

## **Standard Test Method**

# **Test Method for Measurement of Gouge Resistance of Coating Systems**

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Approved 2015-06-25  
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ISBN 1-57590-316-2  
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## Foreword

Organic coatings are the most frequently used materials to protect buried ferrous metal pipelines from corrosion and mechanical damage. During storage, transport, and installation, pipes are exposed to severe mechanical stress that can lead to damage of the protective coating layer.

Therefore, it is important to use coatings with high-mechanical strength and toughness. Impact resistance, wear resistance, hardness, and resistance to shear scratch/indentation are good indicators of the coating's mechanical strength and toughness.

This NACE standard test method describes a reliable measuring methodology for determining the gouge resistance to shear scratch/indentation of coating systems.

The purpose of this standard is to provide a test method for determining the gouge resistance of coating systems used on buried ferrous metal pipelines.

There have been several efforts in the past to develop a reliable test method for determining the gouge resistance of coating systems, but they failed because different kinds of test equipment and test conditions have led to scattered data. This tighter test method should lead to more consistent test data.

This latest effort to develop a test method was driven by the joint efforts of representatives of coating manufacturers, coating applicators, equipment suppliers, corrosion specialists, and other personnel concerned with the construction of underground pipeline facilities.

It is intended to be used by pipeline operating companies, pipeline owners, pipeline contractors, pipeline inspection services, and pipeline coating mills.

This test method was prepared in 2015 by Task Group (TG) 034, "Pipeline Coatings, External—Gouge Test." It is administered by Specific Technology Group (STG) 03, "Coatings and Linings, Protective—Immersion and Buried Service." It is sponsored by STG 35, "Pipelines, Tanks, and Well Casings." This standard is issued by NACE under the auspices of STG 03.

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Standard Test Method**

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Resistance of Coating Systems**

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**Section 1: General**

1.1 This standard describes the design and operation of an apparatus to determine the gouge resistance of pipe coatings.

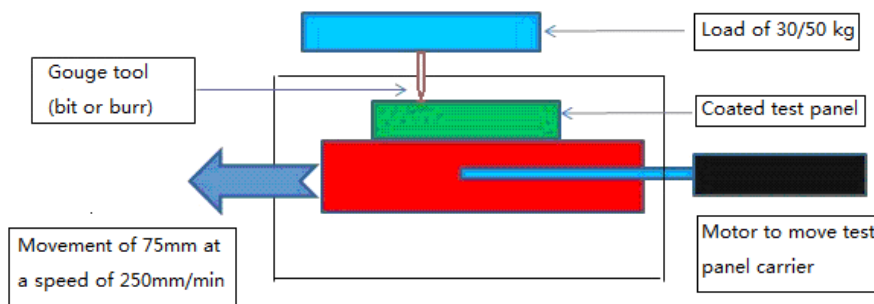
1.2 This test method is used for organic coatings that are used on buried ferrous metal pipelines. The primary application is for testing thermosetting coatings (e.g., fusion-bonded epoxy [FBE], liquid epoxy). Polyolefins (polyethylene [PE] and polypropylene [PP]) may also use this test method.

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**Section 2: Equipment**

2.1 Gouge Test Apparatus

2.1.1 A shear gouge test apparatus consisting of a gouge tool (see Paragraph 2.1.2), an adjustable load system (see Paragraph 2.1.3), and other accessories necessary for repeatable test results shall be used (see Figures 1 and 2).



**Figure 1: Schematic of a Gouge Test Apparatus**



**Figure 2: Example of a Gouge Tester**