GOOD PRACTICES FOR BAG EMPTYING – SMALL BAGS

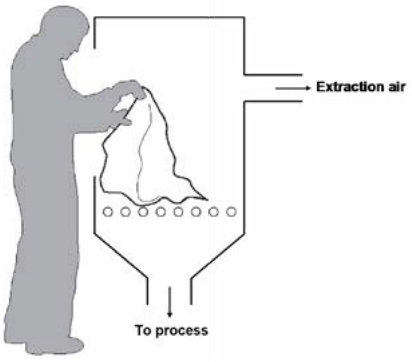
This sheet provides advice on emptying of small bags of products containing crystalline silica in a production unit, particularly those containing dry materials.

ACCESS

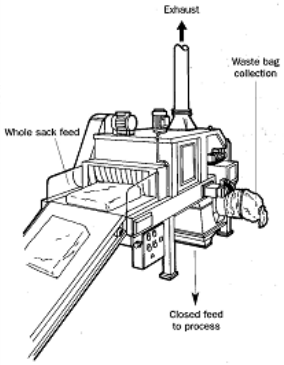
Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- Ensure bag emptying equipment is fit for purpose.
- Enclose the bag emptying equipment as much as possible and keep it under negative pressure by using a local exhaust ventilation system – refer to task guidance sheet **2.1.13**.
- For small bags, the use of automatic or semi-automatic bag dumping stations is recommended for emptying the bags.
- Ensure workers tip the bag contents gently – never dump them. Bags should be emptied with the open end facing away.
- Bag crushing creates a lot of dust. Workers should roll up empty bags within the extraction zone.
- In order to dispose of empty bags without creating dust, drop them into a large plastic sack supported and held open by a metal frame. When it is full, seal the sack and dispose of it in a suitable waste skip. **DO NOT let the waste sack overflow.** Alternatively, use a compactor equipped with a dust extraction system or which is fully enclosed.
- Bag emptying equipment should be connected to a suitable dust arrestment system (e.g. bag filter/cyclone). A permanent dust extraction system is preferred, though a stand-alone mobile unit is acceptable.
- Bag emptying equipment should be designed for easy access to all parts for maintenance, unblocking and cleaning. Access panels should be interlocked or have trip devices where necessary to prevent persons accessing dangerous parts of machinery.
- Consider providing mechanical/pneumatic assistance with bag handling.
- Where possible keep bag emptying equipment away from doors, windows and walkways to prevent draughts affecting the performance of dust extraction systems.
- Provide a clean air supply to the workroom to replace extracted air.



Manual Bag Emptying



Automated Bag Emptying

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 cleaning equipment for signs of damage at least once per week 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 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.
- 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 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

- ☐ Make sure the ventilation system is working properly. Make sure the dust extraction system is switched on and is working correctly before starting work.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell 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.
- ☐ Use handling aids when available.
- ☐ Clear up spills straight away. Use vacuum or wet cleaning methods.
- ☐ Clean up work rooms using vacuum or wet cleaning techniques.
- ☐ 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 good practice advice on dust control during small bag emptying operations.

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.

GOOD PRACTICES FOR BAG EMPTYING – BULK BAGS

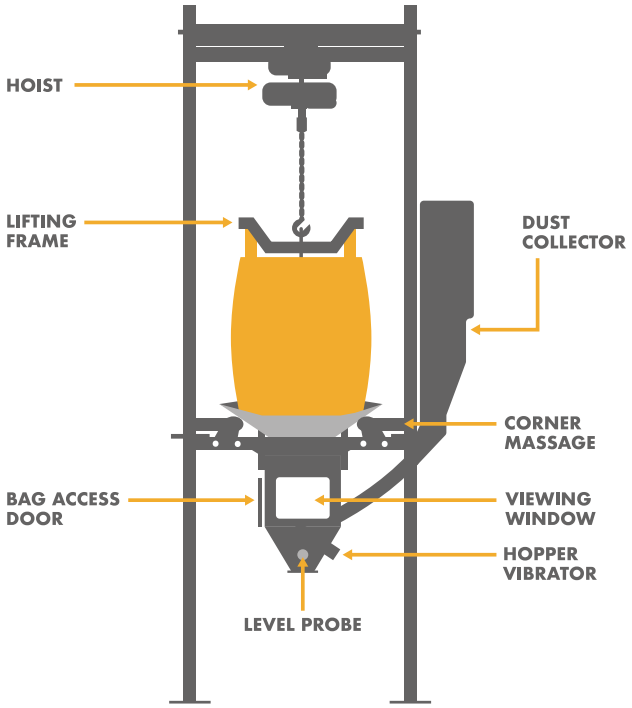
This sheet provides advice on how to empty bulk bags (big bags) of products containing crystalline silica in a production unit, particularly those containing dry materials.

ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- Ensure bag emptying equipment is fit for purpose.
- Enclose the bag emptying equipment as much as possible and keep it under negative pressure by using a local exhaust ventilation system – refer to task guidance sheet **2.1.13**.
- **Manual bag cutting is not recommended without the use of personal protective equipment.**
- For single trip bulk bags without inner liner, use bag emptying equipment featuring pyramidal cutting knives and a rubber membrane to seal off the bag bottom.
- For multiple trip bulk bags, a discharge system with vibrator plate should be used and this should be equipped with local exhaust ventilation.
- Where multiple trip bulk bags are used, which have inner liners, special dust-free outlet connection systems are available which have double ring seals and fully enclosed product discharge.
- In order to dispose of empty bags without creating dust, do not manually compress the empty bags. Instead, drop them into a large plastic sack supported and held open by a metal frame. When it is full, seal the sack and dispose of it in a suitable waste skip. **DO NOT let the waste sack overflow.** Alternatively, use a compactor equipped with a dust extraction system or which is fully enclosed.
- Bag emptying equipment should be connected to a suitable dust arrestment system (e.g. bag filter/cyclone)
- Bag emptying equipment should be designed for easy access to all parts for maintenance, unblocking and cleaning. Access panels should be interlocked or have trip devices where necessary to prevent persons accessing dangerous parts of machinery.
- Consider providing mechanical/pneumatic assistance with bag handling.
- Where possible keep bag emptying equipment away from doors, windows and walkways to prevent draughts affecting the performance of dust extraction systems.
- Provide a clean air supply to the workroom to replace extracted air.



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 cleaning equipment for signs of damage at least once per week 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 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.
- 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 sheets **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

- ☐ Make sure the ventilation system is working properly. Make sure the dust extraction system is switched on and is working correctly before starting work.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell 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.
- ☐ Use handling aids when available.
- ☐ Clear up spills straight away. Use vacuum or wet cleaning methods.
- ☐ Clean up control rooms using vacuum or wet cleaning techniques.
- ☐ 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 good practice advice on dust control during bulk bag emptying operations.

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.

GOOD PRACTICES FOR BATCH CHARGING INTO THE PROCESS - GLASS

This activity relates to the charging of the humid batch by special charging machines from the furnace hopper into the melting furnace, which due to its operating conditions (high temperatures combined with positive pressure) generates a certain amount of dust.

ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- Ensure that charging equipment is fit for purpose and well maintained.
- Adjust the sand seal system in accordance to supplier recommendations.
- Enclose the charging area as far as technically feasible.
- Assure the batch is charged at the appropriate humidity factor into the furnace.
- Furnace hoppers for the wet batch material should have an opening as small as practicable.
- Furnace hopper to be equipped with high level detection linked to alarming system to avoid overfilling.
- Ensure proper ventilation in the charging area.

MAINTENANCE

- Ensure that the equipment is maintained as advised by the supplier in efficient working conditions.
- Check sand seal system on a daily base and adjust if necessary in accordance to supplier recommendations.

EXAMINATION AND TESTING

- Visually check the equipment for signs of damage at least once per week or, if it is in constant use, check it more frequently. If used infrequently, then check it before each use.
- 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

- In order to prevent dust accumulation, clean the workplace on a regular basis.
- Deal immediately with spills. When dealing with bulk spillages of fine, dry, dusty materials, ensure that cleaning work is undertaken following a written safe working procedure and using the information in this sheet.
- Use vacuum or wet cleaning methods.
- **DO NOT clean up with a dry brush or using compressed air.**

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.
- If necessary, respiratory protective equipment 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.
- Risk assessment could be carried out to determine whether existing controls are appropriate.

