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International Hazard Datasheet on Occupation

Artisan and Small Scale Miner

What is a Hazard Datasheet on Occupation?

This datasheet is one of the international Datasheets on Occupations. It is intended for those professionally concerned with health and safety at work: occupational physicians and nurses, safety engineers, hygienists, education and information specialists, inspectors, employers' representatives, workers' representatives, safety officers and other competent persons.

This datasheet lists, in a standard format, different hazards to which Artisan and Small Scale Miners may be exposed in the course of their normal work. This datasheet is a source of information rather than advice. With the knowledge of what causes injuries and diseases, is easier to design and implement suitable measures towards prevention.

Who is an artisan miner?

A worker who mines precious metals and ore using non-mechanized, rudimentary tools and simple recovery and processing techniques.

What is dangerous about this job?

- Work carried out in confined spaces at risk for low oxygen and extreme temperatures
- Risk of methane and coal explosions
- Risk for falling objects
- Inhalation of silica dust leading to lung disease
- Potential for mercury and arsenic inhalation and poisoning
- Repetitive motion, awkward postures, and heavy work leading to musculoskeletal injuries

Hazards related to this job

Accident Hazards 	Risk of deadly explosions from methane and coal explosions.	1 2 3
	Electrical shocks, thermal and electrical burns caused by equipment and tools.	4
	Chemical burns from the skin or eyes coming in contact with rock dust, lime or sulfuric acid (a byproduct of mining).	4
	Accidents related to falling rocks from unstable pillars supports and improper storage of waste rock.	4 5
Physical Hazards 	Numbness in the hands and arms caused by vibrating tools.	4 6 7
	Hearing loss caused by repeated exposure to loud noises in the form of tools, blasting, drilling, crushing and ore processing.	4 7
	Heat stress resulting in dizziness, faintness, shortness or difficulty breathing, palpitations and excessive thirst.	4 7
	Low oxygen environment causing increased breathing rate, dizziness, nausea, headache, coma, asphyxiation and sometimes death.	1 4
Chemical Hazards 	Mercury inhalation and poisoning resulting in neurological, kidney and autoimmune impairment.	4 8
	Silicosis from dust inhalation during drilling, extracting minerals, ore crushing and blasting processes.	3 4
	Arsenic inhalation, ingestion and poisoning during the smelting process can cause health problems ranging from headaches and convulsions to bladder, skin and lung cancers.	4
	Sulfur dioxide and nitrous oxide inhalation during the initial blasting phase and the later tailings collection phase resulting in airway inflammation, bronchoconstriction and asthma symptoms.	3 4
Biological Hazards 	Water-borne diseases (cholera, malaria, dengue fever) from working or living near areas susceptible to water contamination.	9
	Sexually transmitted infections, HIV and AIDS as a result of the migratory nature of the work and engaging in unsafe health behaviors.	10
	Skin infections due to chemical exposures.	4
	Respiratory infections as a result of living in close quarters.	3
	Drug and alcohol abuse as a result of the isolation and transient nature of the work.	12
Ergonomic, Psychosocial and Organizational Factors 	Stress related to poverty, being away from one's family, long work hours, social isolation, cramped living conditions, loss of work due to injury, fear of injury or death.	12
	Fatigue caused by long work shifts, heavy workloads and repetitive actions.	7
	Chronic injury and fatigue from carrying heavy materials over long distances, and bending over in awkward positions.	11
	Overexertion from uncomfortable postures and carrying out repetitive tasks using non-mechanized tools.	11

Preventive measures

1	Monitor gases through the use of inexpensive gas detector tubes (methane, carbon dioxide, hydrogen sulfide, sulfur dioxide). Use of flame safety lamps to check for methane and oxygen deficiency.
2	Rock dusting limestone or dolomite to prevent explosions. Alternatively, use the wetting method by spraying an area with water to reduce dust levels.
3	Improve air ventilation through the use of fans or exhaust systems.
4	Use appropriate protective equipment (long sleeve shirts, protective gloves, eye protection with side shield, safety helmet, ear plugs and earmuffs, respirator, self-contained breathing apparatus, dust mask).
5	Use scaling down procedures to help stabilize pillars and supports.
6	Replace worn down tools that expose worker to greater noise or vibration levels.
7	Take work breaks to minimize the exposure.
8	Use retorts during the mercury amalgamation step to reduce mercury inhalation. Use gravity only, direct smelting and chemical leaching techniques.
9	Education around waste management (mining, animal and human) and accessing clean water.
10	Education around HIV transmission and prevention, condom use, healthy behaviors.
11	Learn and use safe lifting techniques.
12	Obtain counseling or treatment.

Specialized Information

Synonyms	Small-scale mining, informal mining, artisan mining, prospecting, excavating
Definitions and/or description	Artisan mining is labor-intensive work carried out with low-level mechanized tools. Characteristics of artisan mining include: an informal work sector, limited use of mechanized tools, labor intensive work, low-capital and productivity and limited access to land and markets. Artisanal mining is carried out in 55 countries by 13 million people.
Related and specific occupations	Mining, prospecting, excavating
Tasks	Exploring (mine); crushing (ore); concentrating (ore); adding (mercury to extract ore); adding (heat to remove mercury); commercializing (ore); repairing (site); closing (site).
Primary equipment used	Sledgehammers; hammers; drills; pickaxes; rock crushers; chisels; shovels; wheelbarrows; picks; pans; sieves; sluices; pestle and mortar.
Workplaces where the occupation is common	Mines
References	• International Labor Organization (ILO) (2013). ILO Encyclopaedia of Occupational Health and Safety: Part XI: Industries Based on Natural Resources. Retrieved from the ILO website: http://www.ilo.org/oshenc/part-xi/mining-and-quarrying. • Eftimie, A., Heller, K., Strongman, J., Hinton, J., Lahiri-Dutt, K., & Mutemeri, N. (2012). *Gender dimensions of artisanal and small scale mining: A rapid assessment toolkit*. Washington, D.C.: The World Bank. • Hinton, J. (2006). *Communities and small-scale mining: An integrated review for development planning* World Bank. • Hinton, J., Veiga, M. M., & Beinhoff, C. (2003a). Women and artisanal mining: Gender roles and the road ahead. In G. Hilson (Ed.), *The socio-economic impacts of artisanal and small-scale mining in developing countries* (pp. 1-29). Netherlands: A.A. Balkema, Swets Publishers. • Hinton, J., Veiga, M. M., & Beinhoff, C. (2003b). Women, mercury and artisanal gold mining: Risk communication and mitigation. *Journal De Physique, IV, 107*, 617-620. • Lu, J. L. (2012). Occupational health and safety in small scale mining: Focus on women workers in the philippines. *Journal of International Women's Studies, 13*(3), 103-113. • New South Wales Mine Safety Advisory Council. (2009). *Guide to the management of musculoskeletal disorders in the NSW mining and extractives industry*. New South Wales: Industry and Investment New South Wales. • Scott, D., Merritt, E., Miller, A., & Drake, P. (2009). Chemical-related injuries and illnesses in US mining. *Mining Engineering, 61*(7), 41. • Thorsen, D. (2012). *Children working in mines and quarries: Evidence from west and central africa*. Senegal: UNICEF. • Twerefou, D. K. (2009). *Mineral exploitation, environmental sustainability and sustainable development in EAC, SADC, and ECOWAS regions*African Trade Policy Centre, Economic Commission for Africa. • Walle, M. & Jennings, N. (2001) *Safety and health in small-scale surface mines: A handbook*. Geneva, Switzerland: International Labour Organization.

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