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39049 Sterzing/ Vipiteno (BZ)  
Italien

Leoben, May 24, 2016

## **Ref.: Mine ventilation measurements, confirmation of compliance**

1. The Chair of Mining Engineering and Mineral Economics of Montanuniversitaet Leoben in Austria carried out mine ventilation measurements in the Kristallina mine of the Omya Company in Sterzing/Italy during the last nine years: from October 2007 until May 2016.
2. The mine ventilation measurements comprised many measurement campaigns of several weeks each.
3. During the measurement campaigns the following parameters were recorded in typically 30 locations in the underground mine:
  - a. Air velocity and drift cross sections to calculate the volume of air flow
  - b. Quality of air in terms of oxygen content, Carbon monoxide and Carbon dioxide concentration, Nitrogen oxide concentrations
  - c. Air temperature and humidity
  - d. Absolute air pressure
4. The parameters recorded were analyzed and compiled to mine ventilation reports. In total around 10 ventilation reports were prepared.



5. As a general conclusion from the 9 years measurement activities it can be concluded that:
  - a. The ventilation situation in the whole underground Kristallina mine of the Omya Company in Sterzing/Italy is excellent.
  - b. At no moment during the ventilation measurements a concentration of toxic gases was measured that was close to the TLV value or above. All gas measurements showed a high content of oxygen and very low contents of toxic gases.
6. During the period when the primary mine ventilation was done with the help of three ventilation shafts and a ventilation adit, the air flow volume in the mine was sufficient. Since the development of the fourth ventilation shaft and the installation of two more main fans, the air flow volume in the mine is now widely oversized.
7. The whole primary ventilation system with four underground ventilation shafts, one main ventilation adit as an exhaust airway and three adits as intake airways is rather efficient. The exhaust fumes are taken away from the work places very efficiently. The whole mine (apart from the exhaust airway) is under depression.
8. In case of a mine fire the fumes would leave the mine through the ventilation shafts and the exhaust airway where typically no people are working.
9. Opportunities for improvement of the primary ventilation system would comprise:
  - a. Re-design of the two main ventilation fans installed on the ventilation shaft C
  - b. Introduction of a "Ventilation system on demand" on the basis of continuous toxic gas and oxygen measurements
10. The secondary ventilation systems in the mine blow fresh air to working places with only one entrance. These secondary systems fulfill their requirements in terms of fresh air volume, but they are far from being designed and implemented in an optimized way. They show a very high amount of circulating air volumes and short circuits.



As a general final comment it is recommended to carry out ventilation measurements in the future once a year, verifying the excellent quantity and quality of the air in the underground Kristallina mine of the Omya Company in Sterzing/Italy.

Regards



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Head of the Chair

Public certified expert for Mining