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Fine bubble technology — Water treatment applications —

Part 1: Test method for evaluating ozone fine bubble water generating systems by the decolorization of methylene blue

Technologie des fines bulles — Traitement de l'eau —

Partie 1: Méthode d'essai pour évaluer les diffuseurs à fines bulles d'ozone par la décoloration du bleu de méthylène

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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).

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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 281, *Fine bubble technology*.

A list of all parts in the ISO 20304 series can be found on the ISO website.

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Introduction

Ozone is used to improve water quality e.g. for purification and decomposition of hardly decomposable substances and decolorization. The conventional method often uses diffuser tubes. However, it has been found that with ozone fine bubbles, it is possible to use the strong oxidizing power of ozone more efficiently.

In recent years, the establishment of fine bubble generating technology has made ozone utilization efficiency higher than that of diffuser tube systems. Test results demonstrate that ozone fine bubble water generating systems are about 1,6 times more efficient than diffuser tube systems. With this efficiency increase, cost reduction has become possible.

Decolorization is mainly used for factory wastewater, regeneration and sewage water. It is also used on a regular basis for sewage treatment facilities, as advanced treatment technology in the dye-house effluent, etc.

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Part 1:
Test method for evaluating ozone fine bubble water generating systems by the decolorization of methylene blue

WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine the applicability of any other restrictions.

1 Scope

This document specifies a test method to assess the performance of ozone fine bubble water generating systems used for decolorizing water-soluble dye in e.g. wastewater and industrial water. This document does not address the impact of ozone on health and environment.

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 10678, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Determination of photocatalytic activity of surfaces in an aqueous medium by degradation of methylene blue*

ISO 20480-1, *Fine bubble technology — General principles for usage and measurement of fine bubbles — Part 1: Terminology*

ISO 20480-2:2018, *Fine bubble technology — General principles for usage and measurement of fine bubbles — Part 2: Categorization of the attributes of fine bubbles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20480-1 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
fine bubble water
water containing air fine bubbles

3.2
ozone fine bubble water
water containing ozone fine bubbles

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