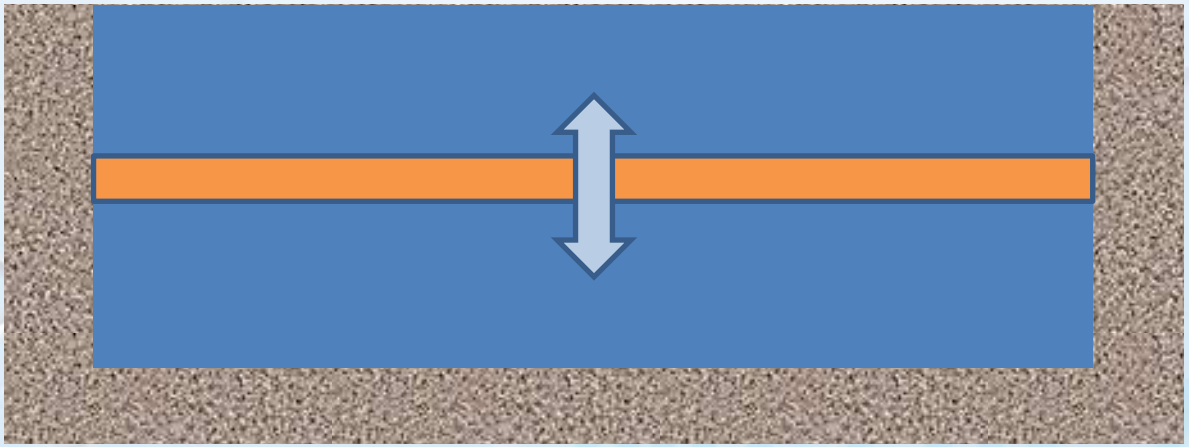
How a movable floor affects Water Hygiene

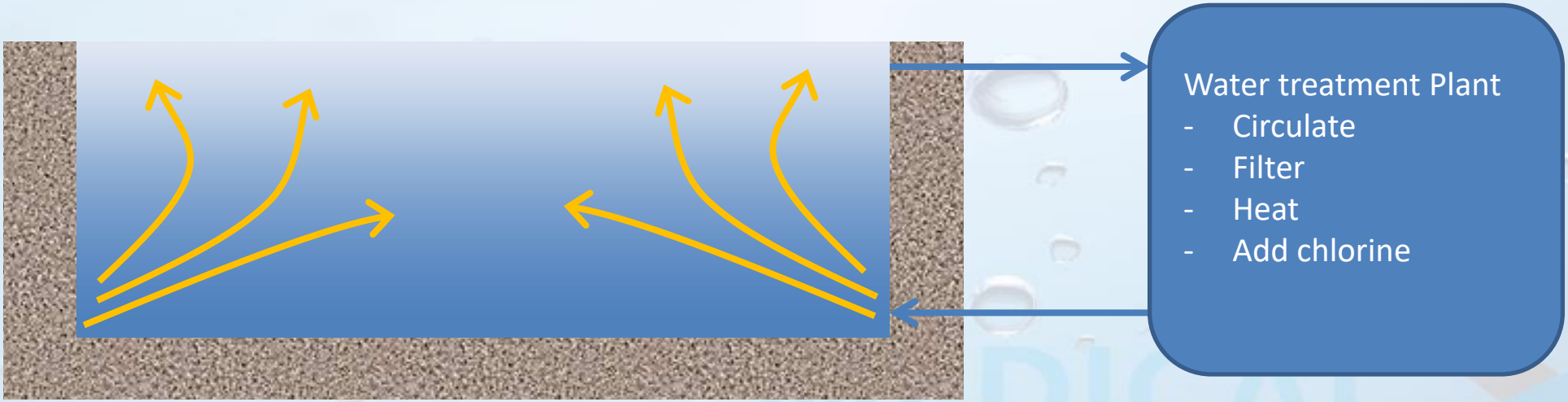


Water Hygiene
Reccomended pre-reading

- Water Hygiene is important in Public pools, and ***Extremely*** important in Aquatic Therapy pools.
- In our separate presentation “The importance of Water Hygiene” we cover the subject of water treatment in Aquatic Therapy pools.

