POOL WATER TREATMENT ADVISORY GROUP

Code of Practice

The following document is a summary of the most significant changes introduced to the PWTAG Code of Practice following the Government announcement that it has decided to move to step 4 of the roadmap on 19 July, a new phase of continued caution whilst managing the risks of COVID-19. The statement reads “the pandemic is not over. Cases are increasing rapidly and a third wave is underway. Step 4 does not mark the end of the need for caution and restraint. At step 4, while many of the legal restrictions that the Government has imposed through the pandemic will be lifted, cautious guidance will remain, making it clear this is not yet a return to normal. While cases are high and rising, everybody needs to continue to act carefully and remain cautious. We will continue to manage the virus and provide guidance over the coming months”.

A full copy of the post pandemic revised Code of Practice is available free to view on the website https://www.pwtag.org/code-of-practice/

Summary of Changes to the Code of Practise Post Pandemic

FOREWORD

This latest edition incorporates the pool water treatment system requirements following the end of some Covid-19 precautionary measures on 19 July 2021. Public Health England have advised that some measures, like local lockdowns and increased surveillance, may continue for some time. The Code of Practice changes that have been introduced are the results of lessons learned from the pandemic, and are in effect improvements in our pool water practices – providing greater levels of protection for the future.

3.7) Bathing load

The maximum bathing load (number of bathers) allowed for at any one time determines the circulation rate, turnover, treatment plant size and other parameters. This bathing load should have been determined at the design stage for the pool. The maximum bathing load takes into account:

- The surface area of water in the pool
- The water depth
- The type of bathing activity the pool is intended for

The maximum bathing load for each pool must be defined in the PSOP and pool managers shall provide systems controlling entrance to the pool or

provide other means of monitoring to ensure that the maximum bathing load is not exceeded.

3.7.1 Guidance from BS EN 15288 – 2 Swimming Pools The maximum number of users at one time in a swimming pool

The maximum number of users shall be defined by the pool operator on the basis of the results of a risk assessment which takes into account

a) the designation of the pool (e. g. swimming pool, wave pool, hotel pool);

b) the pool design capacity (e. g. outdoor leisure pools with large sunbathing areas, small hydromassage pools);

c) the pool use at any one time (e. g. training swimming, diving, water gymnastic);

d) the presence of additional facilities and areas outside the pool surround, which could increase the allowed number of users in the whole pool facility (e. g. saunas, rest areas, sunbathing areas, restaurants);

e) the type of users (e. g. adults, children, people with disabilities).

NOTE A typical occupancy ratio for swimming pools Type 1, mainly used for swimming and teaching swimming, would be a minimum of 3 m^2 of water area per bather.

NOTE Bather loading may be impacted by “social distancing” where required

3.7.2 Bathing Load – Swimming pool water quality

The maximum number of bathers that a pool can accommodate at any one time is known as the maximum instantaneous bather number. This is based on the requirement for there being a minimum area of the pool available per bather to enable them to use the pool safely, without undue interference from other bathers, using the criteria outlined in Table 1. This is nothing to do with the capacity of the water treatment system to maintain acceptable water quality, which might then limit the maximum number of bathers that can use the pool.

Table 1

Water depth	**Maximum bathing load**
< 1.0m	1 bather per 2.2m^2
1.0 m to 1.5m	1 bather per 2.7m^2
> 1.5m	1 bather per 4.0m^2

The operational daily bathing load should be reviewed regularly to determine whether the treatment system is capable of maintaining good water quality. It should be established using this formula:
Operational daily bathing load = 25 to 50% of maximum bathing load x number of hours use per day

The operational daily bathing load for each pool should be recorded, including details of the basis on which it was calculated. If the operational daily bathing load is approached or exceeded frequently, then attention may need to be given to:

- Increasing the treatment plant capability
- Additional dilution of the pool water with fresh water
- The use of secondary disinfection – UV or ozone.
- Reviewing the daily bathing load

3.8) Circulation rate

The circulation rate should be derived from this formula:

Circulation rate (m^3/h) = Maximum bathing load (number of bathers per hour) x $1.7m^3$ water treated per bather.

