

GOOD PRACTICES FOR CRUSHING OF MINERALS/RAW MATERIALS

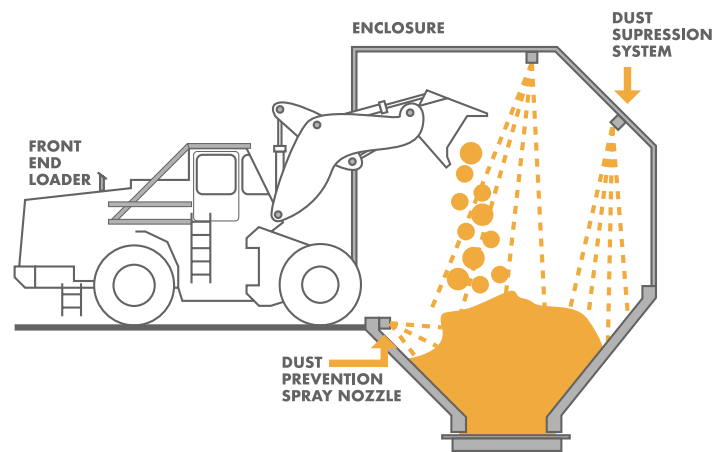
Large quantities of airborne dust may be generated when minerals containing crystalline silica are fractured during crushing operations.

ACCESS

Restrict access to the work area to authorised personnel only. This will help to protect people from the airborne dust hazard and from other hazards associated with crushing e.g. noise and ejected particles.

DESIGN AND EQUIPMENT

- Control of dust at source should be via enclosure of the process, plus water sprays and/or exhaust ventilation.
- The use of water sprays may not be suitable in all cases, depending on the material/process and also the weather conditions. If necessary to keep the material dry, then enclosure and exhaust ventilation may provide the best option.
- When material is fed by a wheel loader or dumper, flexible strip curtains will help to enclose the crusher loading point.
- Machine controls should be located well away from sources of airborne dust generation.
- If it is necessary for someone to constantly supervise the operation of a crusher, then an enclosed, sealed cab should be provided.
- The use of CCTV systems will enable operators to check the operation of the crusher without being exposed to high dust levels.
- Operator's cabs (control rooms) should be physically separated from dusty areas and fed with clean fresh air, supplied under positive pressure. Alternatively, cabs should be fitted with air conditioning, equipped with an air filter that is designed to withstand a high loading of respirable dust particles.
- In order for the positive pressure supply or air conditioning system to provide the greatest protection from dust exposure, the doors and windows of the cab must be kept closed at all times while the crusher is in operation.



- Timing of crushing operations, to coincide with the wetter seasons of the year, will help to reduce airborne dust generation. Consideration should also be given to the use of water sprays to suppress dust.
- Location of a crusher outdoors will result in better ventilation, thus reducing airborne dust concentrations.
- If a crusher is located inside a building, then a good standard of through ventilation will be required to control dust levels.

MAINTENANCE

- Maintain the cab air conditioning system as advised by the supplier, in effective and efficient working order.
- The air conditioning filter should be changed at the interval (in terms of hours of machine operation) advised by the manufacturer.
- Put in place measures to control the risk of bacterial growth within water sources used across site, focusing most on systems where water droplets will be generated.

EXAMINATION AND TESTING

- Exhaust ventilation systems should be subject to regular examination and testing of their performance according to manufacturer's recommendations and legal requirements.
- Crusher operators should check the condition of the cab air conditioning filter as recommended by manufacturers.
- Any faults with the air conditioning/filtration system must be reported as soon as possible so that remedial action can be taken.
- Keep records of inspections for a suitable period of time which complies with national laws (minimum five years).
- Put in place measures to control the risk of bacterial growth within water sources used across site, focusing most on systems where water droplets will be generated.

CLEANING AND HOUSEKEEPING

- A build up of fine dust on the internal surfaces of the operator's cab might suggest a problem with the air conditioning system.
- Preference should be given to the use of vacuum or wet cleaning methods. Avoid using a dry brush when cleaning the internal surfaces of the operator's cab.

