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Corrosion of metals and alloys — Corrosion in artificial atmosphere — Accelerated corrosion test involving exposure under controlled conditions of humidity cycling and intermittent spraying of a salt solution

Corrosion des métaux et alliages — Corrosion en atmosphère artificielle — Essai de corrosion accélérée comprenant des expositions sous conditions contrôlées à des cycles d'humidité et à des vaporisations intermittentes de solution saline

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Foreword

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This document was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 262, *Metallic and other inorganic coatings, including for corrosion protection and corrosion testing of metals and alloys,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 16701:2015), which has been technically revised.

The main changes are as follows:

— The test cycle has been revised with the same intended acceptance criteria to improve field correlation and reproducibility, when performed in various exposure chambers.

— An alternative cycle with alternating temperature in the climate cycling (constant dew point instead of constant temperature) is introduced. It is a modification of the so called ACT1 (originally Volvo Standard 423-0014), however within the same scope and intended acceptance criteria.

— Extensive requirements and guidelines on quality assurance of test equipment and control procedures have been incorporated, mainly as normative and informative annexes.

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Introduction

Atmospheric corrosion of metallic materials, with or without corrosion protection, is influenced by many environmental factors. Their corrosion impact varies with the type of exposed material system. It is therefore not possible to design a laboratory corrosion test in such a way that the complexity and variations of real, in-service conditions are fully represented. Acceleration (forced conditions) as such can also have a negative impact on the correlation-to-field performance. Nevertheless, tests with humidity cycling and only intermittent exposure to a salt solution provide a better correlation-to-field performance than tests using continuous salt spray.

This document was developed in the automotive context, where the major contributor to corrosion is the use of wintertime de-icing road salt in cool/cold temperate areas, most often as sodium chloride depositions that act in cyclic humidity conditions. The test procedure is moderately forced by humidity and salt. It is intended to be applicable for quality assurance of the metals and corrosion protections typically encountered in motor vehicles.[1]-[4] The method is also relevant in other areas of application, provided they have similar climatic conditions with an influence of sodium chloride depositions.[5][6]