



Health and Safety in Swimming Pools - What to inspect?

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Background

- Working in swimming pools for 28 years
- OSHCR Chartered Safety and Health Practitioner
- PWTAG Council Member
- RLSS Technical Advisor on Swimming Pools
- BSI Committee Member
- Institute of Swimming Lead Tutor



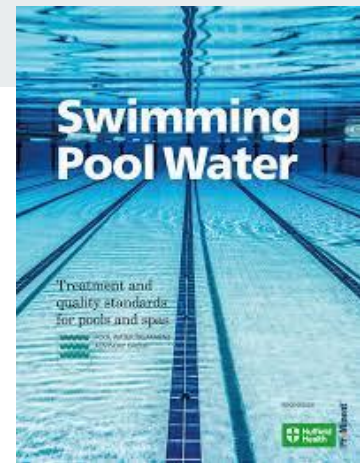
Aim

Highlight some of the major concerns in swimming pools plant rooms in line with current legislation and guidance in the UK

Relevant Guidance UK Guidance

HSG 40 Safe Handling of Chlorine Drums and Cylinders

HSG 179 Health and Safety in Swimming Pools



The Pool Water Treatment Advisory Group (PWTAG) produce detailed guidance on swimming pool water quality and treatment. HSE recognises their guidance as a useful resource for pool operators when drawing up their operating procedures. Enforcing authorities (HSE and local authorities) consider this guidance as the standard to be achieved in effectively managed swimming pools.



HSG 179 - Pool Safety Operating Procedure

The Pool Safety Operating Procedures consists of two documents:

Normal Operating Plan - (NOP)

&

Emergency Action Plan - (EAP)



Normal Operating Plan (HSG 179 V3)

- a) Details of the pool(s) - dimensions and depths
- b) Potential risk - an appreciation of the main hazards
- c) Dealing with the public - arrangements for communicating safety messages to customers,
- d) Lifeguards' duties and responsibilities and special supervision requirements for equipment, etc;
- e) Systems of work including lines of supervision,
- f) Operational systems - controlling access to a pool
- g) Detailed work instructions including pool cleaning procedures,
- h) First aid supplies and training,
- i) Details of alarm systems and any emergency equipment, maintenance arrangements
- j) Conditions of hire to outside organisations.



Emergency Action Plan

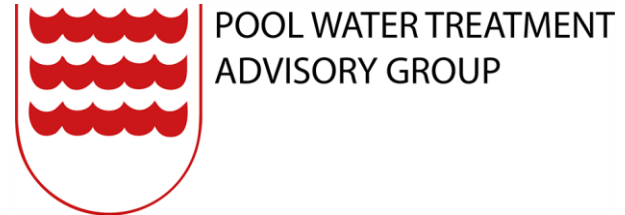
- a) overcrowding;
- b) disorderly behaviour (including violence to staff);
- c) lack of water clarity;
- d) outbreak of fire (or sounding of the alarm to evacuate the building);
- e) bomb threat;
- f) lighting failure;
- g) structural failure;
- h) emission of toxic gases;
- i) serious injury to a bather;
- j) discovery of a casualty in the water.

And more



Pool Water Treatment Advisory Group (PWTAG)

PWTAG is a UK-based independent, non-commercial membership organisation, dedicated to raising standards in pool water treatment. Our work over the last 35 years has made us the authoritative source of standards and guidance in the management of swimming, spa and hydrotherapy pools.





PWTAG Code of Practice

The PWTAG Code of Practice provides pool operators with a structured plan for the technical operation of their pool.

The code ensures that the technical operation of a pool meets quality standards that provide a healthy experience for swimmers using recognised and established practices, techniques, engineering and design. For this reason, all UK pools are encouraged to follow it.

The Code provides a model of operation based on the authority of PWTAG good practice. Following the Code gives an assurance to operators and to the public that the pool meets essential healthy pool operational standards.



POOL WATER TREATMENT
ADVISORY GROUP

PWTAG Technical Notes

PWTAG Technical notes are updates or new material for the standards and guidance given in the PWTAG book, Swimming Pool Water and the PWTAG Code of Practice and should be read in association with these publications.

PWTAG keeps pool operators up to date by providing guidance through these technical notes on the issues of the day.

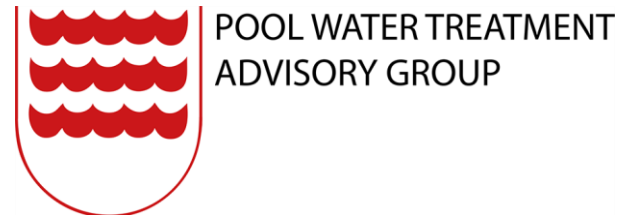
Combining PWTAG's specialist expertise and published scientific data, we aim to optimise swimming pool technical operation.



