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Standard
Test Method

Test Procedures for Organic-Based Conductive Coating Anodes for Use on Concrete Structures

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Foreword

This standard test method evaluates the performance characteristics of organic-based conductive coating anode materials applied to steel-reinforced concrete surfaces for the purpose of supplying cathodic protection current to the embedded steel. The conductive coating systems used for this purpose are not intended to provide a protective barrier coating to the concrete.

This standard is intended for use by consultants, suppliers, and users of cathodic protection systems intended to prevent corrosion of embedded steel in atmospherically exposed reinforced concrete. This standard is expected to be used primarily to qualify organic-based conductive coatings as an anode material, rather than as a quality control procedure.

This standard was prepared by NACE Task Group 045 on Anode Test Procedures, which is administered by Specific Technology Group (STG) 01 on Concrete and Rebar. This task group is also sponsored by STG 05 on Cathodic/Anodic Protection. This standard is issued by NACE International under the auspices of STG 01.

In NACE standards, the terms *shall*, *must*, *should*, and *may* are used in accordance with the definitions of these terms in the NACE Publications Style Manual, 4th ed., Paragraph 7.4.1.9. *Shall* and *must* are used to state mandatory requirements. The term *should* is used to state something good and is recommended but is not mandatory. The term *may* is used to state something considered optional.

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Contents

Section 1: General

1.1 This standard provides methods to test the durability of the organic conductive coating anode under defined laboratory conditions, i.e., conditions present when current discharges from the anode as it would in a working cathodic protection system. The tests consist of resistivity, adhesion, coating appearance, anode life, and water vapor permeation tests.

1.2 The user of this standard should be aware that because of the nature of conductive coating anodes, accelerated tests are not possible so that this test does not reflect the accelerated whole-life performance of a conductive coating anode. It has not been possible to conduct full round-robin testing on a wide range of conductive coating anodes, but a number of products were tested in the original test program on which this test is based[1] and by a laboratory in Europe. A product that passes this test cannot be guaranteed to perform in any given field condition and should be field tested, or existing field performance data should be collected whenever possible to demonstrate its suitability for the particular application intended.

Section 2: Test Panel Construction

2.1 Three concrete test panels shall be fabricated for each material to be tested from the following mix:

Cement, Type 1	385 kg/m^3 (649 lb/yd^3)
Water-to-cement ratio	0.45
Fine aggregate (silica sand)	961 kg/m^3 (1,620 lb/yd^3)
Crushed limestone aggregate (nominal 10 mm)	777 kg/m^3 (1,310 lb/yd^3)

Air entraining additive consistent with manufacturer's directions to provide an air content of 3 to 5%.

2.2 The mix shall contain 2.0% chloride by weight of cement (7.7 kg/m^3 [13 lb/yd^3]) added as sodium chloride.

2.3 Test panel size shall be 750 x 750 x 50 mm (30 x 30 x 2 in.). A 12.7 x 12.7-mm (0.50 x 0.50-in.) steel wire mesh grid shall be embedded near the top of the panel on one 750 x 750-mm (30 x 30-in.) side to act as the cathode. The cathode shall be placed near the top of the panel, opposite to the anode, which shall be applied to the bottom (form side) of the panel. The spacing between the anode and the mesh shall be at least 32 mm (1.3 in.). To make the electrical connection, a contact point shall be allowed to extend from one point of the mesh. Panel construction is shown in Figure 1.

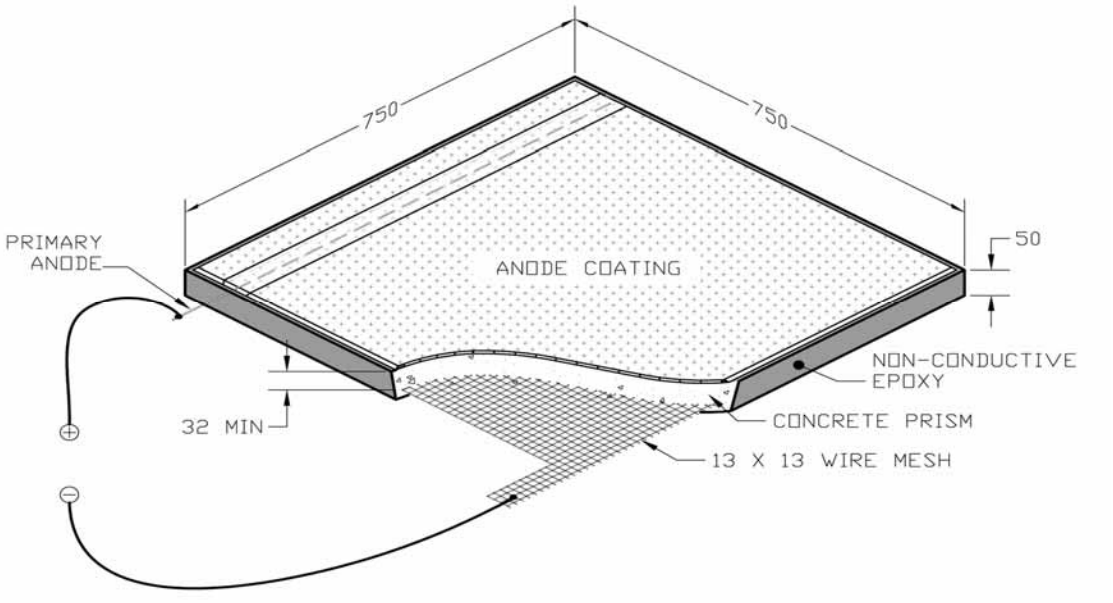

FIGURE 1. Panel Construction with Bottom Side (Form Side) Up
(All dimensions in Figure 1 are in mm.)