

# WATER PROBLEMS

## Instruction for the client

### I Pool Cleaning

Heavy debris that settles on the bottom is removed using a submerged pool vacuum. The pool vacuum head is attached to a telescopic pole and connected to the skimmer by a hose. Vacuuming the pool's bottom is similar to vacuuming a carpet with a regular vacuum cleaner. Pool bottom cleaning operates in a closed water cycle (FILTER setting on the 6-way valve). During vacuuming, debris collects in the sand filter. Eventually, the sand layer in the filter needs to be backwashed. Place a basket in the skimmer during vacuuming to trap larger debris floating in the water or lying on the bottom. Pool walls and floors are scrubbed using a special brush attached to the telescopic pole. For dirty streaks at the waterline, use a brush and chemicals to minimize the amount of chemicals entering the pool water.

### II Water Treatment

Pool water circulates in a closed system and undergoes both mechanical and chemical treatment. Mechanically, it passes through a filter to capture sediment and small particles, while chemically, chemicals are added to kill algae, bacteria, and microorganisms. Pool water should maintain an alkaline pH between 7.2 and 7.6. This range prevents skin and eye irritation, metal corrosion, and ensures the disinfecting effect of chlorine. A set of chemical compounds is used to adjust the pH as needed. If the pH exceeds 7.6, a pH reducer (pH-) should be added. Conversely, if the pH is below 7.0, a pH increaser (pH+) is added. Water is disinfected with chlorine or its compounds, which must be regularly added due to chlorine combining with other chemicals and evaporating. Chlorine consumption depends on water temperature, environmental conditions, pool surface, and usage. Chlorine concentration should be maintained between 0.2–0.5 ppm (max 1.5 ppm). Low chlorine levels can lead to chloramine formation, which gives water an unpleasant odor and reduces chlorine's effectiveness. If chlorine levels fall below 0.2 ppm, add more, and if it exceeds 1.5 ppm, wait for the chlorine to naturally evaporate.

#### Shock Chlorine

- Used to quickly generate active chlorine to eliminate biological flora, minerals, and break down chloramines in the water.
- Dosage:
  - Shock dosing: 150–200g per 10m<sup>3</sup> of water.
  - Daily dosing: 15–20g per 10m<sup>3</sup> of water to maintain active chlorine levels at 0.2–0.5 mg/l.
- Usage: Dissolve in warm water and slowly add to the pool water while the pump is running with the filter head set to FILTRATION.

#### Long-Lasting Chlorine

- Allows slow chlorine release to maintain water chlorine levels.
- Dosage: 1 tablet (200g) for 40–50m<sup>3</sup> of water every 8–14 days.

- Usage: Place the tablet in the skimmer basket while the pump is running.

#### **pH Increaser / pH+**

- A powder that raises the pH level of water when it is too low.
- Dosage: 100g per 10m<sup>3</sup> of water to increase pH by 0.2.
- Usage: Dissolve in warm water and slowly add through the skimmer while the pump runs with the filter head set to FILTRATION.

#### **pH Reducer / pH-**

- A powder that lowers the pH level when it is too high.
- Dosage: 100g per 10m<sup>3</sup> of water to reduce pH by 0.2.
- Usage: Dissolve in warm water and slowly add through the skimmer while the pump runs with the filter head set to FILTRATION.

#### **Coagulant (liquid or powder)**

- Causes precipitation of minerals and metals in water, making smaller particles clump into larger ones, which are easier to capture by the sand filter or settle as sediment.
- Dosage: 100g per 10m<sup>3</sup> of water after backwashing the filter.
- Usage: Dissolve in warm water and slowly add to the water or place directly in the skimmer while the pump runs with the filter head set to FILTRATION.

#### **Algaecide**

- A liquid that prevents algae growth and eliminates existing algae.
- Dosage:
  - Shock dosing: 100–200ml per 10m<sup>3</sup> of water.
  - Weekly dosing: 10–20ml per 10m<sup>3</sup> of water.
- Usage: Slowly add through the skimmer while the pump runs with the filter head set to FILTRATION.