EMPLOYEE CHECKLIST

- ☐ Verify proper function of sand seal. If you notice any anomaly, inform your supervisor.
- ☐ Immediately cleaning up bulk spillages of fine, dry dusty materials by using vacuum or wet cleaning methods. Ensure that you work in accordance with your Company's written safe working instruction.
- ☐ Use, maintain and store any person 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 charging of the humid batch by special charging machines from the furnace hopper into the melting furnace.

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.

GOOD PRACTICES FOR BULK ROAD TANKER UNLOADING (BLOWING OFF)

This activity covers the discharge of silica sand and flour products from a road tanker into a storage silo, particularly dry materials.

ACCESS

Restrict access to the work area to authorised personnel only.

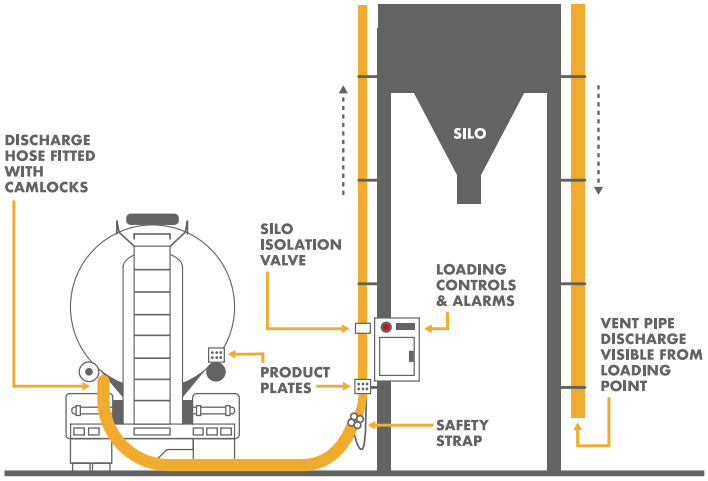
DESIGN AND EQUIPMENT

Road Tanker

- Limit the discharge rate to the design capacity of the receiving silo and dust extraction unit. Offloading pressures should be agreed with the silo operator.
- Tanker offloading pipes, connectors and seals must be designed to withstand the high air pressures and abrasion associated with blowing operations.
- Note that there will be a surge of air pressure as the last sand/flour is blown into a silo. Hence the need for constant supervision of offloading operations.

Customer silo

- Storage silos should be purchased only from reputable suppliers.
- Appropriate engineering design methods should be employed to ensure adequate structural strength.
- Engineering controls must be employed to prevent over-pressurisation of the silo while it is being filled. Ensure that the silos are equipped with pressure relief devices and high level alarms. They must also have dust extraction systems to remove and clean the displaced air.
- Silo dust extraction units must be fitted with filters that are appropriate to the particle size range of the product.
- Offloading pressures should be agreed with the tanker operator.
- Note that flour products have varying bulk density. Put in place procedures to ensure that silos are not overfilled.
- Silos should be equipped with a dust extraction system to prevent the emission of dust from the silo during tanker offloading.



- Pipework and ductwork should be designed to minimise shock losses (caused by bends, constrictions etc.); to minimise dead spots where material may accumulate and to facilitate easy clearing of blockages.
- Silo connection points should be located as close as possible to the delivery tanker parking area. This will eliminate the need for long lengths of flexible hose.
- Safe means of access should be provided to those parts of the silo requiring inspection and maintenance.

MAINTENANCE

- Maintain pipes/hoses, connectors and seals in good condition to reduce the likelihood of dust escaping during blowing operations.
- Dust extraction systems on silos must be maintained in accordance with manufacturers' instructions.

EXAMINATION AND TESTING

- A competent person should test the performance of dust extraction systems at least annually.
- Tanker drivers should check the condition of pipes/hoses and seals daily and obtain replacements as necessary.
- Any faults with the pipes/hoses/connectors and silo dust extraction systems must be reported as soon as possible so that remedial action can be taken.
- Put in place measures of controlling the risk of bacterial growth within water sources used across site, focusing most on systems where water droplets will be generated.

CLEANING AND HOUSEKEEPING

- The tanker offloading area should be kept clean and tidy.
- Clean your workplace on a regular basis.
- 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

- Ensure procedures are in place to prevent overfilling of silos.
- Have a system to check that dust 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.
- Respiratory protective equipment (with the appropriate protection factor) may need to be worn when disconnecting the offloading pipe at the back of the tanker, when remedying any escape of dust or in the event control measures fail.
- Provide storage facilities to keep personal protective equipment clean when not in use. Replace this equipment at intervals recommended by suppliers.

