

# **LIQUID DEICING PLAYBOOK**

# **IMPLEMENTATION STRATEGIES**

## **FOR COMMERCIAL SNOW & ICE CONTRACTORS**





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Jordan Smith of VSI by BOSS Snowplow, formerly known as Voigt Smith Innovation, prepared this report based on 10+ years of experience using liquid brine in his commercial snow and ice management company. He has also assisted more than 250 other companies in the U.S. and Canada with implementing liquid deicing.

The content of this report is considered proprietary. We sent you this report because VSI by BOSS Snowplow can help you implement liquids into your snow and ice operation. Please do not share this report with anyone outside of your organization, unless you are given consent to do so.



# PURPOSE

## INTRODUCTION TO LIQUIDS

Liquid deicing is a tool or replacement alternative to the traditional methods of spreading rock salt or granular material. Simply put, liquids start working immediately to help get you back to a safe surface.

Liquids are the future of snow and ice management. Mass granular product applications will be a distant memory within 10 years, and you can quote us on that! Liquids offer myriad benefits, including saving on salt costs, better application consistency, accuracy and adaptability, environmental impact and more! Many new sites in the U.S. and Canada are already setting chloride limits or chloride-free standards. It's not a question of if but when you will see that in your local market. Don't get left behind!

This playbook will walk you through the basics of applying liquids, which tools are needed and what background knowledge is necessary to implement liquids into your operation.

Up your game with the VSI by BOSS Snowplow Liquid Deicing Playbook!



# LIQUID APPLICATIONS

## APPLICATIONS OF LIQUIDS

Liquid deicing can be applied to surfaces on a 1) Pre-treatment 2) Post-treatment or 3) Interstorm treatment. Review each section below to learn more about each application.

References made to application rate mean the gallons per acre (GPA) being applied. This application rate is vitally important so that you are not overapplying salt and wasting materials.

## PRE-TREATMENT APPLICATION

Pre-treatment applications are made before the storm to **prevent the bond** of snow and ice to the surface and prevent a mild amount of accumulation. This allows for easier mechanical removal of snow and ice and thereby the use of less salt after your plows are finished.

- **Standard Application Rate:** 40-50 GPA
- **Boom Configuration:** Small side nozzles and center boom fan tip.
- **Goal:** Broad, even coverage to reach all the pores in the surface.
- **Timing:** 24-48 hours before a storm (can be much longer if using a quality additive).

## POST-TREATMENT APPLICATION

Post-treatment applications are a viable replacement for rock salt, treated salt and bagged sidewalk products. This application is done **after your plows** have finished and you need to address any remaining residual snow and ice.

- **Standard Application Rate:** 80-100 GPA
- **Boom Configuration:** Medium/large side nozzles and center boom pencil stream.
- **Goal:** Blast liquids with pressure to reach the surface.
- **Timing:** As soon as plows are finished.





# LIQUID APPLICATIONS

## INTERSTORM APPLICATION

Interstorm applications can be necessary for extended events or events with heavy moisture content such as rain to sleet. The best approach is to have your standard pre-treatment application applied and dried before the rain begins. A secondary application around the time rain turns to freezing rain or snow will help **prevent icing over** your surfaces. These applications will help prevent the bonding of moisture to pavement to aid your plows and shovels in getting you back to a safe surface. Interstorm applications can also be useful during long duration snow events, where the initial pre-treatment is no longer effective in preventing snow and ice.

- **Standard Application Rate: 60-80 GPA**
- **Boom Configuration:** Medium side nozzles and center boom pencil stream.
- **Goal:** “Refresher” application to keep surface protected from formation of ice or snowpack.
- **Timing:** Around the time rain turns to freezing rain or halfway through a long duration snow event.

Preventing ice or snowpack accumulations with liquids is much easier than getting rid of it once it has frozen. But don’t panic if timing does not allow for interstorm treatments. An increase to your final application rate to 100-120 GPA will likely meet site condition needs.