The circulation rate and turnover period are related and form the basis for sizing new water treatment plants, and for checking the capacity of existing water treatment plants.

3.11) Instantaneous bathing load

The maximum numbers of bathers using the pool per hour, should be reduced according to the number obtained using the formula below.

$$\text{Maximum number of bathers per hour} = \frac{\text{Water volume (m3)}}{\text{Turnover period (h)} \times 1.7}$$

The turnover period of pools with moveable floors should be appropriate to the pool at its shallowest point (i.e. potentially biggest bathing load).

The pool hydraulics should ensure appropriate turnover periods and good mixing of water in the pool; short circuits and dead legs should be avoided.

6. Disinfection

pH

It is recommended that a pH value of between 7.0 and 7.4 should be the range when using chlorine-based disinfectants and ideally 7.0 to 7.2 for a better disinfectant effect.

7.1) Swimmer hygiene

To protect the public from transfer of disease and to keep disinfection at optimum levels, everyone should use the toilet and shower with soap before entering the pool. Good personal hygiene is essential prior to entering the pool water, making sure heads, armpits, genitals, anal area and feet are clean, free from invisible dirt, dust and microbial loading. Good hygiene has a very positive impact on the pool water and air quality, improving the swimming experience for everyone.

9.5) Free chlorine levels

The values below – indeed, any values – require validation by satisfactory bacteriological water quality standards

For all swimming pools using hypochlorite, assuming the pH value is 7.0 to 7.2, the free chlorine levels should be maintained at 1mg/l or below, to an absolute minimum of 0.75mg/l provided that a satisfactory bacteriological quality can be maintained. (see section 10).

Where pools cannot achieve pH values of 7.0 to 7.2, they must increase the concentration of free chlorine to 2.0 mg/l for pH 7.2 to 7.4

The use of secondary disinfection (UV or ozone) can help minimise the required free chlorine levels. These values can be achieved only where the pool is designed and engineered and operated well with effective pre-swim hygiene and not overloaded.

9.6) Chloroisocyanurates

The same principle applies to pools on chloroisocyanurates (or with cyanurates added as a chlorine stabiliser). For pools using chlorinated isocyanurates as disinfectant, free chlorine should be maintained at 5mg/l and the cyanuric acid at no more than 100 mg/l.

9.13) Balanced water

It is important to maintain the water in balance, but usually this is achieved when the pH is properly controlled. pH and free chlorine at the concentrations given earlier are the main consideration for swimming pool water and take precedence over other factors including alkalinity, calcium hardness, TDS and temperature.

The Langelier index is a formula that brings together all these factors. If used calculate Langelier weekly when measuring alkalinity, calcium hardness and TDS.

13 POOL CLEANING - EQUIPMENT AND SURFACES

13.1) Cleaning, to make a swimming pool environment Covid-secure

All floors in the pool hall area, changing rooms, toilet and shower areas should be thoroughly cleaned each day.

The HSE recommends that so long as the risk from Covid-19 persists employers/pool operators may need to increase how often and how thoroughly they normally clean, as well as cleaning surfaces that they do not normally clean.

Cleaning because of a known or suspected case of COVID-19 in a swimming pool should follow the GOV.UK guidance.

A risk assessment should be done before deciding what cleaning is suitable. This will help manage risk and determine how best to work safely and protect people from Covid-19.

The risk assessment will help identify what the cleaning regime will look like, but there are some general things that to consider.

