Taking the Puck Outside

NHL’s Cool Strategy for The Winter Classic

BY MARY KATE MCGOWAN, ASSOCIATE EDITOR, NEWS

Three thousand gallons (11.36 kL) of glycol coolant, 20,000 gallons (75.71 kL) of water and 200 workers are just a few of the ingredients needed to create professional-level playing surfaces in different outdoor venues, according to the National Hockey League. For the past 10 years, a regular-season game in the National Hockey League has been played outside after the start of the new year in the NHL’s Winter Classic.

From Fenway Park in Boston to Wrigley Field in Chicago, the NHL has created temporary ice rinks in different locations good enough for a professional hockey game. The 2018 Bridgestone NHL Winter Classic® is scheduled for Jan. 1 at Citi Field, the home of the New York Mets.

How It’s Done

The process of building the ice rink from start to finish takes the ice crew—which consists of a core 12 people and a large support staff—about two weeks, according to Dan Craig, the vice president of facilities operations for the NHL.

The crew and the NHL’s “one-of-a-kind” mobile refrigeration unit and rink system—often referred to as the “ice truck”—arrive at the stadium two weeks before the game. The truck is set up in a predetermined location with easy access to the field that allows the crew to easily thread all the hoses and equipment through the stadium onto the field, he said.

At that point, Craig said the team lays down the rink’s foundation: nearly 250 custom-made aluminum trays that are configured on the field in the shape of the ice rink. The crew links up the ice truck’s hoses to these trays and pumps as much as 3,000 gallons (11.36 kL) of glycol coolant into the aluminum trays. The glycol chills the trays, which keeps the ice that will be laid on top of them to its ideal temperature of 22°F (-5.6°C),
according to Craig.

Then, the rink boards are installed, and the actual process of building the ice begins once the ideal surface temperature is attained, he said.

To create the ice, the team slowly sprays 20,000 gallons (75.71 kL) of water in as fine a mist as possible onto the surface until it becomes 2 in. (55 mm) thick ice, which usually takes about five days, he said. Each inch of ice thickness requires about 10,000 gallons (37.85 kL) of water.

The crew then passes a spray wand over the rink hundreds of times to make sure the surface freezes evenly to create a quality playing surface, according to Craig.

But the process is not over.

The lines and logos that decorate the rink are then painted and placed on the surface to transform it into an NHL ice rink, and more ice is built on top, according to Craig.

The ice crew uses about 350 gallons (1,325 L) of water-soluble paint to make the ice rink’s surface have the white appearance NHL rinks are known for, he said.

“One thing that often surprises people is that... we don’t use any ‘special’ water for the ice surface; it’s the same tap water provided into everyone’s homes,” Craig said.

Once the ice is constructed, the crew monitors it 24 hours a day, he said. The NHL embeds 16 “Eye on the Ice” sensors in the surface that provide real-time data on ice conditions.

“The technology provides updates on temperatures at different areas of the ice, signaling an alert prompting the need to pump more glycol or engage the in-line heating system in case the weather gets too cold,” according to Craig.

When the ice becomes too cold, it can be brittle and can crack, according to the NHL.

Indoor vs. Outdoor Rinks

Indoor and outdoor playing surfaces differ in several ways.

First, outdoor rinks such as the Winter Classic playing surfaces require up to 2 in. (25 mm) thick ice to “safeguard from any weather-related evaporation and (we) utilize thermal blankets for various weather considerations to regulate the ice temperature,” according to Craig. Ice in NHL arenas is built to about 1 in. to 1.25 in. (31.75 mm) thick.

The thermal blankets are laid on top of the ice to protect it from the sun, according to reports from previous outdoor NHL games.

Another difference is the terrain of the outdoor surfaces. Six of the 10 Winter Classics, including the upcoming 2018 game at the home of the New York Mets, have been played in baseball stadiums. The remaining four were played in football stadiums.

Craig said baseball diamonds can slope, and football fields are often crowned—creating an arc from sideline to sideline to aid water drainage—which does not happen in hockey arenas. To even out the playing surface,
the crew builds up the rink’s subfloor where needed, he said.

And, indoor ice hockey rinks have built-in equipment, including systems that regulate the ice’s temperature, and are not subject to melting in the sun or other weather issues, unlike the Winter Classic and outdoor games.

The venue’s outdoor location introduces factors into the refrigeration process, he said. Those factors include considering where the sun rises and sets, where the ice truck is parked and how the crew feeds the hoses and equipment through the stadium to the rink surface.

“Something as simple as when the rink goes into the shade for a period of time throughout the day can affect the surface temperature by 10°F (5.6°C) to 12°F (6.7°C),” he said.

These factors are unique to each venue, so the crew must plan in advance. Sometimes, that is not always possible, Craig said.

To prevent anything from going awry, the NHL created its custom refrigeration unit and rink system with the ice truck that now goes to every outdoor game, he said. The ice truck is 53 ft (16 m) long, weighs 96,500 pounds (44 Mg) and has a 300 ton (1055 kW) capacity refrigeration unit. Its key function is to make a great sheet of ice by removing heat from the surface and stabilizing the temperature, according to Craig.

While creating an outdoor rink at Levi’s Stadium in Santa Clara, Calif., for the 2015 Coors Light NHL Stadium Series game, Craig said the glycol transferred the heat from the field back to the ice truck. The truck then extracted the heat, and the glycol returned to the field cold.

The outdoor ice rinks for Winter Classics are created with the same intentions for safety standards and playing surface quality as for indoor arenas, Craig said.
Weather Considerations

“Another challenge is always going to be weather because we’re in an outdoor environment, and you never know what Mother Nature will throw at us,” Craig said.

The ice crew is experienced in the unexpected.

Temperature and rain do not deter the ice crew from its work, Craig said in a press conference while the ice crew was preparing the playing surface for the 2017 Winter Classic in St. Louis last December.

“We’ll freeze (the rain) as soon as it falls,” Craig said last year.

Rain has both slowed down the preparation process and delayed previous Winter Classic games.

Rain delayed the start of the 2011 Winter Classic at Heinz Field in Pittsburgh by seven hours to avoid adverse weather conditions. The ice crew used resurfacing machines to absorb the excess water, and the ice was squeegeed on a regular basis, according to the NHL.

The next year while preparing Citizens Bank Park in Philadelphia to host the 2012 Winter Classic, a steady drizzle slowed down but did not stop the crew’s task of installing the ice pans on the main rink on the field, according to NHL reports.

Since the first Winter Classic in 2008, the temperatures at puck drop have ranged from 13°F (-10.6°C) in 2014 in Ann Arbor, Mich., to 46°F (7.8°C) in 2017 in St. Louis, Mo. He told reporters that the ice crew has created outdoor playing surfaces in California and Colorado when the temperatures were in the 70s.

The 2016 Coors Light NHL Stadium Series game in Denver registered the highest temperature, 65°F (18.3°C), at puck drop, for an outdoor NHL game since 2008, according to the NHL.

“Every stadium or field is different so every outdoor game is unique,” Craig said. “The uncertainty of the weather is probably the greatest challenge, but over the course of the last 10 years we’ve literally faced every scenario.”

With the 2018 Winter Classic® just weeks away, Craig and his crew are preparing to create a world-class outdoor ice rink at Citi Field, no matter the weather, by puck drop on Jan. 1.