

DIN 19643-1:2023-06 (E)

Treatment of water of swimming pools and baths - Part 1: General requirements

Contents		Page
Foreword		6
1	Scope	8
2	Normative references	8
3	Terms and definitions	13
4	General	17
5	Water quality requirements	18
5.1	General	18
5.2	Filling water requirements	18
5.2.1	General	18
5.2.2	Primary filling water requirements	19
5.2.3	Secondary filling water requirements	19
5.3	Requirements for pool water, filtrate and supply water	19
6	Planning and design requirements for pools and technical equipment rooms	26
6.1	General	26
6.2	Pool or bath design	26
6.3	Water tanks	26
6.4	Surfaces in contact with water	26
6.5	Technical equipment rooms	26
6.5.1	General	26
6.5.2	Room for filter systems	27
6.5.3	Room for chemical feeders	27
6.5.4	Disinfection equipment and ozone plant rooms	27
6.5.5	Monitoring equipment room	27
6.5.6	Repairs workshop and spare parts storage	27
6.5.7	Disinfectant storage rooms	27
7	Requirements for baths and pools	28
7.1	General	28
7.2	Diving pools	28
7.3	Swimming pools	28
7.4	Variable-depth pools	28
7.5	Artificial wave pools	28
7.6	Pools for non-swimmers	28
7.7	Paddling pools	28
7.8	Pools with water slides and water slides having a shallow exit	28
7.9	Small-scale pools	29
7.10	Exercise pools	29
7.11	Therapeutic pools	29
7.12	Walk-through pools	29
7.13	Spa pools (hot whirlpools)	30
7.13.1	General	30
7.13.2	Spa pools (hot whirlpools) (for restricted access)	30
7.13.3	Spa pools (hot whirlpools) (for open access)	30
7.14	Warm-water pools	30
7.15	Cold-water plunge pools	30
7.16	Treading pools	31

7.17	Additional water circulation (attractions) or air-injection systems for all types of pool	31
8	Nominal load, load capacity factor, minimum overflow and flow rates	31
8.1	General	31
8.2	Flow rates	31
8.2.1	Nominal load, load capacity factor and treatment flow rate	31
8.2.2	Minimum overflow and pool flow rate	32
8.3	Calculations based on the water area of a pool	32
8.4	Calculations based on the pool volume	33
8.5	Calculations based on the nominal load of a pool	33
8.5.1	General	33
8.5.2	Special case for the rehabilitation of outdoor swimming pools: documented pollution load	34
8.6	Particular specifications	34
9	Hydraulic system requirements	37
9.1	General	37
9.2	Pool flow	37
9.2.1	General	37
9.2.2	Detection of disinfectant distribution and dead zones in the pool	38
9.3	Overflow edge	39
9.4	Overflow channel and grating	39
9.5	Water tanks	40
9.5.1	Raw water tank	40
9.5.2	Backwashing water tank	40
9.5.3	Spent backwashing water tank	40
9.5.4	Tank volumes	40
9.6	Components which might cause hydraulic malfunction	41
10	Requirements for the water treatment plant	41
10.1	General	41
10.2	Filters	41
10.2.1	General	41
10.2.2	Fixed bed filters (rapid filters)	41
10.2.3	Ultrafiltration systems	42
10.2.4	Precoat filters	42
10.3	Machinery and accessories	43
10.3.1	Pumps	43
10.3.2	Flushing air fans	43
10.4	Strainers	43
10.5	Pipework and accessories	44
10.5.1	General	44
10.5.2	Pipe sizing	44
10.5.3	Pipe materials	44
10.5.4	Valves	44
10.6	Filling water pipe	44
10.7	Measuring instruments and monitoring devices	45
10.7.1	General	45
10.7.2	Measuring instruments	45
10.7.3	Water sampling fittings	45
10.8	Corrosion protection	46
10.8.1	General	46
10.8.2	Active corrosion protection	46
10.8.3	Passive corrosion protection	46
10.9	Inspection of the corrosion protection system	46
11	Chemical and dosing requirements	46
11.1	General	46
11.2	Swimming pool water disinfection	47
11.2.1	Disinfection requirements	47
11.2.2	Disinfectants	48
11.2.3	Disinfection units	51

11.3	Dosing of chemicals to adjust the pH value and acid neutralizing capacity	53
11.3.1	General	53
11.3.2	Chemicals used to adjust the pH value and acid neutralizing capacity	53
11.4	Automatically controlled dosing	55
11.4.1	Sampling of test water from pools or baths	55
11.4.2	Measurement	55
11.4.3	Control devices	55
12	Process combinations for pool and bath water treatment	56
13	Operation of swimming and bathing facilities	56
13.1	General	56
13.2	Cleaning	56
13.2.1	General	56
13.2.2	Swimming pools and baths	57
13.2.3	Overflow channel	57
13.2.4	Raw water and backwashing water tanks	58
13.3	Testing of facility components and equipment	58
13.4	Filter backwashing	58
13.4.1	General	58
13.4.2	Fixed bed filter	58
13.4.3	Precoat filters	59
13.4.4	Ultrafiltration systems	59
13.5	Adding filling water	59
13.6	In-house monitoring and maintenance	60
13.6.1	General	60
13.6.2	Maintaining a logbook	60
13.6.3	Inspection and care of plant, machinery, equipment and pool linings	62
13.6.4	Service works and preventive maintenance	62
13.7	Additional requirements for the operation of spa pools having a separate treatment plant	62
13.8	Shutdown and re-commissioning	63
13.8.1	General	63
13.8.2	Outdoor swimming pools	63
13.8.3	Spa pools (hot whirlpools)	63
13.9	Special operating considerations	63
13.9.1	General	63
13.9.2	Partial load operation	64
13.9.3	Algae growth	64
13.9.4	Operation of additional water circulation systems	64
13.10	Accident prevention	65
14	Monitoring water quality during operation	65
14.1	Frequency of checks	65
14.2	Sampling points and sampling	65
14.3	Scope of testing	66
14.4	Evaluation and measures to be taken if Legionella spec. are detected	69
15	Acceptance conditions	72
	Bibliography	73

Figures

Figure 1 — Typical course of NaClO decay at different temperatures.....	49
Figure 2 — Typical chlorate formation in sodium hypochlorite solution as a function of temperature	50

Tables

Table 1 — Microbiological requirements (upper values) for pool water, the filtrate and supply water.....	20
Table 2 — Chemical and physical-chemical requirements for pool water, the filtrate and supply water.....	22
Table 3 — Nominal loads and flow rates.....	35
Table 4 — Data to be entered in the logbook.....	60
Table 5 — Scope of testing when monitoring water quality for all process combinations.....	67
Table 6 — Additional recommended checks to monitor water quality when using certain process combinations and special checks	69
Table 7 — Evaluation of pool water and corrective measures if <i>Legionella spec.</i> are detected	70
Table 8 — Evaluation of filtrate quality (water after treatment but before disinfectants are added) and corrective measures to be taken when <i>Legionella spec.</i> are detected	71