



The Mulvaney Pipeline

Mulvaney
MECHANICAL, INC.
Mechanical Contractors
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De-Icing Chemicals: Why We Shouldn't Just Throw Down Salt



While rock salt (sodium chloride) may serve to get the job done, it is extremely corrosive to steel and destructive to masonry and concrete. Because of its low cost, rock salt has retained its popularity in spite of these damaging properties, but the small savings in up-front product costs is generally insufficient to justify subjecting building materials to this harmful chemical. Ultimately, it may prove the more expensive choice, when the cost of rehabilitating salt-damaged components is taken into account. So what are the options? **Calcium chloride**, while somewhat pricier, is generally the most effective deicing chemical. While detrimental effects do tend to be less severe than with rock salt, calcium chloride is nonetheless a corrosive compound that is damaging to reinforced concrete. Avoiding these harmful properties altogether, however, may mean using a chemical that is somewhat less effective, particularly at lower temperatures. A number of **proprietary products** are also available which claim to correct the deficiencies of any one compound. These products usually combine various organic and inorganic deicing chemicals, sometimes alongside other performance-improving agents, such as corrosion inhibitors or traction enhancers (e.g. corn starch). While proprietary blends pledge greater effectiveness than their simpler counterparts, they also come at a higher price. The chemical that is most sympathetic to existing structures and most highly recommended is **calcium magnesium acetate (CMA)**; however, CMA does not work at lower temperatures, must be applied before snowfall, and demands expeditious, and, often, continuous snow clearing. An ice loosening chemical, CMA does not melt snow or ice, but rather creates a slurry that interferes with the bond of the ice to the surface, aiding mechanical removal. Should an ice melting chemical be required, opt for **potassium chloride** or a **proprietary organic ice melting chemical**, or a blend of the two, but not outside their operating temperature range. For colder, more severe conditions, it may be necessary to use calcium chloride to maintain safety. In all cases, application of **grit/sand** greatly increases traction and diminishes the amount of deicing chemical required. With the high liability of slippery surfaces, it's important to consider snow removal options well before the first snowfall forces last-minute decisions. Pilot test proposed materials to verify suitability and performance, and integrate these into a comprehensive snow and ice removal strategy.

Product	Cost Relative to Road Salt	Freezing Point Depression (degrees C per unit weight)	Effective Lower Limit (degrees F)	Corrosive?	Aquatic Toxicity	Other Environmental Impacts
Road Salt or Rock Salt (NaCl)	\$1.00	1	20	Yes	Moderate	Roadside tree damage
Potassium Chloride (KCl)	\$1.60	0.78	12	Yes	Very	K fertilization
Magnesium Chloride (MgCl ₂)	\$2.40	0.29	5	Yes	Very	Mg addition to soil
Calcium Chloride (CaCl ₂)	\$5.70	0.53	-25	Very	Moderate	Ca addition to soil
CMA- Calcium Magnesium Acetate (C ₈ H ₁₂ CaMgO ₈)	\$19.30	0.30	0	No	Indirect	Decreased aquatic oxygen
Potassium Acetate (CH ₃ CO ₂ K)	\$26.30	0.60	-15	No	Indirect	Decreased aquatic oxygen
Urea (CH ₄ N ₂ O)	\$1.80	0.97	15	No	Indirect	N fertilization
Sand	\$0.60	0	-	No	indirect	Sedimentation

There is almost no limit to what welding can do, especially since developments in the technology continually improve its accuracy, quality and versatility. Welding is, in fact, an increasingly high-tech skill. Welders are being trained to operate robots and other automated systems that use powerful lasers, electron beams and sometimes explosives to bond metals. The ability to work with computers and program software is consequently vital to the successful operation of these systems.

- Explosion welding is a powerful welding process that can accomplish what many other welding methods can't—it can join nearly every kind of metal together, even the most highly dissimilar ones.
- The current record for the world's deepest underwater dry weld, which is carried out in a chamber sealed around the structure to be welded, was set by Global Industries in 1990, at 1,075 ft. deep. But that is only half as deep as the world's record wet weld, set by the U.S. Navy in 2005, at 2,000 ft. deep. Wet welding is performed underwater, directly exposed to the watery environment.
- The first car made with an entirely plastic body was assembled using ultrasonic welding. Even though plastic cars did not catch on, ultrasonic welding did. Ultrasonic plastic welding is an example of a friction welding process, which creates energy through high-intensity acoustic sounds that cause plastic pieces to vibrate together and form a bond.
- Did you know that if two pieces of metal touch in space, they become permanently stuck together? This may sound unbelievable, but it is true. If flat, two pieces of metal without any coating on them will form into one piece in the vacuum of space. This doesn't happen on Earth because the atmosphere puts a layer of oxidized material between the surfaces.
- More than 50% of U.S. products require welding. A few are:

- Computers
- Medical Devices
- Cell Phones
- Scooters
- MP3 Players



WHAT THE HECK IS IT?
WIN A MULVANEY MECHANICAL LEATHER JACKET JUST LIKE THIS ONE

When e-mailing your entry, please write "Newsletter Contest" in the subject line to avoid our SPAM filter.

Send to: MMI@mulvaneyinc.com

If multiple correct answers are received, one winner will be selected at random.



Did you know.....

- In 1903 the Wright brothers flew for 59 seconds. 38 years later the Japanese bombed Pearl Harbor. 28 years after that, we landed on the moon.
- Half of all humans who have ever lived, died from malaria.
- Once Charlie Chaplin entered a contest for "Charlie Chaplin look-alikes" and he came in third.
- Napoleon was not unusually short. The French inch was longer than the British inch, so while he was thought to be 5'2" by most of the world, in reality he was closer to 5'7", an average height for a Frenchman.
- If you keep going North, you will eventually go South. If you keep going East, you will never go West.
- Bizarrely there is more actual lemon juice in Lemon Pledge furniture polish than there is in Country Time Lemonade.
- A Blue Whale's heart is the size of a Volkswagon Beetle.
- We figured out how to put a man on the moon before we figured out putting wheels on luggage.
- There is an island that sits in the middle of the Bay of Bengal called North Sentinel Island. The indigenous people of this island have never been colonized by the outside world and are extremely hostile, ferociously attacking anyone who invades their land without any fear. What makes this even more interesting is that, when taken from the island, these people exhibit symptoms of a mystery illness and die if they are not returned.

If you want to be successful, you must either have a chance or take one.



Last Quarter's Puzzle:
Hand made wooden wool hackle - used for fiber processing and preparing to spin fibers.

We Had 5 Correct answers this quarter!!!

- Charles Swanson - Charles Beckman Swanson Architects
- Richard Mawhinney - Consultant
- Anthony Camillucci - Pipe Fitters Local 777
- Andy Dotter - Consulting Engineering Services
- Randy Clair - Acme-Monaco Corp.

WHAT'S GOIN' ON?

March 5-9	MCAA Annual Convention	San Diego, CA
April 27-29	AIA Convention	Orlando, FL
June 24-27	BOMA 2017 Conference	Nashville, TN
June 24-28	ASHRAE Annual Conference	Long Beach, CA
Oct. 18-20	IFMA Conference & Expo	Houston, TX



We have what it takes to take what you have.



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