

REALIce[®]

Operating Instructions and Ice-Making and Maintenance Tips



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Building Ice

Building ice on an existing ice

First increase the ice temperature to make it easier to shave the ice. Shave the ice to just above lines and/or advertising. After finishing shaving return to the normal ice temperature. Go to: **Ice making instructions**

Building new ice

To build great ice with REALice, use only cold water to avoid burn marks from the hose on the ice.

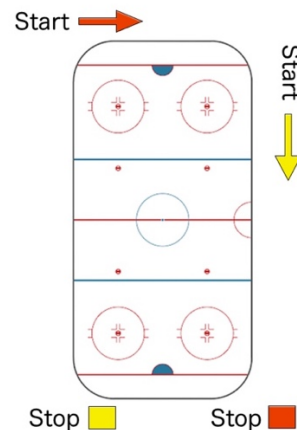


We recommend using the **REALice handheld with the black cap** to build the ice from scratch, although you can use any ice-building methods as long as the water has been treated through the REALice system under pressure (static PSI of 43 or more). The water should be added in thin layers.



Whatever method you choose, never stand still. If using the REALice handheld nozzle, pointing it upward (at a 45° angle) will give better coverage. Move it continuously from one side to the other as you move across the rink. Allow the water to freeze before applying the next layer.

Only ½ inch or 10mm of ice will need to be built before it is strong enough to support the ice resurfacing machine.

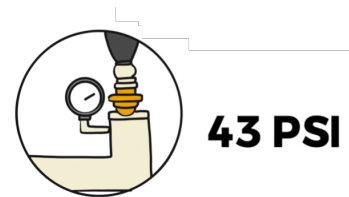


Ice making instructions

Drain all water from the ice resurfacing machine and refill it with REALice-treated water, treated under pressure. **Mixing regular water with REALice-treated water will create bad ice.**

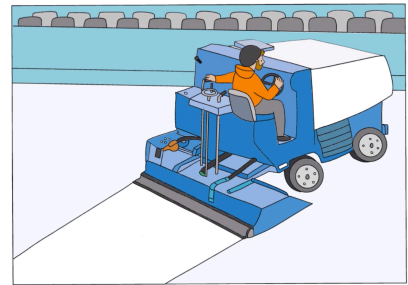


Make sure there is adequate static pressure (43psi) and flow. The tap to the REALice wall unit must be **opened completely** to treat the water: trickle-filling will result in cloudy/wavy ice.



Build the ice in thin layers and wait for each layer to dry before starting a new one.

Once the ice is about $\frac{1}{2}$ " thick (10 mm) it will be **strong enough** to begin using the **ice resurfacing machine**. Adding a layer of water with the ice resurfacing machine should take about 10 minutes (NHL-sized rink) or about 12 minutes (Olympic-sized rink).

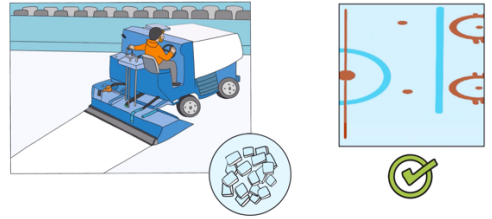


After the first layer of water has been put down using the ice resurfacing machine, return to the filling station and fill the floodwater tank with REALice-treated water once again. Make sure the ice has completely frozen before starting the next layer.

Repeat the above procedure until you have an extra 10-15mm or $\frac{1}{2}$ - $\frac{3}{4}$ inches of ice. When finished, the ice should be about $1\frac{1}{4}$ inches (30 mm) thick

Ice thickness and temperature

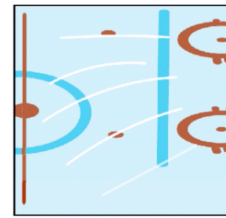
Without micro air bubbles left in the water, the impurities have nothing to cling to and will be forced to the surface. **By dry-shaving** the ice, the **impurities** will be **removed**. Before you've reached your desired thickness, dry-shave the ice once. Then apply another 1-2 layers of REALice-treated water using the ice resurfacing machine. You will have produced a clear, dense sheet of ice.



Next Job: Find the Sweet Spot

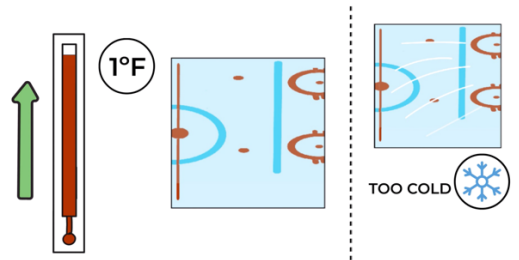
Check the temperature of the ice. Because REALice-treated water freezes so quickly, you will need to raise your brine settings higher or your ice will be brittle. What that temperature will end up being is unique to your building, but you can expect it to be 3-5 °F higher (1-2°C) in order to prevent the water from freezing too quickly.

Raise ice temperature
3-5°F/2-3°C



TOO COLD 

Raising the temperature should be done gradually and in steps of 1°F (½°C) at a time. Before making a second temperature increase, wait about a week as the ice needs to stabilize. Repeat the gradual temperature increases until the snow from a dry-shave is wet. Then, lower the ice temperature by one degree.



