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Standard
Test Method

Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines

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Foreword

Interior surfaces of petroleum product pipelines are subject to general surface corrosion caused by traces of moisture condensed from the products. Rusting can be prevented with corrosion inhibitors. Usually, the amount of protection provided to the pipeline is proportional to the inhibitor concentration in the fuels being transported. More protection is required in a static line than in a flowing line.

The purpose of this standard test method is to provide a uniform method of testing the corrosive properties of petroleum product pipeline cargoes. This standard provides guidelines for performing the test method described in ASTM[(1)] D 665,[1] modified so that it is applicable to gasoline and other petroleum products, and so that it permits analysis within a single working day. This short test is particularly applicable to a batch control procedure because of the need for prompt release of cargoes and because time is limited during the working day. This standard test method is intended to be used by corrosion engineers, corrosion technicians, corrosion consultants, scientists, and others concerned with determining the antirust properties of gasoline and distillate fuels for transport through petroleum product pipelines.

This standard was originally published in 1972 and revised in 1976 by Unit Committee T-3P on Internal Corrosion of Product Pipelines and Tanks. It was reaffirmed with editorial changes in 1986 and 1993 by Unit Committee T-10E on Internal Corrosion of Pipelines, and revised in 2001 by Task Group 042. Task Group 042 is administered by Specific Technology Group (STG) 09 on Measurement and Monitoring Techniques and is sponsored by STG 62 on Testing and Monitoring Procedures. It is issued under the auspices of STG 09 on Measurement and Monitoring Techniques.

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(1) American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

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Contents

Section 1: General

1.1 This standard provides a procedure for conducting a test to determine the corrosive properties of gasoline and distillate fuels in preparation for transport through a pipeline. Also included is information on test specimen preparation, equipment, and a system for rating the test specimens.

1.2 In this test method, the surface of a cylindrical steel test specimen is prepared and then immersed in a mixture of the test fuel and distilled water. The mixture is stirred and is maintained at a prescribed temperature. The test specimen is then rated by the proportion of test surface that has corroded. Experience has shown that if enough inhibitor is present to produce B+ or better results as defined in this standard, general corrosion in flowing pipelines may be controlled.

1.3 This test method does not predict corrosiveness in the standing aqueous phase, nor does it predict microbiological attack.

Section 2: Test Specimen Preparation

2.1 The test specimen should be a threaded steel rod 81.0 x 12.7 mm (3.19 x 0.500 in.) (see Figure 1), used with a plastic or polytetrafluoroethylene (PTFE) holder.

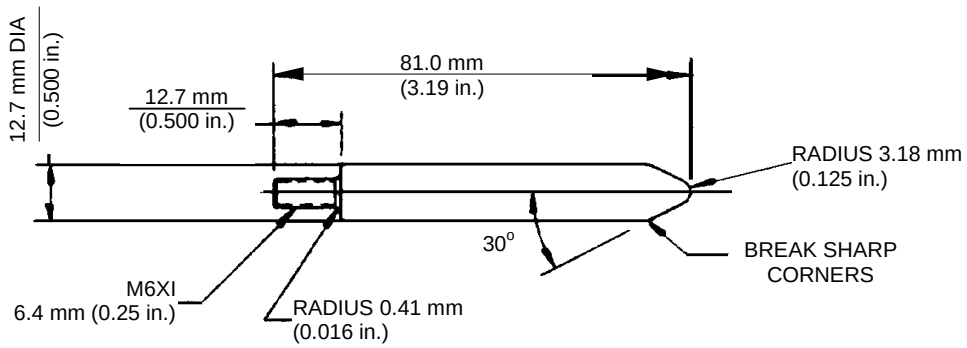

FIGURE 1: Test Specimen
The test specimen should be a threaded steel rod used with a plastic holder (ASTM D 665).
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2.1.1 The test specimen should be made of steel conforming to UNS[(2)] G10150 (Grade 1015), UNS G10180 (1018), UNS G10200 (1020), or UNS G10250 (1025) of ASTM A 108.[2]

2.1.2 If these steels are unavailable, other equivalent steels may be used, provided that they are satisfactory according to comparative tests using this test method.

2.1.3 All test specimens must be tested to establish their corrosion activity in comparative tests using this test method.

2.2 The test specimen, either new or from a previous test, shall be prepared as follows:

2.2.1 Preliminary Grinding

2.2.1.1 If the test specimen has been used previously but is free from rust or other irregularities, preliminary grinding may be omitted and the test specimen subjected only to final surface preparation as prescribed in Paragraph 2.2.2.

[(2)] Metals and Alloys in the Unified Numbering System (latest revision), a joint publication of the American Society for Testing and Materials (ASTM) and the Society of Automotive Engineers Inc. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001.