PWTAG - Qualifications

Swimming Pool Technical Operator

On-site Designated Supervisor





PWTAG Pool Technical Operating Procedure

- 1 - Statement of policy
- 2 - Management system
- 3 - Staff structure and responsibilities
- 4 - Description of pool
- 5 - Schematic of pool and key indicators
- 6 - Normal operating procedures for pool water, heating and ventilation
- 7 - Emergency action plan for pool water, heating and ventilation



POOL WATER TREATMENT
ADVISORY GROUP



Holiday park fined £100,000 after man almost drowned in pool

Woodlands Caravan Site (Trimingham) Ltd, which operated and managed the pool, admitted breaching its duty to ensure that swimmers were not exposed to the risks of drowning between March 12 2015 and April 1 2017.

On Friday September 20 they were sentenced by District Judge John Woollard at Chelmsford Magistrates Court.

Woodlands was ordered to pay fines, costs and a victim surcharge totalling £103,120 and Foley and Baugh Associates is to pay of £5,137.



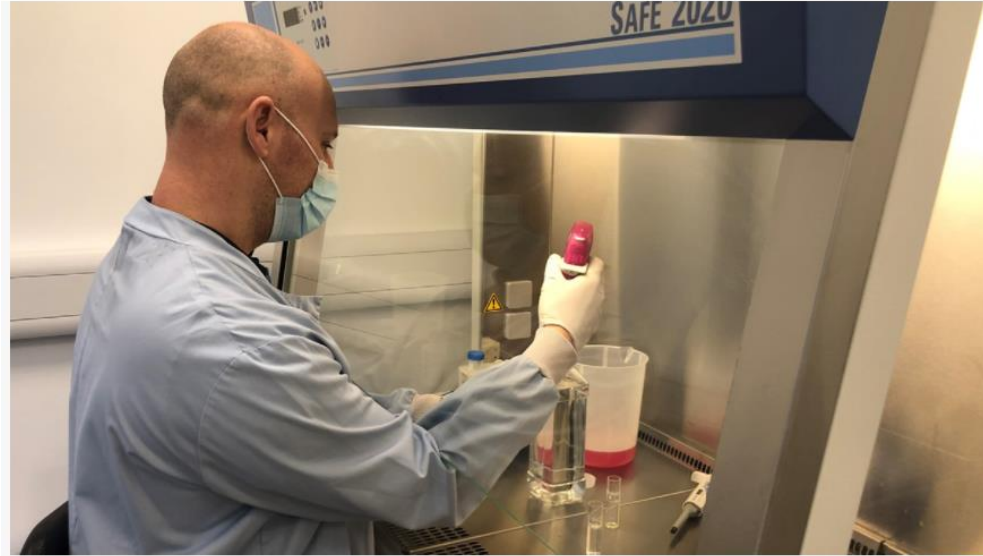
Holiday park fined £100,000 after man almost drowned in pool

Andrew Hird, from Woodlands, said: "Woodland holiday park has in its very early admission of guilt recognised that in this instance the paperwork specifically associated with the swimming pool failed under scrutiny to meet the highest levels of the health and safety standard.

"Since the incident and following our full co-operation with the investigative authorities alongside a rigorous internal review the company has implemented completely new normal and emergency operating procedures and has welcomed many thousands of guests to our leisure facilities."

Swimming Pools and Covid 19

The UK was the first in the world to complete Covid 19 testing in swimming pool water. The paper has been submitted to the journal 'Water Research' for Publication and is currently 'under review' by independent scientists



Swimming pool water inactivates Covid-19 virus in 30 seconds, according to new study

12 April 2021

Swimming pool water can inactivate the Covid-19 virus in only 30 seconds under the right conditions, reveals a study by virologists at Imperial College London

How many swimmers can my plant room deal with

There are two methods of working out how many swimmers can fit in a swimming pool one is from the aspect of spatial awareness and the other from filter capacity.

Health and Safety Executive

- HSE / HSG179 Health and Safety in Swimming Pools method 3 metres

PWTAG Code of Practise

- Water depth under 1.0 metres use 2.2 metres squared
- Water depth between 1.0-1.5 metres use 2.7 metres squared
- Water greater than 1.5 metres use 4.0 metres squared