# LIQUID APPLICATIONS

## ADJUSTMENTS TO STANDARD APPLICATION RATES

Ultimately, you understand your servicing accounts, your climate and your specific snow event the best. The main factors to be aware of are weather conditions and surface temperatures. Adjustments to standard application rates can be made to best match your conditions. Easily adjust your application rate by changing the automatic rate control on your spray units. Here are some common factors for adjustment:

- The **higher the moisture content** in the snow, the higher the application rate should be. Add **20-40 GPA on top** of your standard application rates.
- The higher **quality mechanical removal**, the lower the post-treatment application rate can be. A very **clean** scrape can **reduce** your application rate by **10-20 GPA**. On the reverse side, a **poor** mechanical rate will necessitate an **additional 20-30 GPA or more**.
  - Example: Using 40-60 GPA will remove that slight glaze of snow/ice after plowing. A heavy snowpack or layer of ice will require 120 GPA or more to achieve the same results. Using the best possible equipment and techniques for mechanical removal will always result in the best and most consistent results with liquid.
- If **high winds** are forecasted, we recommend **not spraying** liquid deicing until the winds have **subsided**. Liquids on a parking lot with high winds will act as a magnet for blowing snow, rather than allowing it to blow over the parking lot without sticking to the surface.

A lot of contractors use a standard rate, such as 80 GPA regardless of conditions, for post-treatment, which can result in over application on lots already seasoned. Using this technique can also result in under-application, especially during heavy snowpack or icing events. This standard rate may cause unnecessary over-applications, such as on “seasoned” lots. It may also cause under-applications based on site conditions such as heavy snowpack of icing events. We suggest situational management, which adjusts your GPA rates per storm, per site. This can be achieved easily when your spray systems have automatic rate control like the Legacy Series sprayers from VSI by BOSS Snowplow.





# LIQUID APPLICATIONS

## ADDITIVES

Additives can be used along with your brine to **supercharge** your application. Ready-made additives have many key ingredients to help prevent issues that can be caused by using rock salt or salt brine alone.

These **key ingredients** include:

- **Tackifiers** to help the product hold to the surface through traffic, wind and rain.
- **Corrosion inhibitors** to protect your equipment and your customer’s property. These inhibitors can make your applications up to 80% less corrosive than rock salt alone.
- **Polymers** that aid with traction even when there might be a glaze on the lot and help deform ice particles that do form to make ice less slippery (rough ice vs. smooth ice).
- **Organic content** that substantially lowers the freezing point of water and also help deform ice particles as they form. At temperatures where untreated rock salt becomes ineffective, salt brine blended with quality additives will continue working at much colder temperatures. In addition, this organic content means that even when your chlorides are diluted, you still have protection against refreeze.

## RECOMMENDED USE OF ADDITIVES

We recommend using a quality ready-made additive when working temperatures **go below 15° F**. Additionally, if you service a **high-moisture** content area or are looking for some of the **other benefits** listed above, we recommend using a quality additive.



# LIQUID APPLICATIONS

## OTHER ADDITIVE RECOMMENDATIONS

There are numerous additives available in the marketplace from major deicing product manufacturers. Look for something that is **consistently** made and effective at a **low blend rate** so that you can achieve consistent results. Additives that are **colorless** and **odorless** are a huge benefit to your customer’s property and appearance.

**Avoid** additives that require high blend rates or those that don’t provide the full range of benefits. A lot of contractors use a standard rate, such as 80 GPA regardless of conditions, for post-treatment, which can result in over application on lots already seasoned. Using this technique can also result in under-application, especially during heavy snowpack or icing events.

**Carefully select** the organic matter around which the additive is produced. Organics based on matter such as beet or molasses will leave behind an odor and are more prone to tracking than others when used on sidewalks. Agitation of these types of organic matter-based additives will also be necessary because they cause fallout and settling in your containers.





# LIQUID APPLICATIONS

## BLENDING RATES

To maximize the effectiveness of your applications while minimizing the material costs, we recommend the following blend rates:

- Pre-treating lots: 95% salt brine and 5% additive.
- Post-treating lots for surface temperatures above 15° F: 95% salt brine and 5% additive.
- Post-treating lots for surface temperatures below 15° F: 90% salt brine and 10% additive.
- Parking garages, sidewalks, other highly sensitive areas: 80% salt brine and 20% additive.

In an ideal situation, you will be able to adjust your blend rate as you fill your deicing equipment to match the event, site conditions and temperatures. However, we know that storms happen in the middle of the night and coordinating a company-wide update about blend rates can be a challenge. So, in a manner similar to application rates, we often see contractors establish a default blend rate of 90% salt brine and 10% additives for any applications to lots. While this may avoid miscommunication about which blend rate will be utilized, be aware that you may be using more additive than necessary for the event.



