GOOD PRACTICES FOR TRANSPORT SYSTEMS FOR FINE DRY SILICA PRODUCTS

This activity relates to the design of the transport systems for fine dry silica products.

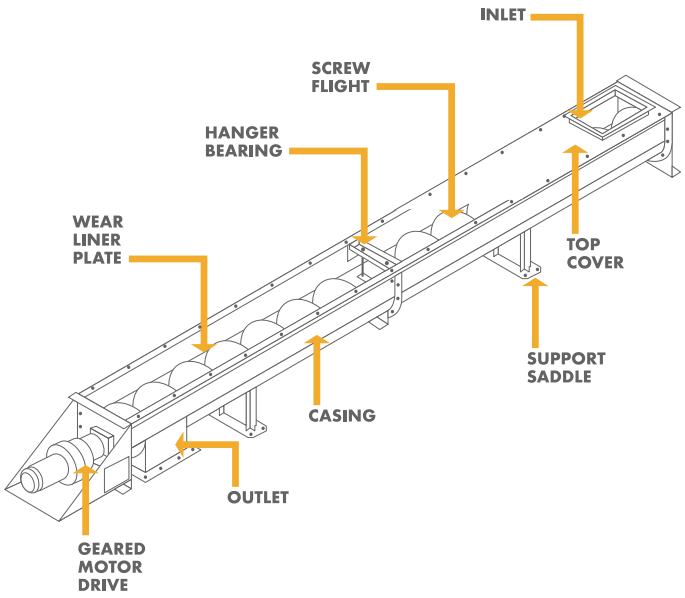
ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- It is preferable to use enclosed handling systems when transporting silica flour.
- **Pneumatic systems** are appropriate for both horizontal and vertical transport of silica flour.
- For horizontal transport in **pneumatic systems**, pipes should be angled downwards where possible to prevent flour settling in the pipes and causing a blockage in the event system pressure is lost.
- The pipe work in **pneumatic systems** should be designed to minimise unnecessary obstacles and to minimise sharp bends. Pipe connections should be properly sealed.
- For **air slides**, the fluidising air will be drawn away by the dust extraction system. For this reason, air slides cannot be used if the product is too fine. If the surface area is more than 10,000 cm^2/g, use screw conveyors. More than one de-dusting connection may be required on long lengths in order to correctly balance airflows.
- **Air slides** should be inclined slightly in order to assist the horizontal transport of silica flour. The quality of the cloth used in air slides should be selected to avoid excessive pressure loss for the fan, whilst also preventing silica flour from falling through the cloth and causing it to become blocked.
- For **screw conveyors**, the screw must be enclosed. Specialist design is required due to the abrasive properties of silica flour (contact an experienced supplier).
- **Screw conveyors** may need to be equipped with dust extraction systems unless they are connected to equipment that already operates under negative pressure. Refer to task guidance sheet **2.1.13**.

- **Conveyor belts are not suitable for the transportation of loose silica flour.** However, they may be used for the transport of other, coarser, materials and in machinery that handles bags of silica flour. Conveyors handling bags of silica flour, or other dusty materials, should be enclosed and equipped with dust extraction.
- **Elevators** are suitable for vertical transport, provided they are fully enclosed. Dust extraction systems may be required unless elevators are connected to equipment that already operates under negative pressure.
- It may be necessary to apply fluidising air at the base of **silos** holding silica flour. Such systems should be designed so that the fluidising air is only applied at times when it is necessary to make the silica flour flow out of the silo. Fluidising air should not be left switched on permanently in situations where the air could migrate and cause silica flour to be emitted under pressure from elsewhere in the system.



MAINTENANCE

- Ensure equipment used in the task is maintained as advised by the supplier/installer in efficient working order and in good repair.
- Replace consumables (filters etc.) in accordance with the manufacturer's recommendations.

EXAMINATION AND TESTING

- Visually check the equipment at least once per week for signs of damage or, if it is in constant use, check it more frequently. If used infrequently, then check it before each use.
- Obtain information on the design performance of the dust suppression and/or extraction equipment from the supplier. Keep this information to compare with future test results.
- 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

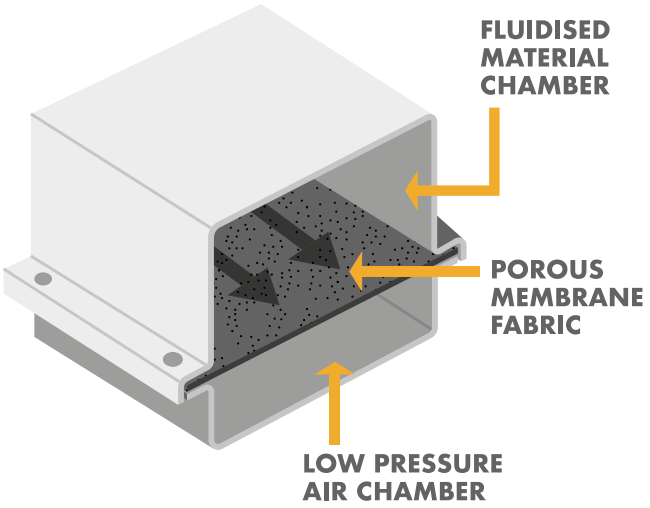
- Clean your workplace on a regular basis.
- **DO NOT clean up with a dry brush orusing compressed air.**
- Use vacuum or wet cleaning methods.

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 on the following page.



PERSONAL PROTECTIVE EQUIPMENT

- Refer to task guidance sheet **2.1.15** dedicated to Personal Protective Equipment.
- Provide pictograms on doors to indicate areas where respiratory protective equipment must be worn.
- Provide storage facilities to keep personal protective equipment clean when not in use.
- Provide enough places where Personal protective equipment can be found (e.g. box with disposable dust masks). Indicate those places with pictograms.

EMPLOYEE CHECKLIST

- ☐ Look for signs of damage or wear of building parts and of your work equipment. If you find any problems, tell your supervisor.
- ☐ Problems with silica flour transportation systems may be indicated by emissions of dust into the workplace air and by the appearance of piles of silica flour on floors and surfaces. Report any of these to your supervisor.
- ☐ 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.
- ☐ Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- ☐ Clean up control cabins using vacuum or wet cleaning methods.
- ☐ Use, maintain and store any respiratory protective equipment provided in accordance with instructions.
- ☐ Check and implement the measures of controlling the risk of bacterial growth within water sources used across site, focusing most on systems where water droplets will be generated.

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 design of transport systems for silica flour products.

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.