**Note:** The doses provided are approximate. The exact dosage of pool water treatment chemicals, both in quantity and frequency, must be determined experimentally as every water source reacts differently to pool treatment chemicals.

**WARNING!!!** Concentrated water treatment chemicals are hazardous to humans, animals, and the environment. Store them in a dry, cool, well-ventilated area in a tightly closed container, away from heat sources. Storage areas should be inaccessible to untrained persons and children. Protect eyes and respiratory tract from exposure to chemicals. Mix chemicals only with water, adding one type at a time. Mixing different chemicals can cause fire and release toxic compounds. Containers and stirrers used for mixing chemicals should not be used for other purposes.

## **III Pool Water Treatment – Water Issues**

Distinguishing whether green pool water is due to iron or algae is crucial, as it requires different methods of treatment. Here's how to differentiate:

### **1. Water Color and Shade**

- *Iron:* Water with dissolved iron often has a green-brown, rusty, or cloudy color. Iron-laden water can also turn orange, brown, or even black after being oxidized by chlorine.

- *Algae*: Algae-affected water typically has a clear, bright green color, resembling the fresh hue of spring grass. Algae may cause water to appear more cloudy, but it won't have the brownish or rusty hues of iron.

## 2. Water Clarity

- *Iron*: Iron-induced green water is usually cloudy and may have brownish sediment. Chlorination can cause iron to precipitate, leaving sediment at the pool's bottom.
- *Algae*: Algae-infested water can be both cloudy and clear, though it remains green throughout.

## 3. Chlorine Reaction

- *Iron*: After adding chlorine (shocking), the water can turn brown or darker as chlorine oxidizes the iron, precipitating it as dark brown sediment.
- *Algae*: After chlorine is added (shocking), algae-infested water should slowly lose its green tint. Within 24–48 hours, if the chlorine is effective, algae will die, and the water will clear up.

## 4. Sediment on Pool Surfaces

- *Iron*: Iron can leave visible brown deposits on pool walls, floors, and equipment, particularly near metal parts.
- *Algae*: Algae create a slimy layer on pool walls and floors, typically green or sometimes black (black algae). This slime is usually stickier than iron deposits.

## 5. Water Testing

- *Iron*: A water test for metals will reveal iron levels. These tests are available at pool supply stores. If iron is detected, it's likely causing the green water.
- *Algae*: If the iron level is low or zero, and chlorine levels are too low, algae might be the culprit for green water.

### Summary:

- If the water darkens after adding chlorine or brown deposits appear, iron is likely the problem.
- If the water brightens after shocking and the green color fades, algae are the most probable cause.

For detailed steps on quickly addressing algae in pool water, managing iron deposits with Metal Magic, and addressing brown water from iron oxidation, follow the outlined procedures to restore water clarity and safety in the pool.

## IV How to Quickly Clean Green Pool Water Caused by Algae?

Here are a few steps that will help you quickly restore the clarity and safety of your pool water:

1. **Adjust the pH Level** The first step is to check the pH level, which should be in the range of 7.2-7.6. If the pH is too high or too low, the water becomes susceptible to algae growth. Use a tester to check the pH and add the appropriate chemicals to balance it. To raise the pH, you can use **pH+**, and to lower the pH, use **pH-**. Be sure to add the chemicals gradually, following the manufacturer's instructions.
2. **Check the Filter** Next, make sure the filtration system is working properly. Clean the filter if it's dirty, or replace the filter media. A functioning filter will help remove suspended particles that cause cloudiness.
3. **Vacuum the Pool** Before starting chemical treatment, it's a good idea to clean the bottom and walls of the pool with a vacuum cleaner. This can be a manual, semi-automatic, or automatic vacuum. Slowly move the vacuum across the pool floor to collect dead algae, leaves, and other debris. Don't forget about hard-to-reach areas like steps or corners.
4. **Shock the Water** Shocking the water is a key step in fighting algae and bacteria. Add a shock treatment (chlorine or non-chlorine) according to the instructions on the package. Chlorine-based products are the most effective but may raise the chlorine level to a point

where the water will need time to stabilize. Turn on the filtration pump for 12-24 hours to ensure circulation and the effectiveness of the treatment.

