Connecticut Best Management Practices

A Guide for Parking Lots and Sidewalks

Updated March 2023

Acknowledgements

Connecticut's Best Management Practices Guide was adapted from New Hampshire's Best Management Practices Guide and originally developed in 2018 in partnership with the following agencies:

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How Salt Works

How Do We Melt Ice?

Ice can be melted by increasing the temperature, or lowering the freezing point of the water. It's not cost effective to use heat to melt ice on our roads, parking lots, and sidewalks so we use chemicals to reduce the freezing point. Anything that will dissolve in water will work, including: salt, sugar, even alcohol!

Why Use Salt?

Salt (Sodium Chloride) is the cheapest and most readily available chemical that efficiently melts ice and can be easily applied to our roadways and parking lots. Alternatives include potassium acetate, and calcium magnesium acetate (CMA), all of which are considerably more expensive than sodium chloride, and have their own environmental concerns.

Brine Makes It Happen

The first step in melting ice is the formation of a brine. Salt crystals pull water molecules out of ice formation which creates a brine with a lower freeze point. Once the brine is formed melting is greatly accelerated. Save time and **money** by pre-wetting your salt with a brine before it hits the pavement to jump start melting! See the Pre-wetting page for more information.

TIPS TO CONSIDER:

BE PROACTIVE– ANTI-ICE

Anti-icing is the proactive method of preventing snow and ice from bonding to pavement. It can be more than 50% more efficient than de-icing. See the Anti-icing page for more information.

PRE-WET FOR FASTER ACTING SALT

Adding brine to salt before you apply it to pavement jump starts the melting process which means your pavement will be clear sooner. See the Pre-wetting page for more information.

KNOW YOUR LIMITS

Dry salt becomes ineffective below 15°F, if possible wait until the temperature rises before applying salt. At 30°F, 1 lb of salt can melt 46.3 lb of ice in 5 minutes. At 15°F, 1 lb of salt can melt 6.3 lb of ice in 1 hour.

PLOW FIRST

Always plow before applying any kind of chemical de-icer to avoid pushing it away!

Save $$, Time and the Environment

As the pavement temperature drops more salt is required. As the pavement temperature rises less salt is required. Save money and the environment by using only what is needed to do the job. In Connecticut, more than 400 private and public wells have been found to have elevated chloride and/or sodium levels. See the application rate charts for the recommended rates.

Be efficient in your operations- plan ahead to where you place snow and save callbacks and refreezing conditions which lead to additional applications. **PLOW** and blow snow to the downhill sides of parking lots and sidewalks so the snow melt does not flow back over parking and walking area. **CLEAR** catch basin drains and drainage leak-offs to ensure a path for snow melt. **CHECK** to make sure building roof gutters are not directed onto pedestrian pathways. **PLAN AHEAD**- establish environmentally reviewed snow dump locations and prepare them for service prior to the start of the winter season so you are ready for severe storms.

Anti-Icing

A Proactive Treatment

Anti-icing before a storm is very similar to using a non-stick spray on a pan before cooking. Just like a non-stick spray prevents food from bonding to the pan, anti-icing prevents or mitigates snow and ice from bonding to the pavement so that it can be plowed away. Anti-icing can save you **money** as it costs 50% less than reactive de-icing and assists in MS4 permit compliance.

Make Your Own Salt Brine

When making brine it is important to add enough salt to produce a 23.3% solution which freezes around 0°F. Roughly 2.5 lb per gallon of water will produce a 23.3% solution. You can verify using a salimeter (~$20). A 23.3% solution will have a specific gravity of 1.176, or 85% salinity. See the Brine Making page for more information.

How Much Should I Use and When?

You can apply brine up to three days in advance of the storm. Typical application rates range from 0.5 to 0.75 gallon per 1000 sq.ft. (10’ x 100’ area). Other chemicals such as magnesium are also available- consult your supplier for application rates. Anti-icing is **not** advised prior to freezing rain events if the event starts out as plain rain.

TIPS TO CONSIDER:

GET OUT EARLY

Typically anti-icing is most effective if applied 1-2 hours before the precipitation begins. However if using brine, it can be applied two to three days in advance.

