



Standard Specification for Closed Rib Steel Pipe with Diameter of 36 in. [900 mm] or Less, Polymer Precoated for Sewers and Drains¹

This standard is issued under the fixed designation A 1019/A 1019M; 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 approval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers polymer precoated, closed rib steel pipe, intended for use for storm water drainage, under-drains, the construction of culverts, and similar uses. Pipe covered by this specification is not normally used for the conveyance of sanitary or industrial wastes. The steel sheet used in fabrication of the pipe has a polymer protective coating over a metallic coating of zinc.

1.2 The polymer precoating provides extra protection of the base metal against corrosion or abrasion, or both, in addition to that provided by the metallic coating. Severe environments are likely to cause corrosion problems to accessory items such as coupling band hardware that does not have a polymer coating unless supplemental protection is provided. Additional protection for polymer precoated steel pipe is available by use of coatings applied after fabrication of the pipe as described in Specification A 849.

1.3 This specification does not include requirements for bedding, backfill, or the relationship between earth cover load and sheet thickness of the pipe. Experience with drainage products has shown that successful performance depends upon the proper selection of rib depth, sheet thickness, type of bedding and backfill, controlled manufacture in the plant, and care in installation. The installation procedure is described in Practice A 798/A 798M.

1.4 This specification is applicable to orders in either inch-pound units as A 1019, or in SI units as A 1019M. Inch-pound units and SI units are not necessarily equivalent. SI units are shown in brackets in the text for clarity, but they are the applicable values when the material is ordered to A 1019M.

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

- A 90/A 90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
- A 153/A 153M Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- A 307 Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
- A 563 Specification for Carbon and Alloy Steel Nuts
- A 563M Specification for Carbon and Alloy Steel Nuts [Metric]
- A 653/A 653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- A 742/A 742M Specification for Steel Sheet, Metallic Coated and Polymer Precoated for Corrugated Steel Pipe
- A 780 Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
- A 796/A 796M Practice for Structural Design of Corrugated Steel Pipe, Pipe-Arches, and Arches for Storm and Sanitary Sewers and Other Buried Applications
- A 798/A 798M Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications
- A 849 Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
- A 902 Terminology Relating to Metallic Coated Steel Products
- A 924/A 924M Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
- B 633 Specification for Electrodeposited Coatings of Zinc on Iron and Steel
- B 695 Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
- C 443 Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- D 1005 Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

¹ This specification is under the jurisdiction of ASTM Committee A05 on Metallic-Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.17 on Corrugated Steel Pipe Specifications.

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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.

- D 1056** Specification for Flexible Cellular Materials—Sponge or Expanded Rubber¹
- E 29** Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- F 568M** Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners
- 2.2 *AASHTO Standard:*
- T 249M** Test for Helical Lock Seam Corrugated Pipe³

3. Terminology

- 3.1 *General Definitions*—For definitions of general terms used in this standard, refer to Terminology **A 902**.
- 3.2 *Definitions of Terms Specific to This Standard:*
 - 3.2.1 *fabricator*—the producer of the pipe.
 - 3.2.2 *manufacturer*—the producer of the sheet.
 - 3.2.3 *purchaser*—the purchaser of the finished product.

4. Classification

- 4.1 The closed rib steel pipe covered by this specification is of the following type:
 - 4.1.1 *Type ICR*—This pipe shall have a full circular cross section with a single thickness of smooth sheet, fabricated with closed helical ribs projecting outwardly.

5. Ordering Information

- 5.1 Orders for material to this specification shall include the following information as necessary, to adequately describe the desired product.
 - 5.1.1 Name of material (polymer-coated closed rib steel pipe),
 - 5.1.2 ASTM designation and year of issue, as A 1019 - XX for inch-pound units or as A 1019M - XX for SI units,
 - 5.1.3 Diameter of circular pipe (**Table 1**),

TABLE 1 Pipe Sizes

Nominal Inside Diameter		Closed Rib Profile Sizes ^A		
in.	mm	¼ by 5-7/16 [6 by 138 mm]	⅜ by 5-7/16 [9.5 by 138 mm]	½ by 5-7/16 [13 by 138 mm]
6	150	x		
8	200	x		
10	250	x		
12	300	x	x	
15	375		x	
18	450		x	
21	500		x	
24	600			x
27	675			x
30	750			x
33	825			x
36	900			x

^A An “x” indicates standard closed rib profile sizes for each nominal diameter of pipe.

- 5.1.4 Length, either total length or length of each piece and number of pieces,
- 5.1.5 Description of wall profile (**7.2**),
- 5.1.6 Sheet thickness (**8.2**),

³ Available from American Association of State Highway and Transportation Officials, 444 N. Capital, Washington, DC 20001.

- 5.1.7 Coupling bands, number, and type (**9.1**) if special type is required,
- 5.1.8 Gaskets for coupling bands, if required (**9.2.5**),
- 5.1.9 Certification, if required (**14.1**), and
- 5.1.10 Special requirements.

6. Materials and Manufacture

- 6.1 *Steel Sheet for Pipe*—All pipe fabricated under this specification shall be formed from polymer pre-coated sheet conforming to **Annex A1** of this specification.
 - 6.1.1 The polymer coating shall be applied to steel sheet having a metallic coating of zinc.
 - 6.2 *Steel Sheet for Coupling Bands*—The sheet used in fabricating coupling bands shall be the same as that specified for fabrication of the pipe furnished under the order, with the same polymer coating and same metallic coating.
 - 6.3 *Hardware for Coupling Bands*—Bolts and nuts for coupling bands shall conform to the following requirements:

	Bolts		Nuts
For A 1019 pipe	A 307		A 563 , Grade A
[For A 1019M pipe]	[F 568, Class 4.6]		[A 563M, Class 5]

- 6.3.1 Bolts, nuts, and other threaded items used with coupling bands shall be zinc coated by one of the following processes: hot-dip process as provided in Specification A 153; electroplating process as provided in Specification **B 633**, Class Fe/Zn 8; or mechanical process as provided in Specification **B 695**, Class 8. Other hardware items used with coupling bands shall be zinc coated by one of the following processes: hot-dip process as provided in Specification A 153; electroplating process as provided in Specification **B 633**, Class Fe/Zn 25; or mechanical process as provided in Specification **B 695**, Class 25.
- 6.4 *Gaskets*—If gaskets are used in couplings, they shall be a band of expanded rubber that meets the requirements of Specification **D 1056** for the “RE” closed cell grades, O-rings meeting the requirements of Specification **C 443**, or other material approved by the purchaser.

7. Fabrication

- 7.1 *General Requirements*—Pipe shall be fabricated in full circular cross section.
 - 7.1.1 The pipe shall be fabricated with essentially closed helical ribs projecting outward, with a continuous lock seam extending from end to end of each length of pipe.
 - 7.2 *Wall Profile*—The dimensions and spacing of the ribs shall be in accordance with **Table 2** for the nominal size indicated on the order. The ribs shall be spaced such that, after every third rib, a wider spacing is provided to accommodate the lock seam.
 - 7.2.1 The maximum spacing of the lock seam, measured perpendicular to the lock seam, shall be 5-¾ in. [146 mm].

NOTE 1—The nominal dimensions and properties for pipe wall profiles are given in Practice **A 796/A 796M**.

- 7.3 *Helical Lock Seams*—The lock seam shall be formed in the flat zone of the pipe wall midway between each pair of ribs having the wider spacing described in **7.2**.

- 7.3.1 The edges of the sheets within the cross section of the lock seam shall lap at least ⅝ in. [4.0 mm] with an occasional