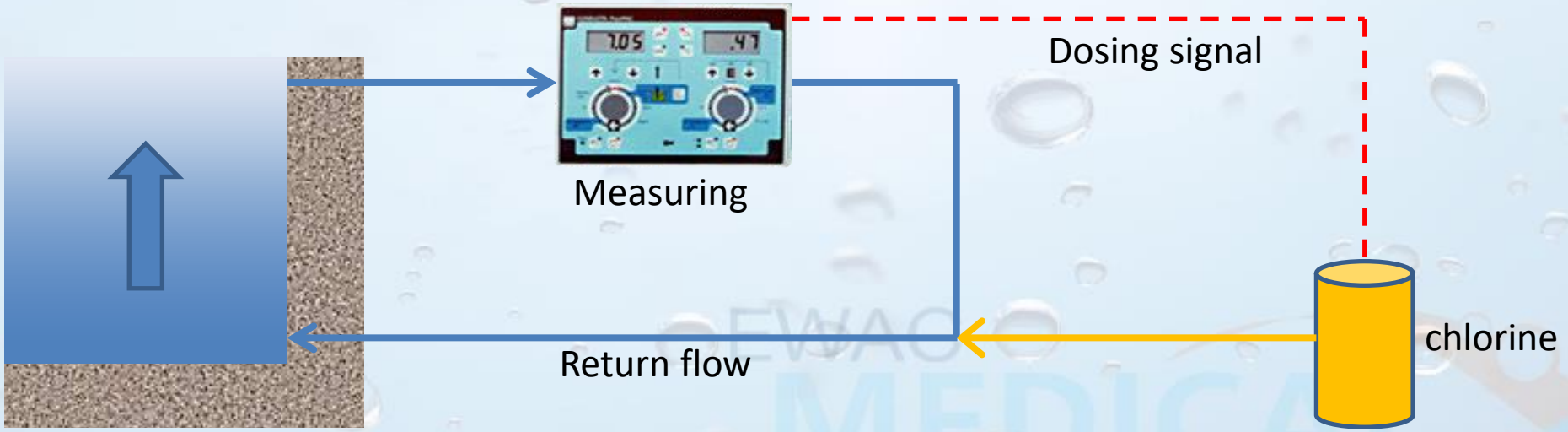
Normal swimming pool

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



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.

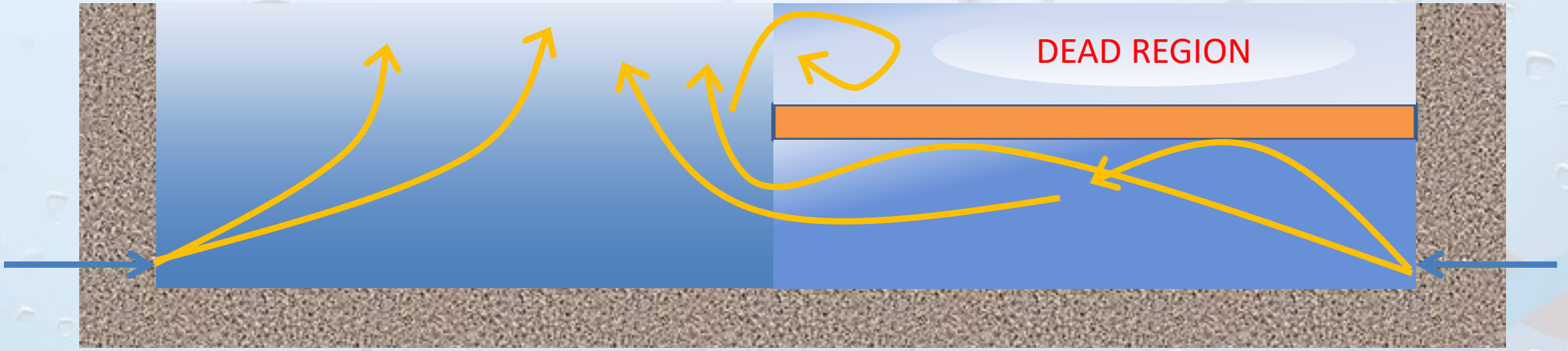


How mixing affects water quality

- 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)