TRY IT FIRST

Trying anti-icing for the first time? Make a 23.3% brine solution and before a storm spray pavement on your own property using a masonry/plant sprayer. Use this experiment to determine how best to use it with your roads, parking lots, and sidewalks.

LEAVE SOME PAVEMENT BARE

It’s always best to use stream nozzles instead of a fan tip to avoid creating a slippery condition. If the anti-icing liquid freezes the bare pavement, it will still provide a traction surface.

USE A FILTER

Having a filter in your liquid dispensing system will reduce clogs in your nozzle. Automotive inline fuel filters work quite well. If your liquid dispenser is not functioning properly be sure to check the filter first.

Getting Started

Try making your own salt brine by putting 13 lb of salt in 5 gallons of water to get a 23.3% salt brine solution. Mix the brine until all of the salt is dissolved. Using a masonry sprayer, apply the liquid several hours before a storm. Start by applying about 0.25 - 0.5 gallons to a 10’ x 50’ area. Adjust the application rates based on your experience. Be careful not to over apply and cause a slippery condition.

Material Storage and Housekeeping

Proper Material Storage

Proper storage of materials (especially chemicals) is essential. If following best management practices, all materials should be stored on an impervious surface. Salt piles should be stored in a covered shed or covered with a water-proof tarp.

Liquid Storage

Liquid chemicals stored using holding tanks must be managed so that there are no releases to drains, groundwater or surface water.

Liquid Storage- Secondary Containment

Secondary containment for your liquid storage is a highly recommended technique to help reduce soil and groundwater contamination. If a tank begins to leak, the secondary containment prevents liquid from seeping into sensitive environments.

TIPS TO CONSIDER:

IMPERMEABLE SURFACE STORAGE

Store salt and liquids on an impermeable surface to prevent groundwater contamination.

COVERED STORAGE AREAS

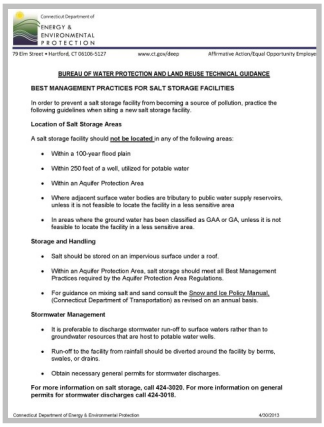
If possible, store your salt in a covered shed to prevent runoff. If there is not a shed available, cover your salt pile well with an impermeable membrane or tarp.

SECONDARY CONTAINMENT

Keep your liquids in an appropriate storage container. Secondary containment should be used incase a leak develops in the primary container.

PROPER DRAINAGE AND COLLECTION

Protect your groundwater supply! A drainage system should be in place to collect runoff from your salt pile, as well as to collect any liquids that may escape containment. Remember, the collected liquid can be used as a base for salt brine.



Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

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BUREAU OF WATER PROTECTION AND LAND REUSE TECHNICAL GUIDANCE

BEST MANAGEMENT PRACTICES FOR SALT STORAGE FACILITIES

In order to prevent a salt storage facility from becoming a source of pollution, practice the following guidelines when siting a new salt storage facility.

Location of Salt Storage Areas

A salt storage facility should not be located in any of the following areas:

- Within a 100-year flood plain
- Within 250 feet of a well, utilized for potable water
- Within an Aquifer Protection Area
- Where adjacent surface water bodies are tributary to public water supply reservoirs, unless it is not feasible to locate the facility in a less sensitive area
- In areas where the ground water has been classified as GAA or GA, unless it is not feasible to locate the facility in a less sensitive area.

Storage and Handling

- Salt should be stored on an impervious surface under a roof.
- Within an Aquifer Protection Area, salt storage should meet all Best Management Practices required by the Aquifer Protection Area Regulations.
- For guidance on mixing salt and sand consult the Snow and Ice Policy Manual, (Connecticut Department of Transportation) as revised on an annual basis.

Stormwater Management

- It is preferable to discharge stormwater run-off to surface waters rather than to groundwater resources that are host to potable water wells.
- Run-off to the facility from rainfall should be diverted around the facility by berms, swales, or drains.
- Obtain necessary general permits for stormwater discharges.

For more information on salt storage, call 424-3020. For more information on general permits for stormwater discharges call 424-3018.

