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1. GENERAL

You have made a well-considered, economical and practical choice with our stainless steel swimming pool.

For decades now, stainless steel has proven its worth as a material. It is the most resistant, durable and efficient material in modern pool construction technology.

To ensure trouble-free and easy maintenance of your stainless steel swimming pool, please observe and comply with the following maintenance and operating instructions.

We cannot accept any liability for damage resulting from failure to observe our operating instructions.

The operation and maintenance of a swimming pool requires a multitude of specific chemical processes. To prevent undesirable side effects, before using chemical products you should check their composition, the corresponding safety instructions, safety data sheets and the protective regulations in accordance with the applicable legal provisions.

When reading this manual carefully, you may get the impression that there is a "science" to maintaining a stainless steel swimming pool. In fact, the opposite is true: it is by far the easiest type of pool to maintain.

However, with these operating and maintenance instructions we want to address all questions that may arise in order to provide you and your operating personnel with a comprehensive guide.

REFERENCES TO LEGISLATION, STANDARDS AND GUIDELINES

In general, a large number of laws, standards and guidelines must be observed for the proper and safe operation of a swimming pool, some of which are standardised throughout Europe and others which are specific to individual countries. In the absence of country-specific regulations, standard guidelines from other countries are also often used as a reference such as the KOK directives for swimming pool construction. Important regulations include, but are not limited to, the following:

EN standards: EN 13451, EN 15288, EN 1069, EN 17164, EN 17232

Germany: DIN 19643
KOK directives for swimming pool construction
Rules and regulations set out by the DGUV (German Social Accident Insurance)
Guidelines of the Deutsche Gesellschaft für das Badewesen (German Association for Bathing)
Stainless Steel information – leaflet 831 (Stainless Steel in Swimming Pools)

France: NF P40-320

Austria: Austrian standard M 6215 to 6217
Act on swimming pool and bathing water hygiene

Switzerland: SIA 385/9
Swiss Council for Accident Prevention (bfu) technical documentation 2.019 –
Swimming pool facilities

SAFETY AND WARNING NOTICES

Safety instructions for general use of the pool:

 Swimming pools have many hidden dangers (diving towers, slides, starting blocks, wave machines, devices with water and air effects, etc.) and require specifically trained personnel to supervise bathing activities as well as to operate the technical equipment. According to EN 15288-2, regular risk analyses are required to determine operational procedures, organisational requirements and procedural instructions to ensure that the swimming pool is safe. Based on the result of the risk analysis, appropriate rules for the use of the facility must be defined by the operator (bathing rules – operating instructions).

Warning notice for unattended or empty pool:

 Unattended swimming pools pose a potential accident risk. Ensure that the bathing facility is always adequately secured and inaccessible to unauthorised persons outside of operating hours. When the pool is emptied, the applicable legal regulations for securing a disused pool facility (fall protection) must also be observed.

Warning notice for use of chemicals:

 Always follow the product instructions or these operating and maintenance instructions for the correct dosage and application of the chemicals used.

To protect your health, always use the personal protective equipment provided (gloves, safety goggles, respiratory protection, etc.) and observe the corresponding manufacturer's safety data sheets.

The relevant safety data sheets and applicable legal regulations must be observed when draining off and disposing of waste water or excipients contaminated with chemicals.

Always check that (new) chemicals are suitable for use with stainless steel before adding them. If you are in any doubt, we will be happy to advise you in advance.

Warning notice for work on electrical system parts in the pool (e.g. underwater floodlights):

 **WARNING** electrical voltage. Risk of injury. Disconnect the power supply!
Electrical installations must only be carried out by a trained electrician.

Before carrying out maintenance or cleaning work, the complete lighting system must be disconnected from the power supply and the relevant manufacturer's safety instructions must be observed. Before replacing lights and luminaires, they must first be allowed to cool down – risk of burns!

Advice on pool installations from subsuppliers (e.g.: play equipment, climbing walls, lifting floors, etc.):

 Always refer to the manufacturer's operating instructions to ensure safe and correct use. If these general operating and maintenance instructions for swimming pools differ from the manufacturer's instructions for the specific equipment or device, the manufacturer's instructions shall take precedence – any ambiguities must be clarified before any further work is carried out. If you do not have any instructions, you must request them in order to safeguard further claims.

Maintenance and care of the installations must be carried out in accordance with the manufacturer's instructions. Any warranty or repair work is subject to the manufacturer's terms and conditions.

2. CHEMICAL RESISTANCE

2.1. Technical room, filter room

If open filters or splash water pools are used in conjunction with stainless steel pools, the following must be observed: **Do not let open filters, open splash pools and the outside of the pool share the same air space**, as a concentration of chlorides in the atmosphere will cause lasting damage to the pool.