EMPLOYEE CHECKLIST

- ☐ Tanker drivers must supervise their offloading operations at all times.
- ☐ Agree offloading pressures with the customer.
- ☐ Check the condition of pipes, hoses and connectors daily.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell 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.
- ☐ Clean up spillages of sand and flour immediately, using wet cleaning methods.
- ☐ Wear a dust mask when it is necessary to enter dusty areas in order to rectify any escape of dust, or in the event other control measures fail.
- ☐ 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 how to minimise the release of airborne dust when blowing off a road tanker of silica sand or flour.

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.

GOOD PRACTICES FOR BULK UNLOADING

This activity covers bulk unloading operations for road (except road tankers), rail and water transport of crystalline silica containing materials, particularly dry materials. Sheet **2.2.4a** offers advice on unloading of road tankers.

ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- Ensure that all unloading equipment is fit for purpose and well maintained.
- When discharging dry products, install dust extraction systems in areas where dust may be emitted into the workplace air.
- Consider isolating the discharge area and keeping it under negative pressure. Alternatively, provide control rooms which are sealed and kept under positive pressure.
- The truck driver should remain in the cab of the truck during unloading with the doors and windows closed. Where possible, a HEPA filter should be incorporated in the cab's HVAC system.
- Design the size and shape of receiving hoppers so that they are appropriate to the capacity of the road haulage vehicles, rail wagons, grabs etc feeding them.
- Prepare offloading procedures. Ensure that hoppers and discharge areas are clearly labelled with their contents.
- **DO NOT discharge flour products in the open air; enclosed systems must be used.**
- See task guidance sheet **2.2.4a** entitled "Bulk Road Tanker Unloading" for advice on blowing off dry products from road tankers.

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 cleaning equipment for signs of damage at least once per week 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 dust extraction equipment from the supplier. Keep this information to compare it 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.
- 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.
- Ensure that delivery drivers are provided with copies of offloading procedures and training on these as necessary.

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.
- Indicate the need for respiratory protective equipment to be worn using appropriate pictogram signs.
- 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 unloading equipment is working properly.
- ☐ Make sure the dust extraction system is switched on and is working.
- ☐ Wear respiratory protective equipment (e.g. a dust mask) in areas where this has been deemed necessary.
- ☐ Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell 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 while the problem persists.
- ☐ Clear up spills straight away. Use vacuum or wet cleaning methods.
- ☐ Use, maintain and store any respiratory protective equipment provided in accordance with instructions.
- ☐ Check and implement the measures to control 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 good practice advice on dust control during bulk unloading operations.

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.

GOOD PRACTICES FOR GLASS FURNACE BATCH CHARGING – CONTAINER GLASS

This activity relates to the charging of glass making raw materials, which contain crystalline silica, to the glass melting furnace.

This guidance sheet is to be read in conjunction with the sheet entitled Cleaning of surfaces and installations **(2.1.1)**.

ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- The extent to which the batch charging equipment can be sealed against the egress of airborne dust is limited by its' operational characteristics and the need to work in harsh temperature conditions. Other design and operational features can reduce the release of dust.
- Stream feed of materials into the batch charger from the furnace batch hopper will:
  - Prevent the blow back of dust into the atmosphere as a result of the furnace atmosphere being held at a positive pressure.
  - Prevent dust being created by materials falling from a height into the charger.
- If delivery equipment linking the furnace batch hopper to the batch charger is used instead of flood feed, then the charger hopper should be fitted with level detection/control to prevent it emptying and allowing blow back of dust into the atmosphere.
- If delivery equipment linking the furnace batch hopper to the batch charger is used instead of flood feed, then it should be sealed against the release of dust where possible.
- In the glass industry the use of moist batch (typically 1-3% moisture content) is the normal practice, which aids dust suppression.
- If dry batch is used then it is recommended that some form of dust extraction or dust suppression should be fitted.
- Furnace hopper to be equipped with level detection to avoid over filling.

MAINTENANCE

- Maintain any dust seals fitted to equipment.
- Maintain charging system to prevent any batch spillages.
- Maintain any level detection equipment that is fitted.
- If a dust extraction system is fitted it must be maintained in accordance with the manufacturers' instructions.