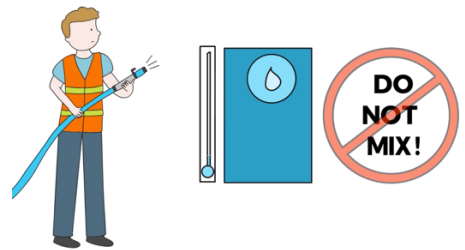
Water temperature

Normally, only cold water will need to be used with REALice. In some circumstances it may be necessary to add some warm water, especially if the ambient temperature above the ice is colder than freezing and the ice is freezing from the top down instead the bottom up. With improper building insulation and cold outdoor temperatures, the towel on the back of the ice resurfacing machine could freeze to the ice unless tempered water is used.

Cold water
5-18°C, 41-64°F

Any tempered water needs to be run through the REALice system. Mixing REALice-treated water with regular water will result in bad ice.

The **water temperature** does **not** need to exceed **18°C/64°F**.



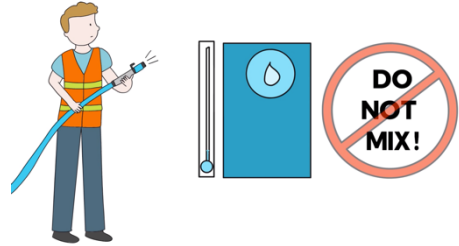
Humidity

High humidity creates ice crystals (rime) on the surface, resulting in more snow being produced. The **humidity** levels in the ice arena should **not exceed 50-55%**

Humidity
between 50-55%

Use only REALice-treated water

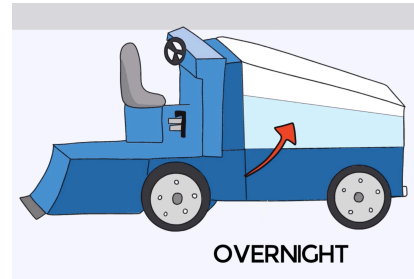
Do NOT mix waters. Normal water and REALice- treated water should never be mixed. They have **different properties** (viscosity), different freezing characteristics and create different ice crystals. **Mixing the waters will result in bad ice** as well as higher energy consumption as your refrigeration plant will be working harder to freeze the resulting slushy water.



REALice-water

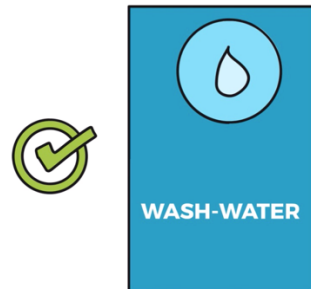
The **effect of a REALice** treatment **lasts at least 24 hours**. This means the left-over floodwater in the ice resurfacing machine can be topped up throughout the day. In fact, the ice resurfacing machine can be filled in the evening and can be used for the first resurfacing the following day.

24h



Wash water

The **wash water** in the ice resurfacing machine may need to be **slightly warmer than the floodwater to prevent it from clogging**.



Ice thickness

Since ice made with REALice is usually clearer than ordinary ice, it is difficult to estimate the ice thickness, especially when building ice from scratch for the very first time! Make it a habit to regularly check that the ice has not become too thick.

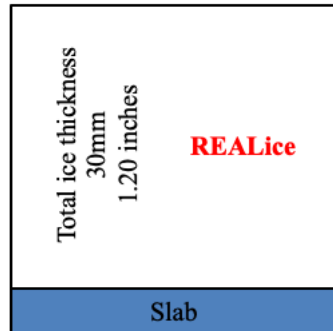
It is generally sufficient to have an **ice thickness of 1¼ inches** (30mm). Aim to keep the ice thickness consistent: an extra thickness of 10mm/.40 inches results in 18m³ or 193.75 ft² of ice to keep frozen during the whole season.

Gates and doors

Make it a habit to always **close gates and doors** to both the arena and to the ice rink. Warm, moist air coming into the rink will result in higher energy costs and poor ice quality if a gate or door remains open for longer than necessary.

If there is an option, an air lock is preferred.

Ice thickness 30mm/1¼ inches.



Ice temperature

The ice has only one temperature range where it's best and that temperature range differs from rink to rink. If the ice is **too warm it will be soft and tough**. If the ice is **too cold, the ice will be dry and brittle**, resulting in a lot of snow on the ice.

The best way to find the optimal range is to **raise ice temperature in small increments**, $\frac{1}{2}^{\circ}\text{C}$ or 1°F at a time and then wait a week before raising the temperature again. During this time, **study the ice quality**. Repeat until the snow from a dry-shave is wet. Then, lower the ice temperature by one step. This is the sweet spot.

To hot – Bad

Optimal

To cold – Bad



Resurfacing

REALice-treated ice is more **durable**, **producing fewer scars and gouges than ordinary ice**. This means the quantity of flood water being put down, in most cases, can be reduced.

Be observant of the **amount of water used** and the **thickness of the ice**. **Shave the ice with each resurfacing**, don't just "collect" the snow. As a rule of thumb, it's always better to shave more than less.