If structural constraints do not permit local separation, the required conditions shall be achieved by installing a partition wall or by covering these containers as tightly as possible. Sufficient forced ventilation into the open reduces the likelihood of corrosion.

2.2. Filled pool

No coating is required as corrosion protection for the material stainless steel. Stainless steel has an invisible passive layer, which is mainly formed by the alloying element chromium in combination with oxygen, and is therefore corrosion resistant. If the passive layer is damaged, it rebuilds automatically under the influence of oxygen.

Under normal operating conditions, high-alloy steel is completely resistant to most water. As is the case with any material, there are certain limits when using stainless steel. Under particular influences or conditions (e.g. filling with water highly contaminated with chlorides, water treatment plants not conforming to standards), special analyses are required to select the material.

Please refer to the standards and legal regulations on the "Treatment and disinfection of swimming and bathing pool water" as well as the permissible quality of pool and filling water – see also point 1. General – References to legislation and standards

➤ **Special filling waters:**

Special tests are required for pools with sea water, mineral water, and medicinal and therapeutic pools. Special guidelines adapted to the respective material must be observed.

2.3. Limit values

The water treatment plant must be operated in such a way that the following values are maintained in the pool water at the usual pool water temperature (max. 32°C):

TABLE 1

Material no. Short name	1.4404 X2CrNiMo17-12-2	1.4462 X2CrNiMoN22-5-3
pH value	6.8 to 7.6	6.8 to 7.6
free chlorine mg/l	0.3 to max. 0.6	0.3 to max. 0.6
Chlorides mg/l	max. 500	max. 2200

For hot tubs and jacuzzis, the concentration of free chlorine in the pool water is 0.7 to max. 1.0 mg/l

For stainless steel pools in material 1.4301 (stainless steel quality mostly used for outdoor pools in the past), observe the limit values according to the operating instructions issued at the time (chlorides max. 200 mg/l)

Should a brief shock chlorination of the pool water be necessary due to operational processes (e.g. contamination of pool water with bacteria), this is permissible in accordance with the normative and legal requirements. In order to protect the metallic components in the water circuit, the chlorine concentration should only be increased to a level that is absolutely necessary.

The maximum chloride content in the pool water specified for the respective material must always be observed regardless and must not be exceeded.

The operator of the bathing facility has the obligation to regularly check and document the values listed in Table 1 for compliance (pH value and free chlorine daily, chlorides at least every 4 weeks).

During initial commissioning of a new water system, a large number of adjustment procedures are necessary, which often lead to serious deviations in the above parameters => for this reason, the chloride content in the pool water must be measured and documented weekly during the trial operation or adjustment phase. This must be done with approved and calibrated measuring instruments or with the aid of a laboratory for water analysis. In case of deviations, please inform us immediately so that we can take appropriate measures to prevent damage to the pool.

If chloride concentrations are too high, an immediate, intensive water exchange is imperative, which can be achieved by adding plenty of fresh water, e.g. after filter backwashing. Corrosion damage to the pool without proof of compliance with the permissible chloride concentration or pH value cannot be accepted as defects for the purposes of the warranty.

2.4. Note on water treatment

General:

The water treatment is carried out using physical and chemical process steps.

In addition to disinfection, the generic term water treatment primarily includes pH value regulation, algae control, flocculation, filtration and the addition of fresh water.

2.4.1. pH value correction

At pH values above or below the values given in Table 1, the disinfecting effect of chlorination is impaired. In addition, undesirable side effects occur. In particular, if the pH value is too low, the material resistance is negatively affected. A correction of the pH-value (raising / lowering) is imperative. A too high or too low pH-value can harm swimmers.

Lowering the pH value:

Under no circumstances may hydrofluoric acid or chloride-containing acids (such as hydrochloric acid) be used.

This leads to the permissible chloride concentration being exceeded and subsequently to the destruction of the material structure. Sulphuric acid, for example, is permissible.

Raising the pH value:

This can be done by adding soda or caustic soda in liquid form.

2.4.2. Flocculants

Aluminium-based flocculants in liquid form are permitted.

Flocculants containing chloride should be avoided. In case of doubt, please contact us for clarification (stating the chloride content and the dosing quantity in relation to the circulation rate).

2.4.3. Germicides

It is permitted to continuously add chlorine-containing substances for disinfection until the free chlorine values listed in Table 1 on page 4 are reached.

Any continuous or intermittent addition of chemicals containing chlorine or chloride that are not used for disinfection is prohibited.

2.4.4. Fresh water / chloride content

Adding 30 litres of fresh water per bathing guest per day, as stipulated in the standards, is usually adequate for meeting the limit values for chlorides. If this is not sufficient for reasons arising from ongoing operation, the fresh water addition must be increased to such an extent that the chloride limit values are complied with.