Medium and high rate filters

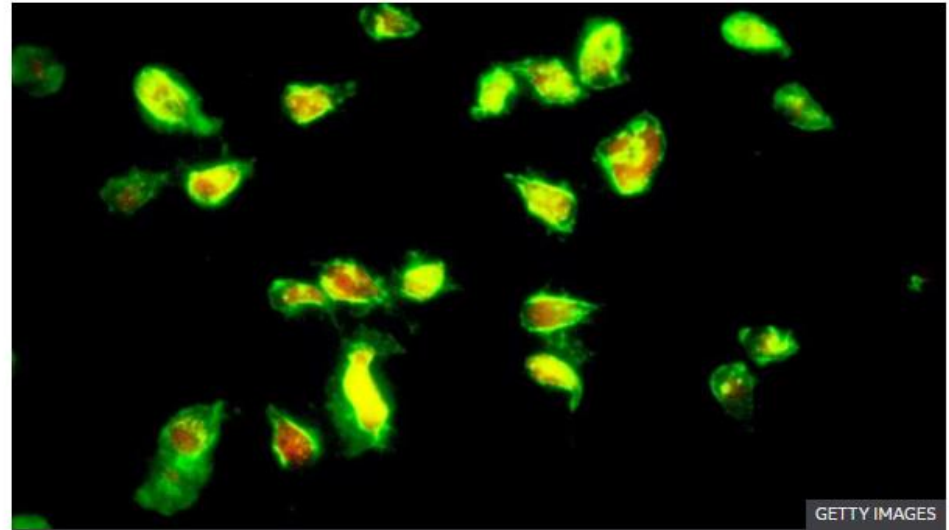


UK's biggest outbreak

To date this is the largest outbreak in the UK within a swimming pool or spa system.

Upper Poppleton 'dirty' swimming pool gave 165 stomach bug

16 January 2019



Giardiasis is a stomach bug that causes symptoms like diarrhoea and bloating

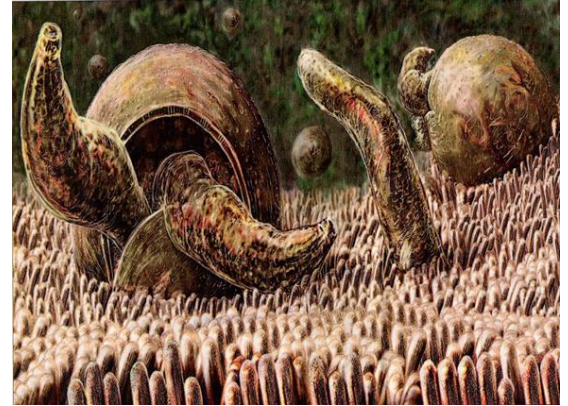
A "dirty" swimming pool led to dozens of young children contracting a stomach bug causing diarrhoea, a council said.

Inspectors who visited Dolphins Swim School in York saw "brown and green" pool water, with 165 children and parents contracting giardiasis.

Cryptosporidium

- Is NOT a bacteria
- It is a parasitic amoeba which lives in the gut of animals
- It is the cause of severe diarrhoea
- It is removed by filtration with continual flocculation and Ultra Violet as secondary disinfection
- Pools MUST follow written procedures in EAP

Probably the biggest risk to your swimming pool







CRYPTO

Starting point for inspections

Following the biggest outbreak of cryptosporidium in a swimming pool in 2009 in Wales. A inspection sheet was compiled for the HSE and EHO's to use.

| | | | |
|---|--|--|--|
| Public Health Wales Microbiology Division | | Guidance for the investigation of <i>Cryptosporidium</i> linked to swimming pools | |
|  | |  | |
| Guidance for the investigation of <i>Cryptosporidium</i> linked to swimming pools | | | |
| Appendix 1: <i>Cryptosporidium</i> Risk Assessment Check List | | | |
| Agencies: Public Health Wales, Public Health England, Local Authorities, the Chartered Institute of Environmental Health, the Pool Water Treatment Advisory Group and the Chartered Institute for the Management of Sport and Physical Activity. | | | |
| Authors and original affiliation: Rachel Chalmers, Head of UK <i>Cryptosporidium</i> Reference Unit, Public Health Wales. Rosemary McCann, Consultant in Communicable Disease Control, Greater Manchester Health Protection Unit. Gwen Lowe, Consultant in Communicable Disease Control, Health Protection Team, Public Health Wales. Ash Modi, Specialist Registrar in Public Health, Greater Manchester Health Protection Unit. Rhianwen Stiff, Specialist Registrar in Public Health, Public Health Wales Catherine Quigley, Regional Epidemiologist, Regional Epidemiology Unit, HPA North West. Paul Cleary, Regional Epidemiologist, Regional Epidemiology Unit, HPA North West. Ayo Oluwalanle, Specialist Registrar in Public Health, Cheshire & Merseyside Health Protection Unit. Peter Lamb, Environmental Health, Trafford Council. Craig Sewell, Environmental Health, Merthyr Tydfil County Borough Council. Sarah Jones, Health improvement, Cardiff City Council, Health Improvement. Mark Elliott, Chair, All Wales Communicable Disease Technical Panel Julie Barratt, Director, CIEH Wales. Janice Calvert, Chair, Pool Water Treatment Advisory Group. Ralph Riley, Institute of Sport and Recreational Management. Gordon Nichols, Consultant Epidemiologist, Health Protection Agency, Centre for Infections. Clare Elliott, Scientific Web Editor, Public Health Wales. | | | |
| Approved by: HPA GI programme board | | Approval date: 24/01/11 | |
| Date issued: 18 July 2016 Document Version: CRUGITO 102 app.1 v3 Page: 1 of 16 If printed, this document is only valid for today 7 September 2021 unless authorised as a controlled copy | | | |

