

Dust Management Standard

Under The Health and Safety at Work Act (2015), Ravensdown has a primary duty of care to look after the health and safety of its workers, this includes exposure to airborne contaminants such as dust and the potentially harmful substances contained in dust.

This Standard has been put in place to create an environment where our people work that does not exceed Workplace Exposure Standards (WES) and discharges beyond the boundaries of our sites do not exceed National Environmental Standards (NES).

Purpose

To effectively risk assess and manage the critical risk associated with dust to create an environment where our people are safe.

Essential Factors Considerations

People

- ✓ People are trained and understand the risk of dust on their health and the environment

Plant

- ✓ Dust generation is considered when operating plant and suppression controls are put in place to lessen the impact on the health of our workers and the environment

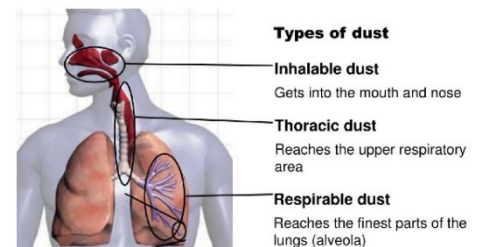
Process

- ✓ Processes consider the risk of dust and controls are put in place that follow the hierarchy of control to ensure minimum impact occurs on our workers health and the environment

Dusts are particles suspended in air, originating from the grinding down of solids or the stirring up of powders or other finely divided materials. Dusts encountered in the workplace typically contain particles covering a wide range of sizes.

Inhalable dust is the portion (or fraction) of airborne dust that is taken in through the mouth and nose during breathing.

Respirable dust corresponds to the fraction of total inhalable dust that is able to penetrate and deposit in the lower bronchioles and alveolar region in the lung.



Exposure Standards:

Workplace exposure standards (WES) are values that refer to the airborne concentration of substances at which it is believed that nearly all workers can be repeatedly exposed day after day without coming to harm.

- The Time Weighted Average (TWA) is the limit of exposure you should have if being exposed to the dust over an 8-hour shift.
- The Short-Term Exposure Limit (STEL) is a spike in exposure of the dust. A STEL is normally a 15-minute average unless specified. A STEL is named to protect workers against effects of irritation, chronic tissue changes or narcosis.
- For longer shifts (longer periods of exposure) the TWA goes down, there is a simple calculation to adjust the TWA.
- Inhalable dust exposure standard is 10mg/m³ TWA for 8 hours.
- Respirable dust exposure standard is 3mg/m³ TWA for 8 hours.
- Some products that produce dust have a specific Workplace Exposure Standard (WES) that is different to the inhalable and respirable dust limits above due to the nature of the product.

Critical Risk Factors and Critical Controls

Critical risk factors and control are site specific due to the sources of dust and the effects of dust across the business. Some sites will have common risks and controls which will be identified from site specific risk assessments.

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Planning & Risk Assessment

- ☐ The source of dust emissions on site are to be identified and a risk assessment conducted to determine the characteristics and health effects of the dust, who is at risk, how they could be exposed and how bad it could be if they are.
- ☐ A Gap Analysis (GA) will be undertaken for every site and a subsequent action plan put in place as we work towards meeting this standard.
- ☐ This forms part of an ongoing improvement process to ensure dust emissions are minimised.
- ☐ The source of dust emissions on site that can be discharged over the site boundary are to be identified and a risk assessment conducted to determine the characteristics and environmental effects of the dust, using the FIDOL method.
- ☐ Occupational exposure monitoring is scheduled and regularly conducted to determine if workplace exposure standards for dust are exceeded. This is to be done at least two yearly.

Work Environment, Equipment & Activities

- ☐ Stopping the discharge of dust is the primary approach, followed by removal of people, engineering controls, administration and finally PPE.
- ☐ Where risk assessments warrant RPE, the appropriate type must be available, with people trained in their use, fit tested and used as required to keep people safe.

People & Training

- ☐ Occupational health monitoring requirements and schedule are determined based on the health effects of the dust.
- ☐ Routine occupational health monitoring is undertaken as scheduled.
- ☐ Health monitoring is conducted on employment and exit from the business.

Documentation

All sites which generate dust must put in place a plan to:

- ☐ Address the issue of dust on your site looking at high level risk first.
- ☐ Verify (including occupational exposure monitoring) the effectiveness of the control measures undertaken to ensure they are working as intended and exposure to dust is below workplace exposure standards.