Remember that high chloride levels damage all metal parts installed in the water circuit.

2.4.5. Algae prevention

If a modern water treatment distribution system is used, algae prevention/protection agents are not required due to the fact that the stainless steel pool has a non-porous surface and our pool hydraulics ensure excellent distribution of pure water.

Algaecides containing heavy metal salts, such as copper sulphate and those containing silver or mercury, must also not be used in stainless steel pools. They are in any case questionable from the point of view of waste water legislation.

Here too, everything that harms the metals in your water cycle also harms your swimmers.

Before using algaecides (= quaternary ammonium compounds), please contact your water regulation authority.

2.4.6. Adding chemicals

Chemicals may only be added to the swimming pool in dissolved, diluted form via the clean water pipe. They must be added continuously to the clean water pipe, directly after the filters (dosing system). Circulation must be maintained for up to 24 hours after the end of chemical addition. This guarantees consistent mixing.

The addition of chemicals directly into the pool is generally prohibited.

The desired qualitative condition of the pool water, depending on pure and raw water, can often be positively influenced by minor changes in the process or in the choice of chemicals.

In case of doubt, we will be happy to advise you and help you find the best solution for your specific case. Please contact us for advice.



Chemicals introduced sporadically and / or in too high a concentration can cause serious damage to stainless steel.

3. CARE AND MAINTENANCE

3.1. Emptying the pool

We recommend an annual emptying of all pools to remove deposits and any corrosion that may have occurred (e.g. due to overlooked coins etc.), and to check all screwed components under water.

The period between pool emptying and pool filling should be kept as short as possible, i.e. limited to the actual cleaning and maintenance time.

Immediately after the pool has been emptied (already during the emptying process in the case of larger pools with slopes and/or gradients in the pool floor), all stainless steel surfaces must be sufficiently rinsed with drinking water (high-pressure device) in order to reliably prevent residues from the pool water from drying. This process must also include all inlet and outlet pipes as well as other installations, i.e. floor channel covers, perforated metal grids, plastic inserts for inlet nozzles, underwater spotlights, bubble loungers, etc. must be removed or opened in order to flush the stainless steel installations or pipes behind them with sufficient drinking water.

When emptying the pool (in the case of outdoor pools), the following must also be observed:

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3.1.1. Floods

Since floods can occur at different speeds, and it is not guaranteed that existing safety devices such as groundwater lowering and flood valves can adequately protect the pool from the amount of water that accumulates, the pool must be secured by filling it up to the overflow edge in case of an impending flood.

3.1.2. Groundwater

The maximum expected groundwater level must be at least 20 cm below the maximum pool depth or be kept at this level by adequate groundwater lowering. If this is not the case, the pool must not be emptied.

Flood valves are used to ensure the safety of the emptied pool in the event of failure of groundwater lowering devices or a slowly rising groundwater level.



Attention! Where stainless steel liners are installed in reinforced concrete tubs (mostly in diving pools in both indoor and outdoor swimming pools), water can accumulate in the space between the stainless steel sheet and the concrete wall / concrete floor. Before emptying the pool, it is essential to check whether the substructure of the pool floor is dry (e.g. via inspection shaft, core drilling in this area). If water can be detected above the lowest level of the pool floor, the pool must not be emptied!

3.1.3. Frost effects

If the outside temperature is below 0°C, the pool must not be emptied. There is a risk of the pool substructure (foundations, gravel bed) freezing.

The pool must also be completely free of ice before emptying – risk of damage from ice floes!

3.1.4. Deposits

In order to facilitate the cleaning of the pool as much as possible, it is advantageous to rinse off visible deposits with a strong water jet (pressure hose or high-pressure cleaner) when emptying the pool, especially in the floor area, in order to avoid the drying of algae, rotten leaves etc.

3.2. Pool cleaning

3.2.1. Principles of pool cleaning

- Sharp tools, abrasive blocks, wire brushes, files, steel wool made of unalloyed or low-alloyed carbon steel etc. **must not be used for cleaning chrome-nickel steel.**
Consequences of non-observance: **Friction marks, scratches, dull spots and the formation of extraneous rust.**
- Metallic hose couplings should be wrapped with a cloth to avoid scratch marks and extraneous rust.
- Any objects used for cleaning and inspection (tools, etc.) must be removed from the pool after the work has been completed.
- Consequences of non-observance: **Formation of extraneous rust, corrosion.**
- Metallic items such as hair clips, coins, etc., left in the pool over the winter, will in most cases have corroded and left rust stains (pool bottom, gully, bench, bubble lounge etc.). These must be removed by pickling. The pickling paste must not dry and must be washed off with a water jet and a cloth or soft brush to avoid staining.

