THE DRIVE TO NET ZERO:

POWERFUL TOOLS FOR SUSTAINABILITY AND SAVINGS

LASER LEVELING SYSTEM

The ice arena business has many challenges.
Arena owners need a tool chest full of efficient equipment and technologies that can deliver every possible advantage to save time, money and valuable resources.

ZAMBONI

Level-Ice®
LASER LEVELING SYSTEM

A number of industries have found value resulting from incorporating lasers and sensors for use with their machines and equipment. Agriculture and farming have adopted the technology for a number of uses including land leveling. Agriculture is a business which like the ice industry, must focus on controlling costs for labor, water and other resources. As farmers face the challenges of their resource constraints and profit margins, they must also do business with attention given to their environmental impact.

Ice-Making Innovations For Savings of Time, Labor, Energy and Water

They look to any available tool to reduce their consumption of resources and increase their efficiency and productivity and laser leveling has proven its effectiveness in this industry, resulting in widespread use in agriculture. Ice arena operators know a thing or two about consumption of resources and the costs associated with utilities.

Justin Fidler is the Community Services Operations Manager for the Middlesex Centre in Komoka, ON Canada. He spoke with Marty Elliott who is the Zamboni Sales Account Representative in Ontario and shared his experience using the Level-Ice system in a number of buildings over the years. "As a facility manager, I saw firsthand the utility savings through reduced refrigeration plant run times. Every location I've been to, that has always been a constant whenever Level-Ice has been implemented, that you immediately saw reduced run times on equipment, which translates into a reduced utility. And those costs, in today's energy market, unfortunately utilities seem to be continually going up and is a major financial component of the ice rink industry. So if you can do your part in that and reduce, it adds more money to your bottom line on your operational side."

While reducing costs and consumption of water and electricity are good goals to have, the reality is that the consistent quality of the ice surface can be a real challenge for arena owners, particularly when there are a number of different machine operators behind the wheel. So many factors contribute to the arena's overall quality of ice.

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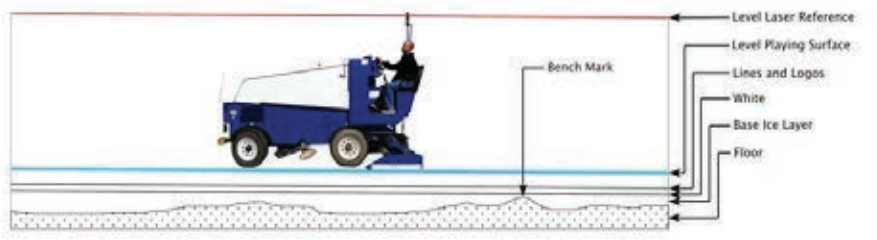
>
> *Justin Fidler, Community Services Operations Manager, Middlesex Centre, Komoka ON*

Concrete and sand floors have deviations and are not precisely level and there are high and low points from the surface of the floor to the top of the ice sheet. Having a well-trained team of ice resurfacer operators seems like a never-



Prior to installation, a simple benchmarking survey is conducted to prepare the system for use in the facility. Once the system is set up for use in the building and the machine is on ice, it automatically controls the cutting blade of the ice resurfacer using a laser transmitter and receiver and an on-dash control

ending task, as operator error contributes to inconsistencies in the ice thickness and quality.

Justin says that Level-Ice is an important page in his playbook. "From an operator standpoint, I'm going to say the ease of which they can effectively do ice maintenance and the reduced time they're having to spend on the ice, whether it's daily, whether it's once every two days, once a week, they're able to feel proud about the level ice sheet they're putting out, while at the same time knowing when they turn a rink over to a part-time operator that's coming in to operate the ice resurfacer for a shift, that when they come back in in the morning, they're going to feel very confident that they're not coming back into a quarter inch of ice being taken off the pad the night before and/or we have super bright lines now because we've hit the goal crease at one end. In using a hand wheel, I think anybody that's been in the business for quite some time can all relate to the horror stories of a part-time operator or even a full-time operator coming to the supervisor and saying, 'Yeah, I got this red tinge in the snow, I don't know what it's from.' Or blue tinge, and sure enough, you go out, look at the rink and you see a swath of missing a line or a crease."