# LIQUID APPLICATIONS

## EUTECTIC POINT OF BRINE

When using or making salt brine, the saturation is an incredibly important factor. The eutectic point of brine means it is saturated to the point with the **lowest possible freezing temperature**. This point is comprised of **2.28 pounds** of salt per gallon of water or **23.3%** saturation.

If 23.3% is good, isn't a higher percentage better? Contrary to this logic, this is not the case. Increasing the saturation of brine to 26.5% would actually increase the freezing temperature to 32° F, the same as water. This demonstrates that getting to the correct salinity level of 23.3% is very important.

Do not use treated salt to make salt brine because it has multiple types of chlorides. Having these multiple types of chlorides will affect the density of the brine and will make it very difficult to confidently know when you brine is properly saturated.

## SALT PURITY

For best performance in brine making, ensure at least **95% purity** in your salt. This purity will reduce common issues of slow brine mixing times, issues with fallout, refreeze and plugging filters on your spray equipment. Gradation of salt, from fines to blocks, will only affect the mixing time of preparing your brine.

## HOW TO TEST SALINITY OF BRINE

As mentioned above, the saturation of your brine is very important. Poorly saturated brine will cause you to have mixed or poor results upon application. Whether making brine yourself or purchasing from elsewhere, be sure to monitor your salinity level.

Testing salinity levels can be done manually one of two ways. You can use a manual hydrometer, which simply floats in the liquid and shows the density. A handheld refractometer can also be used to sample brine and measure its refractive index. Our VSI by BOSS Snowplow Legacy Series and Genesis Series brine makers come with a Bluetooth-controlled digital salinity reader standard so that you can track your levels on your smart-connected device, no extra monitoring equipment needed.



# LIQUID VS. SALT

## BENEFITS OF LIQUID DEICING

Liquids used for deicing provide benefits many of which the spreading of rock salt doesn't provide. Here's a list of some of them:

- Material savings by utilizing less salt.
- Labor savings to cover the same amount surface compared to salt trucks.
- Corrosion inhibitors reduce chloride damages.
- PNS (Pacific Northwest Snowfighters) certification for parking garages and bridge decks—low corrosion.
- Better for the environment:
  - 75% of application is water.
  - Liquids stay where you apply them, even on vertical surfaces.
  - No bounce and scatter during application.
- Effective working temperature down to -30° F (with an 80/20 blend).
- No leftover residue or bulk salt sitting on the surface provides better looking sites.
- Flexibility in application timing—you can treat 24 to 48 hours before an event (can be even sooner in certain conditions).
- Doesn't kill vegetation like granular salt.
- Less expensive to set up remote filling stations than remote bulk salt containers.

The Legacy Series of sprayers from VSI by BOSS Snowplow provide **equipment** benefits as well:

- Fewer moving parts on equipment means less maintenance.
- Stainless steel and poly construction materials means long-lasting equipment.
- Precise and consistent application via automatic rate control.
  - Simply set the rate and go spray!
  - Applies within 3% of desired accuracy.
  - Automatic system adjusts flow with fluctuations in speed.
- Able to handle chloride-free products on LEED-certified or other sensitive surfaces.

# LIQUID VS. SALT

## OTHER BENEFITS

Liquid deicing provides some other ancillary benefits to your snow and ice operations. The first benefit is to your plows. By utilizing liquids as a pre-treatment to prevent the bond of snow and ice to the pavement, your plows achieve a cleaner scrape. This easier and cleaner scrape will then provide benefits, as there is less residual snow on the surface to tackle during post-treatment applications with liquids. Consider using floating edge systems, push boxes or other types of snowplows, and follow best practices in plowing your surface area. It will make a world of difference in your results and margins.

Another ancillary benefit is that a non-CDL truck (under 26,000 lbs GVWR) can cover more acreage with liquids as compared to compared to a properly sized salt spreader. Other smaller trucks, such as an F-350 short bed, which would not be helpful for salting can utilize a Legacy Series 305LP sprayer and cover 7.5+ acres pre-treating lots.

## CHALLENGES

Let's not overlook that making a change to using liquids can have challenges. The most common ones we hear are:

- Liquids are something new and difficult to learn—there is a learning curve.
- Liquids are initially expensive to set up as it requires a different set of equipment from salt spreaders.
- Freezing rain events may be trickier to manage with liquids than with rock salt.