When using the chemical cleaning agents mentioned in point **3.2.5.** below, care must be taken to ensure that they do not dry on the surface under any circumstances. This could result in unsightly staining or damage to the sheet metal surface due to excessive concentration.

Depending on the depth of the water, the pool drain must be kept closed for as long as possible during

the cleaning process, in order to both dilute the washed-off chemicals and to achieve effective neutralisation before the cleaning residues are released into the waste water.

The swimming stripes in the middle of the lanes may only be cleaned with neutral, mild, non-abrasive cleaning agents. When using a high-pressure cleaner, the pressure must be kept low (max. 50 bar, water temperature max. 30°C).

The cleaning of your stainless steel pool must of course also include all ancillary areas such as the balance tank, floor channel, overflow channel, inlets and inlet nozzles etc.

Cleaning of floor channel and floor channel cover:

To clean the floor channels, the floor channel covers must be removed completely. Cleaning is carried out with commercially available stainless steel cleaners as described in 3.2.5.

Notes on cleaning the rubber seals:

- Avoid contact with strongly acidic, alkaline, oxidative and greasy cleaning agents, which are also intended for stainless steel.
- Contact with organic, non-polar solvents (turpentine, petrol, etc.) must be strictly avoided in both pure and mixed forms (emulsion cleaners).
- Most water-based neutral cleaners (surfactants, dishwashing detergents) are suitable as cleaning agents. These should only be used in diluted form.
- Rubber is temperature resistant even in hot water, so the use of warm water (up to 80 °C) with a cleaning agent described above using a sponge / synthetic fleece (without roughened side) is ideal for cleaning the seals.

When cleaning the floor channel covers, first clean the rubber seals according to the above instructions. To clean the stainless steel surface of the floor channel covers, the stainless steel cleaner must be applied with a brush in such a way that it does not come into contact with the rubber seal. After the stainless steel cleaning agent has been left to work for the appropriate time, rinse it off with plenty of water and make sure that the rubber seal is rinsed off again thoroughly.

When reinstalling the floor channel covers, ensure that the seals are fully seated and that the sealing lips are clean. When the floor channel cover is pushed into the lock, the rear sealing lip tends to fold over, so the use of a lubricant and care product for rubber seals is recommended. Check the correct position of the sealing lip. The sealing lips must be directed inwards from the outer edge of the cover.

This also applies to the maintenance of flood valves.

The cover of the flood valve opens automatically when the water level is about 8 cm above the cover level. To ensure this is the case, the seat of the seal as well as the seal itself must be cleaned and the seal must be coated with glycerine. If the seal is not clean or if the flood valve cover is off-centre, this could result in permanent and considerable water loss over time.

Under no circumstances should pool cleaning with chemicals be carried out under intensive sunlight and therefore when the pool is excessively heated, as the chemical processes taking place have much shorter reaction times depending on the temperature and therefore undesirable side effects (burns, staining, etc.) can occur if this is not observed.

To prevent dry spots on the bottom of the pool, sprinkler systems (lawn sprinklers) can be used between cleaning and filling. The water used here also keeps the bottom of the pool at a constant temperature to avoid thermal stress and serves to further dilute the cleaning agents.

3.2.2. Channel gratings

When cleaning the pool with nitric acid, the channel gratings must be removed. The gratings may only be cleaned with phosphorus-containing cleaners (max. concentration 5%). Afterwards they must be washed off with a high-pressure cleaner (max. 50 bar, water temperature max. 30°C). Chlorine bleaching

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liquor or hydrochloric acid are generally forbidden for the cleaning.

3.2.3. Equipment parts

Equipment parts made of plastic are to be cleaned with neutral detergent (such as dishwashing detergent or similar) and scratch-free cloths.

For mechanical cleaning, we recommend the use of a high-pressure cleaner.

Stainless steel equipment must be cleaned the same way as the pools are cleaned.

On the following pages we will give you advice and recommendations for cleaning various types of dirt:

3.2.4. Mechanical cleaning products

Must generally be free of ferrous components.

Resources	Suitable	Unsuitable
Fillers, scrapers, tools in general	Tools are only permitted to be made of stainless steel; spanners and screwdrivers must be made of chrome-nickel-vanadium steel.	Tools made of low or unalloyed steels which are prone to corrosion. Tools with adherent rust.
Bristle products	Brushes with natural, plastic or stainless steel bristles – only in the grinding direction, not on polished surfaces and not on unsanded surfaces in the visible area.	Brushes with bristles of unalloyed steel wire, brushes with grit bristles (plastic bristles containing abrasive particles).
Textiles	Textile material made of natural and man-made fibres as cleaning cloths (cleaning wool) and textile fabrics (knitted and woven fabrics, cleaning cloths, scouring cloth, fringe material, fleece); cleaning textiles made of microfibres are very suitable for removing grip marks from stainless steel surfaces.	Fabric with metal wire woven in.
Synthetic fleece	Without abrasives; mostly available in the following colours: white, beige, yellow. For sanded surfaces in the direction of sanding or smooth sheets in the non-visible area.	For polished and unpolished surfaces in the visible area.
Synthetic fleece	Non-woven abrasive fleece; usually available in the following colours: green, blue, red, dark brown, black (the latter two are the most aggressive). Only for sanded surfaces in the direction of sanding in the visible area.	For polished and unpolished surfaces in the visible area.
Steel wool	Only if steel wool is made of stainless steel and only on ground surfaces in the direction of grinding.	Normal steel wool must not be used, as abrasion causes extraneous rust to form.