Laser technology has been available to arena operators for nearly two decades and word has spread regarding the benefits of using laser leveling to improve the quality of the ice surface, as well as controlling costs and the consumption of resources. Since the introduction of laser technology to ice arena operation, additional advantages of using the Level-Ice system have been demonstrated. With a lower level of ice to maintain, the ice sets and freezes faster, eliminating pools of water left behind during a standard resurfacing. The top surface of the ice is harder and allows for a raised ice temperature to be maintained with less load on the refrigeration equipment. Lines and logos in the ice are maintained at a known height, avoiding expensive mistakes resulting from tearing into painted and textile graphics beneath the ice surface. The operator can focus on other machine functions, not having to manually monitor and maintain the blade adjustment based on inconsistencies in the ice level. Reducing the amount of ice being removed by the blade can result in extension of the blade life by up to 50%. Removing less ice means less water needs to be applied and the reduction in ice making water consumption can be significant.

Proper ice maintenance is another important routine which is sometimes overlooked and the results can be dramatic. A strong ice maintenance program requires a lot of labor to properly execute and commands a consistent commitment from the entire arena staff. Using an edger. Chipping away at ice on/near the kickplate. Using the laser leveling system, ice maintenance doesn't disappear, but the investment of time is significantly reduced. That may mean many hours a week that your team can be focused on other worthy tasks.

During a podcast with Brandon Radeke, the Director of Ice Operations for the NHL's Pittburgh Penguins, Brandon shared some insight into their use in the team building as well as in the practice facility. "Our biggest game-changer is the maintenance time. We aren't edging corners down. We're not doing that hard grinding on the machines. We edge once a day and our ice is perfectly flat." When asked about the feedback regarding ice quality from the NHL players in his buildings, he said "…they seem to be very happy. I was brought here…to change the ice. It wasn't a whole lot of change, it was more or less making sure they knew we were on top of it. I think a big part of this has been the Level-Ice. Showing them the technology that we're using to help improve our sheets and they appreciate it."

Justin concurs: "Edging, whether it would be daily edge or a twice daily edge, we've been able to reduce that. And then the traditional days of a whole day being set aside for ice maintenance is a thing of the past. No longer are we going out to spend four or five hours of wear and tear on the machine and shaved corners, that is gone. So my philosophy is each and every ice resurfacing that you're doing is your ice maintenance. You're doing your nine and a half to 10 minutes ice maintenance. And Level-Ice is allowing us to maintain a consistent level that we have set as a standard for our building.

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> *Brandon Radeke,*
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> *Pittsburgh Penguins*

Each and every building's going to be different, but we have chosen an inch and a quarter that we're trying to maintain above the highest spot. Due to the uneven floor, there will be areas that may be an inch and

three eighths, inch and a half, but we know, and we're well assured that through proper benchmarking that we have a minimum of an inch and a quarter of ice throughout the entire ice sheet. And that goes hand in hand with the corners as well, no longer are we two inches in a corner... In the past, I go back to the 80's and 90's where myself as an operator, would spend an entire day shaving corners once a week, that was the daily thing."

The Level-Ice laser leveling system eliminates operator error, guaranteeing consistency between machine operators. Prior to installation, a simple benchmarking survey is conducted to prepare the system for use in the facility. Once the system is set up for use in the building and the machine is on ice, it automatically controls the cutting blade of the ice resurfacer using a laser transmitter and receiver and an on-dash control system. Advancements in laser technology make this application ideally suited for ice arenas with a goal of achieving perfectly level ice. The transmitter is a safe, low power laser that mounts near the ice above the dasher glass. The unit produces a level reference point for the receiver on the resurfacer to calculate the differences in the height of the ice to within 0.02" or 0.5 mm. Controlling the blade and thus the amount of ice cut is complemented by the ability to maintain water disbursement near 1/1000th of an inch.

Marty Elliott is the Sales Account Representative for Zamboni Company Ltd. in Brantford, ON, Canada. He has a long history with the Level-Ice product dating back to 2012. Over the past decade working with the system, he has had the opportunity to help arena owners quickly see the results, no matter what type of ice activity they support in the building. During a conversation with Dillon Learn, the Chief Engineer and Special Projects Manager for Budweiser Gardens in London, ON, Canada, Marty spoke with Dillon about their busy multi-use facility and the role Level-Ice plays supporting their efficient operation. Marty asked: "With your position at Budweiser Gardens, that's a conversion facility, a stadium facility hosting a lot of non-ice events. Has Level-Ice made a big difference going from non-ice to ice and vice versa?" Dillon replied: "I would say yes, because I like to take ice measurements all the time. Say for example, if on a Wednesday, there's a conversion and the operator didn't do

Photo of S&T Arena, White Township Public Parks
Courtesy of Ryan Shaffer, Recreation Director

measurements, and I can just ask him 'what does the Level-Ice say?' and it says 1.35". Then in my head I know I'm good going into this weekend of conversions and hockey games.