5. **Apply an Algaecide** After shocking the water, it's advisable to apply an algaecide, which will help prevent algae from coming back. There are various types of algaecides available, including copper-based and polymer-based options. Choose a product suited to your pool type and the type of algae in your area, following the instructions on the packaging.
6. **Filter the Water** After shocking and adding algaecide, run the filtration system for at least 24 hours. Make sure the filter is working correctly and clean it regularly to remove debris. Sand filters should be backwashed, and cartridge filters should be thoroughly cleaned.
7. **Clarify the Water** Finally, you can use a water clarifier, which helps gather tiny particles into larger ones that are easier to remove through filtration. Be sure the filtration pump runs for several hours after applying the clarifier to allow for even distribution and maximum effectiveness.

## V How to Handle Brown Water Containing Iron Compounds Using Metal Magic

Metal Magic is a product designed to bind metal ions, allowing them to be removed from the water in the form of precipitated sediment. It works by neutralizing dissolved metals, making them less reactive and easier to filter out.

1. **Prepare the Pool**
  - Ensure that the pool's filtration system is functioning properly. Check and clean the filter if necessary to ensure efficient operation.
2. **Measure the Water's pH**
  - Use a pH tester to measure the water's pH level. The optimal range for Metal Magic is 7.0–7.2. If the pH is outside this range, adjust it using the appropriate chemicals to raise or lower the pH (use **pH-** if it is too high, or **pH+** if it is too low).
3. **Add Metal Magic**
  - Measure the appropriate amount of Metal Magic according to the instructions on the packaging (typically 0.3–0.5 liters per 50 m<sup>3</sup> of water).
  - Pour the product directly into the pool, evenly distributing it across the water's surface.
4. **Run the Filtration System**
  - After adding the product, start the filtration system. The filter should run continuously for at least 24-48 hours to effectively remove the precipitated metals from the water.
5. **Monitor the Process**
  - Check the filter every few hours and backwash it if necessary, as the precipitated contaminants can clog the filter quickly.
  - Within the first 12-24 hours, Metal Magic will begin binding the metals and precipitating them from the water, which will be visible as sediment in the filter.
6. **Clean the Pool**
  - Once the iron is precipitated, sediment may appear at the bottom of the pool. Use a pool vacuum to thoroughly remove the sediment.
7. **Check Water Quality**
  - After the precipitation process is complete, recheck the water parameters, especially the pH level and other indicators, to ensure they are within the normal range (pH between 7.2-7.6).

## 8. Prevent Future Contamination

- Regularly monitor metal levels in the water and use Metal Magic preventively if the

pool water comes from a metallic source, such as a well. Additionally, keep the filtration system well-maintained and ensure the pH level remains balanced.

### Benefits of Using Metal Magic:

- **Effective Metal Removal:** More effective at removing metal compounds than shock chlorination.
- **Stable pH:** Prevents significant fluctuations in pH levels.
- **Protection Against Stains:** Minimizes the risk of difficult-to-remove brown stains forming in the pool.

Following this procedure will help you effectively remove metals, including iron, from your pool water, ensuring its clarity and safety.

**NOTE** If the pool water appears clear on the day of filling but turns dirty brown the day after chlorination, it is most likely due to the oxidation of dissolved iron. This oxidation occurs when the iron in the water reacts with oxygen from the air or the added chlorine, resulting in iron oxide deposits that stain the water brown. To solve this issue, using a metal precipitating agent like Metal Magic is recommended. Follow the steps outlined above for the best results.

## VI Dealing with Green Stains in the Pool

When greenish-brown stains appear in your pool and the walls become slippery, it's a sign that algae are developing. To effectively address this issue, follow these steps:

**Use chemicals during a break in pool use.** For safety reasons, the pool should not be used after chemicals are applied. Always dose according to the instructions on the packaging.

### Step 1: Shock Chlorination

1. Add 150-200 g of shock chlorine per 10 m<sup>3</sup> of water. Shock chlorine quickly kills algae and other microorganisms, restoring water clarity.