Usually, the concerns from contractors about changing to liquids are similar to the concerns customers have about them. Change of any type in your organization poses certain challenges, but the results in making a move toward liquids have been universally positive.





LIQUID VS. SALT

PRICING TO CUSTOMERS

Pricing liquids to your customers should be done in a manner similar or identical to your granular rock salt application pricing. If your pricing is per application, we suggest keeping that same pricing for your liquid applications.

If your pricing is a per pound for granular, then convert that rate to a per gallon rate. For the sake of billing, use a 3:1 ratio (3 lbs = 1 gallon). See later in the playbook for an overview of talking points to use in selling liquids.

EXAMPLE BY THE NUMBERS

Let’s walk through an example of cost savings that liquids could provide compared to spreading bulk salt. Because there are many variables from market to market across the country, let’s make some broad assumptions for our scenario:

- Service area is 100 acres.
- Cost of salt per ton is \$70.
- Brine is blended properly using 2.28 lbs of salt per gallon of water.
- Liquid pre-treatment application is blended with 5% additive, post-treatments at 10% additive.
- Additives cost \$2 per gallon.
- Input costs (electricity, water, real estate space, etc.) of \$0.05 per gallon of brine is included.



LIQUID VS. SALT

ROCK SALT			
PRE-TREATMENT		POST-TREATMENT	EVENT TOTAL
100	Acres	100	
500	Pounds per Acre	1,000	
\$ 70	Cost per Ton	\$ 70	
\$ 1,750	Material Cost	\$ 3,500	\$ 5,250

BRINE & ADDITIVE			
PRE-TREATMENT		POST-TREATMENT	EVENT TOTAL
100	Acres	100	
40	GPA	80	
\$ 70	Cost per Ton	\$ 70	
\$ 0.05	Input Costs per Gal.	\$ 0.05	
\$ 519	Material Cost	\$ 1,038	
5%	ADDITIVE BLEND	10%	
\$ 2.00	Cost per Gal.	\$ 2.00	
\$ 400	Additive Cost	\$ 1,600	
\$ 919	TOTAL COST	\$ 2,638	\$ 3,558

PER EVENT MATERIAL SAVINGS			
PRE-TREATMENT		POST-TREATMENT	EVENT TOTAL
\$ 831	Material Savings	\$ 862	\$ 1,692



# LIQUID VS. SALT

The example on the previous page shows that there is almost a 1.5:1 ratio in the cost of using rock salt vs. liquids. Our experience has also shown a similar reduction ratio in the cost of labor to apply liquids compared to rock salt. Brine applications have a more consistent application rate with less overlap or overapplication. Brine sprayers can cover more acres per application prior to refill compared to a salt truck.

In addition to the financial benefits, the liquids contractor also got the benefits of corrosion inhibitors, fewer chlorides for the property and less landscape damage, The contractor also benefits from a dratically improved working temperature, which means melting power well beyond the range of untreated rock salt.

The numbers demonstrate a high ROI for your operation, which, on top of being environmentally friendly and effective, offer a competitive advantage over rock salt.



# TOOLS AND PRODUCTION

## BRINE PLANT

The most important step in succeeding with liquid is a proper source for quality brine. Brine may be available for purchase locally, but the most cost-efficient method is to mix and store your own brine.

A properly engineering brine plant will be able to:

- Mix your brine quickly and consistently to the proper salinity level.
- Pump brine out to your storage tanks.
- Draw brine and additives from your storage tanks and pump into your sprayers.

Having **water available on demand** will greatly affect your mixing time and efficiency of a brine plant. If you are not able to directly plumb to an one-inch municipal line, we highly recommend a water nurse tank with a float valve to quickly provide a batch of water.

## BRINE AND ADDITIVE STORAGE NEEDS

If you are a heavy liquids user, we recommend you have on hand at least **2-3 times** more of your per-event liquids. Winter storms are often unpredictable and may even come back-to-back. Having an extra amount of liquids in reserve will allow you to manage the current event before needing to stop and mix additional brine.

A common storage setup when beginning to use liquids on parking lots is to have at least **three (3)** 5,000-gallon storage tanks. This allows for two tanks to hold salt brine and one tank for an additive.

A brine plant should be able to expand to easily meet additional storage capacity needs as liquids usage grows.