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>
> *Dillon Learn, Chief Engineer and Special Projects Manager, Budeweiser Gardens*

When in the past I've seen going into the games (because we just had the hand crank) a half an inch or three quarters of an inch. I don't want to go into a weekend of two OHL hockey games and conversions at a three quarter of an inch of ice or a half inch ice. I know with Level-Ice I set it, I'm fairly close to where I need to be, and it's just a confidence thing for myself and in the building, it just helps everything run smoother, there's not much of a worry. And then the conversion guys, they're good with it. They know where it is and they're mindful of it."

Working with arena owners and seeing the results for himself, Marty asked Dillon to talk a little bit about the system from an economical standpoint. One of the measurable areas of savings is related to reduced operational costs for the refrigeration plant not working as hard to maintain the surface temperature of the ice. Dillon concurs with Marty's historical information: "I know our plant doesn't run as often because our ice thickness is perfect and we have the FastICE system as well, so it's like flash freeze, it's great. One of the biggest game changers I find in our building is how level... I'm going to say levelly, it helps me with the ice. Yes, I still do ice maintenance but this is a fast facility, that's the biggest game changer for me. Level-Ice helps me keep it in the parameters that I require myself to keep it in for an OHL game."

Marty has taken his complex understanding of ice arena operations and the factors that contribute to a facility's costs to develop a method of calculating the return on the investment in the laser leveling system for a Zamboni ice resurfacer. "We are able to develop a customized report, using each facility's energy costs, compressor use, ice temperature set point, targeted ice thickness for winter and summer months as well as the application of peak and off-peak pricing and anything else that might be unique to that building. Things the building owner might not have taken into consideration before like the measurable data related to water heating, labor for maintenance and training costs. These are real costs that tie in to ice maintenance. We've seen arenas that have had a complete payback on the cost of the system in a year or two. Sometimes less." Marty often tells facility owners that with the system in control, machine operators are able to focus on the other processes involved during resurfacing, which is an additional benefit of this automation.

Marty continues: "The reports we've been providing for customers who are considering adding the product to their machines give them insight into the anticipated savings.

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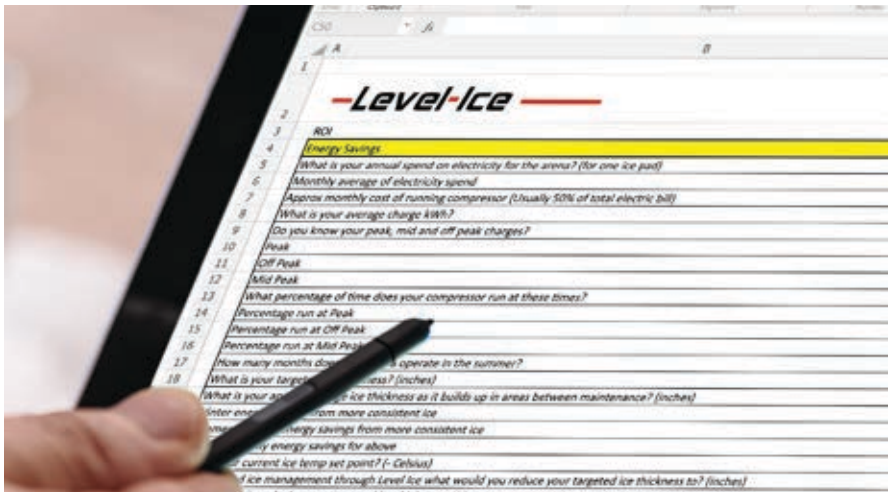
> *Marty Elliott, Sales Account Representative, Zamboni Company Ltd.*

What's really exciting is hearing the results that they actually are seeing. On average, the users are seeing a 25% reduction in water use with the laser system. When they combine FastICE and Level-Ice, they are seeing up to 50% savings in

water. That's significant enough for us to see adoption of this product by arenas at the NHL level and at the community rink level. Everyone is talking about sustainability and goals surrounding net zero and this is one easy way to get there faster." Using the laser's reference points, the system calculates variances on the go with a blade drive motor that replaces the familiar manual blade handle wheel. When the system sees a higher elevation than that which is preset, the blade is lowered to remove more ice. When the system sees less ice, the blade is raised or maintained in a zero-cut position, depending on the presets. The lines and logos in the ice are at a known height so the accidental contact with expensive paint work and applied logos are protected from damage.



