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Subjects: Mining, Mining Engineering   Tags: engineering, mine, mining, presentation, reference, standard, training
Assignment

Investigate different ventilation systems for deep gold mines
Where to start ...
How to search

Youtube video
Searching 101 (4:24)
Ruth Gaba
Concordia University, Wisconsin

http://www.youtube.com/watch?v=0oBr-sxqd-E&list=PLefFgHkOe-s4-4jStalcwsReJB8UyqB9b
But how?

- analyse **T**opic
- **U**nderstand concepts
- determine **K**eywords
- do the **S**earch
Assignment

Investigate different ventilation systems for deep gold mines
Assignment

Investigate different ventilation systems for deep gold mines

• Ventilation systems
• Deep gold mines
Where to search

• Encyclopaedias and reference works
• Handbooks
• Research articles
• Internet
Search University of Pretoria Libraries and beyond.

- ventilation systems
- ventilation systems in Title

See all results for ventilation systems
1. The control of noise in ventilation systems: a designer's guide
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2. Improved life cycle performance of mechanical ventilation systems.
   by Great Britain, Department of Trade and Industry, Chartered Institution of Building Services Engineers
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Water quality: guidelines, standards, and health: assessment of risk and risk management for water-related infectious disease

by Lorna Fewtrell, Jamie Bartram, World Health Organization

Print book 2001

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[BOOK] Eighth International Mine Ventilation Congress
By Gillies, A.D.S. (2005)

The International Mine Ventilation Congress series has become a very important way for those with an interest in mine ventilation and atmosphere control to share information and new developments.... More ▼

See Inside ▼

[CHAPTER] 29.8 Mine Ventilation

...required are =242 gal per hour. MINE VENTILATION Mine ventilation supplies air (oxygen) to underground facilities, d removes dangerous or harmful contaminants such as methane, don, strata gases,... More ▼
Mine Ventilation and Air Conditioning

Table 5 Heating Values for Fuels

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>1000 Btu/ft³</td>
<td>Kennedy 1996</td>
</tr>
<tr>
<td>Propane</td>
<td>90,000 Btu/gal</td>
<td>Kennedy 1996</td>
</tr>
<tr>
<td>Bituminous coal</td>
<td>12,300 to 14,400 Btu/ft³</td>
<td>Abbecon Cal 2001</td>
</tr>
<tr>
<td>Fuel oil</td>
<td>143,000 Btu/ft³</td>
<td>Abbecon Cal 2001</td>
</tr>
<tr>
<td>Wood</td>
<td>15,000,000 to 31,000,000 Btu/cord</td>
<td>Abbecon Cal 2001</td>
</tr>
</tbody>
</table>

shows that the CO content of intake air heated by direct-fired burners can reach 10 to 20 parts per million.

Equation (18) is used to calculate the total heat required, assuming that the air has a low humidity ratio (which is the case for very cold air), and that no water is evaporated in the heater. Heating values for different fuels are given in Table 5.

Heat, Btu/h = (Airflow, cfm)(60 min/h)(density, lb/ft³) × (0.24 Btu/lb°F)(ΔT, °F)  

where ΔT = 34°F minus the intake air temperature.

Example 6. A mine is located where the atmospheric air temperature can drop to ~20°F for two or more weeks per year. Occasionally the temperature drops to ~30°F. An intake shaft handles 400,000 cfm, and the density of air entering the shaft in winter is 0.070 lb/ft³. What heating should be installed at the shaft intake to keep the shaft free of ice?

Solution: Sizing heaters is usually based on average cold periods, not extreme cold snaps. Here, a direct-fired heater is sized to raise ~20°F of the intake air to a safe temperature.

29.11

Nonuranium metal mines range from 75 to 150 cfm per diesel horsepower, depending on the reference cited. With the current emphasis on controlling diesel emissions, start planning at 100 cfm per horsepower.