Dust Reduction Techniques

What follows is a list of possible dust reduction techniques that could be applied to specific areas/processes once the risk assessment has been completed. Consideration must be given to mitigating the risk of dust with controls in the following order, with administration and PPE controls only used as a last resort once Elimination and Substitution, Isolation and Engineering options and opportunities have been exhausted:

Elimination Controls

- Consider if there is anything that can be done to eliminate dust from the task such as not using cleaning methods which generate dust clouds.
- Setting specifications for raw material and finished products that have reduced dust values.
- Work with suppliers of raw materials and finished products to continually look at methods to reduce dust levels.
- Supplier evaluations on product dust levels to promote continuous improvement.
- Compressed air is not to be used for general cleaning except for loader radiator blowback. If compressed air is to be used a thorough risk assessment is undertaken to ensure no harm is being done to people and the environment.

Substitution Controls

- Granulated/Flaked/Compacted lime
 - Glaze additive dust suppressant
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Isolations Controls

- Dust curtains, physical or mist type, on rock hoppers.
- Localised extraction and hoods on plant, hopper etc.
- Use of industrial vacuums where appropriate, except where sulphur dust is present.
- Limiting pedestrian access to dusty areas during intaking or despatching.
- Isolation of dusty products (stores).
- Add cameras reporting back to a control room to reduce number of physical inspections performed.
- Encapsulating bays of dusty products.
- Transport fine powder with screws rather than conveyor belting.
- Enclose conveyors, screens, mills.
- Isolate operators from dust- enclosed mobile plant, working from sealed control rooms.
- Separate working zones so that non-dusty activities do not occur within dusty zones.

Engineering Controls

- Repair damage to buildings housing dusty products to reduce leaks to air.
 - Maintain dust extraction equipment where applicable.
 - Intake hoppers are to have dust reduction baffles in place.
 - Reduce drop heights and pour onto established heaps where able.
 - Programme to clean outside surfaces (via CAM).
 - Have dust reduction systems in place with associated maintenance plan.
 - Use of cones that close on nil product through them to reduce dust in varying feed rates and flows, with associated maintenance regimes to ensure they are kept operational.
 - All loaded trucks to be tarped on leaving site.
 - Reduce spill points, engineer out where possible.
 - Enclosing load outs.
 - Flexible load out socks (elephant trunk/telescopic type, winches up as load fills).
 - Enclosed screens.
 - Review spillage points to reduce spillage, CCTV's in critical areas to limit physical presence in dusty areas.
 - Ensure adequacy of extraction systems where installed.
 - Double door entry to control rooms, positive pressure.
 - Dust extraction on all despatch points (requires an appropriate system if recovering cannot use water unless recovered back into manufacture scrubber system).
 - Dust extraction in rock sheds
 - Buildings with closing doors to encompass an entire vehicle while loading or unloading.
 - Positive pressure control rooms with fresh air inlets.
 - Double screening at despatch with fines re-granulated with a binder.
 - Hoppers with extraction or dust suppression at off load ports.
 - Specific (rather than general) extraction (like welding extraction systems.)
 - Truck washes for quarries.
 - Reduce loader travel by installing conveyors with minimal drop points to reduce spillage.
 - Scrapers on conveyors to remove entrained material and prevent carry back.
 - Seals are adequate, especially around hatches, on plant such as the mixer and den.
 - Add ventilation into buildings.
 - Prevent overflow from plant.
 - Dust cannons.
 - Foam sprays
 - Water cart.
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Administrative Controls

- Product specifications for product limiting dust.
- Practice FIFO where possible to ensure product does not age too much and break down to dust.
- Limit ssp product to less than 6 months old, to reduce break down from age.
- Loaders to trim buckets to reduce spillage and reduced speeds to reduce spillage and dust to air.
- Commercial sweeping.
- Weather protocols for Aerowork.
- Cover all intake belting, extract air where appropriate.
- Rotate roles to reduce exposure time.

Personal Protective (PPE) Controls

- Use and availability of RPE.

Environment

Discharge of dust can be determined using the FIDOL approach as laid out in the Ministry for the Environment Good Practice Guide for Assessing and Managing Dust:

- Frequency
- Intensity
- Duration
- Odour character
- Location

This review can allow ranking and subsequent prioritisation using a risk-based approach and carried out alongside health-based assessments.
