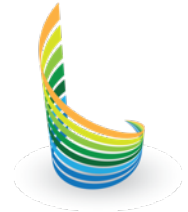


REALICE TRAINING NOTES

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SUSTAINABLE SAVINGS: WATER-ENERGY NEXUS



By: SWITCH Services Inc.
REALICE Customer Service: 888-542-9292
Web: <https://realice.ca>
E-mail: support@realice.ca

I. REALICE TRAINING NOTES

1. The REALice handheld unit - The handheld nozzle treats the water the same way the REALice wall unit does. It's perfect for building ice and for making spot repairs. It comes with a Blue and a Black adaptor.



The **Blue** adaptor creates a narrow mist that diffuses the water to create a clear, durable ice surface.

The **Black** adaptor creates a wider stream.

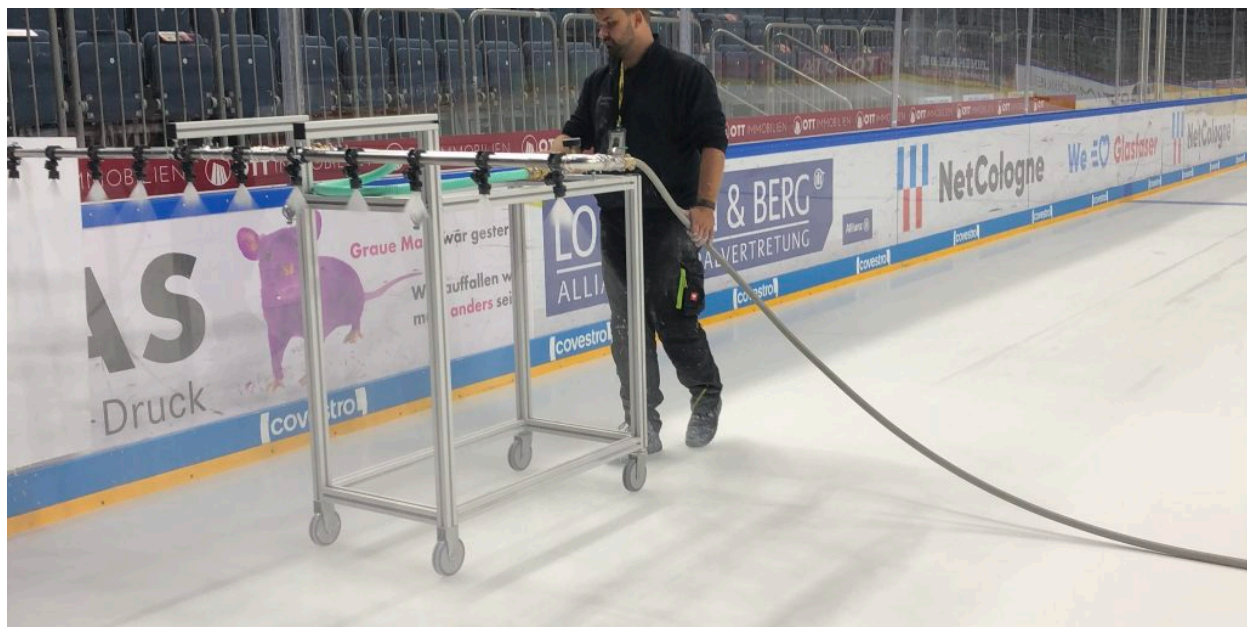
Both adaptors can be used for spot repairs or to quickly fill a pail with REALice-treated water for on-ice repairs.

NOTE: Although pointing the adaptor **down** is easier to do, you'll have better results with your ice if you **point the nozzle up**, move the handheld from side-to-side and continually keep moving as you spread water lightly onto the slab or ice.

Questions:

We have existing ice. What should we do?

REALice-treated water and regular water have different properties and it will take time for the REALice-ice to bond with the existing ice. We recommend that you shave the existing ice down to just above the lines and logos and either use the REALice handheld adaptor to build new ice, or use REALice-treated water in the ice resurfacing machine to rebuild the ice to a thickness of no more than 1¼ inches. Putting REALice-treated water on top of existing ice ***without shaving it down*** will result in sub-standard ice and, depending on the number of resurfaces per day, could take up to three weeks to bond.