TRAINING

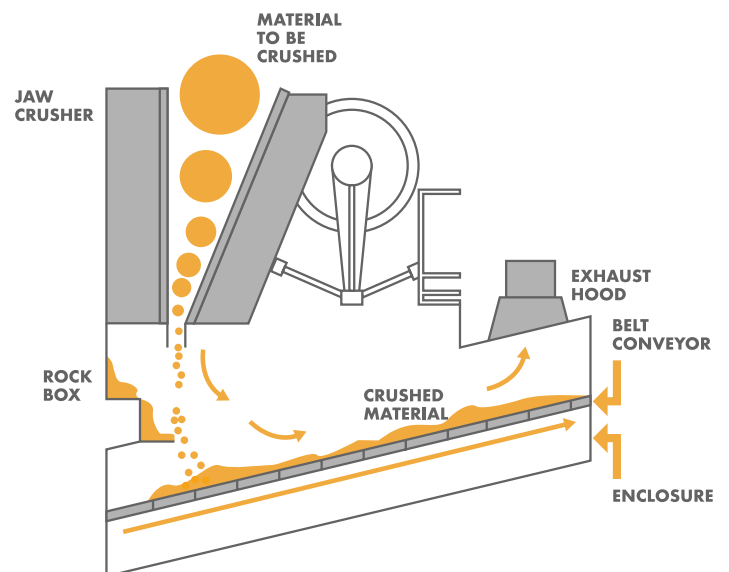
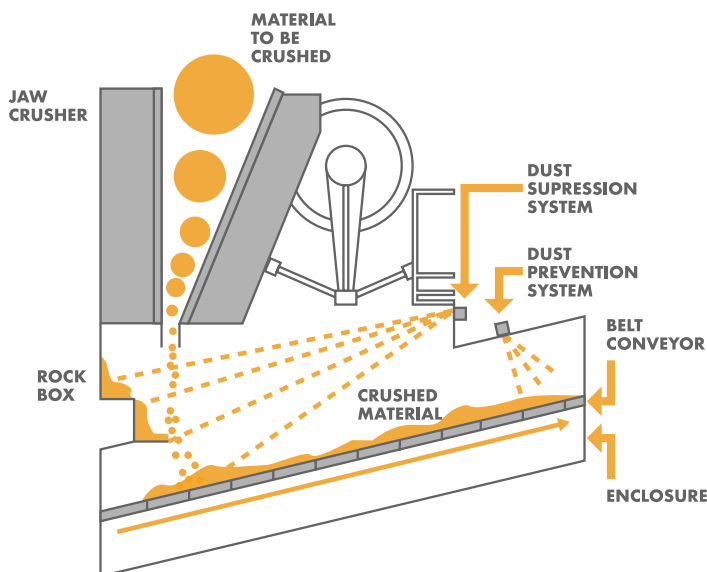
- Give your employees information on the health effects associated with respirable crystalline silica dust.
- Provide employees with training on: dust exposure prevention; checking controls are working and using them; when and how to use any respiratory protective equipment provided and what to do if something goes wrong. Refer to task guidance sheet **2.3.4** and part 1 of the Good Practice Guide.

SUPERVISION

- Have a system to check that control measures are in place and that they are being followed. Refer to task guidance sheet **2.3.3**.
- Employers should make sure that employees have all the means to perform the checklist given below.

PERSONAL PROTECTIVE EQUIPMENT

- Refer to task guidance sheet **2.1.15** dedicated to Personal Protective Equipment.
- Risk assessment must be carried out to check the effectiveness of control measures.
- Provide storage facilities to keep personal protective equipment clean when not in use.
- Replace respiratory protective equipment at intervals recommended by its suppliers.



EMPLOYEE CHECKLIST

- Make sure the water sprays and/or exhaust ventilation system are working.
- Keep the cab or control room doors and windows closed at all times when the crusher is in operation.
- Check the condition of the air conditioning filter once a week.
- Keep records of all safety checks on a daily check sheet.
- Look for signs of dust build up on the surfaces of the cab. This may be a sign that the air filter is in poor condition.
- If you think there is a problem with your dust control equipment, ensure additional control measures are taken to reduce exposure to respirable crystalline silica dust while the problem persists.
- Keep the interior of the cab clean.
- Wear a dust mask when it is necessary to enter dusty areas in order to manually split large boulders, during routine plant checks and during maintenance work.
- Use, maintain and store any respiratory protective equipment provided in accordance with instructions.

This guidance sheet is aimed at employers to help them comply with the requirements of workplace health and safety legislation, by controlling exposure to respirable crystalline silica. Specifically, this sheet provides advice on the use of a crusher to break down boulders of quarried material into smaller lumps.

Following the key points of this task guidance sheet will help reduce exposure.

Depending on the specific circumstances of each case, it may not be necessary to apply all of the control measures identified in this sheet in order to minimise exposure

to respirable crystalline silica. i.e. to apply appropriate protection and prevention measures. This document should also be made available to persons who may be exposed to respirable crystalline silica in the workplace, in order that they may make the best use of the control measures which are implemented.

This sheet forms part of the Good Practices Guide on silica dust prevention, which is aimed specifically at the control of personal exposure to respirable crystalline silica dust in the workplace.