Using a coagulant

- Coagulants/flocculants help improve filtration by removing small particulate matter providing better clarity of the pool water
- They are often dosed into the pool and then go on to form a floc on the filter bed after binding small particles and debris together
- The manufacturers dose rate is important to follow as too much can cause a type of contamination to appear in the pool



BRISTOL STOOL CHART

PWTAG Tec

Does the swimming pc

Do children under the

Can the type of faeces



TYPE 1 - SEVERE CONSTIPATION

Separate, hard lumps



TYPE 2 - MILD CONSTIPATION

Lumpy and sausage like



TYPE 3 - NORMAL

A sausage-shape with cracks in the surface



TYPE 4 - NORMAL

Like a smooth, soft sausage or snake



TYPE 5 - LACKING FIBER

Soft blobs with clear-cut edges



TYPE 6 - MILD DIARRHEA

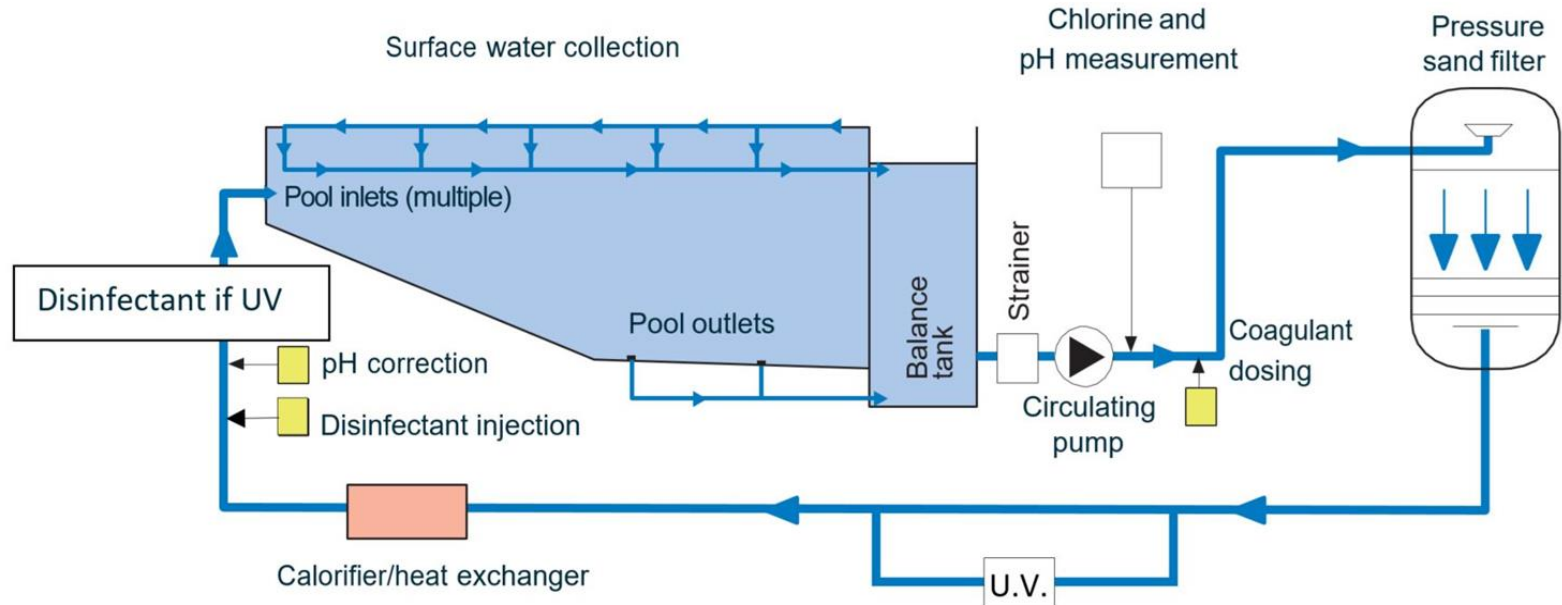
Mushy consistency with ragged edges



TYPE 7 - SEVERE DIARRHEA

Liquid consistency with no solid pieces

Typical Swimming Pool Plant Room Layout



Safe Systems of Work

Pump change over

Cleaning strainer baskets

Cleaning in line strainers

Probe cleaning and Calibration

Backwashing and wasting water

Air bleeds on filters

Cleaning an injector



BS 13451 -3 - Inlets and Outlets



IN TOO DEEP Screaming girl, 6, 'sucked into swimming pool pump and left trapped for three hours in agony' on Costa del Sol holiday

EXCLUSIVE

Brittany Voronov | Tim McHulty
18 Aug 2019, 14:37 | Updated: 19 Aug 2019, 14:06

14 COMMENTS

A SIX-YEAR-OLD girl was sucked into a swimming pool pump and left trapped for three hours in agony while on holiday in Costa del Sol, her family claim.

