Our Elements –
Water And Stainless Steel

BODAN
SCHWIMMBADBAU

I Stainless steel swimming pools I

"Sonnenberg" lido close to Herisau, Switzerland
Water surface: 1.370 m² I Year of Construction 1999

"Im Tal" Experience Baths close to Adliswil, Switzerland
Water Surface: 934 m² I Year of construction 2004

Stainless steel has outstanding advantages for the construction of swimming pools. A low maintenance and materials expenditure makes stainless steel less expensive than conventional building materials. Long construction periods are a thing of the past as the prefabricated individual segments are delivered and then installed on site. The material can be easily processed at low temperatures so that a rehabilitation can be carried out out of season. The smooth surface prevents the formation of algae and provides optimal hygienic conditions both inside and out. The high elasticity of this material renders it almost insensitive to settlements and temperature fluctuations. Stainless steel has for many years being increasing in importance and with its universal moldability, it provides unrestricted possibilities in the language of forms. Experience with this material has shown that it provides a long serviceable life without reducing its optical quality. This means that stainless steel has the ideal requirements for swimming baths.

I www.bodanwerft.com I

The traditional company Bodan-Werft has had comprehensive experience in steel constructions since being established in 1919. We have been constructing stainless steel pools for the past 16 years. We are successful in completing orders for both the large private pools and upmarket private pools segments. Bodan-Werft is one of the leading companies in Germany which sells its products throughout Germany. Bodan-Werft is able to find the right form and size from the paddling pool to the experience and sports pools and the construction of fountains. We process and plan each of the customer orders down to the smallest detail and accompany you from the initial inquiry to the water admission. We are obviously always at your service. Competent advice, detailed construction management and a creative team guarantee you and your guests the highest level of wellness and bathing pleasure.

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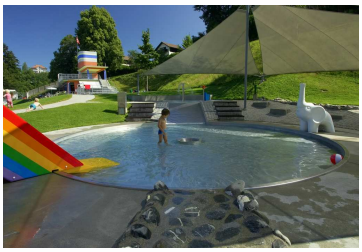
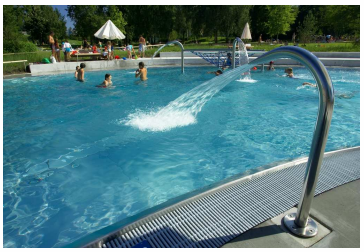
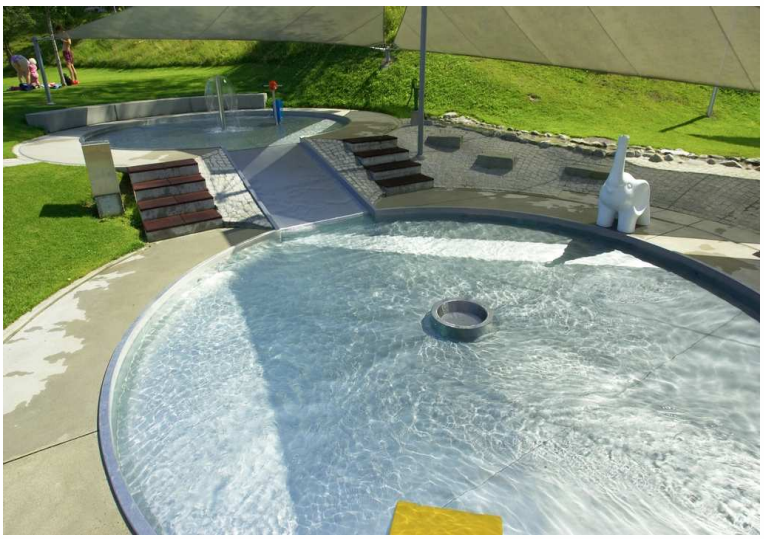
I Stainless steel and its successful path I

Nowadays, lidos are almost only made of stainless steel





Not only the pool but also the water attractions are made of stainless steel



The industrial application of stainless steel started with the granting of a patent for "steels with a high resistance to corrosion" in 1912. This was the starting point for the development of a group of materials containing more than 120 sorts of stainless steel which are used in all fields of human life, from the household to the building industry and the construction of swimming pools.

