

Standard Test Method for Joints, Fittings, and Patches in Coated Pipelines¹

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1. Scope

1.1 This test method describes determination of the comparative corrosion preventative characteristics of materials used for applications to joints, couplings, irregular fittings, and patched areas in coated pipelines. The test method is applicable to materials whose principal function is to act as barriers between the pipe surface and surrounding soil environment.

1.2 The test method described employs measurements of leakage current, capacitance, and dissipation factor to indicate changes in the insulating effectiveness of joint and patching materials.

1.3 *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.*

1.4 The values stated in SI units to three significant decimals are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

G 12 Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel²

3. Summary of Test Method

3.1 The test method consists of an immersion test where coated pipe specimens, each containing a simulated joint, tee, or patched area, are suspended in an electrolyte and placed under cathodic protection by connecting the specimens to the negative (–) terminal of a 6-V d-c power supply (see Fig. 1). An anode, also immersed in the electrolyte and connected to the positive (+) terminal of the power supply, completes the test circuit. Joint or patch performance is followed through periodic determinations of leakage current measured as voltage drops across a calibrated resistor in the anode-to-cathode circuit.

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.48 on Durability of Pipeline Coatings and Linings.

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² Annual Book of ASTM Standards, Vol 06.02.

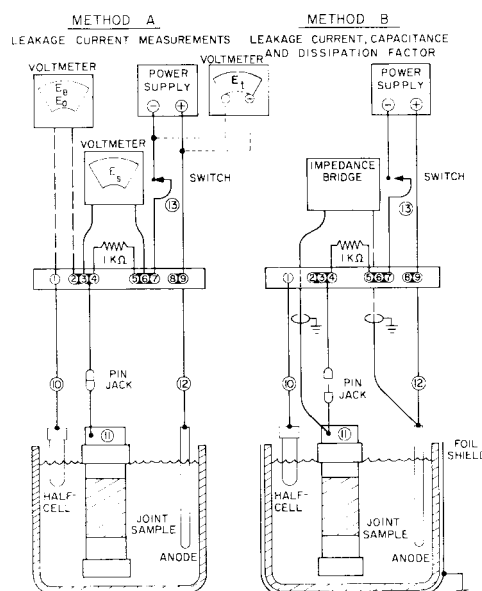


FIG. 1 Test Circuits

3.2 Capacitance and dissipation factor measurements are used to supplement the periodic leakage current determinations.

4. Significance and Use

4.1 The exposed metal surfaces at joints, fittings, and damaged areas in an otherwise coated pipeline will be subjected to corrosion if allowed to come in contact with the soil environment. The performance of joint and patching materials designed to function as protective coverings will depend upon such factors as the ability of the material to bond to both the pipe coating and exposed metal surfaces, the integrity of the moisture seal at lapped joints, and the water absorption characteristics of the joint material.

4.2 The existence of substantial leakage current through the coating joint, patch, or fitting is reliable evidence that the material has suffered a significant decrease in its performance as a protective barrier. In a similar manner, measured changes in joint capacitance and dissipation factor are useful because they are related to the water absorption rate of the joint material. Water permeating an insulating barrier increases its capacitance and its progress can be measured through the use of a suitable impedance bridge.