A sensor detects salt on the road to avoid excess

January 29 2014

Measuring salt on road surfaces helps not to spread an excessive quantity. Credit: Alvac S.A.

Engineers at Carlos III University in Madrid, Spain, have designed an optical sensor that detects how much salt is on road surfaces in real time. This avoids the need to spread the substance excessively, because although this prevents ice from forming on roads, it can also harm

vehicles, infrastructure and the environment.

It is common to spread salt on roads to prevent ice and the hazards it can entail for traffic. This preventive treatment is based on weather forecasts, but does not take into account that the road can already have enough salt, scattered during previous frost and snowfall.

"This overacting can have various repercussions, both financial - as too much product is wasted - and environmental - as sodium chloride damages vegetation and contaminates aquifers - as well as having corrosive effects on vehicles and infrastructure," explains Marta Ruiz-Llata, a lecturer in the Department of Electronic Technology at Carlos III University in Madrid.

The team of which the researcher is a member has developed the first optical sensor to monitor the amount of residual salt on the dry road surface, "which is of great interest for preventive action, since we can avoid adding excessive salt."

The sensor is capable of measuring the luminescent properties of sodium chloride (its range and decay time), which enables concentrations of salt lower than 20 g/m2 - the quantity it is recommended not to exceed - to be detected.

"Furthermore, the device acts remotely and its compact design makes for easy installation in any road maintenance vehicle," Ruiz-Llata affirms. The details are published in the journal Sensors and Actuators B.

This research is driven by Alvac S.A., a pioneering company in comprehensive road preservation. The salt sensor is planned to be part of a future system for monitoring road parameters currently being developed by the team.

More information: Marta Ruiz-Llata, Pedro Martín-Mateos, José R. López, Pablo Acedo. "Remote optical sensor for real-time residual salt monitoring on road surfaces". *Sensors and Actuators B* 191: 371- 376, 2014. Doi: dx.doi.org/10.1016/j.snb.2013.10.009.

Provided by Plataforma SINC, Spain