Arenas using Level-Ice are more efficient and can quantify their actual savings.

Inconsistency between machine operators can result in significant costs for extra water consumption, fuel use, wear on the blade and the machine, energy use and ultimately it impacts ice quality. More water in the corners results in more ice maintenance. The laser leveling system sees the differences and gets out in front of issues by identifying and resolving the inconsistent ice sheet height before additional hours of weekly ice maintenance would otherwise be needed.

During an interview with Ryan Shaffer, the Recreation Director for White Township Public Parks in Indiana, Pennsylvania, he shared a number of reasons he's glad they added the system to their most recent machine purchase. "Obviously there are staffing considerations that play into ice quality. The nice thing about Level-Ice is that it doesn't matter who gets on your machine, your ice quality is always good. It's essentially fool-proof. You teach them to drive and to use the system." Ryan continues "There are a lot of other benefits. Wear and tear on the machine. Water usage. Heat load on the compressor system. There's almost a trickle-down effect. You're using less electricity on your compressors. Not spending as much for blade sharpening. You're not paying as much for the water bill. I'm sure our heat load and water usage has fallen by a third. While working on budgets, I was able to gather information demonstrating our labor savings of $13,000.00 a year. With a number of new efficiencies in the building,

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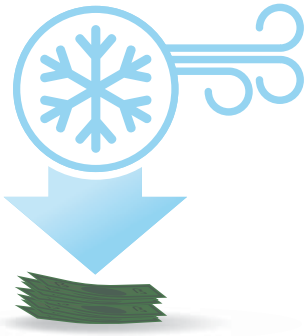
> *Ryan Shaffer, Recreation director*
> *White Township Public Parks, S&T Bank Arena, Indiana, PA*

Reduced Ice Maintenance

Reduced Water Consumption



Reduced Load on Compressors

we will drastically reduce the heat load on our slab as well as the load on our dehumidification and HVAC systems."

It's estimated that to build an NHL sized sheet of ice, it requires between 10,000 and 15,000 gallons. That would be for the initial installation, but when you think about the enormous amount of water used in each ice arena during routine resurfacings, with the potential consumption of thousands of gallons a day just to maintain the ice, using less water has a number of benefits. Less water being applied saves money and valuable resources. Ice sets faster, eliminating pools of water on the ice. Less water on the surface and holding the ice sheet to a lesser thickness results in a reduced heat load on the compressor system, translating into a lower energy bill and less power consumption. A harder ice surface allows for a raised ice temperature to be maintained. That's a win for the facility's bottom line and important for arenas working towards a green goal or ultimately going Net Zero.

The Level-Ice system has caught the attention of arenas from the municipal level to those who oversee ice operations for professional hockey leagues across North America and around the world. With a continued focus on helping the ice arena industry reduce consumption of resources and eliminate GHG in pursuit of a lesser impact on the environment or even achieving a Net Zero presence, the laser leveling technology and Level-Ice system are rising to the top of the wish list for ice resurfacing machine purchases. Being able to justify the purchase with a prompt return on investment is helping facility managers and fleet departments add the Level-Ice product to their purchase orders and the result is clear: arenas using Level-Ice are more efficient and can quantify their actual savings.

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> *Ryan Shaffer, Recreation Director*
> *White Township Public Parks, S&T Bank Arena, Indiana, PA*

Top 10 Benefits of Laser Leveling

1. **Maintain Consistently Level Ice Across the Entire Ice Surface**
2. **Reduced Resurfacing Cut Depth Helps Prevent Paint Line or Fabric Graphic Damage**
3. **Increased Efficiencies and Reduced Workload Result in Less Wear and Tear on Your Ice Resurfacer**
4. **Reduces the Amount of Snow on the Ice for a Higher Quality Surface**
5. **Eliminates Miscalculations by and Inconsistency Between Operators with Automated Blade Adjustment**
6. **Programmable Minimum and Maximum Cut Settings can be Updated by Management**
7. **Lower Operating Costs Relating to Ice Maintenance, Energy Use and Water Consumption**
8. **Run Higher Ice Temperature Set Points Which Reduces Compressor Run Time and Workload on the Refrigeration Equipment**
9. **Users Report Extended Blade Life of Up to 50% or Up to Two Weeks**
10. **Reduces Ice Maintenance Time and Labor by Up to 50%**