

DIN 19643-4:2023-06 (E)

Treatment of water of swimming pools and baths - Part 4: Combinations of process with ultrafiltration

Contents		Page
Foreword		4
1	Scope	6
2	Normative references	6
3	Terms and definitions	7
4	Principles of the process combination	8
5	Process steps	9
5.1	Adjusting the acid neutralizing capacity	9
5.1.1	General	9
5.1.2	Reagents for adjusting acid neutralizing capacity	9
5.1.3	Values of acid neutralizing capacity in raw water or inlet to the filter	9
5.1.4	Checking acid neutralizing capacity	9
5.2	pH value adjustment	9
5.3	Flocculation	10
5.3.1	General	10
5.3.2	Flocculants	13
5.3.3	Minimum quantity of flocculant to be added	14
5.3.4	Checking the flocculation	14
5.3.5	Checking the functioning of the flocculation filtration	14
5.4	Eliminating disinfection by-products	14
5.4.1	Adsorption by powdered activated carbon	14
5.4.2	Sorption filtration	15
5.4.3	UV radiation	15
5.5	Designing UF plants	16
5.5.1	Plant structure	16
5.5.2	Plant design	17
5.5.3	Plant operation	18
5.6	Operating UF plants	18
5.6.1	General	18
5.6.2	Filtration	18
5.6.3	Interruptions in operation	18
5.6.4	Rinsing membranes	18
5.6.5	Monitoring and documentation	21
5.6.6	Maintenance	21
5.6.7	Residue disposal	21
5.6.8	Checking the filtration	21
5.6.9	Chlorination	22
6	Load capacity factor k	23
7	Quality requirements for membrane modules	23
Bibliography		24

Figures

Figure 1 — Dependence of pipe internal diameter and flow rate.....	13
Figure 2 — Schematic diagram of 2-stage ultrafiltration.....	17
Figure 3 — Correlation between transmembrane pressure (source: DIN 19645) and operation time at a constant flow rate.....	19

Tables

Table 1 — Particle size distribution of powdered activated carbon.....	15
Table 2 — Filtration requirements (samples taken downstream of the last treatment stage but before chlorination)	21