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Corrosion of metals and alloys — Corrosion and fouling in industrial cooling water systems —

Part 1: Guidelines and requirements for conducting pilot-scale evaluation of corrosion and fouling control additives for open recirculating cooling water systems

Corrosion des métaux et alliages — Corrosion et encrassement des circuits de refroidissement à eau industriels —

Partie 1: Lignes directrices et exigences pour l'évaluation pilote des additifs anti-corrosion et anti-encrassement pour circuits de refroidissement à eau à recirculation ouverts

Reference number
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Foreword

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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 document 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).

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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 second edition cancels and replaces the first edition (ISO 16784-1:2006), which has been technically revised.

The main changes are as follows:

— the Introduction has been modified;

— normative references have been added;

— Clause 3 has been modified;

— Clause 4 has been modified: the title was changed from "Types of testing" to "General requirements and recommendations" and the latest requirements on environmental protection have been added;

— Clauses 7 and 8 have been combined and content related to new water treatment methods has been added.

— the Bibliography has been modified.

A list of all parts in the ISO 16784 series can be found on the ISO website.

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.

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Introduction

A lot of changes have taken place in the development environment of global industrial enterprises, including advances in related technologies. As the industry grows and competition intensifies, while at the same time more stringent pollution requirements are introduced and water becomes more scarce, businesses have to operate in a safer, greener and more economical way. In many cases, cooling water quality is declining, which leads to higher concentration rates, more corrosion and more susceptibility to scaling.

Cooling water treatment technologies have developed and their use is expanding. Water pollution caused by additives used in cooling system has attracted public attention, and green environmental protection additives have become a new trend in development. Factories need to achieve zero waste water discharge. Cooling water treatments are effective measures for maintaining the best operating efficiency, protect the economic life of equipment, suppress corrosion and prevent scaling, microbial pollution and deposition on various heat transfer surfaces.

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Corrosion of metals and alloys — Corrosion and fouling in industrial cooling water systems —

Part 1: Guidelines and requirements for conducting pilot-scale evaluation of corrosion and fouling control additives for open recirculating cooling water systems

1 Scope

This document specifies general requirements and parameters for the pilot test evaluation of corrosion and scaling control additives in open recirculating cooling water systems. This document covers parameters including test unit design, operation, water quality and contamination. It also covers the design and operation of pilot test devices as well as parameters to be evaluated in pilot test units.

This document covers the criteria that are used in pilot scale testing programmes for selecting water treatment programmes for specific recirculating cooling water systems.

This document is only applicable to open recirculating cooling water systems. It does not apply to closed cooling systems and once-through cooling water systems.

This document applies only to systems that incorporate shell and tube heat exchangers with standard uncoated smooth tubes and cooling water on the tube side. This document does not apply to heat exchangers with shell-side water, plate and frame and/or spiral heat exchangers and other heat exchange devices. However, when the test conditions are properly set up to model the surface temperature and shear stress in more complex heat transfer devices, the test results can predict the results of operating heat exchangers of that design.

The test criteria established in this document are not intended to govern the type of bench and pilot scale testing normally carried out by water treatment companies as part of their proprietary product development programmes. However, water treatment companies can choose to use the criteria in this document as guidelines in the development of their own product development test procedures.

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

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 terminology databases for use in standardization at the following addresses:

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

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

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