We use a... (paint skid, spray boom or elevated spray boom as pictured above*) to build our ice – can we continue to use that to make ice?

Yes, no problem! Just **make sure ALL water is treated through the REALice system**. However... we strongly recommend that you build the ice using the REALice handheld as you will build the ice in thin, dense layers – and you will be surprised at how quickly you are able to build your surface up.

How long will it take? The REALice-treated water will freeze quickly, with little waiting for the ice to freeze before laying the next layer when using the REALice handheld.

2. Mixing the Ice Paint – If using ice paint, mix the ice paint using REALice-treated water at **full water pressure** through either the wall unit or the handheld device. Apply as per the manufacturer's directions.

3. Flooding once the ice paint and logos are sealed.

Question: How quickly will we be able to get the ice resurfacer on the new ice? That's up to you as to when you begin flooding using the resurfacing machine, but since the REALice system delivers stronger ice, you will be able to use your ice resurfacing machine to build up ice faster than what you did in the past. You will not, in most cases, get spider cracks from the weight of the machine once you put it on.

Important Note: If the ice resurfacer has studded tires, make sure the studs are shorter than the depth of the ice you have before you put it on the ice.

4. The REALice wall unit



Go with the flow -- The water needs to enter the REALice system at the wide part of the venturi and exit through the small end to treat the water

properly. **Ensure the wall unit is properly affixed to the wall** so it is not inadvertently pulled off the wall due to a forgotten hose in the ice resurfacing machine.

Since REALice-treated water and regular water have different properties, it is important that you NEVER BYPASS THE REALice SYSTEM. If you do, the ice will have difficulty freezing.

The REALice system needs a **minimum static water pressure of at least 43 PSI** to work properly. If the ice looks wavy, check your static PSI.

Important Note: Use the full water pressure available to treat the water through the REALice wall unit. Using partial pressure for a slow fill of the machine will produce wavy ice. **No trickle filling.**

Question: Do we need a mixing valve before the REALice wall unit?

We suggest it, especially if the temperature in your arena directly above the ice ever goes below freezing. A mixing valve will provide lukewarm REALice-treated water for flooding to prevent the rug on the back of your ice resurfacing machine from freezing to the ice. Ball valves can also be used: we recommend that ALL water in the Zamboni room goes through the REALice system to prevent non-treated water from ever ending up on the ice.

5. REALice and the ice resurfacing machine:

- Make sure the blade on your ice resurfer is always sharp. This is a standard best practice for ice making.
- Shave the ice with each ice make, don't just pick up the snow. Shaving will cut out the ruts and ensure your ice remains clear.
- Use wash water with each ice make if you have that option on your ice resurfacing machine. It's recommended that the wash water be treated with REALice, but as this is a recirculating system, regular water can be used.

- Check the towel. Is it clean or full of rust spots? If you wouldn't wash your car with it, you shouldn't have it on your ice. A clean towel makes a big difference to your ice quality.

6. Ice Quality and Higher Setpoint/Brine Settings



Once your ice is ready, you must begin to raise the brine temperature settings or setpoint **gradually** for great ice. **Refusing to or being unable to or forgetting to change your brine temperatures higher will result in brittle ice that creates too much snow.** The REALice-treated water freezes faster than regular water because it has better heat-transfer properties, so prevent flash freezing by raising the temps. **This is not a recommendation but an industrial process change.**

Each increase should be done **one degree Fahrenheit at a time (1F)** and **give your ice a few days to get accustomed to the warmer temps before raising it again, then wait a few days before raising it again.** The ice will

show you how quickly it adjusts to being warmer with ice that looks brilliant and shiny, not grey and dull. If the ice is still producing too much snow, **your temps are still too low**. As the ice temperature gets warmer, scarring will also be less.