Connecticut Department of Energy & Environmental Protection 4/30/2013

CT DEEP BMP for Salt Storage Facilities

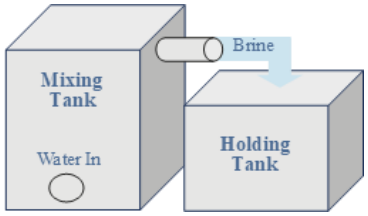
This guidance outlines the basic required specifications for Municipal salt and chemical storage facilities as well as storage and handling of salt and stormwater management considerations. This can be used as a reference for best practices for Private Commercial Applicators.

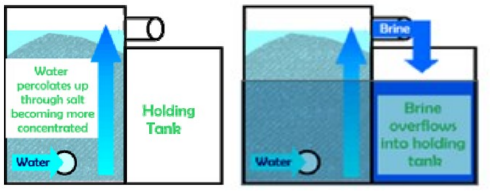
For additional information, please contact the Bureau of Water Protection and Land Reuse at (860) 424-3704.

Brine Making

What Do You Need?

Brine making is a fairly simple process- the only ingredients are salt and water, and the only equipment you'll need is an open top mixing tank, a holding tank, a small pump, and a salimeter.





Images courtesy of Iowa DOT

Step 1: Fill Mixing Tank

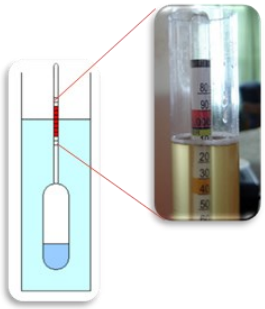
Add Salt: Add about 2.5 lb of salt per gallon of water you plan to add. Make sure your mixing tank has a large opening to make adding salt easy.

Add Water: Slowly add water from the bottom of your brine mixing tank. This will allow it to percolate up through the salt and overflow into the holding tank.

Step 2: Check Concentration

Float a hydrometer or salimeter directly in your holding tank and read the value at the surface of the water. The number should be either 85% or 1.176 depending on the units of your device.

If the values are too low, pump some brine from your holding tank back into the mixing tank and allow it to overflow. If values are too high, simply add some fresh water.



TIPS TO CONSIDER:

GET THE LOWEST FREEZE POINT

When salt brine is 23% salt (measured with a hydrometer: 1.176, or with a salimeter: 85%) it has the lowest freeze point possible (about 0°F).

BRINE STORAGE

23% brine solution may be stored outside, however if temperatures get below 0°F the brine may freeze. A circulator pump will reduce the risk of freezing. If possible store brine indoors to eliminate risk of freezing.

COST OF BRINE

Sodium chloride brine costs about 7¢/gallon (assuming $58/ton for salt) after you have your equipment setup.

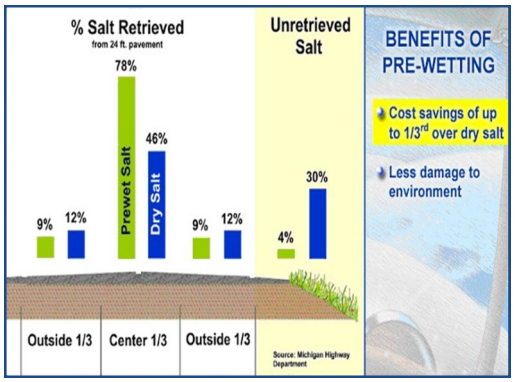
MULTIPLE USES

Brine can be used directly for anti-icing, for pre-wetting salt as it is dispensed from your truck, or to pre-treat salt before it is loaded into your truck. Brine can be safely stored for up to a year, however, the concentration should be tested before use.

Quality Control and Documentation

Make sure that you record the date when you create each batch of brine and document who mixed it and checked the concentration. It is also a good idea to note the final concentration. These records should be kept for at least two years to protect your group in the event of litigation.

Pre-Wetting



What is Pre-Wetting?

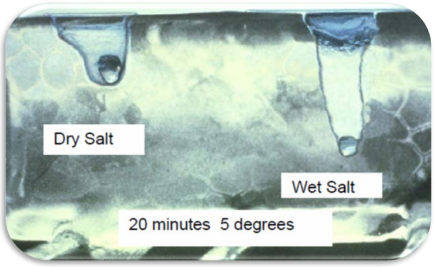
Pre-wetting is the process of coating a solid de-icer with a liquid before it is spread on a roadway, parking lot, or sidewalk.

