

SWIMMING POOL TECHNOLOGY IN THE 21ST CENTURY

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Context

The presence of nitrogen tri-chloride in the pool hall atmosphere, is known to have an adverse effect on the comfort of both bathers and pool hall staff. Concerns are now being raised about potential health effects of the chemical. A recent Belgium study of children that regularly visit chlorinated indoor swimming pools found a possible link between the chlorinated by-products in the air of the pools and childhood asthma. Whilst this work is currently being challenged by the UK's Department of Health, it does raise the need for a better understanding of what is going on and ideally some guideline data on atmospheric disinfection by-products.

Nitrogen tri-chloride

Nitrogen tri-chloride is formed from the reaction of chlorine with nitrogen introduced into the water from bathers' urine, sweat and skin. As it has low solubility in water, it readily evaporates into the air. The resultant concentration in the air is determined both by the water quality and by the type of pool hall air handling system. Recent German and French studies suggest an upper limit of nitrogen tri-chloride of 0.5mg/m³ of air. The recent PWTAG (UK) study indicates a lower limit.

There are four control strategies that can be applied to minimise the level of nitrogen tri-chloride in a pool hall atmosphere, by:

1. controlling the amount of pollution introduced into the water. This requires appropriate control of bathing loads, provision of good bather pre-cleanse facilities and then ensuring that bathers use such facilities
2. managing water treatment, the key issues of which include the use of flocculation, filtration, effective pool water distribution, chlorine control, and the use of ultra violet/ozone/activated carbon, and hydroanthracite
3. having an appropriate air handling system to ensure that chemical levels do not build up in the atmosphere. This requires a minimum level of fresh air dilution and good air distribution patterns. Air handling can be a more significant factor than the water quality itself, and
4. simply, operating good housekeeping - keeping the general environment clean to minimize any further pollution of the pool water.

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