INS

EXAMINATION AND TESTING

- A competent person should test the performance of dust extraction systems at least annually.
- The batch charging system should be inspected for faults or signs of wear that could cause batch spillages once per week or if it is in constant use, more frequently. If used infrequently, then check it before each use.
- 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 the batch charger and the surrounding area on a regular basis.
- **DO NOT clean using compressed air.**
- If practicable, use a vacuum or wet cleaning measures.
- Develop written safe working procedures for dealing with large spillages of dusty materials.

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.
- Appropriate respiratory protective equipment must be provided when carrying out cleaning and if necessary maintenance procedures.
- Provide storage facilities to keep personal protective equipment clean when not in use and replace as required by manufacturers' instructions.
- Risk assessment must be carried out to determine whether existing controls are adequate.

EMPLOYEE CHECKLIST

- ☐ Make sure the equipment is working properly.
- ☐ Look for signs of wear that can lead to batch spillage.
- ☐ If fitted make sure all dust extraction systems are working correctly.
- ☐ Dust clouds may suggest a problem with the system. Investigate them immediately.
- ☐ If you think there is a problem with the plant or 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 or wet cleaning methods. Dispose of spills safely
- ☐ 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 dust control during the charging of glass making raw materials to the furnace.

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.

GOOD PRACTICES FOR USING WATER/ ADDITIVES ON THE ROADS OR OPEN SURFACES TO REDUCE DUST LEVELS

This sheet provides advice on the use of water, additives or a combination of both to reduce dust levels on the roads or in open surfaces in a quarry. This activity relates to the use of water sprays, atomized water mists or additives (e.g. calcium chloride, etc.) to suppress the generation and lower the concentration of airborne crystalline silica dusts on the roads or in open surfaces. Another option is to use lime or cement to stabilise the roads when needed.

ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- For paved roads, consider using a road sweeper.
- If possible, use water fed systems (static or mobile), or trucks sprinkling water for both paved and unpaved roads or working surfaces in the quarry.
- In circumstances where there will be no adverse effects on the environment, process conditions, product quality or health and safety, apply water mists in work areas where airborne crystalline silica may be generated by material and product handling.
- When using additives, a previous evaluation of their effects should be carried out.
- Ensure electrical systems have adequate protection when used with water suppression, spraying or misting.
- Take precautions to ensure the control of legionella and other biological agents in water storage and delivery systems.
- Take precautions to ensure that wastewater and sludges are disposed according to local legislation.
- When possible, it is recommended to use recycled water.
- Consider the use of automatic regulation based on weather conditions (e.g. wind speed, rainfall, etc.). Alternatively, establish a procedure to manage the use of the water system.
- Ensure that the system is designed with an appropriate relationship between the size of the dust and the size of the water drop particles.

MAINTENANCE

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

EXAMINATION AND TESTING

- Visually check all equipment for signs of damage at least once per week 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 dust suppression equipment and of the additives from the supplier (if possible). 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 water dust suppression equipment as instructed by the manufacturer/supplier.
- **Avoid accumulation of slurries/sludges.**
- Ensure spills are cleaned up immediately, and provide adequate spill control equipment.
- **Avoid the dispersion of the collected dust of slurries/sludges.**

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** (Training) 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** (Supervision).
- 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

- ☐ Make sure that water dust suppression equipment is working properly.
- ☐ Ensure water supplies are adequate with an uninterrupted supply during use for dust suppression.
- ☐ Protect water supplies against freezing.
- ☐ Look for signs of damage or malfunction, and if you find any tell your supervisor immediately.
- ☐ Clean up spills immediately.
- ☐ Clean dust suppression equipment regularly and after use.
- ☐ Keep personal protective equipment clean and properly stored.
- ☐ 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.

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 in the workplace.

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.

