Zero Velocity Salt Spreader

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INDOT
Evaluation of Zero Velocity Salt Spreader

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In Cooperation With

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Spread Pattern of Salt on Pavement

- Spreading over a wide path, covering parts of two lanes by means of a spinning disk or a roller extending the width of the truck tailgate
- Windrowing in a narrow path of 1 to 3 feet through a tube or off a dead spinner
Optimal Salt Application Rate

- Level of service required
- Weather conditions and their change with time
- State and characteristic of salt used
- Time of application
- Traffic density at time
- Topography and type of road surface

Issues Concerning Salt Usage

- Proper application rate of salt is a matter of judgment
- Public awareness on the effect to soils, vegetation, water supplies, and structural materials
- Safe pavement surface and minimum cost to the public and to the environment

Approaches to Minimize Salt Use

- Prewetting salt with liquid chemicals
- Direct application of liquid chemicals
- Spreader attributes
- Better management control
- Training
- Adequate weather forecast
- Use of abrasives and snowplowing
Typical Characteristics of Conventional Salt Spreaders

- Loss of material. Blown off the road by traffic especially high speed vehicles
- Particles bouncing off the pavement
- Cast up to 40% of deicing material into an area outside the traffic lanes
- Speed differential between truck-traffic
- Real performance during the winter is hardly tested

Typical Characteristics of Zero Velocity Salt Spreaders

- Electronically operated
- Ground oriented granular material spreader
- Operator with management programming
- Desire spread rate with automatic adjustment
- Maintain consistent pound per mile application rate
- Reduce truck-traffic speed differential

Relation of Salt Use to Travelling Public

- Increased hazard to safe travel
  - Death, injury, and property damage
- Additional economic penalty
  - Delay of traffic and increased cost of operation
Evaluation Settings

- Spreader types
  - Industrial Hydraulic System
  - Muncie System
  - Pengwyn Zero Velocity
  - Swenson Zero Velocity
  - Tyler Zero Velocity

Evaluation Settings...

- Ground Speed
  - 20 Miles per hour
  - 40 Miles per hour

- Size Distribution of Salt
  - Total materials
  - Retained on ASTM #4 Sieve, larger than 4 mm, pea gravel size

Spread Patterns
Tyler System at 20 MPH, Salt Retained on #4 Sieve

Tyler System at 40 MPH, Total Salt

Tyler System at 40 MPH, Salt Retained on #4 Sieve
Conclusions

- Zero Velocity Salt Spreaders in general give a better spread pattern and recovery rate compared to the conventional spreaders at 20 MPH.
- Zero Velocity Salt Spreaders give a much better spread pattern and recovery rate compared to the conventional spreaders at 40 MPH.

Conclusions

- Performance of the Zero Velocity Salt Spreaders depends primarily on the ability of the spreaders to continuously spread the specified amount of salt.
- "Down time" of the spreaders should be taken into account when selecting a Zero Velocity Spreader.