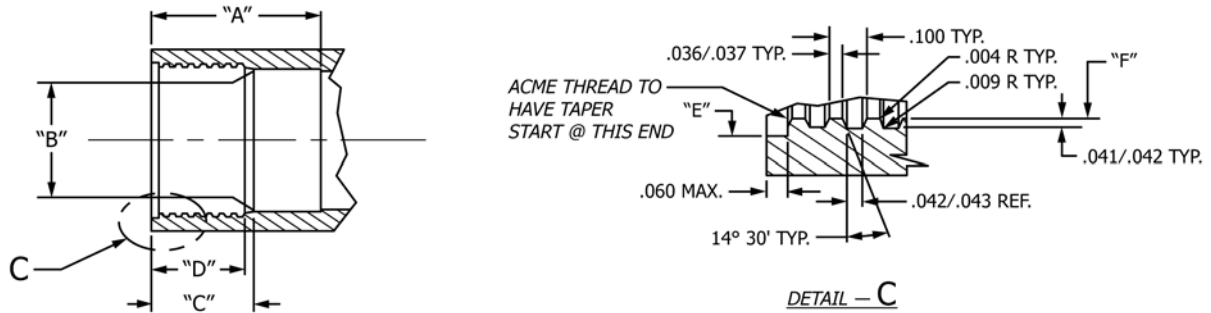
6. Dimensions and Tolerances

6.1 *Female Threads:*

6.2 *Thread Starts—Machined*—Feathered starts are produced by a 45° chamfer on the first thread when the thread is cut with a tap or die. The depth of chamfer shall be from ¾ to 1¼ thread deep. Feathered starts are prone to crossing and mutilation and shall not be molded.

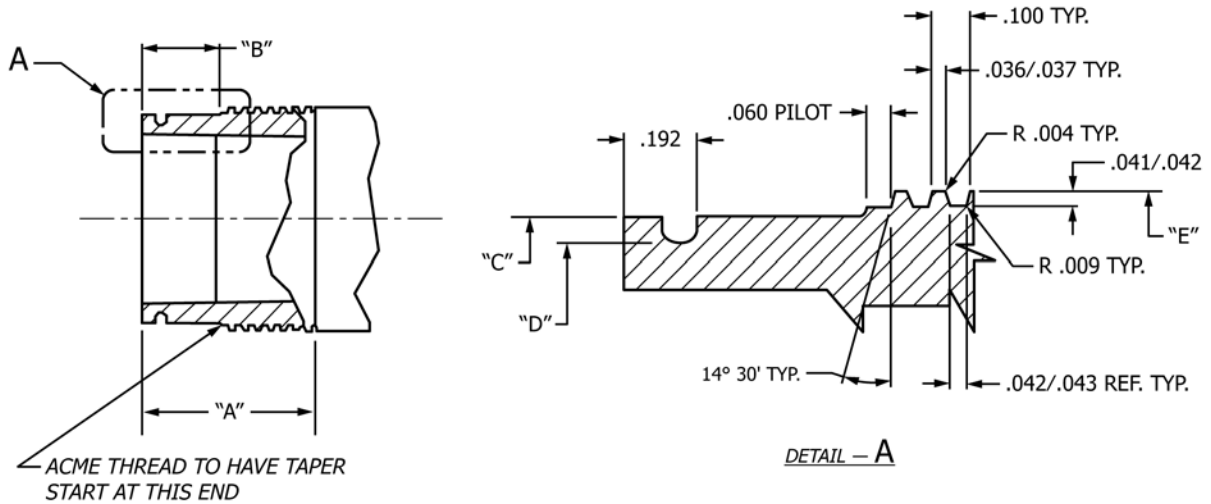
6.3 *Thread Starts—Molded*—Internal and external molded threads shall begin with a taper or blunt start. A pilot shall be provided from the face of the fitting and at the entering end of