3.2.5. Chemical cleaning agents

Must be free of halogens (chloride and fluoride ions), i.e. they must not contain hydrochloric acid, hydrofluoric acid, sodium hypochlorite or calcium hypochlorite. These substances have a damaging effect on the surface and can lead to the destruction of the material structure.

Resources	Composition	Fields of application
All-purpose cleaner	Surfactants, water, often with added phosphates and ammonia solution.	Recommended for minor grease stains.
Neutral cleaners	Surfactants, water and fragrances; dishwashing detergent.	For surfaces soiled with grease and oil (fingerprints).
Alcohol cleaner	Surfactants, alcohol, water and fragrances.	Like all-purpose cleaners.
Alkaline cleaners	Surfactants, water and alkali; often still contain water-soluble organic solvents.	Suitable for severe grease and oil contamination (resinous oils).
Abrasive alkaline cleaners	Surfactants, water and alkali; often still contain water-soluble organic solvents. As an abrasive they contain fine polishing agents (mostly whiting). – May only be used on the pool walls in the grinding direction.	For all heavy grease stains and deposits of mineral substances (soot, rust, light water stains from water containing lime). To be effective, the polishing agents must be harder than the dirt. To avoid damaging the surface, they must be softer than stainless steel.
Solvent cleaner	Usually a mixture of organic solvents; they may be miscible with water (e.g. butyl diglycol, diethylene glycol ether, alcohol) or immiscible with water (petrol, turpentine).	Depending on the type, particularly good for removing grease, oil, wax, tar, adhesives, varnishes and paints.
Non-abrasive emulsion cleaners	Surfactants, water, organic solvents immiscible with water; often additional alkalis.	Particularly suitable for heavy grease stains, waxes, tar, paints. Better than non-abrasive alkaline cleaners, but worse than solvent cleaners.
Abrasive emulsion cleaners	Like non-abrasive emulsion cleaners; however, they contain polishing agents.	Like abrasive alkaline cleaners, but better cleaning effect on grease and tar.

Resources	Composition	Fields of application
Acidic cleaner	<p>Acid (e.g. phosphoric acid, nitric acid, amidosulfonic acid, citric acid, acid-resistant surfactants, water, possibly fragrances).</p> <p>Hydrochloric acid and/or cleaning agents containing hydrochloric acid must not be used. Due to the non-porous nature of the surface of the stainless steel, deep penetration is not possible and therefore not necessary.</p>	Removes soiling such as limescale deposits, rust deposits, grease-bound pigment soiling, light grease stains. Acidic cleaners may only be disposed of in the appropriate dilution (e.g. 1 to 3 for nitric acid/water) in agreement with the responsible authority.
Pickling paste	<p>Highly acidic paste or gel with corrosive properties</p> <p>Nitric acid, hydrofluoric acid</p>	Impurities such as tarnish, extraneous rust and metallic particles pressed into the surface by mechanical processing and surface defects, e.g. organic impurities, which prevent the formation of a perfect passive layer, are removed by pickling (selective application!).
Disinfectant cleaners	<p>Common active ingredients: – quaternary ammonium compounds (= algaecides) with added water (they act as cationic surfactants, simultaneously cleaning and disinfecting) – aldehydes, surfactants and water</p> <p>Chlorine and/or chloride containing cleaners such as sodium hypochlorite must not be used. Due to the non-porous nature of the surface of the stainless steel, deep penetration is not possible and therefore not necessary.</p>	Effect on pathogenic germs varies depending on the disinfecting agent. When using disinfectant cleaners of any kind, consent must be obtained from the competent authority (water rights authority, fishing rights holder, etc.).
Cleaning agent for high pressure cleaners	Alkaline, neutral or acidic agents (see relevant section): depending on the application, they are adjusted to be low-foaming or high-foaming.	High-foaming products: the formation of foam prevents the detergent from running off the wall, thus prolonging its action time.