## BRINE REMOTE REFILL STATIONS

Consider setting up remote refill station tanks on centrally located routes to boost your efficiency. Having these remote tanks will allow your trucks to spend more time spraying instead of traveling down the road to refill. Remote refill stations can be filled before a snow and ice event to prepare for storms, or after for future events. Unlike remote salt locations, no skid loader and no storage container is needed. You only need a tank with locking valves and bollards or bunker blocks to protect it from being hit by vehicles.



# TOOLS AND PRODUCTION

## TRUCK MOUNTED SPRAYERS

Truck mounted sprayers, such as the Legacy Series from VSI by BOSS Snowplow, come in a variety of sizes to meet your application needs. Here are a few key features to look for when investigating spraying equipment:

- **GPS application rate control** to matches the application rate with vehicle speed. Rate control is incredibly important so that you have the confidence you’re applying the right amount of product every single time.
- Application at a **dynamic range of speeds**: Ultimate flexibility is provided when your sprayer can handle slow (5-8 MPH) application speeds as well as a high-volume flow application at faster (15-25 MPH) application speeds.
- A **rugged boom** with a **wide application pattern** allows operators to cover widths up to 30' with independent control of each boom section. This provides significant efficiency by spraying around objects or cars without having to modify your vehicle driving path. In addition, side boom control allows operators to apply liquids to sidewalks that adjoin the parking lot.
- Other contractor-friendly features to quickly get the job done, including a hose reel for stairways and entryways not accessible by a side boom, the ability to **self fill**, which eliminates the need for a dedicated transfer pump or loader to refill equipment, and **material tracking information** so that you can monitor usage and ensure operators are efficient and accurate in applications.

# TOOLS AND PRODUCTION

## SIDEWALK SUPPORT UNITS

Sidewalks are a phenomenal way to use liquids. Many liquid options can be incorporated into your existing fleet of sidewalk units such as UTVs, Toolcats or, our favorites, the BOSS Snowrator® and SR MAG. Optimize your equipment, reduce labor and material expenses, and provide property owners with the utmost service in areas that matter most.

## WALK-BEHIND UNITS

Compact walk-behind sprayers are more options for sidewalks. They’re small enough to fit in the back of a pickup truck or SUV, but large enough to carry enough liquid to tackle deicing applications. Spray wands and multiple tips allow liquids to get to hard-to-reach areas such as stairways, tight corners and around sensitive landscaping or infrastructure.





TOOLS AND PRODUCTION

PRODUCTION RATES

The chart below provides an example of what type of production you can expect out of a good operator with a quality liquid deicing sprayer.

### SERVICING A POST-TREATMENT ROUTE

1,000 Gallon VSI by BOSS Snowplow Legacy Series spray unit  
Application Rate: 80 GPA.  
Average lot size: 2.5 acres (10-minute drive between each site).

### PERFORMANCE

80 GPA covers 12.5 acres or 5 sites.  
Application Production Rate: 4 minutes per acre with a good operator and three-lane boom system.  
  
VSI Legacy Legacy 1000 unit takes approximately 10 minutes to self-fill.

### RESULTS

50 minutes travel time + 10 minutes fill time + 50 minutes spray time  
= 110 minutes to cover 12.5 acres or 6.8 acres per hour effective production time.

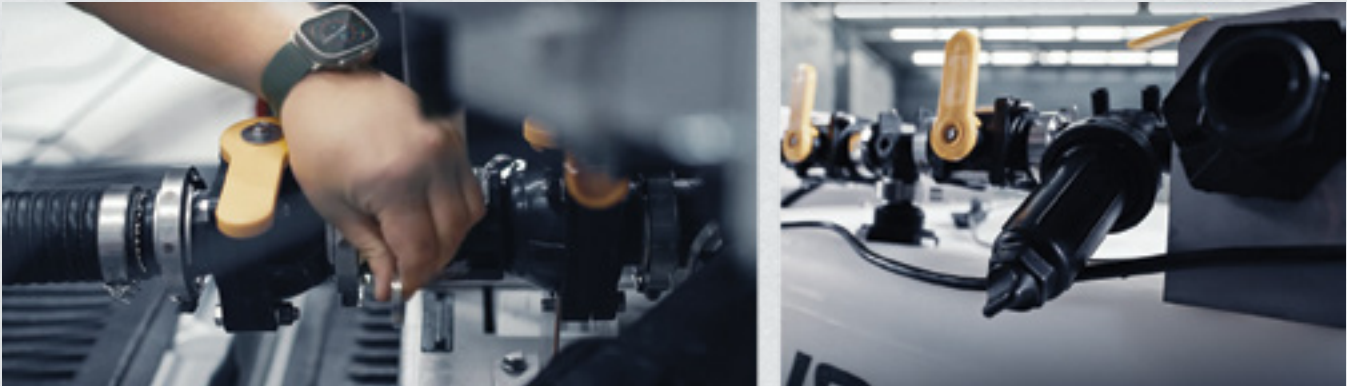
Reducing average travel time between sites from 10 minutes to 5 minutes in this same model will increase production rates to 8.9 acres per hour.