TABLE 1 Female Threads



Nominal Pipe Size	A Bottom		B Bore		C Entrance		D Thread Length		E Pilot Diameter		F Minor thread diameter	
	minimum	diameter	diameter	tolerance	maximum	length	length	tolerance	maximum	diameter	diameter	tolerance
1	1.15	1.197	1.197	± 0.009	0.715	0.590	0.590	± 0.010	1.385	1.252	1.252	± 0.008
1¼	1.29	1.633	1.633	± 0.008	0.820	0.670	0.670	± 0.010	1.820	1.692	1.692	± 0.008
1½	1.38	1.768	1.768	± 0.008	0.870	0.790	0.790	± 0.010	1.940	1.808	1.808	± 0.010

TABLE 2 Male Threads



Nominal Pipe Size	A Length		B Tube		C Tube		D ^A Groove Bottom		E Major thread diameter	
	length	tolerance	length	tolerance	diameter	tolerance	Diameter	tolerance	diameter	tolerance
1	1.207	± 0.013	0.613	± 0.033	1.180	± 0.005	0.985	± 0.003	1.318	± 0.006
1¼	1.263	± 0.023	0.620	± 0.035	1.613	± 0.007	1.470	± 0.005	1.753	± 0.007
1½	1.340	± 0.040	0.590	± 0.040	1.748	± 0.008	1.605	± 0.005	1.869	± 0.007

^A Dimension is for reference only. Dimension may vary to accommodate differing O-ring sizes. The dimension should result in O-ring compression of 15-25% when installed into a mating female component.

the external threads; it shall have a length to the start (flank) of the first thread, equal to ½ to ¾ the width of the thread pitch, 1 to 1¼ thread pitch to the centerline. (Thread pitch equals one turn.) The pilot shall be included in the measurement of the thread length. Taper starts on the first thread are formed by the thread rising from the minimum to maximum diameter while maintaining the ACME thread profile. The length of rise shall not exceed ⅛ turn (45°).

6.4 Blunt starts on the first thread are formed by the thread rising from the minimum to maximum diameter while maintaining the ACME thread profile. The length of rise shall not be greater than twice the thread height. The blunt start is the preferred thread start.

6.5 *Plastic Threads—General*—The minimum wall thickness for the threaded portion of a plastic pipe or fitting depends upon the material and the application. If the wall thickness is not specified in a pipe or fitting standard, the manufacturer must determine the appropriate wall thickness

6.6 *ACME Threads and Elastomeric Seal Joints*—Connections made in accordance with these specifications consist of a Modified Stub ACME external and a Modified Stub ACME internal thread, in addition to an elastomeric seal. The threaded connection is intended to provide limited radial movement of the internal and external threaded components while maintaining a leak-tight connection. Sealing is affected by the elastomeric seal and not between the threaded parts in final assembly.

6.6.1 *Form of Thread:*

6.6.1.1 The basic dimensions of Modified Stub ACME threads are given in Detail A and Detail C.

6.6.1.2 *Diameter of Thread*—The basic pitch diameter of the threads is determined by the outside diameter of pipe.

6.6.1.3 *Thread*—The length of the male thread (A-B) is shown in Table 2. The female thread length (D) is shown in Table 1.

6.6.1.4 *Basic Dimensions*—The basic dimensions of the Modified Stub ACME threads, derived from the above specifications, are given in Table 1, and Table 2. All dimensions are given in inches unless otherwise specified.

6.7 *Tolerances:*

6.7.1 *Tolerances on Thread Elements*—The permissible deviations in thread elements are given in the appropriate tables.

7. Performance Requirements

7.1 Sample conditioning, and test methods shall be per Sections 7, and 8 of Specification F1970.

7.2 *Sealing*—It is intended that the Modified Stub ACME threads conforming to this specification do not provide a leak-tight pressure joint. The elastomeric seal is incorporated to retain pressure and prevent leakage. The seal can be made using either an EPDM or Buna, 60-70 Shore A, standard 0.103-in. (1xx series) or 0.139-inch (2xx series) cross sectional diameter o-ring. The installed cross section of the o-ring must be under 15-25% compression.