Always have a **good, sharp blade** installed. **Drive slowly and consistently** with each resurfacing. Turn off the water where several passes will be made, such as over the creases. Resurfacing an **Olympic rink** should take **10-12 minutes** while an **NHL-rink** should take **8-10 minutes**.

If your ice is having **trouble freezing** the water, **check your ice thickness** and **operators' flooding routine** first. In most cases, the unfrozen water is caused by ice that's too thick.

Lowering the brine temperature to solve the problem of water that won't freeze will result in brittle, chippy ice that scars easily.

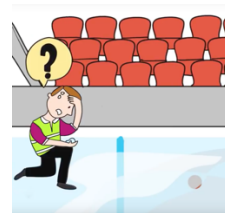
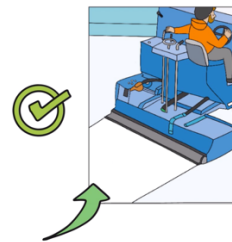
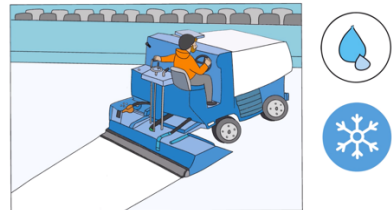
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✓ **CLEAR**
✓ **STRONG**
✓ **RESILIENT**



TOO COLD 

Gradual changes

An ice rink is complex, where many components contribute to the overall ice quality and energy consumption. Experience, care and expertise are needed to build and maintain a really good sheet of ice.

When changes are made after having installed ice using REALice, it is important to make just **one change at a time** to understand how the change has impacted the ice.

There is a certain delay in the ice after an adjustment: wait **at least a week** before making further changes.

One change at a time:

Ice thickness

Resurfacing temperature

Humidity

Spectators

Ice temperature

Outside temperature

Arena temperature

Amount of water

Compressors

Best practices, REALice, summary

	All water used for your rink needs to be REALICE treated	Comments
After install of REALICE	First increase the ice temperature to make it easier to shave the ice. Shave the ice to just above lines and/or advertising. After finishing shaving return to the normal ice temperature.	
Building New Ice	<p>Use REALICE un-heated water</p> <p>Normally, REALICE is used with only cold water. In some circumstances it may be necessary to add some warm water. This is seen more when there is very cold water near 5C/40F and/or if the brine temp either has not been reset upwards or if there are inconsistencies in resetting the brine temperature. Try this by adding a little warm water (REALICE treated) at a time, if you do not get good results with only cold water.</p> <p>Use the REALICE handheld nozzle to build very thin layers for both new ice after taking down the rink and also for building ice over existing ice.</p>	<p>Adjust temp as needed typical un - heated water</p> <p>Note: recommended unit installation to allow hot/cold mixing. This can help with rate of freezing as does confirming accurate control of brine temperature.</p>
Water Pressure	Needs to be at least 3bar/45 psi	City water usually, 3-5 bar or 45-60 psi
Resurfacing Tank	Fill with only REALICE treated water	All cold or mixed
Do not mix REALICE water with untreated water for the best results	<p>Normal water and REALICE-water have different properties and should not be mixed. The different waters have different freezing characteristics and various ice crystals. Mix of water will give you a poor ice quality and higher energy consumption.</p> <p>The effect of REALICE treatment lasts at least 24 hours. This means that you can fill up the Ice Machine in the evening, before next day's work</p>	
Wash water	The wash water in the Ice Machine may usually need to be slightly warmer, not to be cooled by the re-circulating water, to prevent it from clogging.	Does not need to be REALICE water – or can use REALICE but need to use mixing to make warm
Typical Ice thickness about 30mm, or 1.20"	Will vary based on your conditions or if rink is covered for other venues or due to regulations.	
Ice temperature (Brine Temp)	If the ice is too warm it becomes soft and tough. If too cold, the ice becomes dry and brittle and it builds up a lot of snow on the ice. The temperature of the optimal range is different from ice rink to ice rink where each ice rink is unique based on climate zone, age and use of refrigeration equipment, etc. The best way to find the optimal range is to raise ice temperature in small increments, about 0.25 to 0.50°C, 1-1.5°F at a time and then wait at least a couple of days and during the time study the ice quality. This is repeated until you feel that the ice quality is too bad. Then you lower the ice temperature one step.	<p>There needs to be accurate automatic control of the brine temp?</p> <p>How is Brine temp for the specific rink measured/controlled?</p>
Resurfacing	Ice made of REALICE-treated water is more durable than ordinary ice. This means that it does not get as much and as deep scars and injuries in a REALICE compared to a regular ice. This also means that the water that is added at each resurfacing usually can be reduced or use fewer resurfacing rounds. It is important that you shave the ice, not only "collect" the snow.	
Humidity	High humidity creates rime on the ice and therefore produces more snow. To obtain an optimal ice, the humidity in the ice arena should not exceed 50-55%. Also very low ambient temp, (less than 10C/50F) especially if the temp approaches the dew point can cause fogging and frost/rime on the ice.	What is the humidity and dew point