

# GOOD PRACTICES FOR DESIGN OF DUCTING

This activity covers design of the ductwork, which makes up part of a dust extraction system.

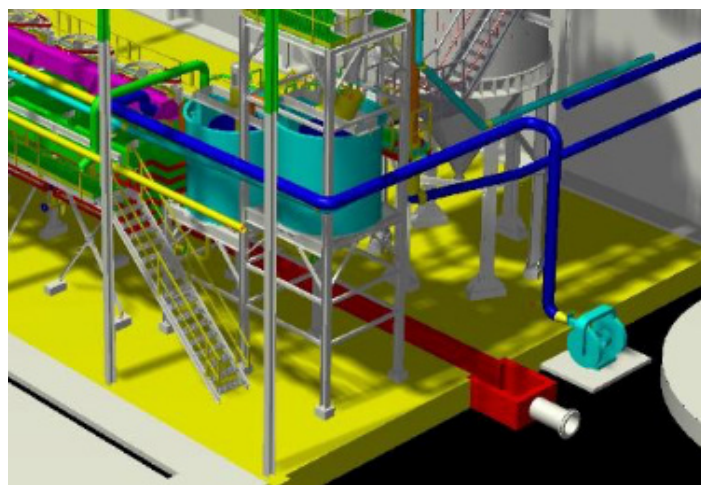
This guidance sheet is to be read in conjunction with the sheets entitled "local exhaust ventilation" and "design of dust extraction units".

## ACCESS

Restrict access to the work area to authorised personnel only.

## DESIGN AND EQUIPMENT

- Use a reputable supplier of ducting. Contact only qualified engineers to quote for the work.
- Keep ducts short and simple.
- **Avoid long sections of flexible duct, which add resistance that restricts the flow of air.**
- Design ductwork to avoid dusts settling inside the duct.
- Settling of dust can be prevented by ensuring a transport velocity which is appropriate to the particle size and density. As an example, for process dusts, a minimum velocity of 20 m/s is recommended. For fine dusts it's 15 m/s. See [hse.gov.uk/pUbns/priced/hsg258.pdf](https://hse.gov.uk/pUbns/priced/hsg258.pdf)
- Where ductwork is divided into several branches, optimal transport velocities can be achieved by varying the diameter of the ducting, such that it gets larger as it approaches the dust collector.
- Design ductwork to minimise internal wear, which may be associated with abrasive dusts.
- Choose an appropriate duct material, which is resistant to wear.
- To minimise resistance and wear, minimise the number of bends in ductwork. Where bends are necessary, make them gradual to reduce shock losses.
- Provide appropriate test points for use when checking the performance of a dust extraction system. Provide suitable sealing devices for these test points when not in use.



## MAINTENANCE

- Maintain the ductwork as advised by the supplier, in efficient working order and good repair.

## EXAMINATION AND TESTING

- Visually check ductwork at least once per week for signs of damage. If it is in constant use, check it more frequently. If used infrequently, then check it before each use.
- Check for any leaks in the ductwork and seal as necessary with duct sealing tape. Repair or replace any sections of ductwork that become damaged. Any dents will cause resistance to the flow of air, affecting the efficiency of the whole system.
- Have the whole system examined and tested against its performance standard 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.

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

### CLEANING AND HOUSEKEEPING

- If it becomes necessary to clean (or unblock) the internal surfaces of ductwork, this activity should be conducted by trained and competent individuals following a written safe working procedure.
- **Do not clean up with a dry brush or using compressed air.**
- Where possible, use vacuum cleaning methods to remove obstructions inside ducts. Use either vacuum or wet cleaning methods to clean up spillages of dust in the working environment.

### 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 controls are adequate. If necessary, respiratory protective equipment (with the appropriate protection factor) should be provided and worn.
- 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"/> Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. | <input type="checkbox"/> 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. | <input type="checkbox"/> Clear up spills straight away. For dry dusts, use vacuum or wet cleaning methods.                      | <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"/> 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 design of ducting, for connection to a dust extraction unit in the workplace.

It describes the key points you need to follow to help design an efficient system of ductwork, which is easy to maintain.

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.