Resources	Composition	Fields of application
Agent for simultaneous cleaning and preservation	<p>These products contain conditioning agents (e.g. hair waxes, plastics, silicones) and cleaning substances. A distinction is made between the following main types:</p> <ul style="list-style-type: none"> – Solvent preservatives (contain conditioning components and organic solvents) – Non-abrasive emulsions (contain conditioning components, surfactants, water and organic solvents) – Abrasive emulsions (contain conditioning components, surfactants, water, organic solvents and soft polishing agents). 	<p>Only recommended for removing minor soiling. Generally used for components above the water level such as diving boards and handrails. Preservation protects the stainless steel surface from flash rust and other damaging foreign substances. Streaks can form on coloured stainless steel which affect its appearance.</p>
Preservative	<ul style="list-style-type: none"> – Solvent preservatives (contain organic solvents and conditioning components) – Emulsion preservatives (contain conditioning components, water and surfactants as emulsifiers). 	<p>Effect like "agent for simultaneous cleaning and preservation".</p>

3.3. Pool filling

After cleaning the pool, it is essential to fill it without direct sunlight, i.e. the filling process should be started in the late evening hours or in cool weather.

Before filling the pool, please check all fittings and in particular all safety features are in good working order and properly fastened – loose bolts/nuts must be tightened.

- ✓ Spotlights – counter-current system
- ✓ Pool cover
- ✓ Gutter grates
- ✓ Ladders – stair rails
- ✓ Fall protection devices
- ✓ Separation rope brackets – signage – etc.
- ✓ Water slides
- ✓ Floor channel cover: make sure that the sealing lip is in the correct position, as it can fold over at one end of the cover when it is pushed in; check floor channel nozzles for fit, wear and completeness
- ✓ Check covers on intake and inlet openings are fully and securely fastened
- ✓ Check flood valves for centric fit and clean sealing surface
- ✓ Close the slide valves of the pool drain

Then you can start filling the pool:

- either through floor channels integrated in the pool / inlet nozzles:
- when filling via floor channels, it is essential to ensure that a permissible filling pressure of 3 m H₂O is not exceeded. The covers of floor channels are designed for a maximum pressure of 5 m H₂O when filled. If the maximum permissible filling pressure is now exceeded without considering the load of the water already in the pool, this can cause the floor channel to become deformed and the seals to lift off. This in turn would result in uncontrolled inflow effects. An even distribution of clean water is no longer ensured. The filling pressure can be regulated as necessary by the pump pressure or mains pressure.
- Fill the pool using a free inlet from a temporarily installed supply line – hose connection to the nearest hydrant or well, etc.

In large pools where it is not possible to ensure that the pool bottom is filled with water and filling also takes place during sunlight, mobile sprinkler systems (lawn sprinklers) should be used to cool the bottom plate. By cooling the entire pool bottom surface evenly, it is possible to prevent uneven retraction of the thermal expansion of the bottom plate (wrinkling).

If the filling water has an extreme temporary hardness of over 20°dH, we recommend the use of a softening plant, whereby a residual hardness of 8-9°dH should be maintained.

This serves to slightly buffer the pH-value during the commissioning phase of the water treatment plant.

If the water treatment (incl. chlorine dosing and pH neutralisation) is not put into operation after the pool has been filled again (e.g. in autumn before winter storage),

- algae will start to appear within a few days (depending on the water temperature and solar radiation).

- We recommend treating the water to prevent lime precipitation in the pool. This means adjusting the acid capacity to approx. 2°dH.

3.4. Pool cleaning during operation

The usual maintenance and cleaning work, such as vacuuming the floor, etc., must be carried out while the pool is in operation. If necessary, the pool edges, side walls and channel gratings can be cleaned with soft handle brushes – while the filter system is running – immediately before backwashing.

Stainless steel components mounted above the water level or outside the pool must be cleaned at least twice a week by flushing with drinking water to remove deposits with an increased chloride concentration due to evaporation of the spray water (e.g. starting block, railings, etc.). This will prevent corrosion due to climatic conditions.

If corrosion has already occurred, it must be removed immediately. As a rule, this is done in isolated spots using pickling paste and subsequent treatment with a stainless steel surface cleaner to restore the protective passive layer. If corrosion occurs repeatedly with no obvious cause, it is essential to consult the pool manufacturer.



Attention! Corrosion that is not or insufficiently treated can result in irreparable damage to the stainless steel pool.

The clean and pool water quality must comply with the legal regulations and standards and be adequate for ensuring the limit values for chlorides according to the table. It is also necessary to provide for the required and prescribed addition of fresh water.

Foreign objects such as coins, hair clips and the like should be removed from the pool as soon as possible to prevent foreign corrosion. Any screws and nuts that come loose during operation must be tightened.

3.5. Wintering (Outdoor pools)

In principle, stainless steel pools may only be wintered when completely full.