The past development is also mirrored in the production figures: The annual crude steel production of non-corrosive steels increased from approx. 12.8 million tonnes to around 18.4 million tonnes between 1990 and 2000. All of the stainless steel sorts have a minimum chromium (Cr) content of 10.5% and have a greatly improved corrosion resistance when compared to non-alloyed steel. The passive layer which acts as a barrier between the alloy and the surrounding media is responsible for this. The passive layer is impermeable. In case of damage, it automatically restores itself under the influence of oxygen. Higher chromium contents and the addition of all alloy elements such as nickel (Ni), molybdenum (Mo), manganese (Mn) and copper (Cu) improve the corrosion resistance, but can also alter the mechanical properties. Due to its extraordinary range or properties, its durability and maintenance friendliness, stainless steel has a considerable added value potential. The material is very often the optimal technical-commercial solution. With a growing quality consciousness, it continuously grows in importance due to its likewise aesthetic possibilities and at the same time opens up new market potentials. In the course of time, manufacturers and processors have utilised various synonyms such as V2A or V4A. Starting from the consumer sector however, the term stainless steel has asserted itself as a collective term. Non-corrosive steels are however designated with allocated material numbers such as 1.4404, 1.4571 or similar.

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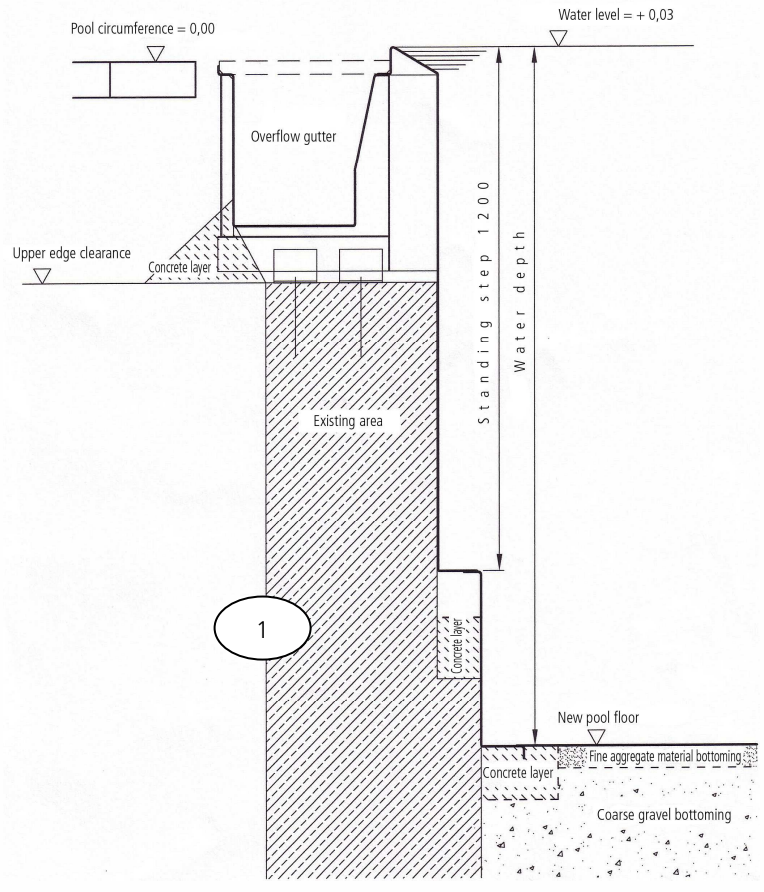
I Rehabilitation of a tiled pool with stainless steel I

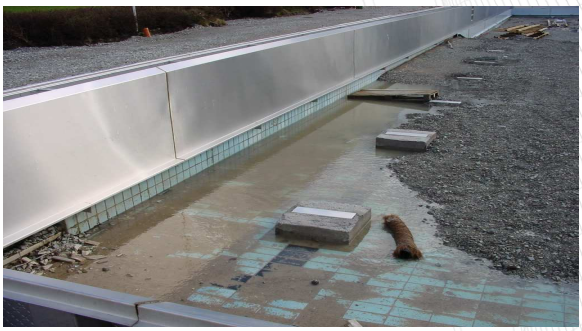
The stainless steel elements are directly mounted on the stripped wall



Sectional drawing1: cross-section of a wall with an untensioned lining

During rehabilitation work, old, unretentive pools were restored to a new condition which corresponds to the latest state of the art. The existing pool head (the area between the circumference and the upper edge clearance) is initially removed in order to obtain a level surface for the installation of the new pool elements. The stainless steel wall elements with the substructure are mounted on the original pool wall. With the untensioned lining, the existing satisfactorily straight wall is able to absorb the hydrostatic loads of the water pressure so that the lining is directly (untensioned) close-fitting against the original pool wall (sectional drawing 1).