Efficient routes with localized refill points make a large impact on production rates and cost much less to set up compared to remote salt loading sites. Increased production rates during storms result in the need to own fewer trucks and spray equipment to accomplish the same amount of work. Trucks and spray equipment cost a lot more than storage tanks!

TOOLS AND PRODUCTION

LONGEVITY AND EASE OF MAINTENANCE

Liquid deicing sprayers are lower maintenance and have lower costs of ownership with a longer operating life than their salting counterparts. With fewer moving parts, they are easier to clean and are not prone to clogging or freezing. Ensure the engine stays clean and the oil is changed regularly per the engine requirements, and you should have nearly twice the service life compared to a salter.





# GETTING STARTED WITH LIQUIDS

## SIDEWALKS

We have found that the easiest way to implement liquids into your operation is to start with sidewalks. Using liquids as an alternative to bagged ice-melt products will vastly improve service quality and margins. Liquids can be easily sprayed with side booms on a spray truck for any sidewalk that runs along curbs with no cars in the way.

Other liquid options include:

- Hose reels.
- Snowrator® and SR MAG.
- Walk-behind spray units.
- Utility tractors.
- ATVs/UTVs.

Easy and inexpensive refill stations on-site or in sidewalk crew trucks can be installed for efficiency. **Always use an 80% salt brine and 20% additive blend on sidewalks for best results and corrosion protection.** Once set up, the material and labor savings on sidewalks will be even more drastic than parking lots. Furthermore, the level of service will be noticed immediately by your property owners because no product will be leftover or tracked into buildings.



# GETTING STARTED WITH LIQUIDS

## FOCUS ACCOUNTS

When getting started with liquids, focus on select accounts to get your team and process dialed in before switching over your entire salting portfolio. In all our years of helping snow contractors implement liquid, this strategy consistently rings true: If you want to grow and succeed with liquids, choose certain routes or areas from select accounts, gain expertise and practice on them until you are comfortable converting the rest of your sites to liquids.

We would still suggest seasoning and pre-treating all your lots, parking garages and sidewalks. The focus, as mentioned above, refers to the applying of liquids either interstorm or in a post-treatment application as a replacement to your traditional rock salt applications.

Focusing on a group of sites allows operators to assess site conditions and adjust applications based on conditions. Do not dilute your efforts by trying to do too much too fast.

## SEASONED SURFACES

Seasoning surfaces involves the concept of maxing out the chloride and additive carrying capacity in the pores of the substrate before an early season snow or ice event. Once built up, this seasoning can be maintained by continuing your pre-treatment, interstorm and post-treatment applications. This technique can provide a jump-start to the entire season for climates with infrequent snow and ice.

Utilizing **5-6 applications spraying 40-50 GPA, with a brine blend of at least 5% additive,** will yield the best results. These applications can be subsequently done as long as the substrate has dried out before the next application. This seasoning technique will not work on pervious surfaces such as permeable asphalt or pavers.

**Seasoning will be especially effective on low-traffic and high-susceptibility areas such as:**

- Sidewalks.
- Parking garages.
- North sides of structures.

Finally, keep in mind that seasoning is not a replacement for pre-treating right before a storm or post-treating after. However, it will make subsequent treatments substantially more effective, and in warmer climates, you may even see the first 2-3" of an event not accumulate on seasoned surfaces.



# GETTING STARTED WITH LIQUIDS

## CUSTOMER CONVERSION

“What if our customers don’t want liquid?” This is a common question snow companies are concerned about, but it doesn’t need to be! As a contractor, here are a few things to remember when contemplating converting customers to liquids:

1. Liquid salt brine is made by combining salt and water. It’s really that simple. Rock salt forms puddles of brine on the surface of the pavement when it reacts with the moisture from the snow or ice. The advantage of liquid that we can skip that phase change and attack snow and ice on contact.
2. “But the customers won’t see the salt.” This is a valid concern that can be removed through customer education. Liquids are better for longevity of surfaces and, when they see rock salt, they are seeing wasted product.
3. As snow and ice contractors, we are the industry experts and there is better technology available than rock salt. Liquid deicing provides a higher level of service and results for our customers.

