

Winter driving conditions in colder climates such as in Canada, Alaska and the Upper Mid-West, can be treacherous and unpredictable as snow and ice builds up and melts down alongside the fluctuating temperatures. For over 70 years the solution to this problem has been to cover the roads in sodium chloride - or white salt. How it works is that salt enters the snow, absorbing the moisture from it, on contact, the way that a sponge or towel will absorb drops of water.

The issue with this however, is that the salt, in granular form or in brine spray, is damaging to the concrete roads. Spreading salt onto concrete dissolves the snow build-up and creates salt water slush. This melting action from the salt allows water to enter into the concrete. If the temperature subsequently drops, the growing ice crystal can literally crack apart the concrete. Further, salt contains chloride and corrosive chloride ions have the capability to penetrate into porous concrete, reaching the metal reinforcements within which leads to long-term corrosion. It is worth noting as well that sodium chloride is ineffective below -20 C.



Photo source: <http://www.kissner.com/category/ice-melt/>

On the other hand, from the environmental perspective, several companies and groups are now looking into alternatives to road salt. Such products being explored are that of magnesium chloride, calcium chloride and potassium chloride. It is believed that these minerals are able to reduce some of the adverse effects that road salt has on concrete. Magnesium chloride for instance, has the advantage of being a lot more forgiving than white salt - and it has a lower freezing point.

The issue lies in the fact that road managers tend to be set in their ways and that switching to magnesium chloride initially seems more expensive in terms of raw materials. Such changes in direction however, will become increasingly important in places such as Canada where standards are being put in place aimed at limiting the amount of salt used annually.

Source:

<http://dailycommercialnews.com/Technology/News/2016/9/Road-de-icing-technology-under-pressure-to-go-green-1018338W/>

*Authors note: It has been brought to our attention that there are many studies that demonstrate that magnesium chloride is actually worse for concrete roads than white salt. This will be explored and a follow-up article will be coming soon*