Why Pre-Wet?

De-icing chemicals must form a brine before they can begin melting ice. Pre-wetting your chemicals accelerates the brine making process, which improves the melting action of the material. Pre-wetting also reduces bounce and scatter of material during spreading and reduces the total amount of de-icer needed to obtain the desired results.

Getting Started

Wet the pile! There are two ways to pre-wet your de-icing chemicals. The easiest way to get started with pre-wetting is to spread your salt pile, spray it with pre-wetting liquid, mix it around, and re-pile it. More advanced truck mounted pre-wet systems can be installed on your trucks if you decide to make the investment.



Source: Wisconsin DOT Transportation

Common Pre-Wetting Agents	Typical Application Rate (gallons per ton)
Salt Brine	8 to 14
Calcium Chloride	6 to 12
Magnesium Chloride	6 to 8

Pre-Wetting Liquids

You have a few options for pre-wetting liquids. The most commonly used is a 23% sodium chloride brine solution. 32% calcium chloride solution and 30% magnesium chloride solution are also used, as well as several other patented products.

TIPS TO CONSIDER:

REDUCED APPLICATION RATES

If you are pre-wetting, don't forget to reduce your application rates accordingly. Reductions in the range of 15-20% are typical.

HOW MUCH LIQUID?

A good rule of thumb is to use 8-14 gallons of sodium chloride liquid for every ton of de-icer. For other chemicals, such as magnesium chloride, consult your supplier for application rates.

Trunk Mounted Systems

These systems are mounted in the truck bed and coat the de-icer with liquid as it comes off the conveyor/auger onto the spinner. These systems have the benefit of applying liquid only to the material you use as you use it. However, these systems must be installed on every truck that will be used to spread pre-wetted material.

Gravity Flow Spreader Calibration

Step 1: Load the Spreader

Partially load the material spreader. Half of a load should be more than adequate for calibration purposes.

Step 2: Set Your Controls

Lever Position or Gate Setting: Set the opening to its lowest practical setting (approximately 1" to 1.5"). After the spreader is calibrated for the lowest gate setting, calibrate for each 1/2" increment greater than the lowest setting. Continue until all gate settings you use are calibrated. If your equipment does not have markings for settings, make your own permanent marks or numbers on the equipment to identify the positions.

Engine Speed: Set the pony motor engine speed to the maximum setting or to the setting you would normally use.

Step 3: Measure Spread Width (B)

Spread out a 10 ft long tarp or mark a distance of 10 ft on the ground. Drive over the tarp or marked area at plowing speed. Measure the width of the deposited material and record to the nearest half of a foot. Multiply this width by the 10 ft length to get the square footage of coverage.

Step 4: Collect and Weigh Material (A)

Collect the deposited material from each pass and weigh the sample. Record your results.

TIPS TO CONSIDER:

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibration is to know how much material you are putting down on a roadway or parking lot for every setting on your spreader that you use. This is why calibrating your equipment is the first step to **reducing salt use and saving money!**

CALIBRATE EACH MATERIAL USED

Each truck must be independently calibrated for each material that it will be used to spread. The salt calibration card **will** be different than the sand calibration card. Calibrations should be performed annually, or after a spreader is serviced!

RECORD DATA, THEN COMPLETE CALCULATIONS

There are a few simple calculations that you must perform in order to complete the calibration. Once all of the necessary data is recorded, you can do the calculations.

Step 5: Perform Calculations

Complete steps 3 and 4 three times for each setting to calculate average spread width and weight. Record those averages in the chart provided. Multiply spread times 10 to get coverage in square footage (C). To determine how much would be spread in 1000 square feet, divide 1000 by the coverage area (C) and multiply by the lbs. of material recovered (A)

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration card in the truck you just calibrated. Also, keep a copy of the calibration card in the office in case the original is damaged.

