DIN CEN/TR 15897:2020-09 (E)

Submerged Membrane Bioreactor (MBR) technology; English version CEN/TR 15897:2018

Contents

Page

European foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms and definitions 6

4 General system — requirements 12
4.1 Basic considerations 12
4.2 Pre-treatment and internal sieving 14
4.3 Characteristics of biological systems used in MBR plants 15
4.3.1 General 15
4.3.2 Mixed liquor suspended solids (MLSS) 15
4.3.3 Hydraulic retention time (HRT (or detention time)) 15
4.3.4 Sludge age (or sludge retention time (SRT)) 15
4.3.5 Chemical phosphorus removal 15
4.3.6 Aeration 15
4.4 Membrane filtration system 15
4.5 Mixed liquor recirculation 17
4.6 Permeate extraction system 17
4.7 Desired effluent system 17

5 Material characteristics 18
5.1 General 18
5.2 Porous membranes 18

6 Configuration 18
6.1 Flat Sheet 18
6.2 Hollow fibre 19

7 Design and operating parameters 19
7.1 General 19
7.2 Influent characteristics 19
7.3 Fouling 20
7.4 Transmembrane pressure 20
7.5 Permeability 21
7.6 Integrity 21

8 Acceptance, commissioning and monitoring tests 21

9 Information and documentation 22

10 Interchangeability 22
10.1 Principle 22
10.2 General 22
10.3 Process flow diagram (PFD) 23
10.4 Scope of supply 25
10.5 Interchangeability aspects 25

10.5.1 General 25
10.5.2 Membrane type 26
10.5.3 Layout 26
10.5.4 Tank 26
10.5.5 Draining and flushing 28
10.5.6 Integrity check 29
10.5.7 Accessibility and maintainability 29
10.5.8 Chemical cleaning 29
10.5.9 Process control system (PLC) 30
Annex A (normative) Information and documentation 34
Annex B (informative) Example for clean water permeability test 38
B.1 Abstract 38
B.2 Materials and methods 38
B.2.1 Measuring apparatus 38
B.2.2 Measuring procedure 39
Annex C (informative) Example for vacuum leak test 40
C.1 Abstract 40
C.2 Materials and methods 40
C.2.1 Measuring apparatus 40
C.2.2 Measuring procedure 41
Annex D (informative) Example for pore diameter measurement 42
D.1 Abstract 42
D.2 Materials and methods 42
D.2.1 Latex solution 42
D.2.2 Measuring apparatus 43
D.2.3 Measuring procedure 43
Annex E (informative) Paper filtration measurement 45
E.1 Objective 45
E.2 Measuring method 45
Annex F (informative) Impact of pore size distribution on membrane fouling 47
Bibliography 48