Terrified Zara Clarkson desperately had to keep her head above water for hours as firefighters armed with jackhammers smashed through the pool's concrete wall to free her.

Boy, 14, fighting for his life after being sucked into water park pool drain 'for dare'

Jimmy McCloskey Thursday 15 Aug 2019 3:05 pm



A 14-year-old boy suffered horrific internal injuries after he climbed into a pool drain at this water park in Crystal Beach, Texas, on a suspected dare (Picture: KTRK)

A 14-year-old boy is critically ill in hospital after being sucked into a water park pool drain in a suspected dare gone wrong.



Equity release is available to homeowners aged 55+. Equity Release may involve a home reversion plan or a lifetime mortgage which is secured against your property. To understand the features and risks ask for a personalised illustration. Any money released, plus accrued interest to be repaid upon death or moving into long-term care and it is a requirement of releasing equity that you repay any outstanding mortgage. * Touchstone data 2018 - Q1 2020.

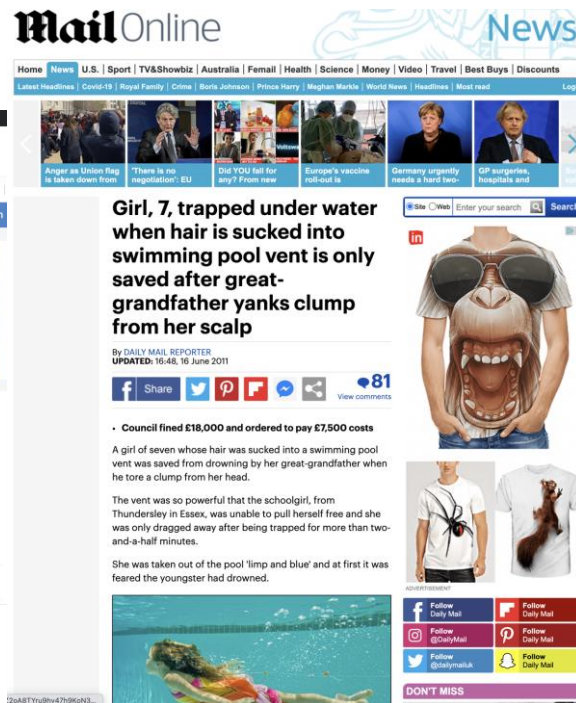


POOL TRAGEDY 'Bad swimming pool design' caused deaths of Brit family who drowned in Costa Del Sol, expert claims

EXCLUSIVE

By Simon Lennon
2 Jan 2020, 17:32 | Updated: 3 Jan 2020, 7:25

188 Comments





Scope of EN 13451-3

This document specifies safety requirements and test methods for inlets and outlets for water/air and water/air based leisure features involving water movement, in addition to the general safety requirements of EN 13451-1.

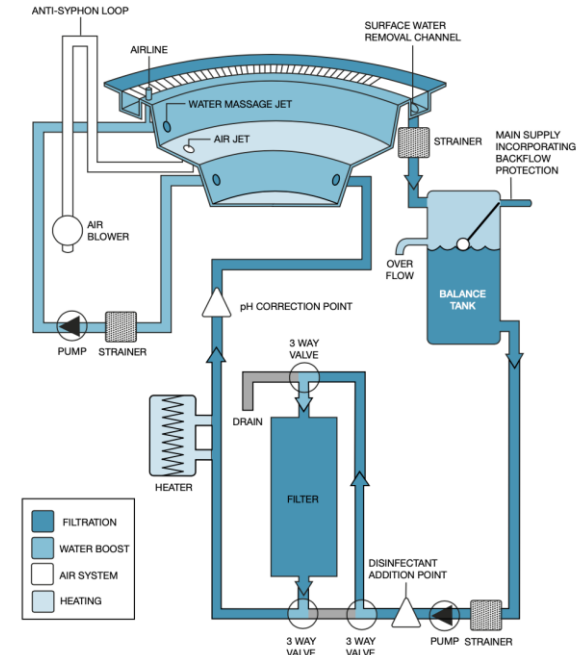
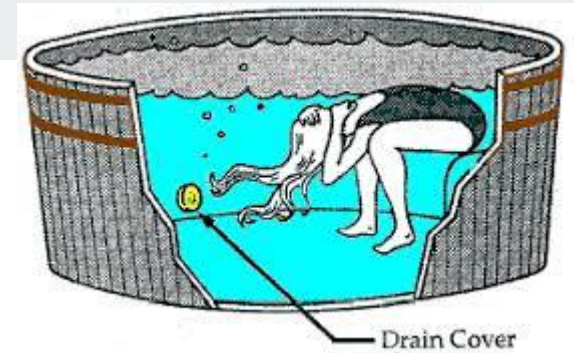
The requirements of this specific standard take priority over those in EN 13451-1.