At the end of the day, using liquids is a win for both contractors and property owners. The initial conversations can be the most difficult or intimidating part of the implementation process, but after that the results speak for themselves.

## CUSTOMER EXAMPLE

Eleven years ago, in our own commercial operation, we gave customers the choice to continue using rock salt or switch to using liquids. At first, only a small minority told us to use what we thought was best (liquid brine). A year later, we converted our entire operation to only liquids. A few customers remained skeptical, but later demanded that we use nothing but liquids after seeing the cleanliness of the applications. A full 180 degree turn from the initial client hesitancy.



# GETTING STARTED WITH LIQUIDS

## PROPERTY OWNER TALKING POINTS

Here are some of the benefits of liquids that will excite a property owner making the change:

### Safety:

- **Liquids work faster**, typically 3-4x faster than rock salt alone. Getting down to bare pavement can aid in preventing very costly slip-and-fall accidents.
- **Liquids prevent the bond of ice and snow to the pavement**. This bond prevention increases machine traction for a better clearing, requires less material after plowing and helps prevent against refreeze liability.
- **Liquids are adaptable to conditions**. Liquids blended with a quality additive can work at substantially lower temperatures. This allows for melting of parking lots and sidewalks in temperatures that rock salt would not work at all.

### Environmental Impacts:

- **Liquids are better for the environment**. Liquids provide as much as 75% chloride application reduction. Rock salt alone may bounce, scatter, track with traffic, or get plowed away into grass, vegetation or storm drains. But liquids stay where you apply them and using rate-controlled equipment ensures you apply the appropriate amount every time.

### Janitorial, Maintenance, and Infrastructure Costs:

- **Liquids are better for concrete and asphalt**. Liquids are up to 80% less corrosive than rock salt alone. When blending with a quality additive, they do not experience freeze/thaw cycles that are the most damaging event to surfaces.
- **Liquids help reduce janitorial costs**. Liquids do not track into buildings like rock salt, ice melt or even calcium chloride pellets. Janitorial staff will be able to attest to that almost immediately upon conversion to liquids—fewer rug changes and less flooring maintenance and wasted time for janitorial staff.
- **Liquids can meet certification for bridge decks and parking structures**. This PNS (Pacific Northwest Snowfighters) Certification verifies low corrosion values and ensures liquids can be used in highly sensitive applications.
- **Liquids can lessen chloride’s hidden costs**. A single ton of salt applied on a property can cause between \$800-\$3,000 of long-term infrastructure damage.\*This long-term damage comes from things such as concrete, structural steel, aluminum, bricks, light poles, signs, underground plumbing, landscaping, turf and more. Liquids reduce the amount of chlorides applied and the likelihood of it coming into contact with these costly infrastructure assets.

\* 2014 study by Fortin Consulting Inc.



# VSI BY BOSS SNOWPLOW EQUIPMENT OVERVIEW

## LEGACY BRINE MAKER

The Legacy Series Brine Maker is the heart of your brine operation. This unit will keep your brine tanks stocked all winter, so you will always be prepared. It comes with smart-connected technology standard to digitally track your brine salinity from your smart phone or tablet.

- 2,500-3,500-gallon-per-hour capacity.
- Digital salinity reader.
- 2-yard salt hopper.
- Stainless steel construction.
- Manifold system for blending.
- Camlock hose connections.
- Air purge system for dry hoses after filling trucks.
- Onboard pump mixes, pumps to storage and draws from storage to pump to trucks.

220V single-phase power with a 30 amp circuit required.



## GENESIS BRINE BUDDY

The Genesis Series Brine Buddy is for those making smaller quantities of brine or for use as a mobile brine making unit in a larger organization. This compact unit runs on a standard 110V, is hand-loaded with a shovel or chute and comes with smart-connected technology standard to digitally track your brine salinity from your smartphone or tablet.

- 900-1,000-gallon-per-hour capacity.
- Digital salinity reader.
- Stainless steel and poly construction.
- Single manifold system for blending.
- Camlock hose connections.
- Air purge system for dry hoses after filling trucks.
- Onboard pump mixes, pumps to storage and draws from storage to pump to trucks.