Alternatively, you can use algaecides at a dose of 200 ml per 10 m<sup>3</sup> of water. These products are specifically designed to combat algae and can also act as a preventive measure for the future.

### Step 2: Removing Sediment

- After eliminating the algae, use an underwater vacuum cleaner to remove sediment from the bottom of the pool. Regular cleaning will help maintain cleanliness and prevent algae from regrowing.

### Step 3: For Intense Algae Growth

- If the algae infestation is severe, consider draining the pool. Then:
  - Clean the pool using a disinfectant.
  - Scrub the bottom and walls to remove all algae residues.
  - Rinse the pool with clean water to remove any chemical remnants.

### Prevention

To avoid future algae problems, regularly monitor the water's chemical parameters, including pH and chlorine levels. Maintain proper values (pH 7.2-7.6) and use algaecides as a preventive measure during the season, especially on hot or sunny days. Following these steps will help restore the pool's cleanliness and ensure safe water for swimmers.

## VII Eye and Respiratory Irritation in the Pool

Burning eyes and respiratory irritation may be caused by an excess of chloramines in the pool water.

Chloramines form when chlorine reacts with organic contaminants such as sweat, cosmetics, or skin residues. Here's how to effectively address this problem:

### Step 1: Increasing pH

1. **Adjust pH:** Raise the water's pH level to 7.4 by adding a pH increaser (pH+). Maintaining the correct pH is crucial for chlorine's effectiveness and swimmer comfort.

### Step 2: Shock Chlorination

2. **Add Shock Chlorine:** Add 150-200 g of shock chlorine per 10 m<sup>3</sup> of water. This process will oxidize the chloramine compounds, eliminating the source of irritation.

### Step 3: Monitoring and Prevention

- **Regular Water Testing:** After completing the process, monitor the water's chemical parameters to prevent future problems.
- **Maintaining Chemical Balance:** Regularly adding chlorine and maintaining the proper pH will help control chloramine levels and prevent further irritation.

By following these steps, you can effectively reduce eye and respiratory irritations, ensuring comfort and safety for pool users.

## VIII Cloudy, milky water

Cloudy and milky water in a pool can be caused by several factors:

1. **Organic contaminants:** Dead algae, leaves, sand, and other debris can cause the water to become cloudy. These particles accumulate at the bottom of the pool and in the filter.
2. **Insufficient filtration:** If the filtration system is not working properly, it cannot effectively remove contaminants from the water.
3. **Improper chemical balance:** A pH, alkalinity, or chlorine level that is too low or too high can affect water clarity. Low pH can promote corrosion and algae growth, while high pH reduces the effectiveness of chlorine.
4. **High levels of chloramines:** These form when chlorine combines with organic contaminants, leading to cloudy water.
5. **Use of inappropriate chemicals:** Some chemicals, such as algaecides or clarifiers, if used excessively, can cause the water to become cloudy.
6. **Rainfall:** Rain can introduce contaminants into the water, contributing to cloudiness.

### Instructions for dealing with cloudy water in a pool

#### Step 1: Test the water

1. Check the water parameters: Measure the pH, alkalinity, and chlorine levels. The ideal values are:
  - pH: 7.2-7.6
  - Alkalinity: 80-120 ppm
  - Chlorine: 1-3 ppm

#### Step 2: Adjust the water chemistry

2. **pH Adjustment**
  - If the pH is too low, add a pH increaser (pH+).
  - If the pH is too high, add a pH reducer (pH-).
3. **Chlorine Addition:** If chlorine levels are low, add shock chlorine to kill bacteria and microorganisms.

#### Step 3: Clean the pool

4. **Remove debris:** Use an underwater vacuum to collect sediments and other debris from the bottom of the pool.

5. **Use a clarifier:** Add a water clarifier to help bind small particles of contaminants, making it easier for the filter to remove them.

#### Step 4: Activate filtration

6. **Run the filtration system:** Ensure the filtration system is operating for at least 24 hours. Regular filtration will help remove cloudy particles from the water.

#### Step 5: Monitoring

7. **Regular testing:** Check water parameters every few days to ensure they are returning to normal. Also, monitor the clarity of the water.