This part of EN 13451 is applicable to swimming pool equipment installed in pools for public use designed for:

- the introduction and/or extraction of water for treatment or leisure purposes;
- the introduction of air for leisure purposes;
- water leisure features involving the movement of water.

Inlets and outlets standards

- Aperture diameter maximum 8mm - prevent finger entrapment
- Permissible water speed 0.4 m/s
- Minimum of 300mm width but ideally 450-600mm width
- Commercial Spas and hot tubs - Guidance in HSG282



Outlets vortexing

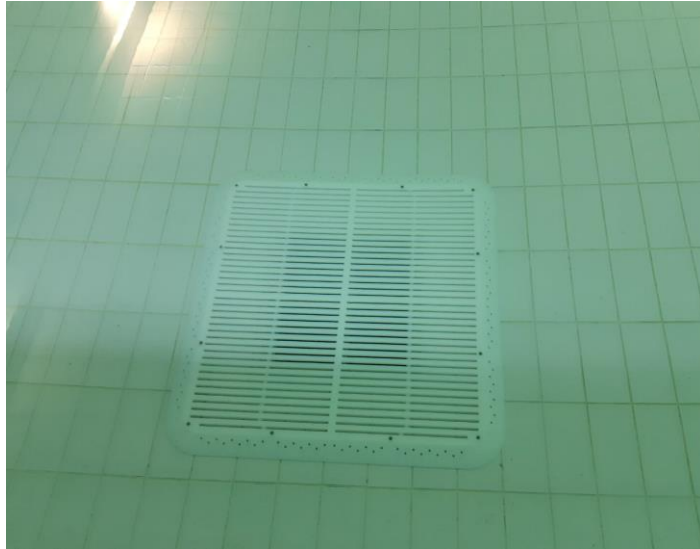




VORTEX single outlet - SCARY



Anti vortex covers





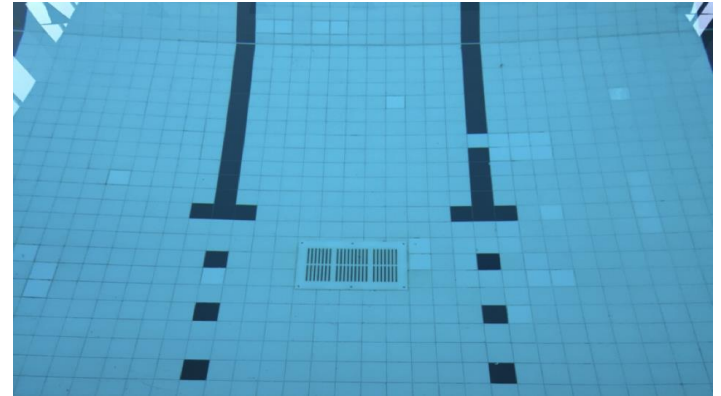
Testing video



Prioritising site to test

The following sites would pose to have an additional risk and may want to be assessed first

- Pool with features (Flumes, rapids, wave machines etc)
- Single water outlets on the base of the pool
- Outlets with a diameter less than 450mm
- Non connected dual outlets
- Uncover vacuum outlets
- Grilles which are constructed from plastic
- Single skimmer box systems
- Swimming pools without flow rate meters
- Counter current devices
- Pools with a depth greater than 2 metres



Dye/Stain Testing



When not to swim

Exclusion policies

Diarrhoea or vomiting – 48 hours

Confirmed case of crypto – 14 days

Babies & Toddlers – Swim nappies

System whereby two nappies are worn by the baby/toddler to reduce the risk of faecal accidents in the pool water from occurring

New nappies technologies now existing using silver lining



Automatic vs hand dosing a pool

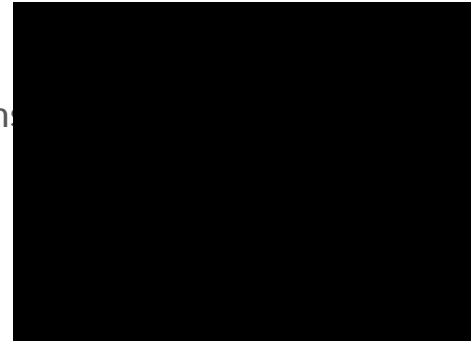
During swimming lessons there would be very little opportunity to hand the swimming pool plus you also require more time after hand dosing for the dynamic flow to take place.

Dosing into a skimmer will also require time to go through the plant room and back to the pool via inlets. Should a customer be next to the inlets then they could potentially be in a chemical hotspot.