7.2.1 *Negative pressure sealing*—The design of the gland (Table 1) must provide for sealing a negative internal pressure of 10 ft-head of water.

NOTE 2—The use of thread sealant paste or tape is not to be used in this type of joint

7.3 *Joint Tightness—Installation Makeup*—Modified Stub ACME threads are used at elastomeric seal connections. Proper assembly of this joint requires it to be completely engaged, or bottomed out, then unthreaded, backed-off, at least one full turn.

7.4 *Inspection*—A gauging method of tolerances is prescribed in this specification to effect a functional inspection of the full engagement of threads. However, conformance to this specification requires that all basic design dimensions be met (within applicable tolerances) to provide for leak-tight connection. Therefore, additional methods of gauging may be employed to evaluate conformance to the basic design dimensions. When additional methods of gauging are employed, they shall be agreed upon between the supplier and the purchaser. Because it is known that injection molded threads that are removed from the mold before they are completely cooled will distort in form so that they will not gage properly, threads suspected of being so distorted should be inspected with an optical comparator to determine their true quality.

7.5 Pressure ratings are to be set by the manufacturer. Specification F1970 will be used to validate the pressure rating. It is permissible to use metal mating parts as test fixtures if a manufacturer only produces an external or internal threaded fitting.

8. Elastomeric Materials and Manufacture

8.1 The elastomeric seals for these joints will require no internal or external pressure to affect the initial seal, shall comply with the requirements of Specification F477, Table 1 for thermoset, Table 2 for thermoplastic. The diameter of the O-ring and the diameter of the gland shall be designed to give the O-ring a squeeze of between 15 and 25 percent. It is recommended that an O-ring lubricant be used. Silicone based lubricants have been found to be effective. Care should be taken in the selection of O-ring material and lubricants to ensure they are compatible with the resin system(s) being joined.

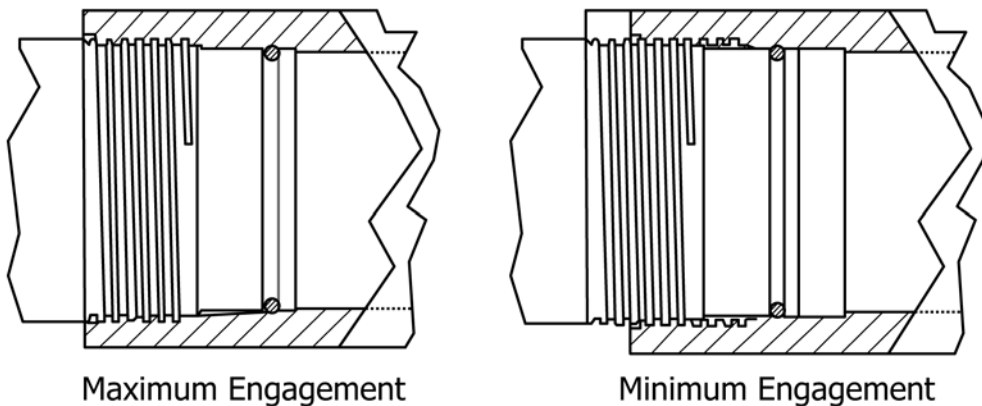


FIG. 1 Joint Assembly

9. Workmanship, Finish, and Appearance

9.1 The requirements of this section are verified by visual (non-magnified) inspection of the components and surfaces.

9.2 All surfaces of the fitting or assembly against which a seal may rest shall be free of imperfections that could adversely affect the performance of the fitting or assembly.

9.3 The surfaces of all thermoplastic and metallic components shall be free from defects which will adversely affect the performance and service of the fitting or assembly.

9.4 The thermoplastic materials, after molding or fabrication, shall be as uniform as commercially practical in color and opacity.

10. Keywords

10.1 fitting threads; pipe threads; plastic pipe threads; taper pipe threads; threads

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