
Standard Specification for Asphalt-Coated Corrugated Metal Culvert Pipe and Pipe-Arches

AASHTO Designation: M 190-22

Technically Revised: 2022

Technical Subcommittee: 4b, Flexible and Metallic Pipe



**American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, DC 20004**

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1. SCOPE

- 1.1. This specification covers asphalt-coated corrugated metal pipe and pipe-arches intended to be used for the construction of metal culverts of the following types.
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2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards:*

- M 36, Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
- M 196, Corrugated Aluminum Pipe for Sewers and Drains
- M 339M/M 339, Thermometers Used in the Testing of Construction Materials
- T 44, Solubility of Bituminous Materials
- T 49, Penetration of Bituminous Materials

2.2. *ASTM Standards:*

- A849, Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
- C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- D6/D6M, Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds
- D1005, Standard Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements
- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers

- 2.3. *International Electrotechnical Commission Standards:*
- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances
 - IEC 60751: 2008 Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. DESCRIPTION

- 3.1. This specification covers four types of asphalt-coated corrugated metal pipe as follows:
Type A—Fully Asphalt-Coated
Type B—Half Asphalt-Coated with Paved-Invert
Type C—Fully Asphalt-Coated and Paved-Invert
Type D—Fully Asphalt-Coated and 100 Percent Paved or Lined
- 3.2. Asphalt-coated corrugated metal culvert pipe and pipe-arches shall conform to the requirements of M 36 or M 196 and, in addition, shall be coated with asphalt material as hereinafter described for the particular type specified.
- 3.2.1. *Type A*—The pipe shall be uniformly coated, inside and outside, to a minimum thickness of 1.3 mm measured on the crest of the corrugations or, in the case of Type 1A pipe, over the inner surface of the pipe. This coating is also used for Type 1A pipe.
- 3.2.2. *Type B*—The pipe shall be uniformly coated for approximately one half the circumference of the pipe (bottom of the pipe installed), inside and outside to a minimum thickness of 1.3 mm and, in addition, the asphalt material shall be applied in such a manner that one or more smooth pavements will be formed in the invert (inside bottom of the pipe when installed), filling the corrugations for at least 25 percent of the circumference of a pipe and 40 percent of the circumference of a pipe-arch. The pavement shall have a minimum thickness of 3.2 mm above the crest of the corrugations, except where the upper edges intersect the corrugations.
- 3.2.3. *Type C*—The pipe shall be fully coated as required for Type A and, in addition, one or more smooth pavements shall be provided as required for Type B.
- 3.2.4. *Type D*—The pipe shall be fully coated as required for Type A and, in addition, a smooth lining of asphalt shall be centrifugally spun inside the pipe. The lining shall have a minimum thickness of 3.2 mm above the crest of the corrugations.

4. ASPHALT MATERIAL

- 4.1. The asphalt material for coating shall be an asphalt having the following properties:

	Limit, %
Solubility in trichloroethylene, not less than	99.0
Loss on heating to 163°C, not more than	1
Penetration of residue after heating compared with penetration of same sample before testing for loss on heating, not less than	85

- 4.2. *Shock Test*—The bitumen shall be considered acceptable if not more than one of four test specimens shows a crack. If it is difficult to determine visually whether a specimen has cracked, the specimen should be removed from the test apparatus and subjected to a slight bending.