Most arenas are able to run their ice 2-5F warmer using REALice-treated water, but some can go even higher. Each rink is individual, so a brine temperature increase of 2F may be the optimal increase for your rink, or it may be 4.5F. **You will need to find your sweet spot** and make adjustments depending on environmental changes (both cold and heat) outside and inside your facility.



READ YOUR ICE to see if it is too cold, warm enough, or too warm. How does it look? Happy and shiny or dead and grey?
How is it reacting? Are you collecting too much snow with each ice make? Is

your ice brittle?

If the answer is yes, then your ice is still too cold.

TEST YOUR ICE using the REALice Snowball Test.



Take the REALice [snowball test](#) using snow from a small dry shave strip to determine if your snow is too dry (too cold) or too wet (too warm).

Important: You WILL need to run your ice warmer than what it was set at for hot water floods. Running the ice warmer will, for each degree warmer you're able to run it, let you save about 2% on your electricity consumption. And warmer ice will result in a better *sliding coefficient*:

“The sliding coefficient between a skate blade and the ice surface are at its best at exactly 28°F.”

– [ORFA – Understanding Ice Operating Temperatures](#)

7. Adopt **better** ice maintenance routines

- Use the full 10 minutes for an ice make for an NHL-sized surface, or 12 minutes for an Olympic-sized surface. These times are recommended by ice resurfacing machine manufacturers.
- Drive the ice resurfacing machine ***slowly and consistently***. Put less water down along the boards; shut off the water and raise the blade

while going over the crease, turn the water back on and put the blade back down once each crease has been passed.

Important Note: For great ice, make sure your operators are not driving the ice resurfacing machine as if they were Mario Andretti.



- Pay attention how each ice make is done to prevent ice buildups along the boards and the corners -- and not enough ice in the middle.

Perform drill tests regularly (weekly at least) and share the high spots and low spots with your operators so they are aware of excesses and deficiencies and work to improve the ice level with each ice make.

- This means, generally, purposely reducing the amount of water that is laid down along the boards and over the creases
- Shut off the water going over the crease and raise the blade, turn the water back on and blade down as you pass the crease
- Build a dry-shave and then a light flood into your early morning routine to set the ice up for the day ahead – the impurities in the water will be forced to the surface of the ice and ice crystals due to humidity in the arena will form on the ice overnight. By **dry shaving** the ice first thing in the morning, the ice will be “cleaned” of the ice crystals and impurities, and a light flood will be the finishing touch to a beautiful sheet of ice.
- Driving slowly and consistently and paying attention to where to put down water (or not) will result in less hours of regular ice maintenance.
- Since REALice-treated water delivers harder ice, your ice thickness can be less than ice made with hot water. We recommend your ice thickness is **no more than 1 ¼ inches** -- or less.

8. Other benefits of REALice

- REALice effects the calcium ions in the water so they no longer cling to each other or to metal surfaces. If you have hard water with an older ice resurfacing machine, you may need to remove the calc which has built up in the floodwater tank as the REALice-treated water will attack that calc and, eventually, make your flood water look milky. No one wants that, so check your floodwater tank to make sure you have no calc buildup.
- The spray nozzles and paint on your ice resurfacing machine will no longer be covered in calc.
- If you re-use the water from the snow melt pit for your cooling tower (filtered, of course), you will need less chemicals for cleaning your

tower, lower your energy spend and increase the cycles of concentration (CoC) of the water used. To learn more about this, contact us.

- Using colder floodwater contributes to lower humidity in the rink so electric fans and de-humidifiers run less, saving more energy.



Best Practices Tip: REALice-treated water **never needs to be dumped** and can be added to, as needed. Fill up the ice resurfacing machine with REALice-treated water last thing at night for use first thing in the morning. The effects of the REALice on the water last for at least 24 hours.

9. Can we use warmer/hot water through the REALice system?

- Yes, that's not a problem – however you will not get the same energy savings as you would using colder water. The REALice unit can withstand water heated up to 212F.

10. Questions? Call Colleen O'Shea at +1-587-579-8500 for any questions, concerns or compliments you have on your REALice system, or via email colleen@realice.ca