Paddling pools and walk-through pools, i.e. pools with very shallow water depth (< approx. 50cm), must be emptied and cleaned for wintering.

Before taking the bathing water treatment system out of operation, the chloride content and the pH value of the pool water must be checked again and, if necessary, reduced to the value specified under point 2.3. by adding fresh water.

For wintering we recommend adjusting the carbonate hardness so that no lime precipitation occurs in the pool during the winter break. This means adjusting the acid capacity to approx. 2°dH (corresponds to approx. 3.56°fH in Switzerland). To prevent heavy lime and algae deposits on the stainless steel pool in winter, a wintering agent can be added to the pool water before wintering. This makes spring cleaning easier – especially with hard water. When adding the wintering agent, the chloride content must not be exceeded according to the specifications in point 2.3.

The addition of the wintering agent has to be carried out according to point 2.4.6 – Application of chemicals.

The supply lines of features such as gargoyles, splashing rhinoceros, water mushrooms, etc. must be emptied at the end of the bathing season. Smaller plastic features such as play objects, children's slides etc. should be cleaned and stored in a dry place at the end of the bathing season.

The shut-off valve of the outlet pipe of the balance tank must be left open to ensure that rainwater and melt water can flow out of the surge water gutter.

Pipelines that may have been laid in frosty areas must be closed at the pool side (except for raw water pipes) and emptied. As a rule, this mostly concerns tapping points for measuring water, high-level massage jets, flow channel jets etc. Here, the cover must be unscrewed, the opening on the pool side sealed with the provided closing component and the pipe drained.

For fixed attractions installed in areas with shallow water depths (e.g. seating steps with air flow, etc.) and where drainage is not possible, additional or alternative measures may be required to prevent frost damage.

If, for any reason, water loss occurs during the winter period, causing the closed ice cover to sink, this can cause massive damage to the stainless steel structure. It is therefore essential to ensure that the inlet and outlet pipes are properly sealed. For swimming pools in areas particularly susceptible to frost (e.g.: at altitudes at 1000m above sea level and higher), we recommend installing additional safety measures such as air pillows and flexible wrapping of handrails leading into the water (e.g. with PE pipe insulation DN 42 x 25 mm fixed with cable ties).

We will be happy to provide you with detailed, project-specific advice and guidance on this matter.

Any free-standing pool equipment and parts such as gutter grates, divider ropes and ladder rails should be dismantled and stored. In the case of channel gratings, we recommend labelling them as they need to fit exactly and they should be stacked in the order in which they are removed.

The pool cover must be wintered according to the manufacturer's instructions.

Skating in stainless steel pools is not advisable, as this can result in mechanical damage to the pool top area, and the thermal conductivity of the pool walls means that the ice surface is not guaranteed to be stable throughout.

3.6. Temporary closure of a filled pool / closing time for indoor pools

Should a pool be taken out of operation for a longer period of time for any reason (shutting down the water treatment), the same guidelines apply as outlined under point 3.5 – Winter storage or 3.1. – emptying the pool.

In particular, all pools (even with water depth <approx. 50 cm) must remain filled, and the pool water must comply with the limit values for pH and free chlorine / chlorides specified under point 2.3. Regarding possible lime precipitation, we refer to point 3.5.

The remaining water level serves to protect the stainless steel construction from stress due to thermal expansion, protection from possible ground water, frost effects on the foundations and mechanical damage.

For indoor stainless steel pools, the structural conditions generally allow them to remain empty for a longer period of time without any problems, since there are no major factors that require a protective filling of water indoors.

Please contact us as the manufacturer if anything is unclear or for clarification in special cases.

3.7. Special usage scenarios of the pools

If operating conditions for the operation and use of the pool deviate from these operating and maintenance instructions, these must be expressly clarified in advance with the manufacturer. Modified or improper use outside the scope of use specified in the project documents or described in these operating and maintenance instructions can lead to technical safety hazards, malfunction of the treated water distribution system, features and other installations, or to serious damage to the stainless steel pool and other system components.

Without claiming to be exhaustive, the following are some examples which may be applicable and in any case require closer examination:

- Modification of gratings at inlet points or other movable parts in the pool
- Subsequent installation and conversion work on the stainless steel pool by third parties
- Changes to swimming pool water technology parameters, e.g.: Operation with reduced circulation capacity / partial capacity operation or change of flow rate for features
- Lowering of the water level outside the operating hours – night-time lowering (e.g., for energy saving measures)
- Daily pool emptying outside of operating hours (e.g., for energy saving measures)
- ...

