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Composites and metal assemblies — Galvanic corrosion tests of carbon fibre reinforced plastics (CFRPs) related bonded or fastened structures in artificial atmospheres — Salt spray tests

Assemblages composites et métal — Essais de corrosion galvanique des structures en plastiques renforcés de fibres de carbone (CFRP) jointes ou fixées en atmosphères artificielles — Essais au brouillard salin

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies the testing method for galvanic corrosion of composites and metal assemblies subject to salt spray environment using a bonded or fastened specimen.

The potential benefits to CFRP-metal users of implementing a galvanic corrosion test based on this document are:

a) addressing corrosion risks relating CFRPs of drastically nobler galvanic potential than metals to form a global cell between CFRP and metal – new risks drastically exceeding the scope of ISO 9227 for a local cell of isolated metal – utilizing the resources of ISO 9227;

b) expanding CFRP applications to the fields of corrosive environments that still require the combinations with metallic components;

c) the detection or the prevention of galvanic current insulation loss, such as ion migration and time-related degradation in sealant film, injected calking layer and glass fibre reinforced plastics (GFRPs) layer;

d) demonstrating the conformity to specified conditions for type certification requirements in the engineering such as aircraft developments;

e) evaluating the corrosion related procedures for maintenance, repair and overhaul (MRO) in the engineering operations such of CFRP aircrafts.

It is not the intent of this document to imply the need for:

— omitting relevant field tests for CFRP related engineering;

— generally specifying the dimensions of test specimen to represent CFRPs related bonded or fastened structures;

— superimposing test results for specific applications of the parameters that exceed the range of this document;

— comparative testing as a means of ranking different protections with respect to corrosion resistance.

Composites and metal assemblies — Galvanic corrosion tests of carbon fibre reinforced plastics (CFRPs) related bonded or fastened structures in artificial atmospheres — Salt spray tests

1 Scope

This document specifies the apparatus, the reagents and the procedure to be used in conducting the neutral salt spray (NSS), acetic acid salt spray (AASS) and copper-accelerated acetic acid salt spray (CASS) tests for assessment of the galvanic corrosion resistance of joints and bonded structures between carbon fibre reinforced plastics (CFRPs) and metallic materials, with or without permanent or temporary insulation for the galvanic current.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1514, *Paints and varnishes — Standard panels for testing*

ISO 2808, *Paints and varnishes — Determination of film thickness*

ISO 3574, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 6361-2, *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 2: Mechanical properties*

ISO 8044, *Corrosion of metals and alloys — Basic terms and definitions*

ISO 8407, *Corrosion of metals and alloys — Removal of corrosion products from corrosion test specimens*

ISO 17872, *Paints and varnishes — Guidelines for the introduction of scribe marks through coatings on metallic panels for corrosion testing*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8044 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
reference material
material with known test performance

3.2
reference specimen
portion of the reference material that is to be exposed with the intention to check the reproducibility and repeatability of the test results for the test cabinet in use