

# GOOD PRACTICES FOR DESIGN OF DUST EXTRACTION UNITS

This activity relates to the design of dust extraction units (i.e. fan, filter and dust collector) which make up part of a dust extraction system.

This guidance sheet is to be read in conjunction with the sheets entitled “Design of ducting” and “Local exhaust ventilation”.

## ACCESS

Restrict access to the work area to authorised personnel only.

## DESIGN AND EQUIPMENT

- In order to prevent emission of dust, equipment handling materials containing crystalline silica dust should be designed so that ductwork is always under negative pressure, properly sealed (in case the negative pressure fails) and with no more flanges and inspections holes than necessary.
- Examples of dust extraction units include drop-out boxes, cyclones, wet scrubbers, bag filters and electrostatic precipitators. Some units use a combination of techniques.
- When selecting filter units, consider
  - the need for a pre-separator (pre-cyclone);
  - the dust loading, moisture content and particle size distribution;
  - the total air flow and maximum temperature at the filter;
  - the presence of any chemical contaminants in the air;
  - chimney stack particulate emission limits;
  - environmental noise limits;
  - maintenance requirements (frequency, work required);
  - their location, which should be outside the main working area, away from draughts and the prevailing wind;
  - the need for inclination of more than 60° at the base of the discharge hopper to help prevent blockages.
- If it is necessary to clean non-process air, a bag filter should be used (the use of a cyclone is not appropriate).
- Design the chimney with appropriate access and sockets for emission monitoring.

See for example:

[hse.gov.uk/pUbns/priced/hsg258.pdf](https://hse.gov.uk/pUbns/priced/hsg258.pdf)

[publikationen.dguv.de/dguv/pdf/10002/209-084.pdf](https://publikationen.dguv.de/dguv/pdf/10002/209-084.pdf)



## MAINTENANCE

- Ensure dust extraction equipment is maintained as advised by the supplier/installer in efficient working order and in good repair. Replace filter cloth and other consumables in accordance with the manufacturer's recommendations.
- **Take extra measures regarding protection of employees during maintenance activities of dust extraction systems.**

## GUIDANCE FOR EMPLOYERS ON CONTROLLING EXPOSURE TO RCS IN THE WORKPLACE

### EXAMINATION AND TESTING

- The condition of a filter can be monitored by checking the pressure drop across it using a pressure gauge.
- Stack emissions testing and/or continuous monitoring from dust extractors (with audible and visual alarms) as may be required by the environmental permit can help to check the performance of the system.
- Have the whole system examined and tested against its performance standard upon installation and at least once each year.
- 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

- Deal with spills immediately.
- **DO NOT clean up with a dry brush or using 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 below.

### PERSONAL PROTECTIVE EQUIPMENT

- Refer to task guidance sheet **2.1.15** dedicated to Personal Protective Equipment.
- Risk assessment must be carried out to determine whether existing dust controls are adequate. If necessary, respiratory protective equipment (with the appropriate protection factor) should be provided and worn (e.g. during maintenance activities of dust extraction equipment).
- 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

- |                                                                                                                                 |                                                                                                                                                  |                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Check the pressure drop across the filter daily to ensure that it remains within the acceptable range. | <input type="checkbox"/> Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. | <input type="checkbox"/> Check and implement measures to control the risk of bacterial growth within water sources used across site, focusing most on systems where water droplets will be generated. |
| <input type="checkbox"/> Check the condition of the filters cloths regularly.                                                   | <input type="checkbox"/> If you think there is a problem with your dust control equipment, ensure additional control measures are taken          |                                                                                                                                                                                                       |
|                                                                                                                                 | <input type="checkbox"/> Follow appropriate procedures when working with dust extraction systems.                                                |                                                                                                                                                                                                       |

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 dust extraction units, which make up part of a dust extraction system.

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.

Dust extraction systems are used to capture dust at transfer points, chutes and many other dusty points in industrial processes.

All installations must conform to European standards.