

Extract From International Bodies

- The three types of sand filtration work on the same basic principle with the major difference being the water flow rate through the sand as below

Low Rate upto 10m³ /m²/hr | **Medium Rate** 11-30m³ /m²/hr | **High Rate** 31-50m³ /m²/hr

- Flow rate for back wash should not be lower than 30m³/m²/hr.
- Low rate sand systems require media of particle size 0.83mm to 1.3 mm.
- Medium and high rate systems require media of particle size 16/30.
- Cartridge filters use a system where the filter internal is re-usable, which removes up to 5 microns.
- The removal of the water from the surface of the pool is an important factor as 70-75% of impurities, e.g. body oils, in the water are found within the top 75mm.
- Drains located at the deepest point of the pool (with suction to ensure velocity is not likely to endanger bathers)
- Surface water skimmers or Overflow channels when deck level design is used with suitably designed outlets to the balance tank.
- Return inlets, sized accordingly to the flow rate volume, capable of passing the total design flow rate (100%). Screws and fittings should be tamper proof with secure face plates.
- Water inlets and fittings should be constructed of non-corroding material and protected by a suitable grille with a maximum width between bars of 8mm.
- Where more than one skimmer is employed, the pipe sizing shall be so balanced as to ensure the optimum efficiency of each skimmer at all times. It should be possible to control each individual skimmer at all times.
- On a skimmer system – recommendations are for 70% - (surface) 30% (main drain) ration. 70:30
- On a level deck system this recommendation changes to a minimum 50%:50%ratio to a maximum 80%:20%ratio
- The main outlet drains should be constructed of non-corroding material, and each should be protected by a suitable grille. The maximum distance between the bars of the grille must not exceed 8mm (6/16 in). At least two outlets should be provided at the lowest point of the floor to drain the entire floor area completely.
- The spacing between 2main drain outlets should not be greater than 2m apart on centres and not more than 3m from each side wall.
- For safety reasons, it is recommended that the flow rate for the sump is split between at least 2 sumps to ensure velocity is not such to create a danger to bathers. The size of the grille should be as large as possible creating a slow even flow through a large area and thus preventing entrapment. A grille gap of 8mm max is advised.
- Vacuum fitting(s) shall be located in an accessible positions(s) below the water line and shall be constructed of non-corroding material. A sealing plug should be fitted when not in use.
- Except when provided as a massage jet or rapid flow inlet, no inlet should provide a velocity greater than 2.4/2.745m/sec in private pool conditions, 1.5-2m/sec in commercial pool conditions

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- Class C (6 bar) is considered suitable for standard residential use whilst for underground pipework for commercial pools and in case of specific stress Class E (16 bar) should be used with following pipe velocities.
- Suctions Velocity (maximum 1.2 meters/sec)
- Return Velocity (maximum 2.0 meters/sec)
- Grille Velocity (maximum 0.3 meters/sec)
- The sizing of the Balance Tank will depend on several, often conflicting, criteria. The tank is provided to hold a volume of water, in excess of the pool volume, to compensate for the displacement of water when bathers enter the pool.
- All pipe work shall be hydraulically tested to a minimum pressure of 10-15 psi (residential) or 35-45 psi (commercial) with a maximum equivalent to 1 ½ times the shut off head of the pump and this pressure shall be maintained for a period of 30 minutes.
- While installing , Sanitiser should be dosed before the filters in the circulation system to avoid mixing with pH control agents and to provide disinfection to the filters.
- PH agents should be introduced after the heat exchanger to avoid mixing with the sanitiser and avoid corrosion of the heat exchanger elements.
- For heated pool, 28°C -30°C (82°F-86°F) appears to be the most common requirement.
- The standard maximum flow rate and water turnover rates shall be
- Commercial pools - 25m³ /m²/hr with 3 hours water turnover rate
- Private pools - 50m³ /m²/hr with 8 hours water turnover rate
- The following table (when used in conjunction with other design criteria) should prove helpful in the sizing of a filter plant.

Type of pool

Turnover period in hours

| | |
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| Leisure water bubble pools/Spas | 0.1 – 0.33 |
| Teaching Pools/ Waterslide splash pools | 0.5 – 1 |
| Leisure waters up to 0.5m deep | 0.2 – 0.6 |
| Leisure waters up to 0.5 – 1m deep | 0.6 – 1.2 |
| Leisure waters 1 – 1.5m deep | 1 – 1.8 |
| Conventional public pools up to 25m long | 2.5 – 3 |
| Competition pools 50m long | 3 – 4.5 |
| Domestic Pools/ Diving pools | 4 – 8 |