

آکام استخر

کیفیت آب استخرهای شنا بر اساس استاندارد DIN آلمان

آکام استخر

طراح و مجری سیستم های تصفیه استخرهای شنا و پارک های آبی

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Acknowledged rules of technology (DIN 19643)

- 1984 First engineering rules released(DIN 19643)
- 1989 First revision
- 1984 -89 Practical experience is gathered
- 1997 DIN 19643 part1, 2 and 3
- 1999 DIN 19643 part4
- 2000 DIN 19643 part5

DIN 19643 part1: Treatment of poolwater

General requirements

- Disinfection capacity: Reduction of 10^4 *P. aeruginosa* in 30 sec
- Chemistry: Reduction of organic substances by a dequate treatment
- Treatment: Combination of coagulation, filtration, oxidation, adsorption
- Fill-upwater: Generally drinking water quality

Maximum values:

- Fe 0.1 mg/l,
- Mn 0.05 mg/l
- NH_4 2 mg/l
- P 0.005 mg/l

Requirements for poolwater quality

Microbiology:

- *E. coli* 0 in 100 ml
- *P. aeruginosa* 0 in 100 ml
- Aerobic count 100 cfu/ ml
- *Legionella* 0 in 1 ml/ 100 ml

Requirements for poolwater quality

Chemistry:

- pH 6.5 –7.6
- Nitrate Max. 20 mg/l above fill-up water
- KMnO_4 -consumption Max. 3 mg/l above fill-up water
- Oxidation-reduction potential 750 -770 mV
- Free chlorine 0.3 –0.6 mg/l
- Combinedchlorine Max. 0.2 mg/l
- THMMax. 0.2 mg/l

Structural and technical requirements

- Materials may not influence the water treatment
- Water depth, necessary water area/ bather, nominal load sand necessary flow rates are listed
- 30 l fresh water/ day and bather are minimum
- Requirements for filter construction, disinfection and backwashing are defined
- Continuous and automatic dosing of disinfectant necessary
- Continuous measurement and automatic control technology for freechlorine, Ph and oxidation-reduction potential necessary

Further requirements

- Disinfectant systems are clearly described
- Technical operation of a pool is described
- Control points and monitoring parameters are listed

DIN 19643 part2 -5: Process combinations

DIN 19643-2:

adsorption—coagulation—filtration-chlorine disinfection

DIN 19643 part2

- Adsorption: dissolved and colloidal substances adsorb on granular activated carbon after regulation of pH and acid capacity
- Coagulation: Coagulation with Al and Fe salts
- Filtration: Filtration with rapid filters or multiple layer filters
- Minimum time between two backwash cycles 24h Clear definitions for backwashing requirements Filtrate: no pathogens, turbidity max. 0.1 FNU, combined chlorine max. 0.2 mg/l, THM max. 0.02 mg/l, P max. 0.005 mg/l

- Chlorination:

Normal pools free chlorine 0.3 –0.6 mg/l

Whirlpools 0.7 –1 mg/l

DIN 19643 part2 -5: Processcombinations

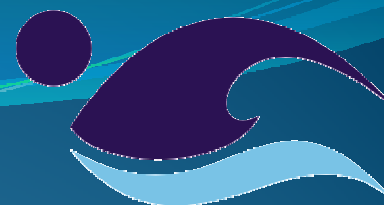
- DIN 19643-2: adsorption–coagulation–filtration–chlorine disinfection
- DIN 19643-3: coagulation-filtration-ozonation-sorptive filtration-chlorine disinfection
- DIN 19643-4: coagulation–ozonation–multiple layer filtration–chlorine disinfection
- DIN 19643-5:coagulation–single layer filtration–adsorptionto activated carbon-chlorine disinfection



The German pool water philosophyrules of technology (DIN 19643)

أكاديمية العلوم

- 1.Reduction of dissolved and colloidal substances as far as possible
- 4.Concentration of free chlorine as low as necessary to retain enough disinfection capacity
- 5.Only achievable by application of clearly defined treatment processes including sorption to activated carbon
- 3.Reduction of disinfection by-products as far as possible
- 2.Ensuring a good disinfection by maintaining the oxidation-reduction potential at 750 mV



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با تشکر از توجه شما

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