

Measurement While Drilling

Technical specification



Measurement While Drilling, MWD, is an optional function for logging and recording drill performance parameters during drilling of holes in a tunnel.

Introduction

One of the most difficult, yet extremely important, steps in drifting and tunnelling is to predict the geological and geomechanical properties ahead of the tunnel face, particularly in stretches where rock formations are expected to vary considerably. Early prediction of these properties can save much valuable time and money and improve safety by allowing appropriate measures to be taken before reaching the difficult and dangerous formations.

Measurement While Drilling, MWD, is a method for collecting appropriate drilling data and presenting it systematically on the office computer for evaluation and prediction.

The MWD method has been developed to be an integral part of the normal drill and blast activities. A Boomer rig with Rig Control System (RCS) can be upgraded for MWD application. Since the procedure of collecting MWD data can be combined with other normal drilling activities, this method can be easily integrated into normal tunnelling activities.

MWD data can be used for immediate evaluation. As soon as the recorded data is available, the results of the recorded data can be plotted and evaluated.

Features

- Eight different parameters can be sampled during drilling
- Data can be sampled during normal drilling at a pre-defined interval
- Data is handled and stored in the rig's Rig Control System
- Easy transfer of data to and from the drill rig

Functions

MWD data can be recorded from selected holes either at the driller's choice or controlled by a parameter from the drill plan. In both cases eight parameters are recorded at the pre-defined interval that can be set from 2 cm and upwards*.

The recorded parameters are:

- Penetration rate
- Feed pressure
- Percussive pressure
- Rotation pressure
- Rotation speed
- Damper pressure
- Water pressure
- Water flow

The parameters are recorded in the rig and stored on a PC-card, on a USB-stick or for transfer via network. The data is then used in the office computer for documentation and evaluation of the results.

* The value 2 cm is valid for penetration rates of 3 m/min or less. For higher penetration rates the sample interval will increase.



Detailed graph of the percussion pressure for one hole.

Requirements

- MWD is intended for use on Boomer rigs equipped with Rig Control System (RCS) and Advanced Boom Control, ABC Regular or ABC Total
- If collection of data is planned in longer than single-pass holes the feeds should be equipped for extension drilling
- The MWD option is an option per boom. One or all booms on the rig can be equipped for MWD data collection

MWD evaluation

- MWD data can be evaluated with the Atlas Copco software Tunnel Manager Pro or Tunnel Manager MWD. MWD data is completely integrated with other basic functions in the Tunnel Manager software. For further details, please see the technical specifications for Tunnel Manager Pro and Tunnel Manager MWD.