# VSI BY BOSS SNOWPLOW EQUIPMENT OVERVIEW

## SIDEWALK SUPPORT UNITS

VSI By BOSS Snowplow has expanded its line of sidewalk equipment. Stay tuned as we continue to add more products to our sidewalk line!

## GENESIS SERIES 110LP

- 110-gallon low-profile tank.
- 12V electric pump.
- 50' spring rewind hose reel.
- Works great in the bed of a UTV or the Toro® Workman®.
- 4' receiver-mount boom perfect for sidewalks.



## LEGACY SERIES SIDEWALK SLAYER

- 100' electric rewind hose reel with guide rollers.
- 25' fill hose for refilling Snowrator®, SR MAG or other sidewalk equipment.
- Self-fill and pump-out.
- 200-gallon capacity.



## GENESIS SERIES SIDEWALK SLAYER

- Dual electric 12V pumps.
- 50' spring rewind hose reel.
- 200-gallon capacity.



## GENESIS SERIES PUSH PAL

- Compact walk-behind spray unit.
- Quick-change camlock caps.
- Pre-treatment, post-treatment and spray wand applications.
- 5-gallon cube containers.
- Containers can be prefilled prior to the storm and simply swapped out as needed.





# VSI BY BOSS SNOWPLOW EQUIPMENT OVERVIEW

## LEGACY SERIES SPRAY UNITS

The Legacy Series of sprayer units use the same engine, plumbing and electronics configurations, allowing operators to seamlessly transition between units. The modular design offers flexibility for the future if changing to a different tank size. Use the unit specifications to match the footprint and weight of your fleet vehicle.

### LEGACY SERIES 305LP

Pre-treat: 7.6 Acres\*  
Post-treat: 3.8 Acres\*



### LEGACY SERIES 1000

Pre-treat: 25 Acres\*  
Post treat: 12.5 Acres\*



### LEGACY SERIES 500

Pre-treat: 12.5 Acres\*  
Post treat: 6.25 Acres\*



### LEGACY SERIES 1600

Pre-treat: 40 Acres\*  
Post treat: 20 Acres\*



### LEGACY SERIES 750

Pre-treat: 18.75 Acres\*  
Post treat: 9.38 Acres\*



### LEGACY SERIES APB

The Legacy APB (Automated Power Bundle) does not come with a tank and allows flexibility to connect to any size tank you desire.



\*Approximate pre-treatment coverage at 40 GPA, post-treatment at 80 GPA

# VSI BY BOSS SNOWPLOW EQUIPMENT OVERVIEW

## LEGACY SERIES STANDARD FEATURES

The VSI by BOSS Snowplow Legacy Series of sprayers are highly productive sprayers coupled with the latest technology. Here are a few of the key features that come standard equipped on all Legacy Series Sprayers:

- GPS rate-controlled application.
- Wireless installation.
- Wireless operation via smart connected device.
- Job tracking and reporting.
- Gas-powered motor capable of up to 72 GPM (gallons per minute).
- Three-lane independently controlled boom sections.
- 100' electric hose reel
- Work and strobe lights.
- Capable of self-fill and pump out.
- Stainless steel skids and cradles.
- Rugged pile driver three-lane high-flow boom.
- Total Control system for wireless control of engine functions.
- Rugged handheld remote for simultaneous operation with mobile device.

## GENESIS SERIES SPRAY UNITS

Our Genesis Series is a line of electric truck-mounted sprayers in 305, 500 and Power Bundle sizes. They feature dual 12V pumps, a 50' spring rewind hose reels and a single lane 84" boom, which work great for pre-treatment or post-treatment of small lots.





## SUMMARY

VSI by BOSS Snowplow comes from a contractor background, and still operates that way to this day. We know what it takes for equipment to work in the field the way you need it to. We also have helped many companies implement liquid into their businesses. For over 10 years, we have not spread any granular product and do not even own a salt spreader.

When you partner with VSI by BOSS Snowplow, you are not just buying a liquid spray system, you are integrating liquid into your culture. We can walk with you each step of the way, from the initial consultation, to equipment sourcing, and then implementation and situational management via phone or email. Talk to anyone who has worked with VSI by BOSS Snowplow; we are a true partner, not just a vendor.

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