POOL WATER TREATMENT
ADVISORY GROUP

TECHNICAL NOTE

66 – Suction Entrapment In Spa Pools

January 2023

This technical note provides guidance on the important issue of preventing suction entrapment in spa pools.

Suction fittings

In order to reduce the potential for suction entrapment it is important that the circulation pumps are not drawing from a single suction fitting. One way to achieve this is to use total deck-level circulation: ie a deck-level system where all the water leaving the pool for the balance tank is withdrawn this way, with no outlets in the pool tank.

There should be at least two suction fittings associated with each pump, preferably in two different planes. The deck-level overflow channel, skimmer and base suction outlets are all considered to be suction fittings. It is important that the two deep suction outlets are connected with correctly sized and equal pipework, so that should one become blocked the full flow can divert to the open suction fitting. This prevents the generation of enough force to trap a bather.

A spa (especially commercial) will have relatively high bather load and confined space, so two deep suctions per dedicated pump suction line should be the minimum. If an existing commercial spa cannot be converted, a mechanical safety device should be fitted to limit the risk.

Precautions

There should be signage to warn bathers not to have their heads below water. A poolside emergency cut-off button should be considered, so that the circulation pump can be be switched off quickly in the event of an incident.

Standards

For Domestic Spas and Hot Tubs, the European Standard EN 17125 applies. This states that:

Spas suction outlets and fittings shall be designed to prevent hair and body entrapment. They shall:
— meet the requirements of EN 16713-2, or— be tested for hair and body entrapment as hydraulically mounted on the spa and with the pump(s) in use running at 100 % of its/their capacity, regardless of the velocity according to the methods of EN 16713-2:2016, 5.3 and 5.4.

Spa suctions shall be plumbed so that each pump has — a minimum of 2 suction fittings, or— one suction fitting that is compliant with a single grille according to EN 16713-2, or— skimmer and a suction fitting equipped with a vacuum release system.

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NOTE The use of a vacuum release system is not considered "fail safe", as there is no known suction vacuum release system that will completely protect against all outlet entrapment hazards. Presenting Vacuum Release Systems as "fail safe" systems would promote a false sense of security among the users of these devices/systems.

The suction system shall:

a. *not be designed with suction fittings in horizontal steps, seats, loungers or backrest(s) of such areas, and*
b. *be installed in a manner that it is unlikely that both suctions (or suction and skimmer) would be able to be blocked at the same time. Examples of this would be to orientate the suctions (or suction and skimmer) on different planes, or separated by a minimum of 0,9 m if in the same plane.*