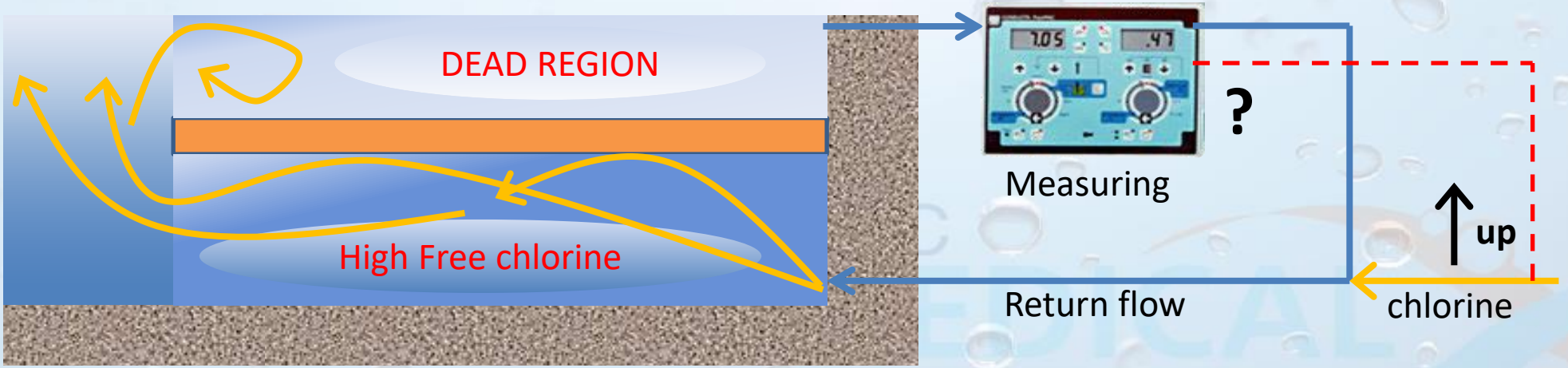
How obstacles affect water mixing

- 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’ regions, 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.



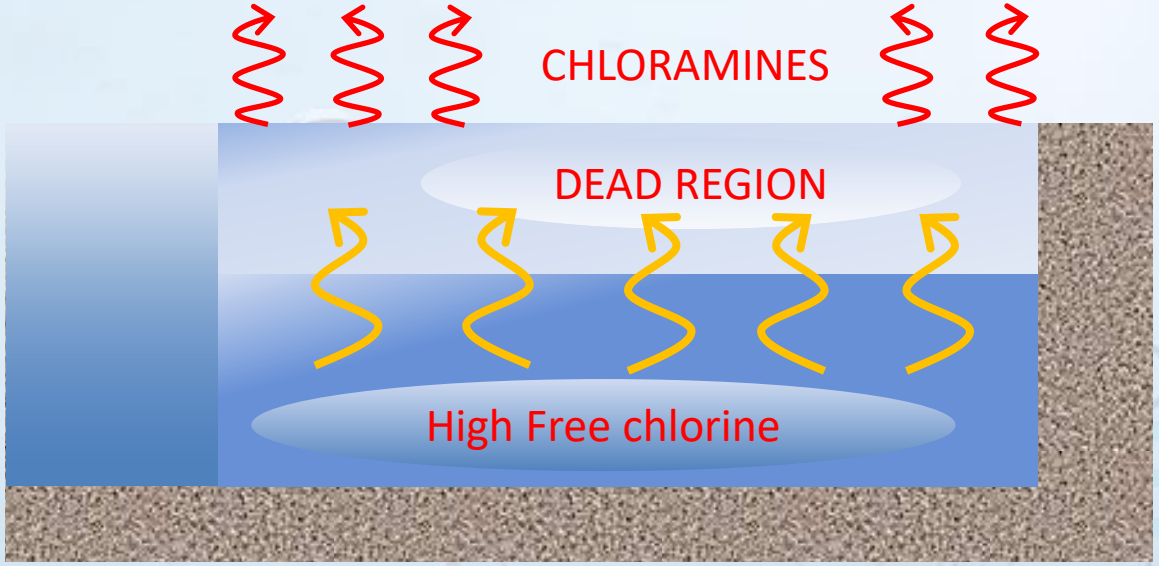
How obstacles affect measurement and control of Free chlorine levels

