



BRINGING
ADVANCED
TECHNOLOGY TO THE RINK
INDUSTRY



LASER CONTROLLED
BLADE ADJUSTMENT SYSTEM

Principle

- 1) The laser beam coming from the transmitter on the side of the rink is horizontal.
- 2) Ice machine's receiver moves vertically according to the imperfections of the ice, and the automatic system adjusts the cutter blade in relation to a laser.

ICEguard receiver has been manufactured specially to meet the requirements of ice treatment. The outer shell is made of aluminum and to prevent breakdowns, a magnetic fuse is installed.



The laser transmitter, manufactured by Trimble, represents the world's leading laser technology.

Since 2002



ICEguard 2010 Control Panel

- Real time display of the level of ice surface.
- Touch of a button can change the desired thickness of the ice.
- Ability to select laser guided or manual.
- Easily adjustable CUT and +CUT values.
- Automatic adjustment of the blade angle when the blade is changed. The desired blade angle is put in the panel in degrees, and the blade is automatically reset.



Laser-guided treatment of ice the blade is cutting the ice as follows:

If the ice is thicker than desired, the cutting is automatically increased and the ice will be cut according to + CUT value.

Desired thickness of the ice:

If the ice is as desired or thinner, it will be cut according to the CUT value.



ICEguard makes it possible to quickly identify a freezing pipe failure caused by frost. When the ground is frosting it begins to bring ice level up, which can be detected with the laser. When this kind of problem is found in early stage it is possible to prevent costly damage.

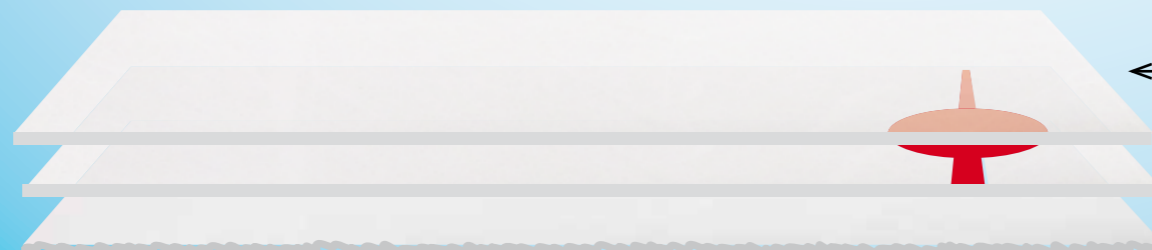
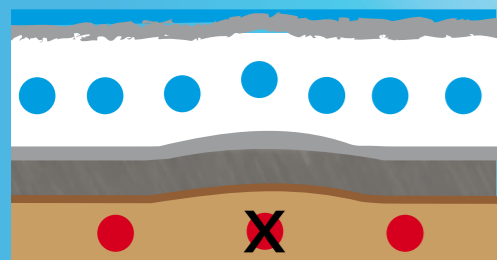
Patented!

The laser receiver moves freely on the surface of the ice and is placed in front of the conditioner. This allows an adequate period of time for the blade to react to the rapidly changing height fluctuations of the ice.



ICEguard Blade - motor Control

The electric actuator is made in cooperation with LINAK, the world's largest spindle motor producer. In the engine, there is also a mechanical override.

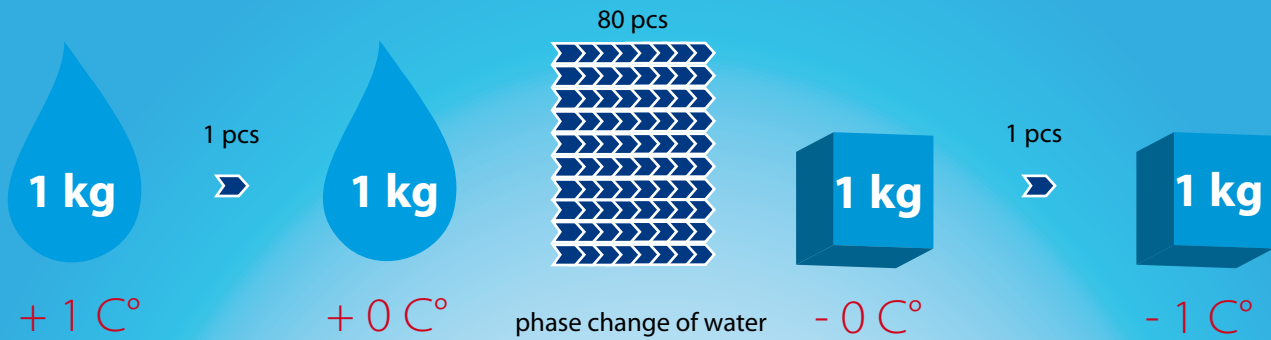


Ice and paintings made with the ICEguard

- 1) Uneven floor.
- 2) The layer of ice is levelled by the laser system, where the ice painting will be added: bottom ice will be trimmed with the ICEguard laser guidance (ice thickness regulation 10mm.) Base cutting value is set to 0 and the +CUT value set higher, such as 1.0 Extra, ice thickness will be planed off, then the field is levelled for painting.
- 3) The actual ice is on the top of the painting, (example ice thickness 22mm).

The energy effects of water freezing

➤ The required amount of energy



The annual electrical energy consumption and savings of the facility, items which ICEguard can affect to:

1. Amount of freezing water.

- ICEguard raises the blade in thin areas of the ice.
Less freezing water volume is needed to obtain good ice.
100litres/ Resurfacing savings.

2. Thin ice paint lines and the need for extra ice correction are eliminated.

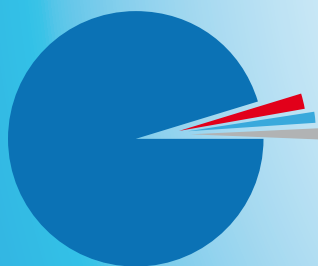
- For example, in the evenings the ice machine's water tanks can be emptied to the low points of the ice (800 liters).

3. Ice thickness can be optimized and kept at the desired level.



General annual facility energy use:

- Electricity consumption: 780 000 kWh
- Average in Finland and Sweden: 850 000 kWh
- Best: 500 000 kWh
- Resurfacings: 10/day
- Cold machinery average efficiency: 3.0 COP km
- Cost of electricity, including transfer fee 0.10 e / kWh



- 95,4 % Facility's annual electricity need (95.4% = 743 730 kWh)
- 1,9% 100 liters/ resurfacing (1.9% = 14 820 kWh)
- 1,5% Field adjustment (1.5% = 11 700 kWh)
- 1,25% 15 mm of extra ice (1.25% = 9 750 kWh)

Electrical energy savings with the ICEguard: 36 270 kWh,
= 3620 euros!

- **Less ice maintenance.**
- **Ice always remains level.**
- **Easier ice management.**
- **Preserve ice painting.**

Manufacturer:

Kaspek Oy/Ltd

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