Dust hazards in assay labs

Assay laboratory employers have a duty of care under the *Occupational Safety and Heath Act (1984)* to not expose workers or others at the workplace to hazards.

- Milling or pulverising ore samples for assaying generates dust.
- Ore samples may contain crystalline silica, asbestos and/or other hazardous substances.
- Both respirable crystalline silica and asbestos may cause lung diseases including fibrosis and cancer through inhalation.
- Dust may be generated at different points in the work process.
- WorkSafe air monitoring data indicates that excessive exposures to inhalable dust, respirable dust and respirable crystalline silica commonly occur in these workplaces.

NOTE: This document relates to dust from the samples – not to lead dust from flux.

WorkSafe Bulletin

Employer responsibilities

Identifying dust hazards

- Communicate with clients about the types of samples and associated hazards.
- Identify all hazards associated with samples eg. silica, asbestos, heavy metals. Consider the source geology.
- Identify dust hazards throughout the process, including during sample unloading, storage, milling, weighing, analysis and subsequent residue storage, transport and disposal.
- Require clients to document any hazards associated with their samples. This should be documented on the paperwork for the sample and the sample labels, if practical.

Assessing health risks

- Assess the risk to health from hazardous substances and keep a record of the outcome of the assessment.
- Keep a full report of the risk assessment, where there is a significant risk.

For further guidance on risk assessments for hazardous substances, refer to the Guidance note for the assessment of health risks arising from the use of hazardous substances in the workplace [NOHSC: 3017 (1994)].

Type of risk assessment

- Exposure standards for hazardous substances must not be exceeded.
- Workers should be consulted as part of the risk assessment.
- In most assay laboratory environments, it will not be possible to get an accurate indication of the health risks associated with airborne silica and asbestos as hazardous airborne dust levels may not be visible to the naked eye.
- Engaging an occupational hygienist to undertake air monitoring is a way to assess the risk accurately.
- If exposure levels are more than 50 per cent of the exposure standard, this should be considered an ‘action level’ and controls reviewed to ensure exposure is minimised.

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Review of risk assessment

- The risk assessment must be reviewed at least every five years or if any significant change occurs.
- In milling work, due to the regular changes in sample composition and the potential for gradual changes in engineering controls, as well as the seriousness of the risk, risk assessments must be reviewed frequently to ensure that the risks associated with different types of samples are understood and quantified. Air monitoring at least annually is recommended in these circumstances.

Controlling dust hazards

Ways to reduce risks from hazardous substances, include:

- Prevent exposure to the hazardous substance - for example, the assay lab may implement a policy of not accepting samples from areas with high levels of naturally occurring asbestos.
- Use controls other than personal protective equipment - if it is not practical to prevent exposure. This can include a combination of the controls listed below:
    - Consider isolating the work from workers eg. by the use of robotic sample preparation equipment.
    - Use local extraction ventilation systems to remove dust at source from each mill and crushing machine. Ensure local extraction ventilation systems are designed with an airflow that will effectively capture dust released by the equipment.
    - Provide suitable equipment to prevent dust becoming airborne. For example, instead of using compressed air to blow down equipment, a vacuum system should be used. Compressed air should not be used to clean milling machines.
    - Ventilation systems must be designed so that dust can be collected for disposal without exposing workers to dust hazards.
    - Engineering controls such as ventilation systems and vacuum cleaners must be well maintained.
    - Do not sweep dust, as it will generate dust clouds in the breathing zone. Use a vacuum cleaner with HEPA filters instead.
    - The use of compressed air, or dry brushing, shaking or sweeping in any work involving asbestos is prohibited.
    - Where there are no practicable alternatives to using compressed air for cleaning machinery, ensuring the machinery is installed in a work booth or similar, equipped with a local extraction ventilation system with an airflow sufficient to capture dust released by the cleaning process.
- Use personal protective clothing and/or equipment - if the risk cannot be adequately managed by (a) and (b) above. Depending on the results of the risk assessment and the effectiveness of other controls, in an assay lab environment protective clothing and equipment may include:
    - safety glasses;
    - safety boots;
    - Class P1 or Class P2 particulate respirator;
    - personal hearing protection; and
    - protective coveralls.
- Provide safe systems of work and information, training and supervision
    - The *Occupational Safety and Health Act 1984* requires that the employer provide safe systems of work.
    - Safe working procedures should be documented for handling samples.
    - These procedures should cover safety and health aspects of all handling of samples, including but not limited to storage, transport, milling, cleaning up (routine and/or spill situations), weighing, analysis and disposal.
    - Specific procedures and higher level controls may be required where the samples are known to have significant asbestos content.
    - Before commencing work, workers must be provided with information and training on the:
        - potential health risks associated with the hazardous substances;
        - control measures in place;
        - correct use of control measures;
        - correct care and use of personal protective clothing and equipment; and
        - need for, and details of, any health surveillance.
    - Records of the above training must be kept.
    - Adequate supervision of workers must be provided including during non-standard work shifts, for example night work.

Health surveillance

- Provide health surveillance at no cost to the person, if the health of a person is at risk as a result of their exposure to crystalline silica or asbestos.
- Keep results of health surveillance confidentially for 30 years.
- Consider factors such as duration of dust exposure, level of exposure and frequency of exposure to determine whether health surveillance is likely to be required.

Further information

- Occupational Safety and Health Act 1984 and Occupational Safety and Health Regulations 1996, available from the State Law Publisher.

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