3.8. Equipment parts

3.8.1. Underwater spotlights / underwater speakers / underwater cameras

- Spotlight operation:
Switching on the spotlights and carrying out a function test is only permitted when the pool is full. The spotlights must be installed for this purpose.
- Spotlight installation from the pool side (water side):
Place the spotlight on the edge of the pool, put the pressure screw and the sealing insert adapted to the cable diameter over the cable and then pull the rubber cable through the screw connection and the cable tube to the outside; push the sealing insert into the cable screw connection and seal it by means of the pressure screw (you will find a specially shaped spanner in our service box for tightening the screw connections). When inserting the spotlight, roll the rubber cable into the installation canister, insert the spotlight into the canister and secure it with the screws provided. The rolled-up cable length in the installation canister must be long enough to allow it to be unscrewed under water and placed on the edge of the pool during subsequent service work on the spotlight.
- Maintenance work on the spotlight (changing the bulb):
 - a) Halogen or PAR 56 lamps:
Unscrew the spotlight under water, place it on the edge of the pool and dry it. Install replacement bulbs according to the manufacturer's instructions, paying particular attention to the correct fit of the seals. Moisture in the lamp housing considerably reduces the service life of the lamp and can lead to serious operating problems.
 - b) LED spotlights:
Usually, the electronics required for the lighting are tightly sealed in the housing. It is not usually possible for the user to replace them. In the event of failure or reduced light output, the spotlight must be completely replaced or sent to the manufacturer to replace the defective electronic components. Further information about the spotlights installed in your pool can be found in our technical documentation or on the website of the respective manufacturer.
- The sealing cable bushings must be checked regularly for leaks and replaced if necessary (in the course of cleaning the pool) – depending on the system installed, either the complete PG gland or only the sealing insert. In addition, the connection cable of the spotlight (especially the part of it that is in the installation canister and therefore in the water) must be checked regularly for damage and brittleness – moisture can reach either the spotlight or, in the other direction, the power supply unit via the smallest cracks in the protective sheathing of the cable and cause damage in both cases. As a guideline, a scheduled cable replacement should be carried out after approx. 5 years of operation due to normal wear and tear.
- Information on sealing and maintenance also applies to other systems installed in the pool's installation canisters, e.g.: Underwater loudspeakers or pool monitoring systems – detailed information on these can be found in our technical documentation, where applicable.

- For large pools where the pool wall is accessible from the rear (technical basement), systems with operation from the outside can be installed (=underwater window with spotlight installed behind it or also a surveillance camera). Replacement lamps must be installed in accordance with the manufacturer's specifications – the seal of the glass pane to the pool must be checked regularly.

3.8.2 Scoreboards

These boards are intended for competitive swimming training and competitions and for use with timing mats. Due to their design, there is a risk of accidents. Therefore, they are only to be used during competitions or swim training and are to be removed for normal pool use. Before storage, the surface must be rinsed with drinking water to avoid corrosion arising from chlorides drying on the surface.

3.8.3 Floating ropes / divider ropes / barrier ropes in the overflow channel

Lifeguards must prevent people from sitting on the ropes. This leads to excessive forces being exerted on both the rope and the brackets on the edge of the pool, which can result in damage to both components.

3.8.4 Starting blocks

Starting blocks are made of a stainless steel base body with screwed-on, non-slip GRP treads. When used in indoor swimming pools, the base body is finished with a resistant powder coating for easier cleaning. If the coating is damaged, it must be repaired quickly to prevent the damage from further infiltrating through the affected area. This can be done, for example, by using a touch-up applicator.

When used in outdoor pools, the surface of the basic body is left polished in stainless steel. To prevent corrosion due to climatic conditions, it must be rinsed regularly with drinking water.

Starting blocks are a type of sports equipment. Make sure that they are only used for this purpose and not as "play equipment" – due to their design, there is an increased risk of accidents!

4. WALK-THROUGH POOLS

To clean walk-through pools, follow the procedure outlined above under pool cleaning. We would like to point out that stainless steel walk-through pools must be filled and operated while the swimming pool is open.



Attention! Emptied stainless steel walk-through pools can become very hot when exposed to sunlight and cause burns and injuries.

5. WARRANTY

As already mentioned at the beginning, our warranty will expire if these operating instructions are not observed.

If there are any uncertainties on your part, please contact us immediately. We are always available to provide further information and explanation.

If you should nevertheless suffer damage to your stainless steel pool, please let us know immediately, stating the key facts:

- What is damaged?
- Where?
- What is the probable reason for the damage?
- What circumstances could have led to this?

- What consequences are to be expected/foreseeable?
- Who is responsible?
- Where and how can you be reached?

NOTES:

- You can also find the **operating and maintenance instructions** on our website
<https://hsb.eu/de/service/#care-instructions>
- You can also **order spare parts** on our website
<https://hsb.eu/de/service/ersatzteile/>

**WE WISH YOU AND YOUR GUESTS LOTS OF FUN AND CAREFREE SWIMMING
ENJOYMENT.**

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