If an untensioned lining is not possible, a construction behind the stainless steel walls is able to absorb the water pressure of approx. 5 tonnes per square metres-. After the floor channels have been installed and stabilised with concrete, one fills the spaces with coarse gravel and fine aggregate material. The floor plates are then laid according to plan and welded so that they are waterproof. The pool is then subjected to steeping treatment and can then be filled with water.



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I Rehabilitation in the Prinzregenten Swimming baths, Munich I

Rehabilitated experience pools with a flow channel, water mushroom and chute
Water surface: 945 m² I Year of construction 2002

The dye test demonstrates the passing through of the pool

One of the rehabilitation tasks in Munich was the subdividing of a 50 metres competition pool into 2 separate functional areas - experience and swimming areas. The pool head of the existing reinforced concrete pool had to be stripped first so as to make space for the new wall elements with an overflow gutter.

The former pool form was subdivided into two individual pools by means of new reinforced concrete partitions. Prefabricated wall elements were installed in the pools. The existing walls supported the inserted metal pool. The pool floors were also in the form of a metallic skin, whereby the forces were transmitted to the substrate (fine aggregate material and coarse gravel).

Stainless steel wall elements as a self-supporting construction were installed to a water depth of approx. 2 metres. The experience pool was equipped with numerous new attractions: e.g. stainless steel chute, flow channel, water mushroom, floor geyser, water shoot, floor jets.

After the pool had been installed, the tightness of the complete construction was tested for a period of five days by it being filled with water. After the initial filling had taken place, proof was furnished of the functionability of the pool hydraulic system by means of a dye test.

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I Modernisation of a private pool on Ibiza, Spain I

Rehabilitated pool with a lamella cover and glass face wall
Water surface: 94.5 m² I Year of construction 2005

Whirlpool loungers and steps with handrail at the entrance

The former reinforced concrete pool head was initially uncovered. The complete prefabricated pool components were transported to the construction site on Ibiza by truck and positioned at their place of installation by means of a crane. The complete walls were mounted on the cut-off former concrete walls within a few days.

After the walls had been positioned and the concrete layer had been applied, the floor of the pool was filled with fine aggregate material and coarse gravel before being compacted. The floor plates were then laid on this level bed has planned.

The outdated pool hydraulic system was replaced by floor channels for the streaming in of the water; a vertical passing through of the pool ensures an optimal water exchange and hygienic conditions.

It was now possible to weld the floor plate for plate. The whirlpool loungers were then placed in a prefabricated foundation and connected.

Only the glass wall and the overflow gutter which was mounted outside on the supporting arms and seal-welded. After tightly sealing in the glass pane and the roller housing, the pool had been completed and could be cleaned and steeped. The pool was taken into operation after it had been filled with water and the shutter had been mounted.

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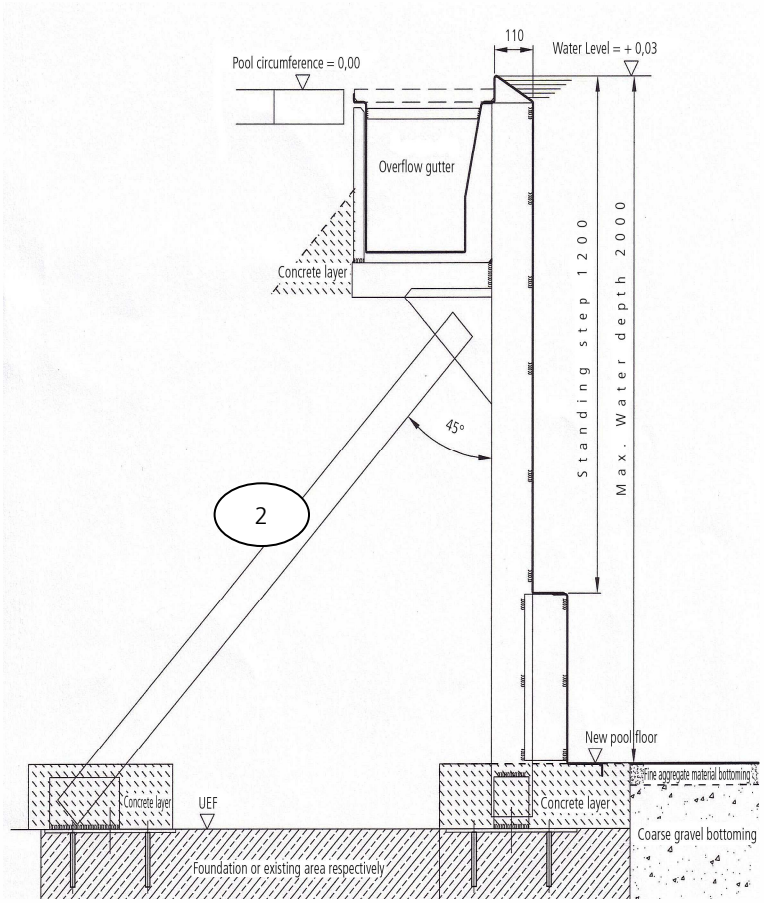
I New construction of a stainless steel outside pool I