#### Step 6: Prevention

8. **Regular cleaning:** Frequently check and clean the filter to ensure its efficiency. Also, inspect the pumps and other components of the filtration system.
9. **Managing contaminants:** After every rainfall or heavy pool use, make sure to remove leaves and other debris to prevent their accumulation.

## IX Rough deposits on the bottom and walls of the pool – how to deal with them? How to identify the cause of the deposits?

Deposits in the pool can be caused by excessive amounts of magnesium/calcium or iron compounds.

#### How to recognize the deposits?

##### Deposits caused by magnesium/calcium:

- **Appearance:** Typically, these are white, gray, or light yellow deposits that may have a rough texture.
- **Reaction to acid:** You can perform an acid test (e.g., with vinegar). If the deposit dissolves quickly upon the application of acid, it is likely calcium or magnesium carbonate.
- **Location:** These types of deposits often accumulate on the edges of the pool and around the filter jets.

##### Deposits caused by iron:

- **Appearance:** Usually has a brown, rusty, or dark green color and may have a smooth or sticky texture.
- **Reaction to acid:** Iron deposits may not dissolve in acid as easily as calcium deposits, but they may change color to darker.
- **Location:** Iron deposits can be more visible at the bottom of the pool and in areas where water stagnates.

##### Additional tests:

- **Metal test:** Use a water tester to check for metal levels, including iron.
- **Chemical analysis:** You can send a water sample to a laboratory for a detailed analysis of its chemical composition.

##### What to do next:

- **For calcium/magnesium:** Adjust pH (lower the pH value).

##### Check water hardness:

Ensure that the water in the pool is not too hard (high levels of calcium and magnesium). Hard water promotes deposit formation.

- **pH adjustment:**  
Keep the water pH in the optimal range of 7.2-7.6. Use pH increasers (pH+) to raise it and pH reducers (pH-) to lower it.

- **Filter cleaning:**  
Check if the filters are clean. If necessary, rinse them or replace the filter sand.
- **Vacuuming the pool:**  
Use a pool vacuum to remove deposits from the bottom and walls. Move the vacuum slowly to avoid stirring up the deposits.
- **Shock chemical treatment:**  
Add a large dose of shock chlorine to kill microorganisms and help dissolve deposits.
- **Use of flocculants:**  
Use a flocculant to bind small particles of deposits, making it easier for the filtration system to remove them.
- **Regular filtration:**  
Ensure that the filtration system runs continuously for at least 24 hours after applying chemical treatments.
- **Monitoring water parameters:**  
Regularly check water hardness, pH, and chlorine levels to prevent deposit recurrence.
- **Preventing future issues:**  
Implement regular maintenance procedures, including filter cleaning and monitoring water chemistry. By following these steps, you can effectively remove rough deposits and maintain clean water in the pool.
- **For iron:** Use Metal Magic or other metal removal products to precipitate and remove the deposits. Instructions for using Metal Magic are provided above.

In cases where the deposits do not come off after using standard chemical treatments, it is recommended to drain the pool and apply stronger cleaning agents to thoroughly wash the pool surface. An alternative solution is to mechanically remove the deposits using sandpaper. For assistance in selecting appropriate cleaning agents, please contact our service department.

**Caution:** Be careful when using and dosing chemicals, as they may damage the pool surface. Always use products according to the manufacturer's instructions provided on the packaging.

### Preventing water overheating

To prevent water from overheating, leave the cover slightly ajar to allow air circulation and cooling. During the summer season, regularly open the enclosure or other pool covers to maintain an appropriate water temperature.

### Protection against chemical reactions

High water temperatures can accelerate chemical reactions occurring in the pool. Maintaining the water at a moderate temperature can help stabilize the chemical balance, preventing potential problems with pH and other water parameters. However, remember that each pool may have its specific conditions. Therefore, monitoring water parameters such as temperature, pH, and chlorine levels, and adjusting actions to the individual needs of the pool is essential. Regular water testing and maintaining proper circulation and filtration will help keep the pool in good condition throughout the summer season.