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Submerged Membrane Bioreactor (MBR) technology

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National foreword

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English Version

Submerged Membrane Bioreactor (MBR) technology

Technologie MBR - Bioréacteurs à membrane immergée

Getauchte Membranbelebungsreaktor (MBR) Technologie

This Technical Report was approved by CEN on 4 April 2016. It has been drawn up by the Technical Committee CEN/TC 165.

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European foreword

This document (CEN/TR 15897:2018) has been prepared by Technical Committee CEN/TC 165 “Wastewater engineering”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document is based on the CWA 15897:2008, Submerged Membrane Bioreactor (MBR) Technology which was prepared by the CEN Workshop 34 – 'Submerged' Membrane Bioreactor (MBR) technology.

This document supersedes CWA 15897:2008.

Introduction

This document deals with custom designed MBR systems for more than 500 PT. It became clear that it is not possible to have interchangeable membrane modules without considering a complete system. So this led to the conclusion that this document deals with the entire membrane system rather than the membrane modules alone.

It was realized that today's market is a growing one with fast developments in membrane technology. Standards might be too early and may hamper the technological development. So it was decided at this stage to create a basic document for submerged MBR technology by means of a Technical Report.

Regarding interchangeability of MBR systems, this document especially focuses on separate membrane tanks as there is a tendency that large MBR systems (more than 10 000 m3/d) are designed with separated membrane tanks.

Although there are differences between hollow fibre and flat sheet membrane manufacturers' designs, it is believed that there is no need for separate guidelines because these are focused on membrane tanks. Furthermore, it is clear that interchangeability between hollow fibre membrane systems is not so easy and the same is true for flat sheet membrane systems. Thus, producing two sets of guidelines would be of no real benefit to interchangeability.

1 Scope

This Technical Report defines terms commonly used in the field of membrane bioreactor technology.

This document aims at submerged MBR systems for the treatment of municipal wastewater with MBR Separate Systems and MBR Integrated Systems.

This document establishes general principles for MBR filtration systems interchangeability between different MBR filtration systems from different manufacturers.

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.

EN 12255-11, *Wastewater treatment plants - Part 11: General data required*

EN 16323, *Glossary of wastewater engineering terms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16323 and the following apply.

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

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

• ISO Online browsing platform: available at http://www.iso.org/obp

NOTE Some manufacturers may use different terms for their products, but nevertheless the following terms and definitions are used in this document.

3.1
backwashing
backflush
backpulse
short-term reversal of the flow direction through the membrane in intervals to remove the particles accumulated during the filtration process (covering layer), usually with permeate

3.2
biofouling
development of a biofilm on the membrane surface or in the membrane due to the growth of micro-organisms

Note 1 to entry: See Figure 1.

Note 2 to entry: Biofouling causes a reduction of the performance or the permeability (see also fouling and scaling).