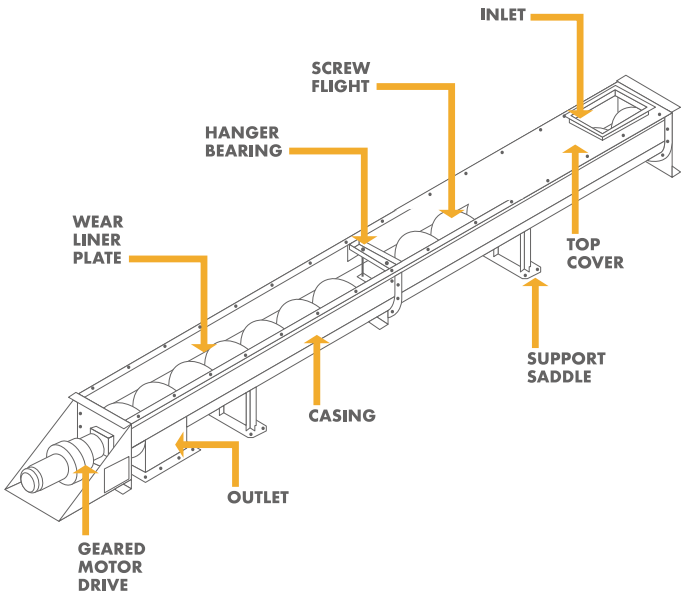
ACCESS

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

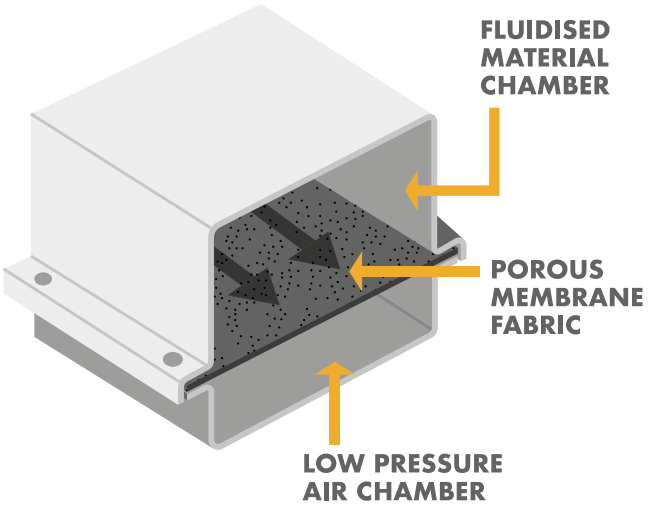
- Clean your workplace on a regular basis.
- **DO NOT clean up with a dry brush orusing compressed air.**
- Use vacuum or wet cleaning methods.

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.

GOOD PRACTICES FOR WATER ASSISTED DUST SUPPRESSION

This activity relates to the use of water flooding and of atomised water mists to suppress the generation and lower the concentration of airborne crystalline silica dusts.

ACCESS

Restrict access to the work area to authorised personnel only.

DESIGN AND EQUIPMENT

- If possible, use water fed tools for cutting, grinding and shaping crystalline silica containing products.
- Consider the application of water sprays or trickles to working surfaces when water fed tools are not available.
- In circumstances where there will be no adverse impact on process conditions, product quality or health and safety, apply water mists in work areas where airborne crystalline silica may be generated by material and product handling.
- Ensure electrical systems have adequate protection when used with water flooding, spraying or misting.
- Take precautions to ensure the control of legionella and other biological agents in water storage and delivery systems.
- Take precautions to ensure that wastewater and sludges are disposed according to appropriate prescriptions.

MAINTENANCE

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

EXAMINATION AND TESTING

- Visually check all equipment for signs of damage at least once per week 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 dust suppression 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 water dust suppression equipment as instructed by the manufacturer/supplier.
- **Avoid accumulation of slurries/sludges.**
- Ensure spills are cleaned up immediately, and provide adequate spill control equipment.
- **DO NOT allow collected slurries/sludges to dry out and the dust to become airborne.**

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 areas where personal protective equipment must be used. 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 personal protective equipment at intervals recommended by the manufacturer/supplier.

EMPLOYEE CHECKLIST

- ☐ Make sure that water dust suppression equipment is working properly.
- ☐ Ensure water supplies are adequate with an uninterrupted supply during use for dust suppression.
- ☐ Protect water supplies against freezing.
- ☐ Look for signs of damage or malfunction, and if you find any tell your supervisor immediately.
- ☐ Clean up spills immediately.
- ☐ Clean dust suppression equipment regularly and after use.
- ☐ Keep personal protective equipment clean and properly stored.
- ☐ 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 good practice advice on dust control by using water flooding and atomised water mists.

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 Document on silica dust prevention, which is aimed specifically at the control of personal exposure to respirable crystalline silica dust in the workplace.