Gravity Flow Spreader Calibration

Calibration Chart for Gravity Flow Equipment						
Vehicle or spreader number:					Date:	
Material type:				Calibrated by:		
		A	B	C	D	E
Speed	Lever position or gate setting	Lbs. of material recovered in 10 feet	Spread width in feet	Square feet covered with material **(B x 10)**	Application rate in lbs./1000 ft^2 **(1000/C x A)**	Application rate in lbs./lane mile (12' width) **(D x 63.4)**

Taken from Minnesota Winter Parking Lot and Sidewalk Maintenance Manual

Hydraulic-Run Spreader Calibration

Step 1: Warm and Load the Truck

Warm the truck's hydraulic oil to normal operating temperature with spreader system running. Partially load the truck– half of a full load should be more than adequate for calibration purposes.

Step 2: Prepare Auger or Conveyor

Mark shaft end of auger or conveyor and dump salt on auger or conveyor.

Step 3: Count Revolutions

Rev truck engine to operating RPM (at least 2000 RPM). Count the number of shaft revolutions per minute at each spreader control setting and record.

Step 4: Collect and Weigh Material

Collect salt for one revolution and weigh, deducting weight of container. For greater accuracy, collect salt for several revolutions and divide by this number of turns to get the weight for one revolution. This can be accomplished at idle or very low engine RPM.

TIPS TO CONSIDER:

WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibration is to know how much material you are putting down on a roadway or parking lot for every setting on your spreader that you use. This is why calibrating your equipment is the first step to **reducing salt use and saving money!**

CALIBRATE EACH MATERIAL USED

Each truck must be independently calibrated for each material that it will be used to spread. The salt calibration card **will** be different than the sand calibration card. Calibrations should be performed annually, or after a spreader is serviced!

RECORD DATA, THEN COMPLETE CALCULATIONS

There are a few simple calculations that you must perform in order to complete the calibration. Once all of the necessary data is recorded, you can do the calculations.

Step 5: Perform Calculations

Multiply shaft RPM (Column A) by discharge per revolution (Column B) to get discharge rate in pounds per minute (Column C). Then multiply discharge rate by minutes to travel one mile at various truck speeds to get pounds discharged per mile.

For example, at 20 MPH with 30 shaft RPM and 7 lb. discharge: 30 x 7= 210 x 3.00= 630 lb per mile.

Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration card in the truck you just calibrated. Also, keep a copy of the calibration card in the office in case the original is damaged.

Hydraulic-Run Spreader Calibration

CALIBRATION CHART (US)

Agency: _____

Location: _____

Truck No: _____ Spreader No: _____

Date: _____ By: _____

Gate Opening _____ (Inches) (Hopper Type Spreaders)				DISCHARGE RATE (pounds discharged per mile)								
	A	B	C	TRAVEL SPEED AND COMPUTATION MULTIPLIER ( )								
Control Setting	Shaft RPM (Loaded)	Discharge per Revolution (pounds)	Discharge per Minute (lb) (A x B)	5 mph (x 12.00)	10 mph (x 6.00)	15 mph (x 4.00)	20 mph (x 3.00)	25 mph (x 2.40)	30 mph (x 2.00)	35 mph (x 1.71)	40 mph (x 1.50)	45 mph (x 1.33)
1			-		-		-	-	-	-	-	-
2			-	-	-	-	-	-	-	-	-	-
3			-	-	-	-	-	-	-	-	-	-
4			-	-	-	-	-	-	-	-	-	-
5			-	-	-	-	-	-	-	-	-	-
6			-	-	-	-	-	-	-	-	-	-
7			-	-	-	-	-	-	-	-	-	-
8			-	-	-	-	-	-	-	-	-	-
9			-	-	-	-	-	-	-	-	-	-
10			-	-	-	-	-	-	-	-	-	-
11			-	-	-	-	-	-	-	-	-	-

THE ACTUAL APPLICATION RATE (POUNDS PER LANE MILE) **ON THE HIGHWAY IS THE DISCHARGE RATE DIVIDED BY THE NUMBER OF LANES BEING TREATED**

SPREADER CALIBRATION PROCEDURE

Calibration is simply calculating the pounds per mile discharged for each control setting at various travel speeds by first counting the number of auger or conveyor shaft revolutions per minute, measuring the weight of salt discharged in one revolution, then multiply the two to obtain discharge per minute, and finally multiplying the discharge per minute by the time it takes to travel 1 mile. Most spreaders have multiple gate openings; so you must calibrate for specific gate openings.

