



## Drilling in snow

Soil investigation, mining exploration and geothermal drilling must go on, come sunshine or snow

The 4.5t GM75 in Murmansk, Russia

**G**eamachine (GM), a Finnish manufacturer of drill rigs, knows something about the Arctic conditions and how to prepare.

"In Finland we call this a good winter," Jukka Ylänen, managing director of Geomachine, says. "There is a lot of snow and the temperatures are well below freezing point. For the Nordic countries in general, this is the third good winter in row."

"The winter capabilities of the soil investigation, mining exploration and geothermal drill rigs are getting very important. Since we make these rigs in Finland we also know something about how to make them work in these demanding conditions. Geomachine rigs from 2t to 10t are designed to do the job."

### Export expansion

Last year Geomachine added two export countries to its northern territories. The multi-purpose soil investigation rig GM75 was delivered to the country of Iceland

and the smaller geotechnical rig GM50 Combi to Spitsbergen in Norway.

The 5t GM75 is equipped for the total sondering to drill through the volcanic soil layers and the 3t GM50 Combi goes with the auger and coring tools to the Polish Geological Institute in Spitsbergen. In addition to these export countries, Geomachine is already well known in Finland, Norway, Russia and Sweden.

### Good winter capabilities

The rigs need to have good traction capacities in the snow. Here, under-carriage design has the major importance. The deeper the free space is between the crawler tracks, the better the rig advances in the snow.

The roller wheels between the driving-end wheels should be designed as pumper pairs and not as a fixed structure. The rubber tracks need to have steel ribbons inserted every 150mm and they should run free without casings so that the snow does not get into the inner crawler structure and finally push the tracks off. All the GM rigs can also have

100mm-wider tracks fitted for the winter.

Outside in the snow, the cold start cannot be avoided. That is why Scandinavian rig suppliers use the most appropriate engine oil, diesel supply and hydraulic oil heaters. They can be thermo or diesel driven and be controlled remotely. The datalogger booth and the electrical cabin are also heated for extreme conditions.

### Over 500 rigs

In 2015, Geomachine celebrates its 30th anniversary. Over the years the company has delivered more than 500 rigs. Most of them have been used for soil investigation drilling, but an increasing number also go to mining exploration and geothermal drilling.

"Additionally, we have developed a very special underground down-the-hole and jet grouting rig. The product development at Geomachine for 2013-14 is focusing more on mining exploration and geothermal rigs, as well as survey tools for soil investigation. And of course, all of them can work in the snow below zero," Ylänen says.

### Positive prospects

"In the Nordic countries, overall business is looking balanced and quite strong. For the soil investigation business, the hard environment requires constant ground-engineering surveys and maintenance work. Due to the special ground qualities – formed by the last glacier period 10,000 years ago – investigation methods are adapted accordingly in each Nordic country," says Ylänen.

Mining exploration is a growing business. There are several new gold, silver and coppers layers found in the northern part of the countries, where modern mining enrichment processes can be used and make the mine development projects financially sound. Operators are moving from shallow coring to deep-hole coring.

Geothermal drilling has been well applied already during the latest few decades. It all started when the government addressed direct and indirect subsidies, but during the last few years the private and communal investments have become profitable on their own.

"The depths of the geothermal holes may change between the countries and between areas of the country, but in general we are drilling deeper now, close to 300m. The payback time of the average, complete geothermal installation is between five and seven years," says Ylänen. ♥

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6t GM100 drilling rig in action



This article was written by Jukka Ylänen, managing director, Geomachine, Finland. For more information: [www.geomachine.fi](http://www.geomachine.fi)