The rear support supports the stainless steel walls

When constructing new stainless steel pools, a strip footing is created for the walls and steps (step 2). The floor channels and fitted parts such as the attractions are later mounted onto the individual footing.

A rear construction (bearers welded to the wall and anchored to the floor with a concrete layer) stabilise the self-supporting side wall. The overflow gutter and stainless steel elements are mounted to the pool head. After all of the fittings have been installed and the concrete layer applied, all of the spaces in the floor are filled out with a fine aggregate material and coarse gravel so as to provide the floor plates with a level surface. These are laid according to plan and welded so that they are waterproof.



Sectional drawing 2: Diagrammatic view of a self-supporting pool wall

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I New construction of a lido in Singen I

Swimmer, diving and experience area with a flow channel
Water surface: 1,625 m² I Year of construction 2004

Water mushroom un the massage area and a giant chute with run-out pool

The Aachbad swimming baths which were built in 1936 is of great historical importance for the town of Singen. New baths had to be erected however, after these had to be closed on the grounds of defects.

First of all, the former pools and their foundations had to be broken up and removed. A level surface was created so as to enable the supplied stainless steel walls and the corresponding fittings to be installed. More than 15 companies worked on the construction site at the same time. Today, a modern treatment system ensures that the pool water meets the latest legal requirements. The pumped off and treated water for the Aachbad comes from the River Aach close by. The more than 2 million litres of water are economically and ecologically heated up by use of a solar absorption system on the roof with more than 1200 square metres of pipelines. This makes it possible to achieve an average water temperature of approximately 23° Celsius and is therefore extremely economically viable for the future. The new competition pool which is of Olympic dimensions was constructed in a self-supporting design.

The experience area of 875 square metres is next to this pool. Here, attractiveness is guaranteed by a water mushroom (2.5 metres diameter), two gush showers, two water canons, one of which swivels, a massage area with floor bubble devices and a flow channel. Comfortable pool accesses with various water depths and a large chute which is almost 100 meters long ensure a comfortable bathing experience.

A total of more than 2000 metres of pipelines of various nominal diameters of up to 400 millimetres are laid above each other in various layers in the ground and connected to pumps, filter boilers and the new technology building.

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I Cleaning of and caring for stainless steel swimming pools I

Many people spend their time in public swimming paths in summer

Stainless steel pools only require a small amount of maintenance and care after completion

During the bathing season, soiling is brought into the pool from the environment and by the guests themselves. Finely distributed, they are led to the treatment plant via the water but some of it remains in the pools and can be deposited on the floor. These dirt particles can however not fasten themselves to the completely closed stainless steel surfaces. Contrary to tiled pools with their high share of joints, algae cannot settle down on stainless steel. As far as stainless steel components which are not continuously surrounded by water are concerned, the repeated drying of pool water on results in deposits and a concentration of chlorides. These components are protected from corrosion by them being regularly cleaned with suitable household agents.

Cleaning agents containing hydrochloric acid are not to be used as they cause corrosion.

After the lido season has come to an end, the water level is lowered somewhat so that it is possible to absorb the precipitation. An overwintering agent which prevents limestone from depositing in the pool. Experience has shown that the rising terrestrial heart suffices to prevent ice from freezing to the pool wall. The maintenance work which has to be carried out after the winter break is restricted to a thorough cleaning and an inspection of the water inlet gutters in the pool floor. When compared with conventional pools, the cleaning agents consumption is low, resulting in reduced costs and a reduced level of environmental impact.