Hand dosing in a swimming pool is not impossible during lessons.



con



Pool Water Testing

In line with PWTAG Code of Practice

- Automatic dosing systems should at least three times a day
- Manual dosing systems every two - three hours
- Hand dosing system every two hours

Tests should include for a chlorine disinfectant based pool Free Chlorine, Total Chlorine to establish the Combined Chlorine and pH.

Photometers should be calibrated on an annual basis in accordance with BS EN ISO 17025 : 2017





Water Testing Parameters

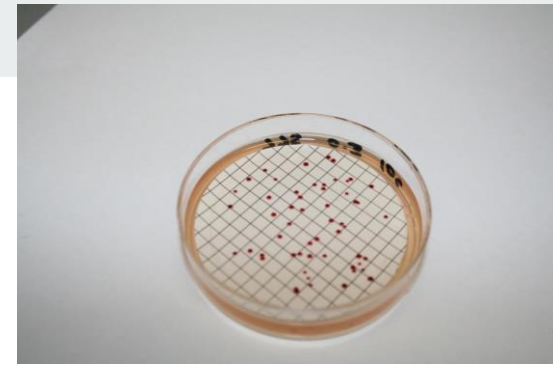
- Free Chlorine minimum 0.75mg/l maximum 5.0mg/l
- pH levels ideal 7.0-7.2 minimum 6.8 maximum 7.6
- pH levels above 7.2 the minimum free chlorine level should be 2.0mg/l
- Cyanuric acid (outdoor pools only should use stabilised chlorine) minimum 50mg/l maximum 100mg/l
- Total Alkalinity minimum 80mg/l maximum 200mg/l
- Calcium Hardness minimum 80mg/l maximum 500mg/l
- TDS no more than 1000ppm above the mains or 1500ppm for salt based
- Balance water testing -0.5 to +0.5
- Salt based 3000mg/l - 4000mg/l

Microbiological testing

Microbiological Testing in swimming pools is a requirement under the COSHH Regulation 2002 Regulation 6 (2) (k) - the approved classification of any biological agent

Frequency of testing

- Swimming pool monthly
- Spa systems monthly with quarterly legionella testing as well
- Hydrotherapy pools weekly



Postal testing are generally not accepted as they meet the requirements of storage 3-4 degrees



Microbiological Testing

Microbiological outbreaks in swimming pools come under the COSHH Regulations 2002 however the frequency of testing was prescribed initially in PAS 39 and more recently the PWTAG Code of Practice.

Test must be completed by a UKAS Laboratories and should be for the following

- Total Viable Conliforms TVC37
- Pseudamonus Aerogiounos
- Coliform Organisms
- E-coli 0157

Swimming pools should be tested in the calendar month Hydrotherapy pools weekly



Update report for PWTAG Council on Monday 21st June 2021

HSG 282 - Hotels, Holiday Parks and Air BnB

Regarding HSE updates re:
HSG 282 and Scandinavian hot tubs, and Air BnB's
And a call for data for spa pool systems

This brief report provides an update to PWTAG Council on email correspondence with Duncan Smith and Margaret Wade at HSE.

HSG 282 scope

The first update is regarding HSG 282 guidance for whether Scandinavian hot tubs are in scope of HSG 282. Despite the definition of a hot tub not being as applicable for a Scandinavian hot tub (due to a lack of pumps, jets, etc to cause aerosolization of the water regarding legionella risks) the HSE have confirmed that these hot tubs are in scope.

The HSE have confirmed by email that while there is no current plan to update HSG 282, they do consider that as these spa pool systems are covered in the scope of HSG 282 (due to other infectious agents in spa pool systems) and that the industry should provide this clear message. BISHTA will be updating its factsheets to make sure this is communicated to the industry. PWTAG may wish to promote a similar message, if applicable.

Similarly, when BISHTA asked the HSE for clarification if Air BnB's were in scope of HSG 282, the reply in summary was that as it was covered under the Health & Safety at Work Act, the HSE consider this activity is in scope of HSG 282. Given the diverse nature of how Air BnB's may be used in relation to a hot tub, there may be a need for additional guidance to make sure that normal operating procedures are as reasonable as practicable.

68 Where domestic-type spa pools are used as a business activity, the bather load is restricted to a discrete group of users.

Spa Pool Systems

Bespoke spas

69 A bespoke spa pool is built in situ using standard, factory-built parts which may be modified or added to on site. Bather loads, water temperature and the size of the pool may vary greatly but usually they have a higher bather load and are in a commercial setting (defined below). These pools typically have either an overflow or deck-level spa with a separate filter and continuous chemical feeder system (see Figure 1 on page 26). The design includes a separate balance tank generally located in the plant room. The complexity of the design features, any associated equipment and the aerosol exposure must be considered during the risk assessment and will require enhanced levels of control and monitoring.

