There are three fundamental snow and ice control strategies in winter maintenance: Anti-icing, Deicing and Snow Removal… all of which seek to address the safety issues that result from the buildup of snow and ice on pavement.

Anti-icing and deicing utilize many of the same types of equipment and materials, but where they differ is when and how they are utilized. Snowfighters armed with the appropriate tools to execute each of these strategies are optimally prepared to expedite service objectives and gain a competitive edge when a storm hits.

Anti-icing is a preventative measure that inhibits snow and ice from bonding to the pavement whereas deicing is a reactive measure to break an established ice-to-pavement bond.

To achieve optimum outcomes, anti-icing requires substantive judgment in assessing a variety of ‘real time’ conditions to determine what approach is most advised. Factors impacting such decisions include pavement surface temperature, the amount of moisture present/expected, the type of deicing material used, cycle times and the anticipated amount of sunlight/traffic during the event.

ANTI-ICING

- **A Proactive strategy** – typically executed just prior to or at the onset of a storm.
- **A Bottom-Up strategy** to inhibit snow and ice from forming a strong bond with the pavement.
- **The ‘Best practice’** utilizes a light application of a liquid deicer applied directly to the bare pavement surface but pre-wet solids can also be used when appropriate.
- New studies show that under certain conditions, During Storm Direct Liquid Application (DLA) of a deicer can be both an effective and efficient strategy as long as a bond has not formed.

**Anti-Icing Benefits:**

- Expands operational timeframe to achieve service goals.
- As a preventive strategy provides expedited safety objectives at a lower cost.
- Reduces salt damage to property and landscaping when applied correctly.
- Reduces time and labor required to achieve Level of Service … Effective and Efficient.

"Anti-icing requires about ¼ the material and 1/10 the overall cost of deicing. It is the most cost effective and environmentally safe practice in winter maintenance.” Winter Parking Lot and Sidewalk Maintenance Manual, 2010 Minnesota PCA, MLTAP and Fortin Consulting

Do not apply liquid anti-icing applications on top of an existing ice layer or ahead of rain, sleet or high winds. Timing of operations is paramount!
DEICING

- **A Reactive Strategy** – Employed during or after a storm.

- A Top-Down application to penetrate and break a compacted snow or ice-to-pavement bond and expedite plowing.

- The ‘Best Practice’ utilizes a liquid deicer to pre-wet rock salt in the auger or chute just prior to spreading.

Benefits of Deicing with Pre-Wet:

- “Pre-wetting salt with brine or other liquid chemicals has proven to reduce application rates by 20-30 percent.” Innovative Environmental Management of Winter Salt Runoff Problems at INDOT Yards, 2004 Joint Transportation Research Program Study Purdue University, INDOT and the FHA

- Less salt bounces off surface, conserving material and reducing environmental impacts.

- Pre-wetting with salt brine jumpstarts the brining process and accelerates performance — solid deicers must first form a liquid to work.

- Pre-wetting with one of the exothermic chlorides (Calcium Chloride or Magnesium Chloride) will also lower the eutectic temperature of the salt.

- Reduces time and labor required to achieve the desired Level of Service … Effective and Efficient.

The more common (trigger) approach to snow and ice control is to wait until an inch or more of snow accumulates on the pavement before starting to plow and treat the surface with deicers or abrasives. This approach often results in compacted snow bonding to the pavement surface. When this occurs, deicing measures are called for, requiring substantially more material to undercut the ice pack and weaken the bond to allow for removal.

“Because deicing is reactionary … as a result of its inherent delay, it often provides less safety, at higher cost, than anti-icing. Nonetheless, the reactive technique of deicing will remain important for snow and ice control, as there will always be lower priority service levels that preclude preventive operations.”


The key to successful anti-icing and deicing involves:

- Obtaining the right equipment and materials to execute each of these operations

- Providing your crew with comprehensive training on the strategies

- Obtaining accurate, advance and “real time” information relative to the unique conditions of a given storm

- Assessing these tools, resources and information to determine the best strategies and timing of operations to achieve optimum performance outcomes

The snowfighter who masters these elements can save thousands of dollars during the course of a season and obtain the competitive edge needed to grow his or her business.