Clean frequently

- keep surfaces clear so that cleaning can be carried out more effectively
- areas should be regularly cleaned in line with the cleaning plan
- clear guidance for the use and cleaning of toilets, showers and changing facilities will ensure they are kept clean and social distancing is achieved as much as possible
- work areas and equipment should be cleaned between uses
- objects and surfaces that are touched regularly should be regularly cleaned and disinfected shared equipment should be cleaned after each use

Identify frequently touched surfaces

Doors, bannisters, steps, rails, shower controls, buttons and anything that is frequently touched, especially if touched by lots of people, will need more regular cleaning than normal. Other examples include:

- handles on doors, windows, rails, dispensers and water coolers
- common areas like toilets, reception, changing rooms, corridors and lifts
- control panels for machinery, control pads and switches
- shared equipment like floats, noodles, arm bands and rubber rings

There should be measures to clean surfaces and objects after each use where possible. If it's not practical to clean after each use, because they are used continuously throughout the day, they should be cleaned often.

Any adequate cleaning regime should involve deep and periodic cleaning. Deep cleaning is a thorough clean of all frequently touched surfaces at least once a day.

Periodic cleaning is cleaning at different times throughout the day. It can include cleaning items immediately after use as well as cleaning surfaces on a regular basis throughout a single day.

Cleaning in a pool environment will often require washing with soap and/or disinfection.

For disinfection of surfaces or equipment then the UK government and WHO advise using a disinfectant solution of 1,000 mg/l available chlorine (or ppm av.cl.) This can be prepared by diluting 10ml of 10% w/w sodium hypochlorite with 1 litre of tap water this is equivalent to 100ml or half a cup of 10% strength sodium hypochlorite in a 10-litre bucket of water.

13.1) Cleaning the pool surround

Pool surrounds should be cleaned at the start of each day and as necessary thereafter (see 13.4). Mechanical scrubber driers on separated extra-low voltage (SELV) pick up the water and solution used in cleaning and then dry the surface. These are ideal but should be emptied and disinfected and dried after each use.

If a deck-level pool surround falls away (to drain) from the transfer channel, temporarily lowering the water level in the pool can keep any cleaning residue out of the pool water.

13.2) Cleaning the water line

Deposits of dirt etc. just above the water line of a freeboard pool can be cleaned off with a chemical-free scouring pad, using sodium bicarbonate or carbonate solution. Operators should wear gloves and goggles.

13.3) Transfer channel

Some pools have a transfer channel fitted with a drain valve, which is capable of being isolated from the pool water system. So for cleaning purposes the pool water level can be lowered (pool circulation stopped) so that water from the pool no longer flows down the channel. Then the transfer channel can be cleaned and it can also be used to take any cleaning residue from cleaning the pool surround. By opening the drain valve and thoroughly flushing, the cleaning residue goes to waste.

13.4) Cleaning agents

Proprietary chemical cleaners should be avoided altogether if possible They may contain surfactants that affect the monitoring of chlorine residual and cause foaming or phosphates, which promote algal growth. They may contain oxidising agents that give a false reading on water tests. Other compounds simply contain ammonia (they may smell of it) and could produce unhealthy pool conditions (through high combined chlorine levels).

If this is not possible every effort should be made to keep cleaning products out of the pool and any channel. Ideally, there should be some way of draining all poolside washings to waste. Certainly care should be taken to avoid outright incompatibility between cleaning and pool chemicals, which could be dangerous. Chlorinated isocyanurates – often called trichlor or dichlor – can react violently with neat hypochlorites (particularly calcium hypochlorite). In general, reactions between acid and alkalis are potentially dangerous.

13.5) Proprietary cleaners where used

If proprietary cleaners are required, they should be formulated for poolside use, and come from reputable suppliers (even though the target is to prevent them getting into the pool water). Cleaners containing detergents/surfactants or phosphates are not suitable for poolside use.

13.6) Chemical cleaning agents and pool water

Chemicals used for cleaning – whether for pool surrounds or the water line – should never be used when there are people in the pool.

