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**M.T. Shishinashvili**
Georgian Technical University
Doctor of engineering Sciences, associate professor, Georgia

**G. A. Chubinidze**
Georgian Technical University
Doctor of engineering Sciences, assistant professor, Georgia

# THE METHODS OF ICE REMOVAL FROM MOTOR ROADS

***Abstract***: *We have considered conventional methods of struggle against freezing on the motor roads in winter used in various countries and have offered an up-to-date technology with the use of reagent. Worth noticing that a reagent has no impact on environment pollution.*

*Reagent allows removing an ice layer from highways in a short period of time and impedes its formation afterwards. Reagent occurs in both liquid and powdered state. Special-purpose vehicles are necessary for reagent use. Types of reagent and broad option of producing companies makes it possible to purchase it on beneficial terms.*

*Introduction of this method in Georgia will be positively reflected on national economy development in winter period.*

***Key words***: *road, frozen road, sodium calcium chloride, magnum chloride.*

***Language***: *English*

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## Introduction

As far as you know, starting with winter season we face a new problem on the motor roads – formation of snow and ice layer on road pavement. There are many ways and technologies of struggle against this natural phenomenon. The most spread method used in many countries worldwide lies in salt sprinkling on a frozen road. Frequently, this method pays its way right off the snowfall, while it is ineffective in struggle against an already laid-down snow.

In Russia and many countries in Europe, except salt there are used special chemical solutions, reagents and their assortment is wide. Special-purpose vehicles are necessary for both salt sprinkling and use of reagents. In contradistinction from salt, reagents can liberate already frozen road pavement from ice layer.

In Sweden and Norway there is developed and widely used a heated wet sand (where water comprises 30% of total mass), which fuses in the ice and increases 1,5-2 times tire adhesion with the undercarriage, and the car moves on frozen road as if it drives on a wet asphalt concrete pavement. The effect of this technology use is very good, but after pavement's drying it is necessary to clean it and remove the rest sand from the surface, in such case this type of mixture should be scattered on the motor road using special vehicles.

There is a broad choice of reagents today, but the most important is to select such type of reagent, which will give maximum effect with minimum expenses.

The operation principle of a reagent is that a freezing temperature of water entering into it is lower than in natural occasion that itself impedes ice formation. There are different percentage ratios of salt and chemical reagent in reagent's composition, which have no effect on environment pollution. The reagent occurs in both liquid and powdered state. Reagent is mainly based on wide spread and well known modified sodium calcium chloride and magnum chloride that is also called magnum chloride hexahydrate.

Reagent can be used on both motor road undercarriage and on parking areas, sidewalks, children's playground etc.

The reagent acts on the ice as follows (see Fig. 1): after hitting the ice surface a granula enters into reaction with ice, penetrates its structure and starts to decompose it, until the ice transforms into water, and afterwards impedes water conversion into ice.

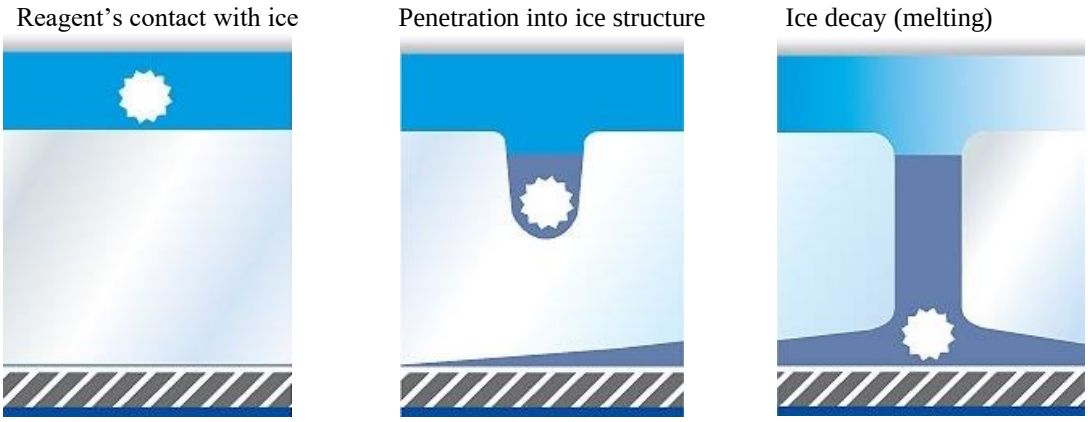


**Figure 1. Operation principle of reagent**

Reagent's operation at negative temperatures can be determined beforehand, and the maximum for reagent is -35°C. It is already prepared according to corresponding scale or takes place its dilution with water, i.e. temperature reduction. The process of ice conversion into water is very quick right after reagent's contact with ice. Therefore, the effect of its use is tremendous.

Similar to types of reagents there are lots of reagent producing companies today and there is a broad option on a global market.

Use of this method will have a great effect for Georgian highways, in particular it will reduce traffic jams and road accidents to the minimum. This method will cut the costs and will simplify roads maintenance and protection.

As of today the experience of many countries worldwide evidences the efficiency of this method that should be taken into account and necessarily introduced proceeding from winter conditions in Georgia.

Salt can be used in Georgia on relatively low-intensity roads, while using the reagent on central highways we will be able to simplify to a maximum extent vehicle movement in winter period, as a result the cargo turnover will not be inhibited and all of this will be positively reflected on revenues earned in this season.

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