Electrostatic safety test of Dursan coating

Technical Insight

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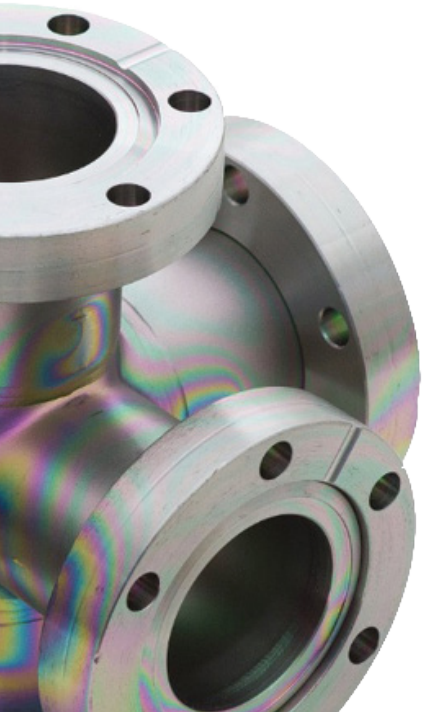

Synopsis

This TI provides a summary of the electrostatic safety test performed on SilcoTek's Dursan coating. The test was conducted by Dekra Testing and Certification GmbH and this TI is based on the test report generated by Dekra.

Background

SilcoTek's Dursan coating is an electrically insulating coating; the dielectric properties of Dursan can be found in more detail here. The insulating and corrosion-resistant properties of Dursan were of particular interest to one customer, who commissioned an electrostatic safety test via Dekra Testing and Certification GmbH, to ensure that Dursan can be safely used in their application. SilcoTek purchased a copy of the test report to make the data available for other customers who may have similar needs in the future.

Test Procedures and Results

A stainless-steel sheet approximately 30 cm x 30 cm in size was run through the standard Dursan process at SilcoTek. The coating thickness was measured to be about 1500 nm, which is in the upper range of the typical Dursan thickness output (400 – 1600 nm).

An electrostatic safety test was conducted per IEC 60079-32-2 Ed. 1.0, clause 4.11 by Dekra Testing and Certification GmbH. The same test is also defined in IEC 60079-0 Ed. 7.0, clause 26.17. This is a test standard that describes test methods concerning equipment, product, and process properties necessary to avoid ignition and electrostatic shock hazards arising from static electricity. It is intended for use in a risk assessment of electrostatic hazards or for the preparation of product family or dedicated product standards for electrical or non-electrical machines or equipment.

Before the test, the sample was stored in ambient atmosphere and temperature between 22 to 24°C and a relative humidity between 25 and 30%. The test was conducted in the same storage environment, and the sample was charged manually using a leather cloth, a polyimide cloth, a cotton cloth, and a viscose cloth, and also with a high voltage of 40 kV via a corona electrode. After charging, an attempt was made to initiate individual discharge to a grounded 25 mm spherical electrode and any transferred charge was measured. Each test sequence was repeated 10 times to ensure reproducibility. Figure 1 shows the test setup with the Dursan-coated plate and the scraped corner for ground connection.

Figure 1: Electrostatic safety test setup showing the Dursan-coated plate and the scraped corner for ground clamp connection

After each testing scenario, no discharge could be initiated and no transferred charge could be measured. According to IEC/TS 60079-32-1 Ed. 1.0, clause 6.3.9, and IEC 60079 Ed. 7.0, clause 7.4.2, the Dursan coating on metallic substrates with the specified coating thickness is considered electrostatically safe.

Summary

This TI provides a summary of the electrostatic safety test performed on a Dursan-coated stainless-steel plate. The test was conducted per IEC 60079-32-2 Ed. 1.0, clause 4.11 by Dekra Testing and Certification GmbH. The test sample was manually charged with four cloths made of different materials and by use of a high voltage corona electrode (40 kV). Each test sequence was repeated 10 times. The test found no discharge and no measurable charge transfer from the Dursan-coated plate. According to IEC/TS 60079-32-1 Ed. 1.0, clause 6.3.9, and IEC 60079 Ed. 7.0, clause 7.4.2, the Dursan coating on metallic substrates with the specified coating thickness is considered electrostatically safe.