13.7) Periodic removal of hard water scaling and body grease

It may be necessary in all wet areas, pool surrounds, showers, changing rooms and toilets to tackle a build- up of lime scale from the water and/or body grease and oils from bathers. Use sodium bicarbonate or carbonate to remove any organic build-up such as body oils or grease. Use an acid-based cleaner (e.g. weak hydrochloric acid/or citric acid) for removing scale. Care should be taken when using acid descalers as prolonged contact at too high a strength may dissolve cementitious grout. It is important that no residue from these cleaning programmes returns to the pool water.

13.8) Showers

Hot water should be stored at 60°C and distributed to ensure that water at 50°C is obtained at the point of entry to the thermostatic mixing valve to the shower, within one minute. Cold water should be maintained and supplied at no more than 20°C within two minutes of running. Hot and cold water supplies to the shower thermostatic valve should be mixed within 2m of the point of use to 40°C (± 2°C).

• Shower floor, walls, and drains should be cleaned at the start of each day and as appropriate thereafter

- Showers should run to waste.
- All showers installations should comply with HSG 274 part 2. The control of legionella bacteria in hot and cold water systems.
- All showers should be cleaned and descaled in accordance with HSG 274 part 2 requirements

13.9) Pool covers

Pool covers should be checked regularly for any contamination, cleaned as necessary and disinfected with 1000mg/l chlorinated water

13.10) Pool equipment

Any equipment, especially floating types, should be checked to ensure they are hygienic and clean before being used in the pool. This includes inflatable play devices, canoes, sub aqua equipment, arm bands, floats etc. They should be frequently cleaned physically, and periodically disinfected with 1000mg/l chlorinated

water solution and air dried prior to storage. Or alternatively, anything with an impermeable, non-porous surface could be wiped down with 60% v/v ethanol or 70% v/v isopropanol and then allowed to air dry.

13.11) Transfer channels

Deck-level transfer channels should be inspected for dirt and biofilm and cleaned as required, at least once a month. They should be drained and flushed out with 1000mg/l chlorinated water which can be returned to the balance tank. Grilles should be scrubbed at least once a month with 1000mg/l chlorinated water.

13.12) Balance Tanks

Balance tanks should be accessed twice a year for visual inspection, including any mechanical or electrical equipment. The balance tank should be cleaned at least once a year. Debris should be removed and inner surfaces brushed and flushed down with 1000mg/l chlorinated water (see above), which can be returned to the circulation system via the filters.

13.13) Pool bottom

The pool bottom should be kept clear of contamination, algae, and general debris by either daily suction cleaning or other means. Pool cleaning apparatus should be stored in a suitable area and kept clean between uses.

13.14) Pool shell

If a pool is emptied, then the bottom and sides should be scrubbed thoroughly with 1000mg/l chlorinated water before refilling. It should be flushed thoroughly to drain before refilling. Check the integrity of the structure while the pool is empty.

13.15) Underfloor Areas

Debris can collate underneath moveable floors, bulkheads and disabled access platforms. These areas should be inspected and thoroughly cleaned at least once a year. To minimise disruption to pool use, these areas are cleaned using an appropriately certified commercial diving team. Debris is removed via a vacuum system with portable filtering system (debris should not be transferred to the transfer channel or balance tank). Alternatively, the pool can be drained for cleaning procedures; refer to floor manufacturers guidelines for propping instructions prior to draining.

14) Heating and Ventilation

Ventilation systems should ideally be designed to provide 100% fresh air or where this is not achievable a minimum of 12 litres per second of fresh air for each occupant of the pool hall (bathers, staff and spectators). An extra 10% on top of the running rate should be available when necessary (e.g. for temporary higher bather loads or if high levels of contaminants are detected in the pool atmosphere) there is

further guidance on the HSE website. (Ventilation and air conditioning during the coronavirus (COVID-19) pandemic Removal of some coronavirus (COVID-19) restrictions https://www.hse.gov.uk/coronavirus/equipment-and-machinery/air-conditioning-and-ventilation/index.htm).