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IEEE Guide for the Application, Maintenance, and Evaluation of Room-Temperature Vulcanizing (RTV) Silicone Rubber Coatings for Outdoor Ceramic Insulators

IEEE Dielectrics and Electrical Insulation Society

Sponsored by the
Standards Committee

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Abstract: The various important aspects that need to be considered for satisfactory long-term performance of room-temperature vulcanizing (RTV) silicone rubber high-voltage insulator coatings (HVIC) are outlined in the guide. Methods of application, pre-coated applications, maintenance issues on coated applications, factors affecting long-term performance, erosion resistance, temporary loss of hydrophobicity, aging, laboratory accelerated tests, partially coated insulation, and functional outdoor evaluation are described.

Keywords: applications, evaluation, IEEE 1523™, maintenance, RTV silicone rubber coatings, tests

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Introduction

This introduction is not part of IEEE Std 1523-2018, IEEE Guide for the Application, Maintenance, and Evaluation of Room-Temperature Vulcanizing (RTV) Silicone Rubber Coatings for Outdoor Ceramic Insulators.

One of the most promising methods of helping prevent the flashover of outdoor insulation under contaminated and wet conditions, room-temperature vulcanized (RTV) silicone rubber high voltage insulator coating (HVIC) has been applied to conventional (ceramic) and polymeric (non-ceramic) insulation to help preventative maintenance activities. The use of RTV coatings began on a trial basis during the 1970s and large-scale application of the coatings began in the 1980s. The work on an application guide began in the early 1990s with round robin tests in several laboratories and concurrently with user experience, the first IEEE application guide was issued in 2002. Since that time considerable advances have been made in the understanding and use of RTV HVIC. From early beginnings of a maintenance coating, present day applications are often applied as an original equipment manufacturer product. This revision of the guide incorporates the knowledge obtained over 15 years of experience on the application, maintenance, and evaluation of RTV silicone rubber coatings for outdoor ceramic insulators, since the existing guide was issued in 2002.

Acknowledgments

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Contents

1. Overview 9
1.1 Scope 9
1.2 Purpose 9

2. Normative references 9

3. Definitions 10

4. Background 10

5. Types of RTV coatings 11

6. Application guidelines 12
6.1 Test for adhesion 12
6.2 Application on de-energized equipment or lines 12
6.3 Application on energized equipment and lines 14
6.4 Safety and handling 15
6.5 Quality control after application 15

7. Pre-coated insulators 16
7.1 Advantages of pre-coated insulators 16
7.2 Packaging and shipment of pre-coated Insulators 16
7.3 Installation of pre-coated insulators 17

8. Maintaining RTV coated insulators 17
8.1 Audible detection of partial discharges 17
8.2 Visual detection of partial discharges 17
8.3 Water washing of coated insulators 17
8.4 Re-coating of Insulators 18

9. Factors that influence coating performance and life 18
9.1 Loss of hydrophobicity 18
9.2 Dry band arcing and erosion 18
9.3 Corona 18
9.4 Ultraviolet 19
9.5 Severe environments 19

10. DC applications 19

11. Partially coated insulators 19

Annex A (normative) Tests for evaluating electrical properties of RTV coatings 20

Annex B (informative) Bibliography 23

IEEE Guide for the Application, Maintenance, and Evaluation of Room-Temperature Vulcanizing (RTV) Silicone Rubber Coatings for Outdoor Ceramic Insulators

1. Overview

1.1 Scope

This guide is based on the knowledge and more than 25 years of experience on the use of room-temperature vulcanizing (RTV) silicone rubber coatings that are used to improve the contamination performance of outdoor high-voltage (HV) insulators. This guide discusses various important aspects that are needed for satisfactory long-term performance of HV insulator coatings (HVIC); namely, various application methods, pre-coated insulators, partially coated insulators, maintenance issues on coated insulators, factors affecting long-term performance, the question of aging, laboratory accelerated tests, and functional outdoor evaluation. However, it must be clear that for any specific application, judgment and experience are required to analyze and balance the many characteristics, which are discussed to obtain satisfactory performance and reliability.

1.2 Purpose

This guide is intended for the use of RTV coatings on ceramic insulation. In this context, ceramic is used to denote wet process porcelain and toughened glass insulators.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies. (See Annex A for more information.)

ASTM D 149-09 (2013), Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies.

ASTM D 150-11, Standard Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation.