How a movable floor affects water hygiene

Water Hygiene, Recommended pre-reading

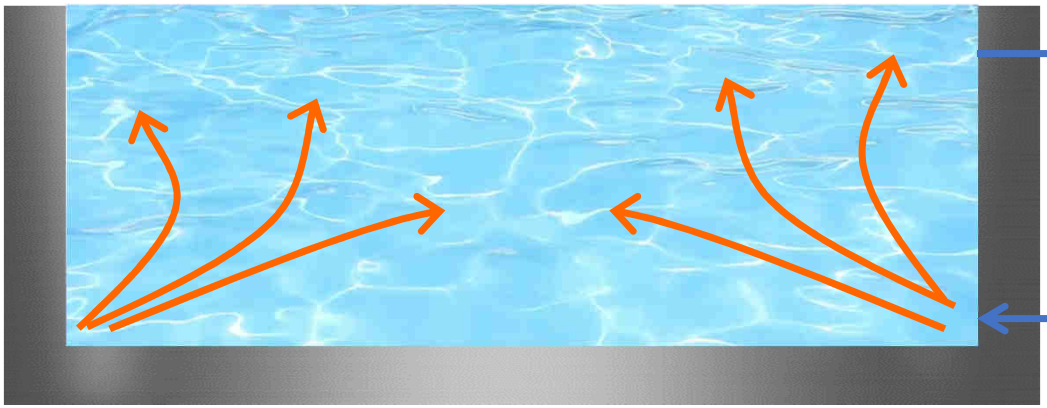
- Water Hygiene is important in Public pools, and ***Extremely*** **important** in Aquatic Therapy pools.
- Aquatic Therapy pools are often used by vulnerable patients



- In our separate presentation "The importance of Water Hygiene" we cover the subject of water treatment in Aquatic Therapy pools. See: https://is.gd/HWvawg

Regular swimming pool

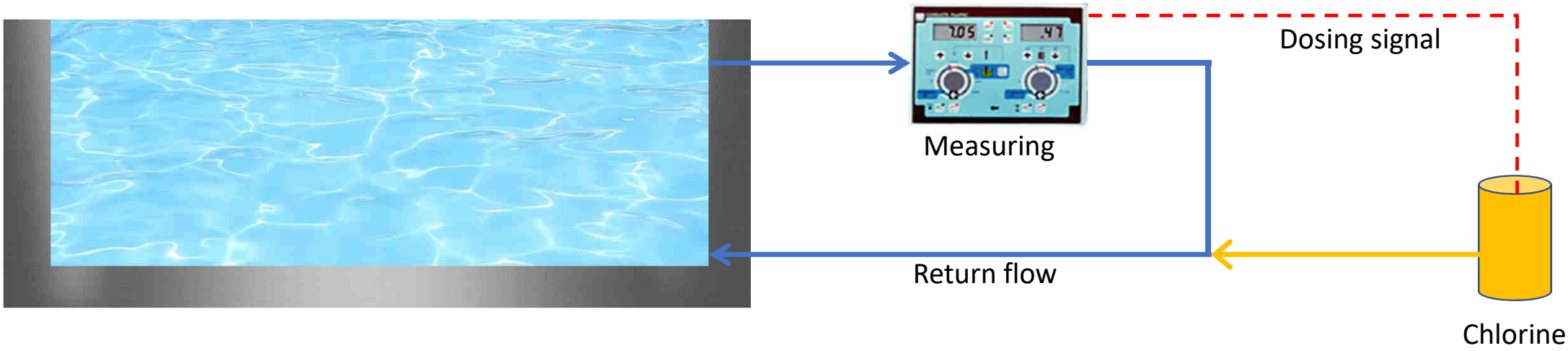
- In a regular swimming pool, water is drawn from the top (skimmers or overflow gutter), treated, and re-injected through bottom inlets.



Water treatment Plant
- Circulate
- Filter
- Heat
- Add chlorine

Measurement and adjustment of chlorine levels

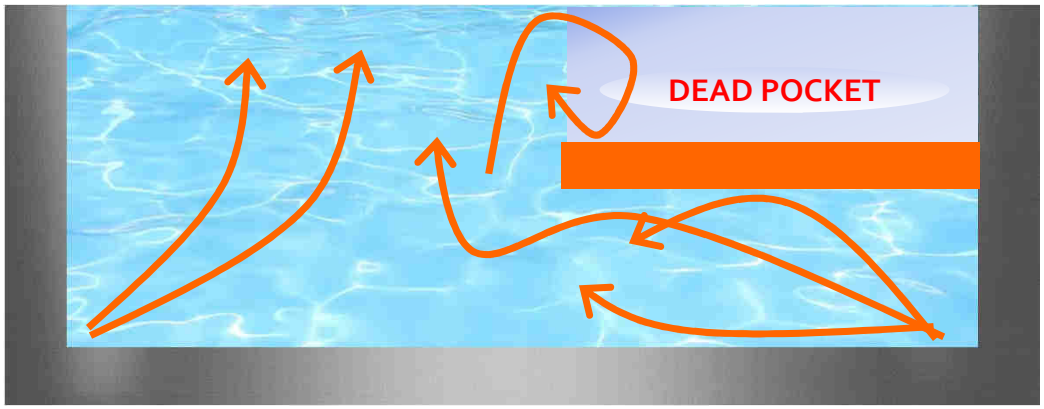
- As the water comes out of the pool, the Free chlorine concentration is measured. If the measured value is lower than the set value, an extra amount of chlorine will be added to the return flow of the water.
- Therefore, the measurement is done in a location in the pool with the ***Lowest*** expected Free chlorine level. Towards the bottom of the swimming pool, a ***Higher*** Free chlorine level can be expected. Because the water is also heated by the water treatment plant, the re-injected water can be expected to rise to the top quickly, fully mixing in the Free chlorine.


Measuring
Dosing signal
Return flow
Chlorine

How mixing affects water quality

- To be effective against Bacteria, the Free chlorine must be ***Fully*** mixed with the swimming pool water. Mixing water of different temperatures seems simple, but in fact it is much harder.
- This is practically demonstrated by nature in Manaus, Brazil, where two rivers with a different temperature meet and the water does not mix for about 6 km.(Picture courtesy Wikipedia, creative commons)

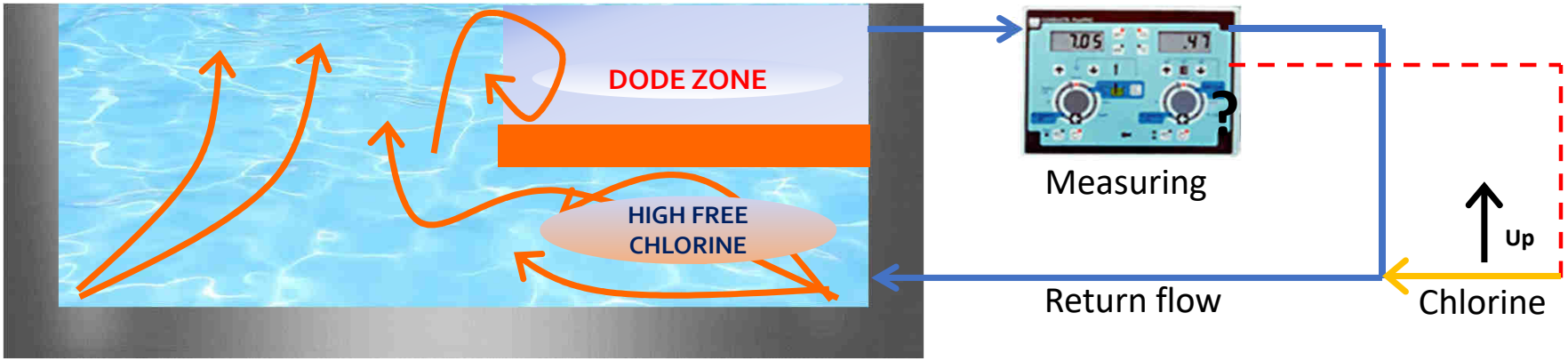
How obstacles affect water mixing



- When there is an object in the water, this will prevent the chlorinated water from the treatment plant to reach all the corners of the swimming pool.
- In these regions, so called ‘dead pockets’, the water is not sufficiently replenished, causing the Free chlorine concentration to drop below acceptable levels, enabling bacteria to procreate.
- Dead regions in swimming pools should be avoided! They pose a ***Health Risk*** to the users.

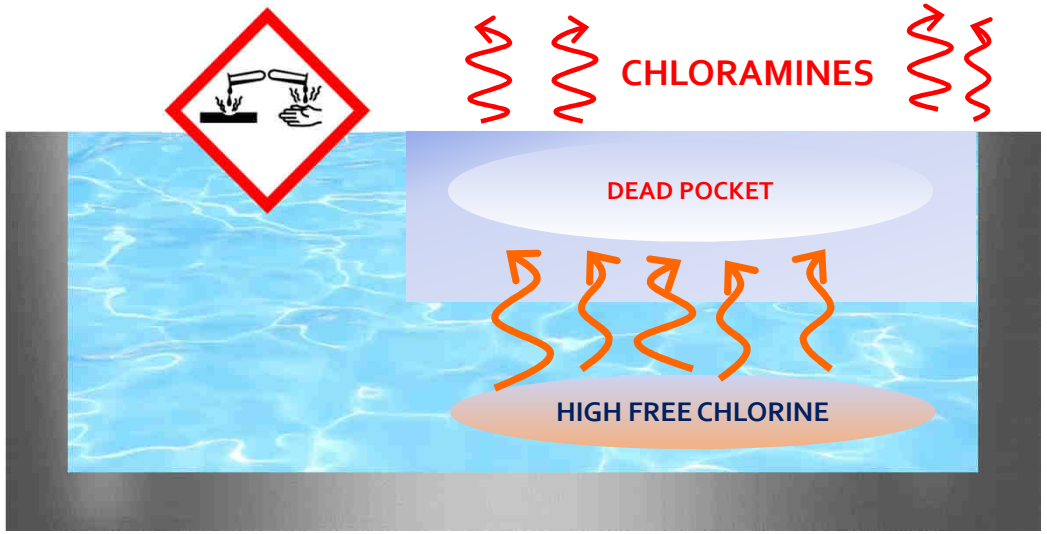
How obstacles affect measurement and control of Free chlorine levels

- When water is measured from a dead region, the Measurement & Control unit will misinterpret the Free chlorine level and add more chlorine into the pool than actually required.
- This results in excessive Free chlorine levels underneath the obstacle.



When the two waters meet and mix

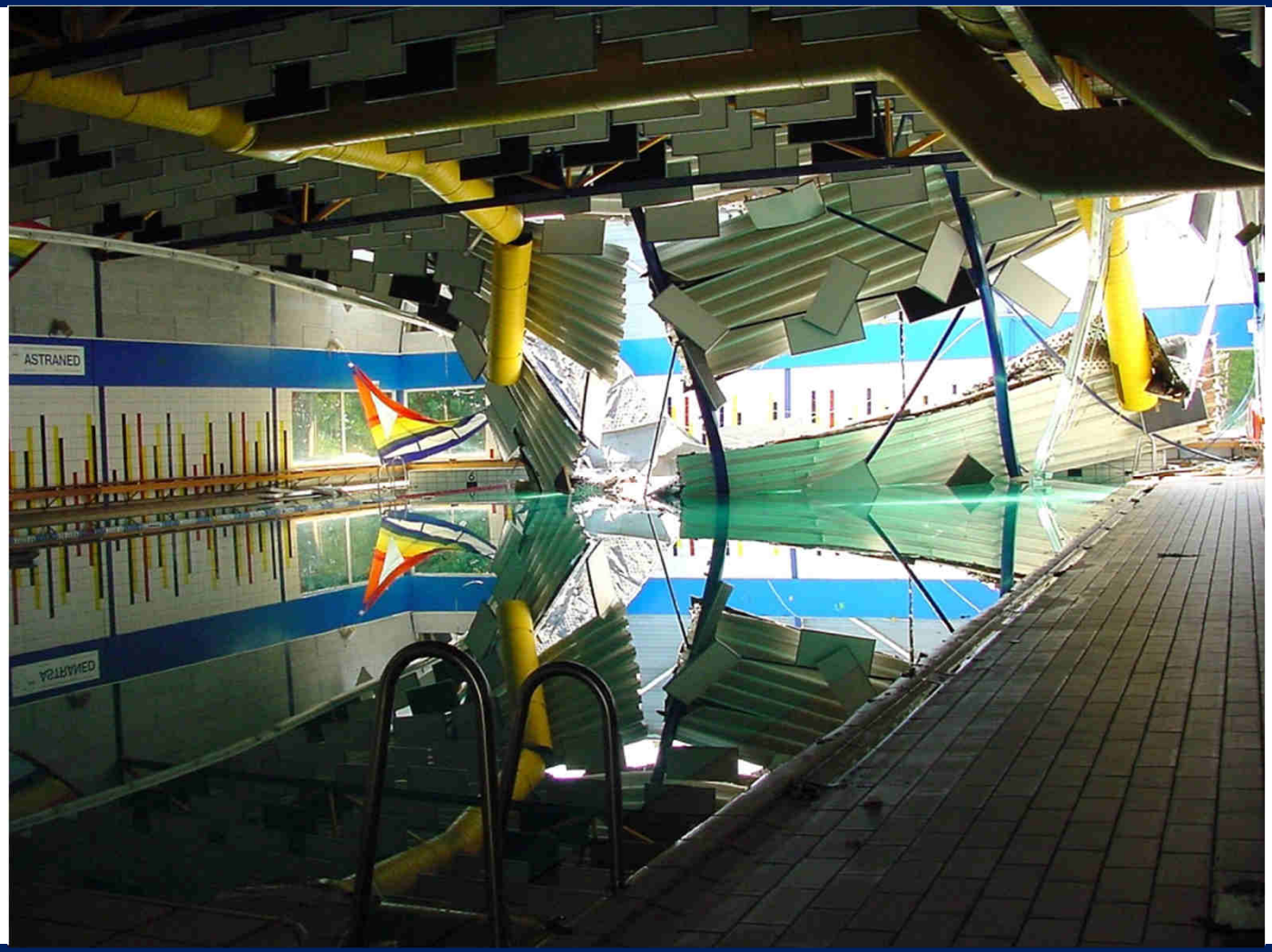
- Above the obstacle, we have water with a low Free chlorine content. Because of the low amount of Free chlorine, Bacteria will start to grow.
- Beneath the obstacle, we have water with a high Free chlorine content.
- If the obstacle is taken away or moved, the waters will meet and mix. The Free chlorine will instantly bind to the bacteria that are present in the low- Free chlorine water, producing high amounts of ***airborne Chloramines***, causing a ***very strong chlorine odour***.



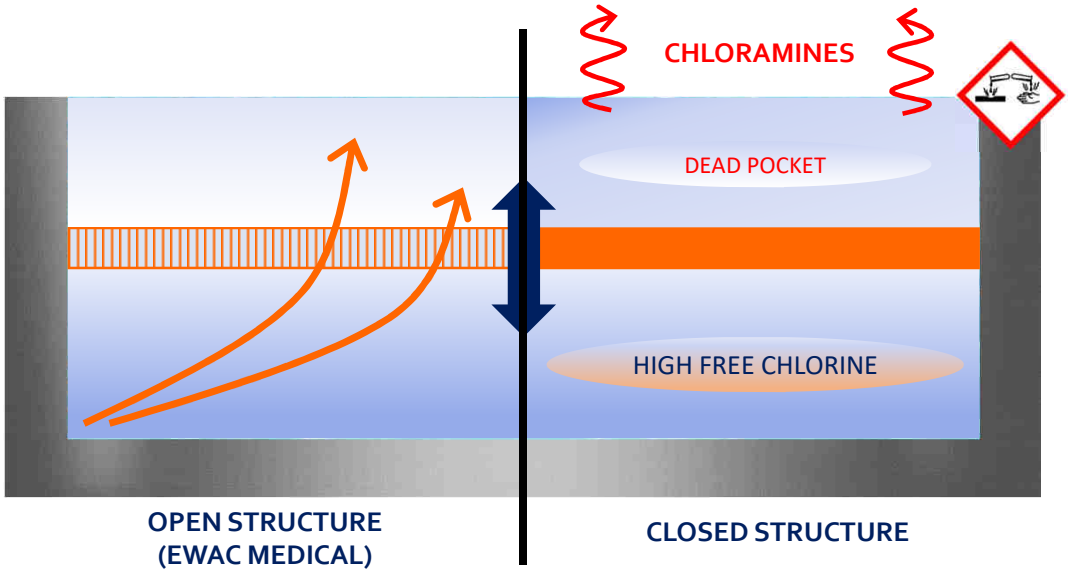
How Airborne Chloramines affect corrosion

- Airborne Chloramines are ***extremely corrosive***. They attack all metals, such as in the support structure of the building.
- This has been practically demonstrated in multiple accidents that have happened in the past, including the collapse of entire ceilings in swimming pool buildings.

Ceiling collapse in Steenwijk, The Netherlands


ASTRAND

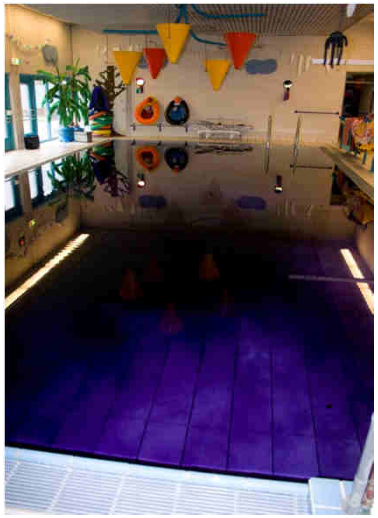
What this has to do with a *movable floor*



- A movable floor is principally just an **object** in the water that influences how water moves through the pool.
- If the movable floor has an ***open structure***, the influence will be only minimal
- If the movable floor has a ***closed structure***, it will cause the problems that have been previously stated.

How to determine the influence of a movable floor

- To assess the influence of a movable floor on water circulation, European Regulation EN-15228-2:2018 requires a ***Dye Test*** to be performed
- A colorant is added to the recirculated water. After 15 minutes, the swimming pool water should be evenly coloured.

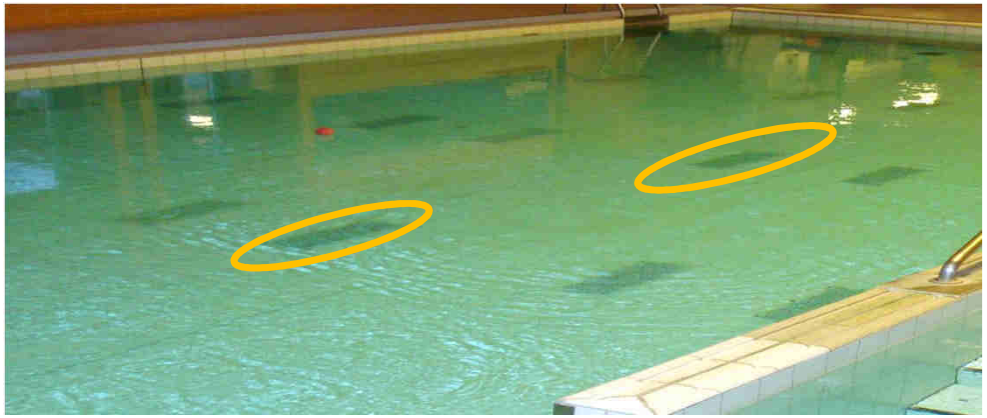


15 minutes

Support for an open structure

- An **EWAC Medical movable floor** has an open structure, letting water through **distributed evenly** over the whole surface area. Therefore the water will stay healthy
- This has been proven in countless dye tests
- Because of its open structure, the EWAC movable floor outperforms its competitors by far.

Effects of a closed structure

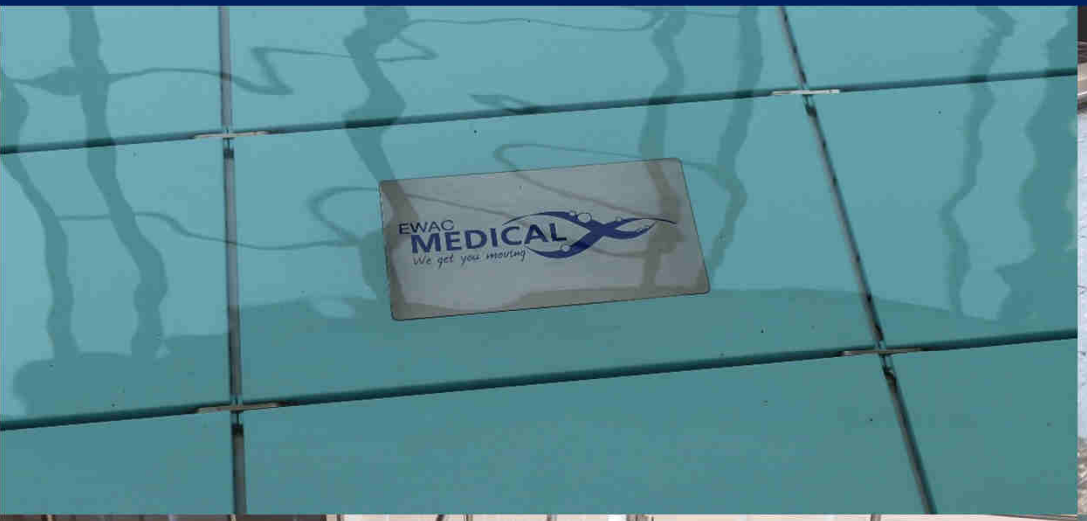


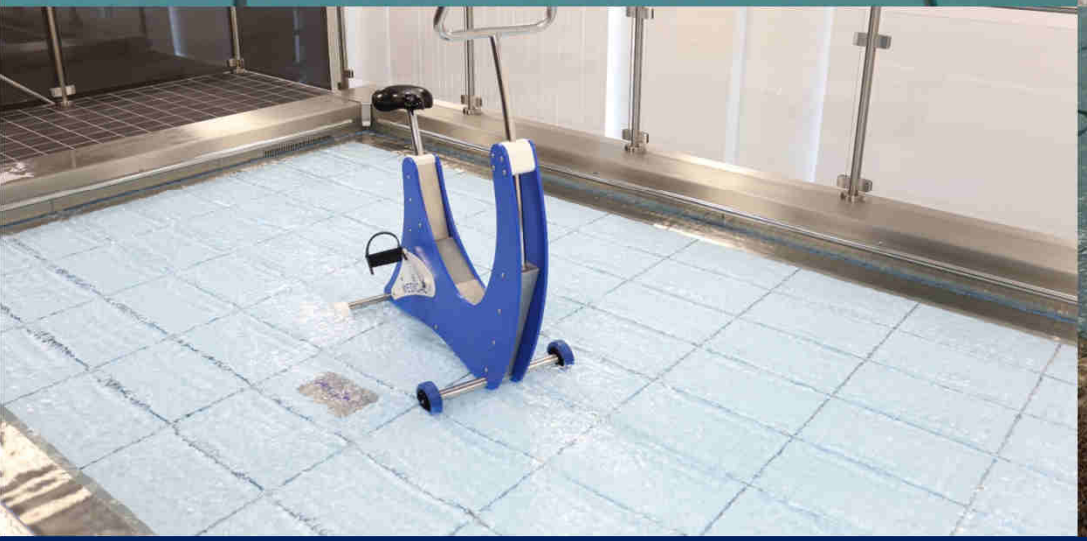
- In a closed structure, manufacturers have to add some kind of grating in the floor to let at least a small amount of water through (highlighted in the picture).
- When these gratings are unevenly spread, the pool water will not mix well enough, causing elevated Free Chlorine levels underneath the movable floor.
- If the floor is now moved, the waters will mix and produce excessive amounts of Chloramines and ***become odorous***.

Conclusion

- Water quality is a ***real issue*** in an aquatic exercise environment.
- Badly managed water leads to airborne Chloramines, which ***attack*** constructive parts of the building.
- An EWAC movable floor has an ***open structure*** which enables you to:
  - Manage water quality in a far better way
  - Avoid the formation of aggressive Chloramines
  - Ensure user safety and health

EWAC MEDICAL
We get you moving



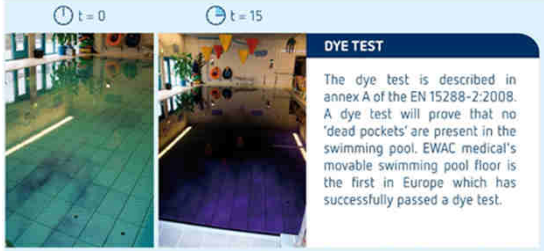


WATER TREATMENT

Apart from state of the art Aquatic Therapy equipment, EWAC Medical also takes care of the entire water treatment plant to ensure optimal hygienic safety for the patient.

WATER TREATMENT

Using modern and well tested technologies, EWAC Medical builds the right system that suits the size and use of the pool. Especially in medical treatment situations, hygienic safety of the water is paramount. With our water treatment systems the chlorine concentration can be kept at a value that is both low and safe, and also the pH is kept at a safe and comfortable level for the userss



DYE TEST

The dye test is described in annex A of the EN 15288-2:2008. A dye test will prove that no 'dead pockets' are present in the swimming pool. EWAC medical's movable swimming pool floor is the first in Europe which has successfully passed a dye test.

WATER TREATMENT

In combination with the EWAC Medical movable floor system, our systems are unique in the market because they conform to the strict 15288-2:2008 Annex A Dye test. This means that regardless of the presence of an adjustable floor in the water, the water is still properly circulated and bacteria are still effectively countered by the water treatment system.

CONTACT DETAILS

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We get you moving

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