GLACIER® ICE PLANTS BY CONCOOL, LLC
Glacier® ice plants by ConCool are manufactured to incorporate 50 years of experience in the concrete cooling business. Our technique will provide the highest possible quality of ice to meet client specifications. Whether it be a large dam project or a small ready mix plant, Glacier® ice plants by ConCool will deliver results.

The choice of components is critical in a plant, which must offer years of low maintenance and high reliability operation under demanding conditions. Therefore, our Glacier® ice plants feature the following:

- **NorthStar** dry flake ice makers and rakes
- Robust refrigeration units incorporating globally available components of the highest quality, designed to use the best refrigerant available in the local market
- Purpose-built ice storage bins available in a wide range of materials
- Proprietary design day tanks and ice batching systems
- Proprietary control systems which ensure that the correct amount of ice is delivered to the batch plant, dynamically adjusting to actual conditions.

**Why Should You Use Glacier® Ice?**

Ice will absorb 125 times more energy than an equivalent weight of chilled water at 32°F (0°C). The thin, dry flakes that Glacier® ice plants produce using NorthStar ice makers deliver this result faster and more completely than any other type of ice, a result of the very large surface areas exposed to contact between the ice flakes and the concrete constituent components.

The dry flake ice produced by Glacier® ice plants is thin, super cold (-7°C), and extremely reliable, as the ice making machinery is from NorthStar, the world leader in dry flake ice manufacturing.

This dry flake ice provides approximately 1600 M² of contact surface between the ice and the concrete constituent materials, offering the following advantages to the concrete producer:

- Greatest possible energy absorption
- Complete conversion from ice to mix water, ensuring compliance with specified W/C ratios
- Immediate mixing start when batched constituent materials enter the mixer
- Homogeneous concrete

**Why We Use North Star® Ice Makers**

Glacier® Ice Plants by ConCool include North Star® ice makers to produce the highest quality ice available. This is possible due to the following:

- Ultra-thin 1.5 mm flake ice that results in almost 1600 M² of contact area per ton ensures the maximum rate of heat transfer to concrete during mixing
- Small flake size also prevents unmelted ice chunks from creating voids in concrete, lowering strength
- Sub-cooled -7°C flake ice grants additional energy absorption capacity while minimizing the risk of ice fusing to itself in storage or delivery
- High-quality solid carbon steel freezing surface results in greater heat transfer efficiency as well as increased resistance to damage over time, such as pitting or chipping.
- High density polyurethane insulation minimizes environmental heat loss while providing increased durability through a reinforced fiberglass shell.
- Evaporator designed to operate without a defrost cycle guarantees all energy is used to produce ice
- Doubled-walled stationary evaporator scheme removes the potential for refrigerant seals leaking and reduces maintenance
- NorthStar drip shield assures that all of the water is converted to ice, with zero waste
- Modular design for ease of installation and maintenance
- Lifetime evaporator warranty
- Built to either ASME or PED codes to ensure the vessel meets local safety protocols around the world
How We Keep Ice Moving
ConCool ice plants utilize NorthStar modular ice rake systems to maintain a constant supply of usable flake ice in ice plant storage. These state-of-the-art ice rakes provide significant advantages over typical ice rakes used in other plants. These patented ice rakes level the ice as it is produced from the ice maker and will reliably discharge dry flake ice to the delivery systems to meet requirements of batch-type ice-on-demand applications.

NorthStar ice rakes include various options of construction material while enduring continuous operation and durability. The rake assembly is powered by a variable electric drive using a brushless motor for maximum operational flexibility in rake speed. It also includes a soft starting hydraulic fluid drive coupling and low speed overload detection for superior power control. Furthermore, there is an electrical control panel with programmable logic controller (PLC), motor starters, circuit breakers, consolidated power supply wiring with main electrical disconnect, control power transformer, and optional operator interface panel and Internet communication. There is also the option for operation in either manual or fully automatic mode. And finally, all rakes are manufactured to meet local and international safety standards and include state-of-the-art safety and cut-off protection features.

How We Deliver To Day Tanks
ConCool uses one of two methods for delivery of dry flake ice from the ice storage to the day tank. For distances under 50 ft (16 m), a screw auger is applied. If plant layout requires a longer run from storage to day tank, a pneumatic delivery system is utilized. In both cases, stainless steel components ensure maximum durability and minimum maintenance over the lifetime of the plant. Both the pneumatic and screw systems include high-density polyurethane insulation to curtail energy exchange with the surroundings.

How We Deliver From Day Tanks To The Batch Plant
ConCool utilizes a highly sophisticated system to deliver dry flake ice from the day tank to the concrete mixer. First, ice is transferred via screw augur from the day tank to a stainless steel weigh batcher located above the aggregate infeed belt. Based on temperature information from the aggregate storage bins, the weigh batcher weighs the precise amount of ice to be added to the current mix and quickly discharges the ice onto the aggregates while they are on the way to the mixer. The speed, size, and idler configuration of the aggregate infeed conveyors should be precisely sized to accept the ice in addition to the aggregate without overloading or spilling any of the ice. Conversely, both the discharge point and rate of discharge of the ice can be designed to work with existing plant configurations.

The 1.5 mm NorthStar dry flake ice will completely melt on the aggregates prior to entering the mixer due to the exceptionally high contact area between the ice and the aggregates. This ensures a homogeneous mix with no clumping of cementitious material.

The weigh batcher control is integrated into a complex temperature control software system that monitors aggregate bin, mix water, and powder temperatures. This allows the temperature control software to predetermine the concrete mixture temperature and adjust the exact amount of ice dispensed to the mix to meet the specification. Such dynamic temperature adjustment, as opposed to typical reactive adjustment based on previous batch conditions, will lead to substantial efficiency gains and energy savings throughout the life of a project.