- 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 The Netherlands

‘Agonizing and ghastly’

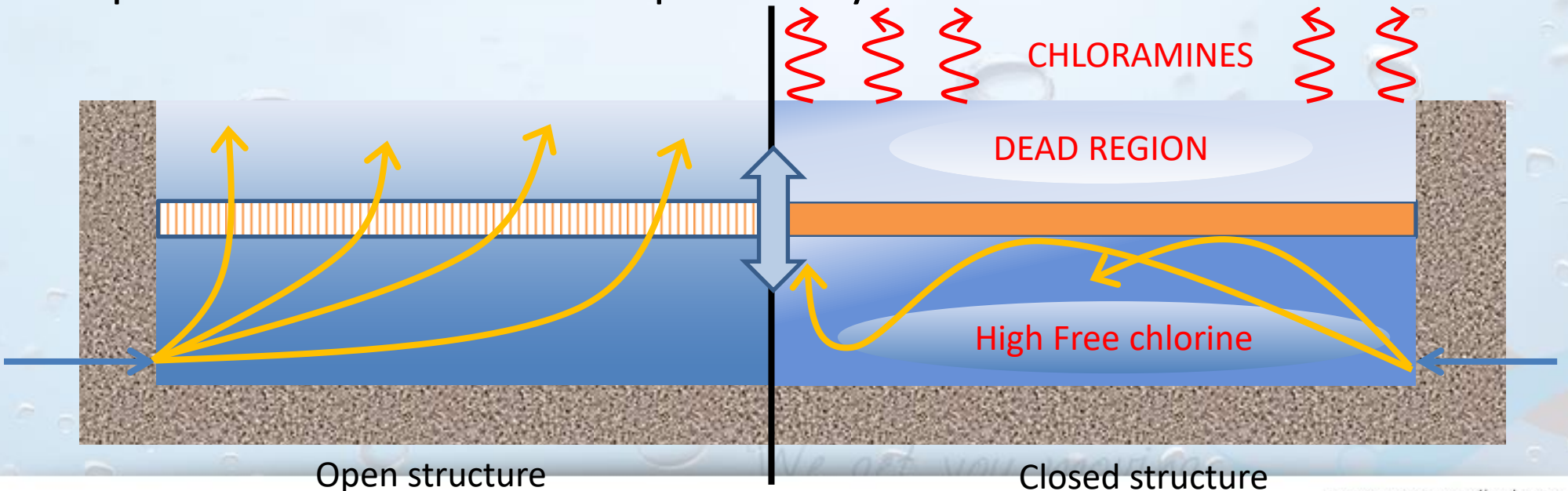
Ceiling collapse kills 12 at Swiss indoor swimming pool

USTER, Switzerland (AP) — A 4-inch-thick concrete and steel ceiling collapsed "like a lid" onto three indoor public swimming pools, killing 12 people, including five schoolchildren, and trapping others, police said today.

