Swenson & Schmidt
Chloride Reduction Conference
Automated Systems
Who is Swenson Products
  • History
  • Today’s Swenson Products

Developments in Spreading

Considerations for “Today’s” Fleet

Automated Operations

Automated Results

Conclusion
Who is Swenson Products?
Who Is Swenson Products
Who is Swenson Products

• Celebrating 80 Years in the Industry (79 Years in Lindenwood)
• Manufacture over 4000 Spreaders, Spray Systems and Bodies Annually.
• Specialize in Customized Manufacturing Across our Product Offerings.
• Over 130 FTE+ and occupy 130,000 sq ft
  • One Piece Flow
  • 3 Focused Factories
As of October 1 2015, we have become the North American division of a privately held, European-based parent company known as the...
Developments in Snow & Ice Control
Developments in spreading

50s  Man with shovel

60s  Salt spreaders

70s  Speed-related

80s  Pre-wet

90s  Focus on environment

00s  Spreading management

10s >  Spraying
     Automatic Spreading
Winter Maintenance: Considerations

- How Should Protection of Lives and Commerce Balance with Protection of the Environment?
- What Risks and Sacrifices are we Willing to Take and Make when the Safety and Economic Livelihood of so many are at Stake?
- Increased Population, and Decrease of Budgets, Make it Difficult to Maintain a Clear Safe Road.
- If not Properly used or stored, salt can get into wells or groundwater.
- Environmental Restrictions Continue to Increase with Regards to Storage, Clean-up, and Tracking.
Developments in Spreading

- Traditional Spreading Equipment
  - Manual Controls, or Limited Automation with Today’s Systems
  - Tailgate Spreaders Still Predominantly used in Midwest Markets
  - Electric or Hydraulic Prewet Pumps with Limited Capabilities
  - Hazardous Conditions for Operators and Motorists
The Age of Automation
Age of Automation

• 2 Levels of Automation Currently Offered
  • Dictated by Predetermined Routes
  • Dictated by Live Weather/Road Conditions

• Safety as the Driving Force
  • Eliminates the Operators Need to Interact with Control System
  • Immediately Reacts to Road & Weather Conditions Before Driving Conditions Become Unsafe.

• Financial as the Secondary Concern
  • Places Material only in Areas Required
  • Salt Consumption Reduced by a Minimum of 30%
Age of Automation

• Automated Operation
  • Route is Pre-Programmed Into Spreader Controller During Non-Winter Months
    • Multiple Routes Can be Programmed and Saved to Controller
  • When & Where Material Should be Spread is Also Pre-Programmed into the Spreader Controller
    • Material Placement Only Where Specified
Age of Automation

- Routes Stored Via USB Drive
- Data Protected With Authorization Password
- Easily Toggles from Automated to Manual Depending on Required Performance, and GPS Location
- Route information Accumulated Includes:
  - Driving Distance
  - Spreading, Time, Area
  - Salt and Brine Consumption.

<table>
<thead>
<tr>
<th>Distance / Time</th>
<th>Distance:</th>
<th>Time:</th>
<th>Average speed:</th>
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<tbody>
<tr>
<td>Driving</td>
<td>0,9 km</td>
<td>0:01 h</td>
<td>30 km/h</td>
</tr>
<tr>
<td>Spreading / Spraying</td>
<td>9,5 km</td>
<td>0:28 h</td>
<td>20 km/h</td>
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<tr>
<td>Total</td>
<td>10,4 km</td>
<td>0:30 h</td>
<td></td>
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<tr>
<td>Upto last action</td>
<td>10,0 km</td>
<td>0:29 h</td>
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<table>
<thead>
<tr>
<th>Spread amount</th>
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<tbody>
<tr>
<td>Dry</td>
<td>314,1 kg</td>
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<tr>
<td>Wet</td>
<td>30 %</td>
<td>134,6 kg</td>
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<td>Total</td>
<td>448,7 kg</td>
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<tr>
<td>Area</td>
<td>43,249,8 m²</td>
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13-Nov-17 Author / Date
• **Automated Results**
  
  • Material & Liquid Application Dictated by Road Conditions & Temperatures
  
  • Percentage of Material & Liquid Volume Adjusts Instantaneously Based on Feedback from Spreader Sensors
Factors that Determine the Dosage of Material and Liquid Include:

- Road temperature
- Type and quantity of the icing factors:
  - Rain
  - Ice
  - Snow
- Residual salt
- Weather forecast
• Automation Based On Monitoring 3 Parameters:

  • The driver chooses the kind of humidity:
    → Dew
    → Moist
    → Wet
    → Snow

  • The spreader measures continuously the road temperature with an infrared sensor

  • If preventive spreading, the expected temperature drop is set by the driver (offset temperature)
Smart Spreading Enhances Automated Results

- Ability to spread different volumes of material and liquid, based on pre-determined variables automatically.
- Change from 100% liquid to 100% solid automatically, based on weather conditions.
- Produce 50/50 blend for high traffic, low temperature areas such as bridges and overpasses.

1. Supply of salt
2. Supply of liquid
3. Mixing chamber wall: rotary movement
4. Mixing disc: liquid is mixed with salt
5. Optimum mixture leaves the spreading disc
Results Of Automation
Results of Automation

• Safer Streets
• Increased Financial Savings due to Decreased Salt Consumption
• Enhanced Performance and Reaction to Changing Weather Conditions in Real Time
• **Before Automated Operations**

![Image of a snowy street](image-url)
Age Of Automation

• *After Automated Operations* ......

[Image of a snowy road]
Age of Automation

• Safer Environment for Operators
• Healthier Environment for Operators
Thank you!