Equipment needed:

1. Scale to weigh salt
2. Salt collection device
3. Marking device
4. Watch with second hand

Calibration steps:

1. Remove, by-pass or turn off spinner.
2. Warm truck's hydraulic oil to normal operating temperature with spreader system running.
3. Put partial load of salt on truck.
4. Mark shaft end of auger or conveyor.
5. Dump salt on auger.
6. Rev truck engine to operating RPM.
7. Count number of shaft revolutions per minute at each spreader control setting, record.
8. Collect salt discharged for one revolution, weigh it and deduct the weight of the container. (For greater accuracy, collect salt for several revolutions and divide by that number of revolutions to get the weight for one revolution.)
9. Multiply Column A by Column B to get Column C; then multiply Column C by the number of minutes to travel one mile ( ) at various truck speeds to get pounds Discharged per mile."

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CALIBRATION OF AUTOMATIC CONTROLS

Automatic controls may be calibrated using the following steps:

1. Remove, by-pass or turn of spinner.
2. Set control on given number.
3. Tie sack or heavy canvas under spreader discharge area.
4. Mark specific distance on a highway or other paved area, such as 1000 ft. .
5. Drive that distance with spreader operating.
6. Weigh salt collected.

Slide-In Spreader Calibration

WHAT YOU NEED FOR CALIBRATION:

- Bucket
- Scale
- Marker
- Tarp
- Tape measure
- Broom and dustpan or shovel
- Pencil or pen
- Timer
- Calibration chart

Step 1: Place a Bucket on a Scale

Either zero out the scale or determine the weight of the empty bucket for future measurements.

Step 2: Start with an Empty Spreader

Step 3: Set the Conveyor Chain Speed to the Lowest Setting (A)

Mark a spot on the drive shaft next to the conveyor chain and set the control to the lowest setting typically used for conveyor chain speed. Record this setting in column **(A)**.

Step 4: Count Revolutions (C)

Count the number of revolutions in one minute at this conveyor chain speed setting. Record in column **(C)**.

Repeat Steps 3-4 for each Conveyor Chain Speed Setting

Record in columns **(A)** and **(C)**.

Step 5: Load the Spreader with Material

Step 6: Place a Tarp Under the Spreader

Step 7: Set the Flow Gate to the Lowest Setting (B)

Set the flow gate setting to the smallest opening typically used. Record this setting in column **(B)**.

Step 8: Complete One Revolution

With the vehicle parked, turn on the conveyor belt for one revolution with material running through.

Step 9: Collect and Weigh Material (D)

Collect the material from one revolution on a tarp and weigh it in the bucket. Record in column **(D)**.

Repeat Steps 7-9 for each Flow Gate and Conveyor Chain Speed Setting

Record in columns **(A)**, **(B)**, and **(D)**.

Slide-In Spreader Calibration

Step 10: Set the Spreader Width Control to the Lowest Setting (F)

Set the control to the lowest setting typically used for spreader width. Record this setting in column **(F)**.

Step 11: Measure Spread Width (G)

Remove the tarp and measure the maximum width of material spread in feet, subtracting 2 feet from the measured value to take into account that the edges of the spread will not get the full application. Sweep up the material after measuring the spread width. Record this value in column **(G)**.

Repeat Steps 10-11 for each Spreader Width Setting

Record in columns **(F)** and **(G)**.

TIPS TO CONSIDER:

CALIBRATE EACH MATERIAL USED

Each truck must be independently calibrated for each material that it will be used to spread. The salt calibration card **will** be different than the sand calibration card. Calibrations should be performed annually, or after a spreader is serviced!

RECORD DATA, THEN COMPLETE CALCULATIONS

There are a few simple calculations that you must perform in order to complete the calibration. Once all of the necessary data is recorded, you can do the calculations.

Step 12: Calculate Material to Spinner (E)

Multiply the number of revolutions in one minute **(C)** by the pounds of material from one revolution **(D)**. Record this value in column **(E)**.

Step 13: Determine Application Rate (H)

Reference the application rate table for parking lots/sidewalks to determine the desired application rate based on the pavement temperature, trend, weather condition and material used. Record this value in column **(H)**.