Rescue workers drained some water from the pools, then used jackhammers and their bare hands to dig at least one hole through the slab, enabling divers

What this has to do with a ***movable floor***

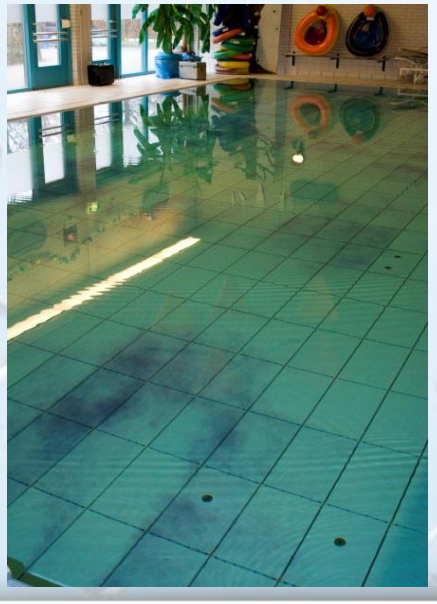
- A movable floor is principally just an **object** in the water that influences how water moves through the pool.
- If the movable floor has an ***open structure***, the influence will be only minimal
- If the movable floor has a ***closed structure***, it will cause the problems that have been previously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



How to determine the influence of a movable floor

- To assess the influence of a movable floor on water circulation, European Regulation EN-15228-2:2008 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.

Start



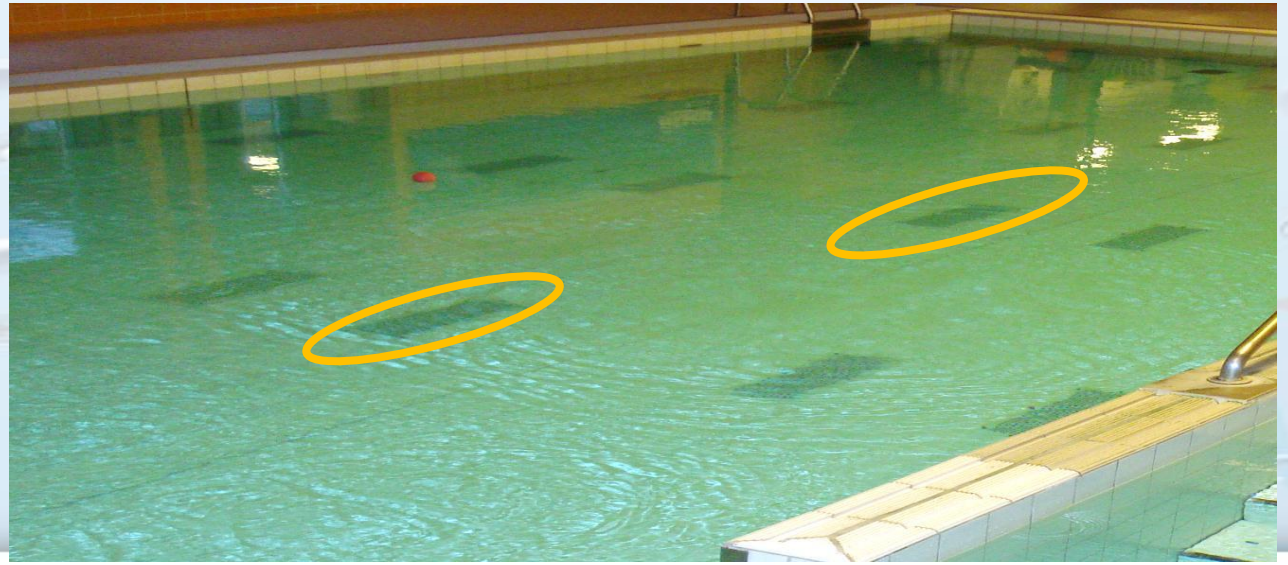
End

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 (see our website).
- 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 below).
- 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

2013