Cold comfort

A new trend to counter the formation of ice on roads in winter is the spreading of liquid salt – brine – but not everyone is convinced. *Transport Engineer* looks at how best to prevent salt build-up on commercial vehicles to help preserve chassis and body components

Even if the weather is kind right now, one thing is certain – winter is coming. That means being prepared to keep icy and snowbound roads open to traffic – and, for those at the sharp end, the spreading of grit and salt.

Salt, of course, lowers the freezing point of the water that forms ice, leading to melting and thus preventing falling snow or rain from being able to freeze. That said, there is salt and 'salt'. The choices for those tasked with keeping traffic flowing and accidents to a minimum come down to: dry salt; 'wetted' salt (dry salt wetted to some degree before application); and liquid brine-only salt, which has been gaining increasing favour (pictured, p44).

Recent studies in Europe have focused on the durability of liquid brine-only spreading, compared to pre-wetted salt. According to a Transport Research Laboratory report, "sodium chloride brine-only spreading requires less salt and a greater proportion stays longer on the surface". (See *www.is.gd/gazate*.)

However, while brine – a mix of rock salt (sodium chloride) and magnesium chloride dissolved in water – may stick better than dry salt (whose crystals have a tendency to bounce off), there may be a downside: brine splashing up on to the underside of vehicles where it holds fast and dries, potentially creating a future home for rust, as magnesium chloride is more corrosive than sodium chloride.

Salt speeds up the effects of corrosion by attracting moisture, which, in turn, accelerates the rusting process, points out Snow and Ice Management Association's Greg Lawrie. "Salt removal on its own requires a closer look. The time required after every event to wash vehicles is very costly and, unless done properly, cabs, doors, fenders, wiring and various areas under the vehicles may be left unwashed." Another way of looking at it? "You are pushing the salts into your vehicle. Creating barriers between metal and moisture adds a layer of protection."

BREAKING THE CYCLE

Matt Dilley, marketing manager at Premier Pits, is well aware of the damage salt can do. "I've had two local authorities get in touch recently; both reported issues where the accumulation of salt on disc brakes made it much harder to separate and change them over. We've become more aware of the issues that can come with salting roads since we became UK distributor for BrakeMate, which is helping customers to deal with this."

BrakeMate operates as an elevated service platform for servicing heavy vehicle disc brake assemblies. "Splitting the hub can be difficult, especially where salt may have penetrated," says Dilley. BrakeMate V-Splitter separates corroded HGV, bus/coach and waste management vehicle disc brake assemblies. "It allows you to split seized discs from the hub, using three 10-tonne (10,000psi) hydraulic cylinders, connected to an air/hydraulic foot pump. Realigning the hubs is simple, and they are then fitted

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Laura Cardwell

back on the vehicle safely and accurately, using the hydraulic lift control."

For Geoff Elbrow, managing director of vehicle washing equipment supplier WNV Systems, the problem of corrosion goes beyond any move towards brine-only salting. "I don't think it really matters which type of salt is being used: whether liquid or granular, there is a proven problem with corrosion."

WNV Systems' under-chassis wash systems (pictured inset p43) are used in various environments: from local authorities washing down gritting lorries and bus companies – including Stagecoach and Arriva – cleaning their fleets, to an integral part of the production line at the Caterpillar factory. Its chassis wash can also be specified with a hot foam application to cover undercarriages with a traffic film remover before starting the clean.

Laura Cardwell, managing director of Lymm Truckwash, Cheshire, which washes more than 60,000 trucks a year, and counts Bosch, AW Jenkinson, DHL and BP among its customers, also stresses the need to stay on top of these rust threats. "You have to get the salt and dirt off the wagons as quickly as possible over the winter months to prevent any possible corrosion damage occurring. Also, dirt builds up and sticks on the wagon, making it harder to get off, if left too long. We use TFR [traffic film remover] as part of our wash programme, to our own bespoke specification, which is stronger in winter when the conditions are that much harsher."

For fleet owners, winter road treatments threaten truck bodies, as abrasive and corrosive elements spatter vehicle undercarriages and bodies, according to Diane Campbell, lubricant area manager at Certas Energy Lubricants Tectyl. "These harsh winter elements will eventually take their toll, rusting vehicle structures and systems, and shortening truck service lives." One of the biggest corrosion prevention steps fleet owners can take is to apply an appropriate coating to truck underbodies and wheel wells, she advises.

Rustbuster is another company offering rust-proofing services to all kinds of transport, including trucks and trailers. Its main salt remover product Chlor-X has been designed to get behind dry crystallised salt and lift it from the steel. "What is does is change the surface tension of the salt crystal, so it lifts off and can then be washed away with fresh water, significantly reducing the concentration of salt," says company director Chris Allen.

He cites some disturbing statistics, most tellingly that a single salt crystal left on the steel's surface can exert a pressure of 15,000psi of pumping power, sucking at the paint film to draw moisture into the crystal, turning it into what he describes as a perfect rust cell. "This results in a blister on the surface of your finished paint that eventually will pop, revealing a wet rusty pit. Most likely, there will be several.

"When you think in Lincolnshire alone [where Rustbuster is based], something like £6 million worth of salt was destined for our roads last winter – that's an awful lot going on to vehicles." TE

BRIDGING THE GAP

Anywhere there might be a threat to water or aquatic life, for instance, there is a requirement to conform to Environment Agency standards, says Omex logistics manager Paul Wakelen. Its non-toxic, non-hazardous de-icing products include Isomex, a liquid de-icer used by airports and on elevated reinforced structures like bridges where corrosion can be a problem.

"We do supply salt brine to county councils as well," says Wakelen. "It forms a glue that makes it stick to the road surface." What about it sticking to the underbelly of sprayers and traffic as well, and potentially causing corrosion? "It's not like it was many years ago when vehicles were so susceptible to rust," he states. "They are far more resistant now."

HOW TO BUILD CORROSION-RESISTANT TRAILERS

Cartwright has created what it believes to be the most advanced Insuliner trailer for Scottish freight, distribution and transportation operator Northwards, one of the main operators on the routes to Orkney and Shetland. The trailer is said to combat the major corrosion problems Northwards has experienced in the past, as its trailers are continually exposed to salt spray during the 14-hour ferry trip between the islands and the mainland, with rust then becoming a particular problem.

Neil Leslie, director of Northwards, states: "The problem of salt was affecting the build integrity of our trailers, particularly corrosion on the front bulkheads."

The trailer has been designed around a fully galvanised chassis, with the headboard and rear door pillars made from the same material. For the crossbearers (supporting the insulated floor), side rave and cant rail, Magnelis-coated steel was used, which, says Cartwright, offers strength and "corrosion-resistant properties up to ten times better than galvanising".