Domestic-type spa pools – used as a business activity

76 Domestic-type spa pools or hot tubs used as part of a business activity (eg in a holiday park rental unit or hotel bedroom(s) with their own dedicated spa, or as part of a rental agreement for a single family or group use) are subject to the general duties under the HSW Act. There is a legal requirement for these systems to be managed and controlled in proportion to the risk and the risk assessment should consider the type of pool and its use. Domestic-type spa pools are for use by a small, discrete group of people at any one time and are typically:

- of either a rigid or inflatable/foam-filled structure with freeboard and skimmer;
- systems where the water should be changed after each rental/week, whichever is the shorter;
- disinfected using bromine or chlorine through the use of an inline disinfectant feeder.

| Operational actions | Typical frequencies | |
|--|--|--|
| | Commercial-type spa pools (high bather load) | Domestic-type spa pools and hot tubs |
| Replace cartridge filter with a cleaned cartridge | - | At water replacement |
| Inspect strainers and grilles | Daily | At water replacement |
| Record incidents | Daily | As appropriate |
| Check any automatic systems are operating correctly | Daily | Daily, where fitted |
| Drain spa pool, clean whole system including strainers and refill | Daily to weekly based on risk assessment | Between each group of users or at least weekly, whichever is shorter |
| Drain and clean balance tank | At least twice per year based on risk assessment and weekly visual checks | - |
| Inspect accessible pipework and jets and clean as necessary | Weekly | Weekly |
| Disinfect flexible hoses | Monthly | Monthly |
| Microbiological testing | Monthly for ACC, coliforms, <i>E coli</i> , <i>P aeruginosa</i> and quarterly for legionella | Monthly for ACC, coliforms, <i>E coli</i> , <i>P aeruginosa</i> and quarterly for legionella |
| Clean input air filter | Monthly | Monthly |
| Full chemical test dependent on water quality | Monthly or as determined by risk assessment | As determined by risk assessment |
| Disinfectant/pH controller – clean electrode and check calibration | Monthly or according to manufacturers' instructions | Monthly, where fitted, or according to manufacturers' instructions |
| Check effectiveness of filtration | Quarterly | - |
| Check, clean, disinfect and dry filter cartridge | - | Between each group of users or weekly, whichever is shorter |
| Clean and disinfect airlines | Quarterly | Weekly where appropriate |
| Check sand filter | Quarterly check and annual sand replacement | - |

| Operational actions | Typical frequencies | |
|---|---|--|
| | Commercial-type spa pools (high bather load) | Domestic-type spa pools and hot tubs |
| Check water clarity | Daily at opening and every two hours thereafter | At least twice daily depending on risk assessment and usage |
| Check if dosing system is working | Daily at opening | Daily |
| Check chemical reservoir level | Daily at opening | Daily where appropriate |
| Determine pH value, and residual disinfectant | Daily at opening and every two hours thereafter | At least twice daily depending on risk assessment and usage |
| Determine TDS | Daily | - |
| Clean the water-line | Daily – at end of the day/ user period with a fresh damp cloth using sodium bicarbonate (sodium hydrogen carbonate) | Check daily and clean as appropriate but as a minimum at water replacement |
| Clean overflow channels and skimmers | Daily – at end of the day/ user period | Check daily and clean as appropriate but as a minimum at water replacement |
| Clean spa-pool surround | Daily – at end of the day/ user period | Check daily and clean as appropriate but as a minimum at water replacement |
| Backwash filter | Daily – at the end of the day/user period | - |

Why are spas potentially more dangerous?

This is due to the aeration of the water and the fine droplets of water given off via a spa. Spas can give off a bacteria called Legionella if they are not maintained.

- Legionella ideal growth conditions are between 20-45 degrees celsius
- Stagnant water eg lack of circulation
- No chlorination and being aerated



'We've sold out': Hot tub sales rise by 1,000% and suppliers struggle to keep up with demand as Britons spend more time in the garden

Legionnaires' deaths: Stoke-on-Trent firm JTF fined £1m

© 3 July 2017



IRWIN MITCHELL

The family of delivery driver Richard Griffin said he had never taken a day off in 30 years

A hot tub sales firm has been fined £1m following the deaths of two men from Legionnaires disease.

Twenty others were also affected after a hot tub on display at JTF warehouse in Stoke-on-Trent exposed people to harmful levels of Legionella bacteria.

sed with eBay seeing orders soar by 1,080% in April
g time in their garden due to lockdown

Richard Griffin and William Hammersley, 79, from Chesterton, died in 2012. Harry Cadman, 71, from Stoke-on-Trent, died from a pre-existing condition.

he cash refunds from cancelled holidays
posing to rent them for events like birthdays

JTF admitted a health and safety breach at Stafford Crown Court on Friday
seeing a huge increase in business in recent months



Thank you for your time

Any questions

Contact - ianogilvie6724@gmail.com