Step 14: Calculate Vehicle Speed (I)

Calculate the speed of the vehicle necessary for the desired application rate. Record this value in column **(I)**.

$$mph = 11.36 \times \frac{E}{G \times H}$$

Step 15: Create Calibration Cards!

Once you complete the measurements and calculations, make calibration cards for each truck that corresponds to the different settings and materials utilized.

Slide-In Spreader Calibration

Calibration Chart for Slide-In Spreader Equipment								
Vehicle or spreader number:				Date calibration completed:				
Material type:				Calibrated by:				
A	B	C	D	E	F	G	H	I
Conveyor Speed Setting	Gate Setting	Number of revolutions in one minute	Pounds of material from one revolution	Material to spinner (lbs/min) (C x D)	Spreader Width Setting	Spread width in feet	Application Rate (lbs/per 1000 sq. ft)	Speed of the vehicle (mph) $mph = 11.36 \times \frac{E}{G \times H}$

Broadcast Push Spreader Calibration

WHAT YOU NEED FOR CALIBRATION:

- Bucket
- Scale
- Chalk
- Tarp or smooth area of pavement
- Tape measure
- Broom and dustpan or shovel
- Pencil or pen
- Calibration chart

Step 1: Place a Bucket on a Scale

Either zero out the scale or determine the weight of the empty bucket for future measurements.

Step 2: Load the Spreader with Material

Step 3: Mark a 10-Foot Long Area

You can either mark a 10-foot long area on smooth swept pavement with chalk or lay down a tarp and mark it with tape. If you want to use a longer test area to increase accuracy, you will have to adjust the equation in column **(E)** to correspond to your test area length that you use.

Step 4: Set the Lever/Gate Position to the Lowest Setting (B)

If there are no numbers for the different settings, start at the lowest practical setting (approximately 1 to 1.5”) and make permanent marks/numbers to identify the positions in .5’ increments. Record this setting in column **(B)**.

Step 5: Apply One Pass of Material

Position the broadcast push spreader a couple feet before the marked test area and using a constant walking speed **(A)** apply one pass of material.

Note: the speed of the operator (mph) will not be used in the calculations, but a consistent walking speed should be utilized.

Broadcast Push Spreader Calibration

Step 6: Measure Spread Width (D)

Measure the width that the material is spread in feet. Record in column **(D)**.

Note: if your spreader has deflectors for an adjustable spread range, you can measure the spread width at different deflector positions or determine the deflector position that you will use as a constant setting for the spread width.

Step 7: Collect and Weigh Material (C)

Sweep up and weigh the material in the marked test area. Record in column **(C)**.

Note: to determine the average weight of material applied in three runs, you can repeat Steps 4-6 two more times at each setting.

TIPS TO CONSIDER:

CALIBRATE EACH MATERIAL USED

Each spreader must be independently calibrated for each material that it will be used to spread. The salt calibration card **will** be different than the sand calibration card. Calibrations should be performed annually, or after a spreader is serviced!

RECORD DATA, THEN COMPLETE CALCULATIONS

There are a few simple calculations that you must perform in order to complete the calibration. Once all of the necessary data is recorded, you can do the calculations.

Step 8: Calculate Coverage Area (E)

Calculate the coverage area (sq. ft.). Record this value in column **(E)**.

Note: if your test area is longer than 10-feet, use that number in your calculation.

$$(D \times 10)^*$$

Step 9: Calculate Application Rate (F)

Calculate the application rate (lbs/per 1000 sq. ft.). Record this value in column **(F)**.

$$\frac{C}{E} \times 1000$$

Step 10: Create Calibration Cards!

Once you complete the measurements and calculations, make calibration cards for each broadcast push spreader that corresponds to the different settings and materials utilized.

Broadcast Push Spreader Calibration

Calibration Chart for Broadcast Push Spreader	
Spreader number:	Date calibration completed:
Material type:	Calibrated by:
*If your test area is longer than 10-feet, use that number in your calculation for column **(E)**	

A	B	C	D	E	F
Speed of Operator (mph)	Lever Position or Gate Setting	Weight of material spread in test area (lbs)	Spread width (feet)	Coverage area (sq. ft.) $(D \times 10)^*$	Application Rate (lbs/per 1000 sq. ft.) $\frac{C}{E} \times 1000$

Adapted from Wisconsin Saltwise