Total airflow is a summation of airflows for individual work areas, plus a leakage factor. Leakage is defined as airflow that does not ventilate any active work area or permanent site such as a pump room. A "tight" system minimizes leakage through well-constructed doors and seals, by minimizing the number of possible leakage paths, and by careful fan placement. Leakage can range from 10% of total airflow at a tight metal mine to 80% at some coal mines.

The ratio of tons of air per ton of ore production is about 2 to 4 for block cave mines, 6 to 8 for nondieselized cut-and-fill metal mines, and 9 to 16 for dieselized metal mines. Gassy coal and uranium mines can have significantly higher ratios, depending on the methane or radon generation rate.

Example 7. A new mechanized cut-and-fill gold mine is planned. Ore production is expected to be 1,200,000 tons per year. Intake air density is 0.070 lb/ft³. What is the rough airflow required for ventilation?

Solution: The airflow range is 9 to 16 tons of air per ton of ore for dieselized metal mines. For a first-pass guess, assume an average 12.5 tons per ton. The total weight of the air through the mine in a year is

(1,200,000 tons ore per year) × (12.5 tons air per ton ore) = 15,000,000 tons air per year
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Exploring the use of deep level gold mines in South Africa for underground pumped hydroelectric energy storage schemes
Review article
Renewable and Sustainable Energy Reviews, Volume 78, October 2017, Pages 668-682
Frank Winde, Friederike Kaiser, Ewald Erasmus
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Integrated energy simulation of a deep level mine cooling system through a combination of forward and first-principle models applied to system side parameters
Research article
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Research and Application of Controlled Circulating Ventilation in Deep Mining
Open access, Research article
Procedia Engineering, Volume 84, 2014, Pages 758-763
Wang Peng, Zhu Kunlei, Zhou Yu, Liu Jingxian, Shi Changyan
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- Exploring the use of deep level gold mines in South Africa for underground pumped hydroelectric energy storage schemes
  - Review article
  - Renewable and Sustainable Energy Reviews, Volume 78, October 2017, Pages 668-682
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- Assessment of mine ventilation systems and air pollution impacts on artisanal tanzanite miners at Merelani, Tanzania
  - Research article
  - Journal of Cleaner Production, Volume 116, 10 March 2016, Pages 118-124
  - Laurent Paul Mayala, Marcello M. Veiga, Mohammad Babaei Khorzoughi
  - Download PDF (725 KB)
Publication history

Currently known as:
Mining Technology: Transactions of the Institute of Mining and Metallurgy (2018 - current)

Formerly known as
<table>
<thead>
<tr>
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<tr>
<td>Volume 122 2013</td>
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<tr>
<td>Issue 4</td>
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<tr>
<td>2013 pages 185–255</td>
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<td>Issue 1</td>
</tr>
<tr>
<td>2013 pages 1–61</td>
</tr>
<tr>
<td>Volume 121 2012</td>
</tr>
</tbody>
</table>
Subsurface flow and transport process model for time dependent mine ventilation simulations

G L Danko

Pages: 134-144

Published online: 18 Nov 2013

Abstract | Full Text | References | PDF (847 KB)
Control of smoke flow in tunnel fires using longitudinal ventilation systems—a study of the critical velocity
Y Wu, MZA Bakar - Fire Safety Journal, 2000 - Elsevier
Abstract The “critical velocity” is the minimum air velocity required to suppress the smoke spreading against the longitudinal ventilation flow during tunnel fire situations. The current techniques for prediction of the values of the critical velocity for various tunnels were mainly

Applications of computational fluid dynamics (CFD) in the modelling and design of ventilation systems in the agricultural industry: A review
T Norton, DW Sun, J Grant, R Fallon, Y Dodd - Bioresource technology, 2007 - Elsevier
Abstract The application of computational fluid dynamics (CFD) in the agricultural industry is becoming ever more important. Over the years, the versatility, accuracy and user-friendliness offered by CFD has led to its increased take-up by the agricultural engineering

A critical review on the performance and design of combined cooled ceiling and displacement ventilation systems
A Novosebac, J Srebic - Energy and buildings, 2002 - Elsevier
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